

Twin-Path Extra® Slings provided by Junior and Team Lift-It.
Rigging and Photo: Advanced American Construction - Portland, Oregon

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QUALITY • SERVICE • INNOVATION

"When Only The Best Is Good Enough"

AS9100 ISO9001 ISO REGISTERED



Thirty-three years of dedicated service to the sling and rigging industries has allowed us to earn our reputation for quality, service and innovation.

Only the finest materials are used in our products. These discriminating requirements and the skill of our dedicated, fabrication specialists, with combined experience, which must be expressed in terms of centuries, results in the finest quality products available.

We have always had stringent quality control procedures. Our commitment to excellence was further demonstrated as Lift-It® successfully passed its registration audit and was registered by SAI Global for ISO 9001:2008 and AS9100B:2009, Quality Management Systems-Regulations for Aviation, Space and Defense Organizations. Excellence is our standard, not our goal.

My son and grandson lead a group of dedicated professionals who provide 24/7/365 service. Easter Sunday 2010 found them making slings for a large nuclear facility within driving distance of some of the biggest rigging lofts in the USA. The Lift-It®"family" is ready, willing and able to provide service that our customers demand and have come to expect.

We are active members of the Web Sling and Tie Down Association (WSTDA). I serve as an association director, president and am a member of the technical committees for Web, Roundsling and chair the Legal Resource Committee. We have maintained membership in the Associated Wire Rope Fabricators (AWRF) for the past twenty-five years, where I serve on the technical subcommittees for web slings and roundslings. I am a member of the ASME B30.9 sling subcommittee and belong to the Association of Crane and Rigging Professionals (ACRP). Our participation in these associations and others requires a tremendous amount of time, travel and expense.

We have presented countless accident prevention training programs for over thirty years and have educated thousands of sling users and inspectors. Much of this training has been done at our own expense and has been heralded as the best ever by the participants.

It is impossible to produce a superior product, to bear the costs associated with our contributions to our industry and be the "successful" low bidder. We manufacture the finest rigging available, but what we really offer is safety, service, technical expertise and solutions that exceed our customer's expectations.

Sincerely,

Michael J. Gelskey, Sr.
Chief Executive Officer

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SLINGMAX®

Our catalog is the most complete and descriptive of its kind and we hope that you find it to be a valuable resource. Most catalogs provide minimal details of items with the express intent of sales and commerce.



Our catalog is divided into various sections and we would recommend that you begin by reading the General Information section before any and all others. The General Information section contains important information on Warnings and Product Training that must be read and understood before purchase and certainly before use. Another striking difference about our catalog is the extensive Warning Information section that precedes each Catalog Section. Warning Sections also include specific manufacturer product information for the items we resell.

⚠WARNING is a pointing out and notice of danger. The purpose of a "warning" is to apprise sling users and others involved of the existence of danger of which they should be, but may not be aware of; and to enable sling and rigging users to protect themselves and others, where applicable, against such danger. An attempt is made herein to warn against reasonable and reasonably foreseeable danger in the proper use and possible misuse of products shown in our catalog.

The use of slings and rigging involves more than simply attaching the rigging and lifting the load. The use of slings and rigging is subject to certain hazards that cannot be mitigated by engineered features, but only by the exercise of: intelligence, care, common sense and experience in anticipating the effects and results of any rigging and lifting operation. Use this guidance in conjunction with the warnings, cautions and safety instructions sent out with all products. If you do not receive this information, please contact us or view the details online at www.lift-it.com.

Printed materials can contain outdated or incorrect information. For the most current and accurate information visit www.lift-it.com.

We manufacture our products as if our own loved ones were using them. If you are our customer, you're part of our family and we would encourage you to use all products responsibly so that you return safe and sound to your loved ones, at the end of each and every day. Rig right, to go home at night! If you are not trained or are not sure of what you are doing, DO NOT USE any sling or rigging device until you are absolutely sure of what you are doing.

Thousands of hours have been devoted to carefully developing our catalog. The information contained is © Lift-It Mfg. Co., Inc. 2012. I will track, hunt down and prosecute to the fullest extent of the law, anyone that would reproduce any part of our catalog without our permission. Some have tried and have subsequently paid $2500 for the unauthorized use of a partial page.

Lastly, the dimensions and specifications listed in our catalog are subject to change without notice. Dimensions are nominal and may vary depending upon the lot and source of supply. If dimensions are critical for your application, please make your Lift-It® sales professional aware of your requirements.

Thank you for your consideration and for the opportunity to be of service.

The Lift-It Family

The ⚠WARNING Icon, used throughout our catalog is done to alert sling and rigging users to potentially hazardous conditions and situations.

⚠WARNING Read and understand the information contained in this publication and follow OSHA, ASME, Association, Industry and Manufacturer guidelines. Rigging and manipulating loads involves more than attaching equipment and raising the load. There are certain hazards that cannot be mitigated by engineered features, but only by the exercise of intelligence, care, common sense and experience in anticipating the effects and results of rigging any load with any type of equipment. Use this guidance in conjunction with the warnings, cautions and safety instructions supplied with any product. If you do not receive this information, contact us for additional copies.

⚠WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations.

Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable, or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠WARNING Our Catalog DOES NOT contain all the information you need to know about handling and manipulating materials and loads safely. Sling use is only one part of a lifting system and it is your responsibility to consider all risk factors prior to using any rigging device or product. Failure to do this may result in severe INJURY or DEATH due to sling or equipment failure and/or loss of the load.

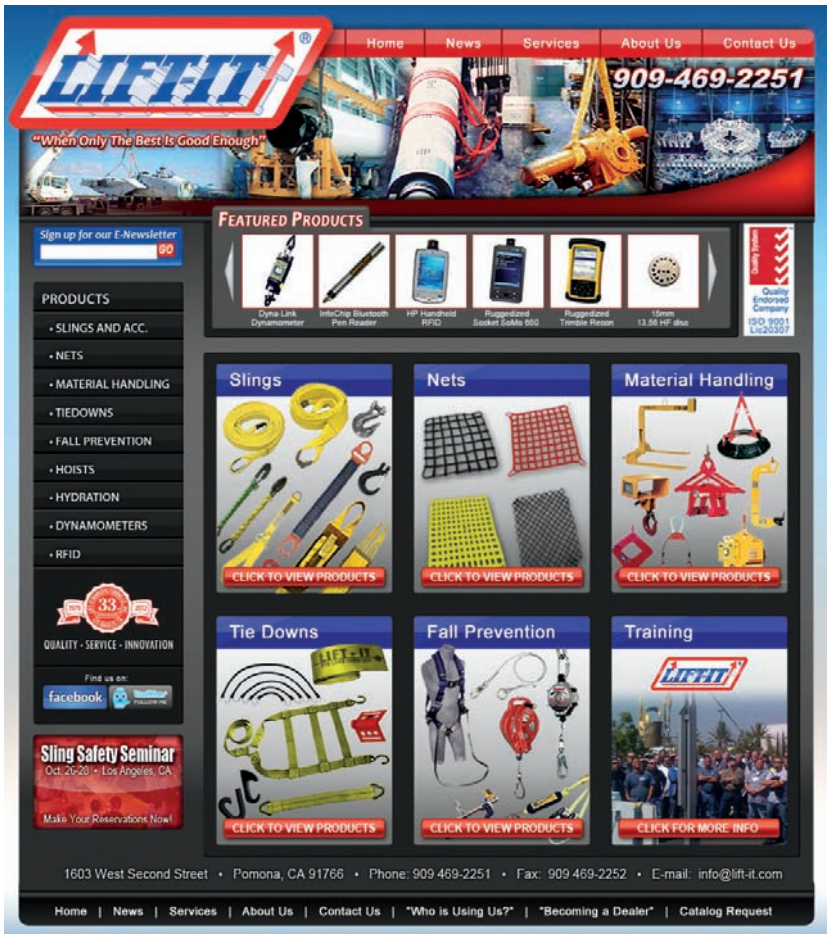
⚠WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and Rigging products will fail if damaged, abused, misused, overused or improperly maintained. Regular inspection must be conducted to determine if any product can be used at the assigned Work Load Limit (WLL) or whether the product shall be removed from service. OSHA and ASME stipulate that a visual inspection of the sling must be made daily or before each shift in Normal service conditions. In addition, Web Sling and Tie Down Association recommends that slings be inspected prior to each use in Severe service conditions. If you are unsure if the required inspection has been done for either service condition, take the time to inspect slings prior to use. Slings that are damaged or determined to be unsafe shall not be used for any application.

⚠WARNING All Work Load Limits (WLL) indicated in our catalog are applicable only to new or "in as new" condition products. Work Load Limits indicate the greatest force or load a device can carry under normal circumstances. Work Load Limits are based upon destruction testing, done in controlled, laboratory conditions, which will never be duplicated during actual usage. Any instantaneous change (sudden drops or rapid acceleration) constitutes hazardous shock loading and THE WORK LOAD LIMITS AS STATED, DO NOT APPLY. Shock loading, side loading and extraordinary or unique conditions must be taken into account when using any device in a rigging system.

⚠WARNING Our Products may contain chemicals known to cause cancer, birth defects and/or other reproductive harm.

Please note that information developed by the Web Sling and Tie Down Association (WSTDA) relative to warnings is included in our catalog with the permission of the WSTDA. This information is © WSTDA-2010.

Our website provides the most current information about our goods and services. Printed material can be obsolete before the ink is dry. Catalogs printed years ago with outdated or technically challenged content may still be part of your reference "library". The Lift-It® website is updated as new information becomes available. Be sure to visit and stay up to date with new technology, industry developments and regulatory guidelines.



Our website features an online catalog and is available to download. You also have access to: Articles of Interest, Lift-It® Newsletter, Frequently Asked Questions, Instructional Videos and Important Use and Warning Information.

Providing valuable information has ALWAYS been a priority for Team Lift-It®. With this in mind we have totally revamped our website and it includes many new features. What does all of this mean for you?

E-commerce for Easy Ordering

In addition to the ways you have always placed your orders, you will also be able to place them online via our new E-commerce enabled website.

Videos-Exciting and Educational

We have developed our own You Tube Channel that will showcase our products and services. We will also be adding educational content.

E-Learning on the Way!

Sling and rigging classes will soon be available, allowing riggers to learn at their convenience.

Communication and "Reaching Out"

Deepening the already strong relationships we have with each of you is very important to us. We have entered the world of Social Media and you will find us on Facebook, LinkedIn and Twitter. Each of these communication platforms are available to alternatively reach us. Join the conversation with Team Lift-It and network to share the latest information. We still answer emails, faxes and have caring people that greet each caller instead of reaching a dial by name directory.

We've got an App for that!

Get ready for the Lift-It® Sling User Lifting App. Use our Mobile App whenever you need to calculate sling tension. Valuable information is at your fingertips to assist in proper sling selection. Available soon it will contain valuable use and inspection information for responsible sling users. The new app will soon be ready for download at the App store®.

Knowledge is Power.

You can join our online newsletter and view featured articles to keep up with the latest news from Lift-It®. Industry professionals turn to us for the most in depth and leading edge knowledge available. Be sure to sign up and start receiving the Lift-It® Newsletter. Receive promotional information and news of Webinars, training sessions and professional development programs.

Sling and Rigging Training

Long before it was fashionable, I began training sling users and inspectors. I would travel anywhere, at my own expense and flap my gums around the clock to educate men and women with the goal of enabling them to perform their jobs more safely. Our motto and mission has always been, "Accident Prevention through Education".

Even after thirty years, I am still passionate about the training I present and know that I have a sacred duty to instill a quest for excellence in my students that goes far beyond traditional sling and rigging topics. My energy is contagious and at the conclusion of my presentations, at jobsites, mines and power plants, my students applaud and thank me for my message, which is: God, country, family, respect for life, life's blessings and excellence that does not allow compromise.

We are honored in our association with Rigging Institute and particularly the people that make Rigging Institute a great training organization: Mike Riggs, Connie Riggs, Tom De Soo and Harley Gist.

These folks are as dedicated and passionate about your safety as I am or we would not be associated. They also operate on a level of integrity and morality that is not only rare, but inspirational.

Lift-It® and Rigging Institute have set up Learning Centers with our trusted associates who hold the same values. Be sure to view upcoming educational opportunities on line at lift-it.com.

You have many options to assist you in attaining your training objectives. You can either enroll with our Learning Centers in Open Enrollment Programs or we can come to your location for an On-Site Presentation.

We look forward to not just training our students to pass a test, but to exposing them to principles and life skills that will serve them well in any endeavor. Excellence knows no boundaries and we will ignite the spark that helps our students be the best that they can be.

Sincerely,
Mike Gelskey

SLING AND RIGGING TRAINING CURRICULUM						
Course	Hours	On-Site Requirements and Details				
		Classroom Set Up	Display Tables	Set Up (Hours)	Minimum Number	Maximum Number
Sling User	4 or 8	Yes	4	1.5	-	75
Designated Synthetic Sling Inspector	4 or 8	Yes	14	1.5	-	25
Facility Program	4 or 8	Yes	-	1	-	12
Advanced Rigging	4	Yes	-	1	-	25
Designated Sling & Hardware Inspector	4 or 8	Yes	20	8	-	25
Management Awareness	1, 2 or 4	No	-	.5	-	*
Product Procurement	2 or 4	Yes	4	1	-	25
Design and Engineering	2 or 4	Yes	4	1	-	25
Hands On or Job Specific Rigging	8 or 16	Yes	4	8	-	12
Equipment Training	8 to 40	Yes	2	8	-	25
Competent Rigger 1	8	Yes	4	2.5	10	*
Competent Rigger 2	16	Yes	4	2.5	10	*
Qualified Signalperson	8	Yes	2	1.5	12	25
NCCCO Rigger 1	16	Yes	8	4	12	12**
NCCCO Rigger 2	16	Yes	8	4	12	12**
NCCCO Signalperson	8	Yes	3	3	12	16
Train-the-Trainer	24	Yes	6	4	6	12

* Student Population is dictated by the facility
** Number of students will dictate the number of practical exam days



Mike Riggs
President
Rigging Institute



Connie Riggs
The Great Woman behind the Great Man



Tom DeSoo
Vice President
Rigging Institute



Michelle Brown
Learning Center Coordinator



Harley Gist
Lead Instructor
Rigging Institute

ACCIDENT PREVENTION THROUGH EDUCATION

The benefits of educating sling users, prior to death or injury, clearly outweigh any effort done in reaction to a liability incident. The Lift-It® Sling Safety Program is concise and coordinates sling users, the inspection process and your facility into an ongoing and viable system that protects sling users, property and the corporate bottom line.

The Lift-It® Sling Safety Program provides detailed instruction to all parties who are involved with slings and rigging. Participants should include: specialized and incidental riggers, sling inspectors, safety, training, loss control, quality assurance, tool room and purchasing personnel.

Our goal is accident prevention through education. The cost for our services is truly incidental when compared to the expense of a single "incident". If together we prevent just one accident, then we have accomplished our objective. Arrange a mutually convenient, training experience and take the first step to improve overall efficiency, safety consciousness and morale.

SAFETY AND TRAINING SEMINARS

Safety and Training Seminars are presented regularly, by Lift-It®. Visit www.lift-it.com for upcoming events. The Seminars are presented in the Los Angeles area and are generally two or three days in duration.

For over twelve years we presented the Lift-It® Sling Safety Seminar and received rave reviews. We will continue to offer this popular training session and have expanded our curriculum to include other course offerings.

Competent Rigger Levels 1 and 2, Certified Rigger Preparatory Levels 1 and 2, Sling and Rigging Hardware Designated Inspector and Certified Signal Person are two day programs with the third day dedicated to practical exams.

The Lift-It® Sling Safety Seminar features: Basic and Advanced Rigging, Sling Inspection, Fall Prevention Demonstrations, a tour of the Lift-It® facility and Hands-on-Rigging during the first two days. Day Three may feature a Train-the-Trainer Program. This program will give an overview of what is necessary to develop and communicate the message of proper sling and rigging techniques. Required prerequisites for Train-the-Trainer are Days One and Two.

Students can register for Day One and/or Day Two and not attend Day Three, Train-the-Trainer. Early registrations are encouraged as the class size is deliberately limited to facilitate maximum participation.



USER / INSPECTOR TRAINING



LIFT-IT® FACTORY TOUR



FALL PREVENTION



HANDS ON RIGGING

COMMENTS FROM OUR SEMINAR PARTICIPANTS

I learned more in the first ninety minutes than I did when attending another conference that lasted five, long days.

Very well presented, nice to see such passion about the subjects.

Excellent program and well worth the time. The seminar greatly enhanced my understanding of rigging practices.

Very good information on sling inspection with definite answers on what to look for. A great learning experience.

A very informative seminar, much new information obtained, great job, Mike.

Thanks for the excellent training, you have changed the way I look at sling and rigging for the better. I am moving forward in a safer direction.

The seminar took a lot of mystery out of things I do every day. It was an extremely knowledgeable experience and I am glad I attended. I do a lot of iron work and will always practice what I learned here today. Thank you Lift-It.

ON - SITE PROGRAMS

Thousands of sling users and inspectors have been educated, on location, through the Lift-It® Sling Safety Program.

The preferred program is two days in duration. Day One features Sling User instruction and Day Two features a Designated Sling Inspector Class and a Facility Program. Arrange class modules in any desired sequence to compliment scheduling and attain your training objectives.

Invite other interested parties to your program and "share" not only the benefits, but the cost.

PROGRAM CURRICULUM

SLING USER TRAINING

Sling User Training features information on: sling input materials, sling designs and design features, on a generic level, with an emphasis on proper application and usage. Mechanical considerations, sling angles and tension, center of gravity, tension factors and sling protection are explored in an interactive format. Environmental considerations: water, temperature, chemical exposure and ultraviolet light are examined. Sling inspection systems, techniques and removal from service criteria are presented in Sling User Training.

Recommended class size: 50-75
Class duration: 4 or 8 hours
Requirements:
Tables and Chairs
Large Screen
2 Hour Classroom Set Up



DESIGNATED SYNTHETIC SLING INSPECTOR TRAINING

Designated Synthetic Sling Inspector Training provides detailed information on sling inspection per ASME B30.9 and OSHA 1910.184. General information and sling damage, with a heavy emphasis upon cause-effect and recommendation are presented. In addition, sling inspection systems, techniques and removal from service criteria are covered. Sling User Training is a recommended prerequisite, but not required.

Recommended class size: 25
Class duration: 4 or 8 hours
Requirements: Same as Sling User



FACILITY PROGRAM

The Facility Program is a capstone class. Participants are taken from the classroom into the "real" world and actual inspections are conducted. Sling storage locations and consumption patterns are analyzed, from the perspective of inventory management. The need for sling protection is reinforced to maximize sling service life and overall safety. Either Designated Synthetic Sling Inspector or Designated Sling and Rigging Hardware Inspector are mandatory prerequisites for Facility Program Training.

Recommended class size: 12 Class duration: 4 or 8 hours Requirements: PPE and Sling User requirements.

ADVANCED RIGGING TRAINING

Advanced Rigging features: advanced weight calculations, center of gravity and load moment calculations. Sling User Training is a mandatory prerequisite.

Recommended class size: 25 Class duration: 4 hours Requirements: Same as Sling User

PROGRAM CURRICULUM



DESIGNATED SLING AND RIGGING HARDWARE INSPECTOR

Participants will be trained to identify sling and rigging hardware types, components and removal from service criteria per ASME, DOL-OSHA, association standards and manufacturer recommendations. Damage identification with an emphasis on probable causes and recommendations to mitigate reoccurring damage will also be presented. The two day program features training and hands on inspection exercises for synthetic (web, round and Twin-Path®), wire rope, chain and metal mesh slings. Sling hardware (eyebolts, swivel hoist rings, hooks, shackles and wire rope clips) is also included. Sling Identification (Tagging), Proof Testing, Repair, Inspection Systems, Techniques and Recordkeeping are presented.

Participants will be tested after each day's instruction and receive a Certificate of Achievement based upon cumulative examination results. The program can also be customized to include site specific gear and expanded to include Hoists and Below the Hook Equipment.

Recommended Class Size: 20
Class duration: 16 hours
Requirements: Same as Sling User, except 5 hour set up.
Twenty tables (6 ft.) for exhibits with cardboard covers.



TRAIN-THE-TRAINER

Sling User Training is a required prerequisite for the Train-the-Trainer Program. The course will give an overview of the necessary ingredients to successfully develop and communicate the message of proper sling and rigging techniques. Topics include: enabling and terminal objectives, outline development and presentation methods. The participants will be provided a PowerPoint presentation to facilitate effective presentations and have an option to purchase training aids.

Train-the-Trainer is much more than traditional trainer programs which simply repeat course content. Train-the-Trainer is a professional development course with very profound benefits, which will enhance all future training activities.

Recommended class size: 4

Class duration: 16 to 32 hours

Requirements: Same as Sling User.

CUSTOMIZED PRESENTATIONS

Customized Presentations can be developed to assist in attaining your specific training objectives.

Management Awareness provides an overview of ingredients necessary for successful operations and accident prevention. 45, 60 or 90 minute presentations are done for groups of any size.

Product Procurement educates and informs those tasked with purchasing rigging equipment. Generic product specifications will assist in establishing baseline requirements, enabling the purchase of quality equipment at a competitive price. Class duration: 4 hours Recommended Class Size: 12

Design and Engineering provides instruction to those tasked with developing lifting and tie down assemblies. Design parameters, material specifications and component compatibility are explored.
Class duration: 4 hours Recommended Class Size: 12

The following information describes the qualified rigger requirements of subpart CC – Cranes and Derricks in Construction, as specified in 29 CFR 1926.1401, 1926.1404, and 1926.1425. Additional details are available at www.osha.gov

Employers must use qualified riggers during hoisting activities for crane assembly and disassembly (1926.1404(r)(1). Additionally, qualified riggers are required whenever workers are within the fall zone, hooking, unhooking or guiding a load or doing the initial connection of a load to a component or structure (1926.1425(c).

The OSHA Standard requires Crane Operators of most cranes above 2,000 lbs., when used in construction be certified by an accredited third party, testing organization or qualified through an audited employer program. The standard DOES NOT require riggers or signal persons to be certified. The rigger and signal person must be qualified.

Who can be a qualified rigger? A qualified rigger is a rigger who meets the criteria for a qualified person. Employers must determine whether a person is qualified to perform specific rigging tasks.

Each qualified rigger may have different credentials or experience. A qualified rigger is a person, who:

- Possesses a recognized degree, certificate or professional standing
- Has extensive knowledge, training and experience
- Can successfully demonstrate the ability to solve problems related to rigging loads.

Persons designated as qualified riggers must have the ability to properly rig the load for a particular job. It does not mean that a rigger must be qualified to do every type of rigging job. Each load has unique properties that can range from the simple to the complex. For example, a rigger may have gained extensive experience over many years in rigging structural components and other equipment to support specific construction activities. However, this experience does not automatically qualify the rigger to rig unstable, unusually heavy or eccentric loads that may require a tandem lift, multiple lifts or the use of custom rigging equipment. Employers must ensure that personnel can do the rigging work needed for the exact types of loads and lifts for a particular job with the equipment and rigging that will be used for specific jobs.

Do qualified riggers have to be trained or certified by an accredited organization or assessed by a third party?
No. Riggers do not have to be certified by an accredited organization or assessed by a third party. Employers may choose to use a third party entity to assess the qualifications of the rigger candidate, but they are not required to do so.

Does attending a Lift-It® or Rigging Institute seminar make me a certified rigger?
No. We do not certify riggers. We provide the training that will enable the participant to become qualified or competent as determined by the employer or to pass the written and practical exams described above.

What is required to become a "Certified" Rigger?
The candidate must pass a written and a practical (Hands On) exam administered by a third party, testing organization, such as NCCCO (National Commission for the Certification of Crane Operators) or NCCER (National Center for Construction Education and Research).

Does a certified operator also meet the requirements of a qualified rigger?
A certified operator does not necessarily meet the requirements of a qualified rigger. Determining whether a person is a qualified rigger is based on their knowledge and experience, the nature of the load, lift and equipment used for lifting. A certified operator may meet the requirements of a qualified rigger, depending on the operator's knowledge and experience with rigging.

There are a couple of routes you can take to comply with the OSHA mandate:

- Competent Rigger-Level 1 (One day program-includes testing).
- Competent Rigger-Level 2 (Two Day Program-includes testing).
- Qualified Signal Person (One Day program-includes testing).

- NCCCO Rigger-Level 1 (Two day program-does not include testing).
- NCCCO Rigger-Level 2 (Two day program-does not include testing).
  [Level-1 is a prerequisite if you wish to participate in Level 2 testing].
- NCCCO Signal Person (One day program-does not include testing).

Training Details
Participants are tested in Competent Rigger Training. Qualified Signal Person training also involves a practical exam. The practical exam for Qualified Signal Person is required to satisfy the OSHA requirement and generally takes 15-20 minutes per person.

Exams
NCCCO must administer the written, certification examinations. Normally NCCCO requires 5 weeks advance notice and surcharges apply with less advance notice. Computer Based Testing is available at over 270 locations and requires substantially less advance notice.

We can administer the Rigging Practical Exams. Normally, 6-7 candidates would complete the Rigging Practical Exams per day. The candidate then has one year to complete the written exam.

Our training provides life skills and is not designed strictly to enable your folks to pass a test. Likewise we have partnered with the best third party certification entity, if you elect to go that route.

PROGRAM CURRICULUM

COMPETENT RIGGER LEVEL 1
TIME: 8 HOURS



Competent Rigger Level 1 training consists of basic to intermediate rigging applications and prepares students to perform Level 1 rigging activities. Training will include: common sling hitches, load weight calculations, sling tension calculations based on sling angles for symmetrical loads, center of gravity and sling protection considerations. Students will learn pre-use inspection techniques and an overview of signal person responsibilities. Competent Rigger Level 1 training does not cover all signal person responsibilities. A course review and test is administered by Rigging Institute.

COMPETENT RIGGER LEVEL 2
TIME: 16 HOURS

Competent Rigger Level 2 training involves intense study of intermediate to advanced rigging applications, preparing students to perform Level 2 rigging activities. Training includes tension calculations based on sling angles for symmetrical and non-symmetrical loads, load weight calculation, center of gravity and sling protection considerations. Students will learn sling and hardware selection based on proper application and efficiency, pre-use inspection techniques and an overview of signal person responsibilities. Competent Rigger Level 2 training does not cover all signal person responsibilities. A course review and test is administered by Rigging Institute.

QUALIFIED SIGNAL PERSON - TIME: 8 HOURS

Qualified Signal Person training prepares students to meet the requirements of OSHA 29 CFR 1926.1400. Students will be shown proper methods to communicate with mobile, tower and overhead crane operators. Course study includes hand and voice communication, crane functions and limitations, suspended personnel platform regulations and overhead power line considerations. Rigging Institute written and practical exams are included in Qualified Signal Person training.

NCCCO RIGGER LEVEL 1 CERTIFICATION PREPARATORY TRAINING - TIME: 16 HOURS

NCCCO Rigger Level 1 Certification Preparatory Training prepares students for the successful completion of Level 1 Rigger certification testing. Students will participate in classroom instruction and hands-on workshops for: slings, rigging, hardware, sling tension, angles, center of gravity considerations, sling protection, knot tying and an overview of signal person responsibilities. A practice test is administered, with a discussion of test answers and a review of course materials. Upon completion, students will be not only be prepared for third party testing, but more importantly, acquire the knowledge necessary for the competent performance of Level 1 Rigger duties.

For NCCCO Rigger Level 1 and Rigger Level 2 Certification Preparatory Training, we do not administer the written exam. Participants have 12 months to complete the written NCCCO test at approved computer based, testing (CBT) centers. To locate a Computer Based Testing Center use the following link http://nccco.org/faq/index.html#CBT. Select the option to locate a CBT exam and you will be prompted to enter a sponsor for the examination. Use the drop down and select NCCCO and enter the other pertinent information: zip code, distance and days to obtain a listing of CBT centers in your area. We can administer the practical exams for Rigger 1 and Rigger 2. The necessary exam time is a function of student population.

NCCCO RIGGER LEVEL 2 CERTIFICATION PREPARATORY TRAINING - TIME: 16 HOURS

NCCCO Rigger Level 2 Certification Preparatory Training prepares students for the successful completion of Level 2 Rigger certification testing. Students will participate in extensive studies in sling hitch applications, calculations for off-set centers of gravity and determination of load weight distribution. Additionally, students will learn methods of determining sling tension, drifting and rotating suspended loads. A practice test is administered, with a discussion of test answers and a review of course materials. Classroom and hands-on workshops are utilized to prepare students for third party testing and acquiring the necessary knowledge for the competent performance of Level 2 Rigger duties. Candidates that are not Level 1 Certified can attend, but are not allowed to participate in Level 2 testing.

CERTIFIED SIGNAL PERSON TRAINING - TIME: 16 HOURS

NCCCO Certified Signal Person Training prepares beginning and experienced signal persons to meet the requirements necessary to pass written and practical, third party testing. More importantly, students will gain the skills needed to effectively communicate with crane operators. Course work includes hand and voice communication for mobile, overhead and tower cranes. Students will become familiar with crane limitations influenced by crane movement and also learn the regulations for suspended personnel platforms. Student success is optimized through a combination of classroom workshops, hands-on practice and crane signal review. Day 1, Certified Signal Person training is instructional. Written and practical examination by a third party is done on Day 2. Registration must be made at least 5 weeks in advance or additional charges may apply.

COMMENTS FROM OUR ON-SITE CLIENTS

We would like to commend you on the quality of the training that was provided by you; one word can sum it all up, "excellent." With the type of education you provided, our people are one step closer to an accident free environment.

C. E. VANWINKLE
BNSF RAILROAD

Thank you for a most informative seminar. The information presented was without a doubt, outstanding. We recommend the seminar to others without reservation. The personnel enjoyed your practical approach, which made the seminar interesting and informative.

DAVE ASKINS
PG&E-Diablo Canyon Power Plant

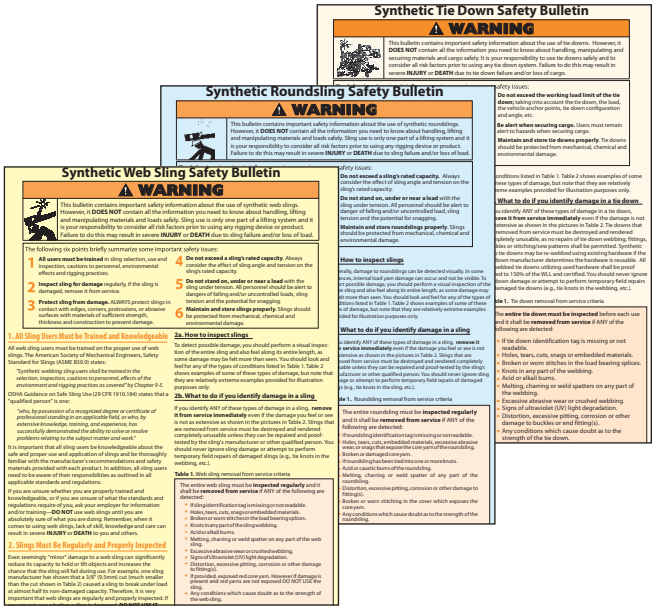
Mr. Gelskey,
Just wanted to drop you a line and say thanks! I have been through numerous trainings and seminars in my short 27 years of blue collar survival and have to say that the last four days have been monumental to say the least. You have set the bar for training in this line of work, not just in this industry line, but you brought to me a personal line of training that dictated what it is to be a man of integrity. You taught the important values of safe rigging and quality, how to be transparent, validating the values of God, being an American, and the importance of family, friends and community. I am grateful that the world of commerce has not compromised you. For most, it's all about the wallet. Keep up the great work in the greatest race you will ever run.

Thanks again,
Paul Kriege

PRODUCT SAFETY BULLETINS

Proper use, care and inspection information are contained in Lift-It® Product Safety Bulletins, which accompany every product. The bulletins were developed by the Web Sling and Tie Down Association in conjunction with a Human Factors Expert.

The combination of Warning Tags and Product Safety Bulletins greatly enhances safety for responsible sling users.



WALL CHARTS

Wall Charts are a valuable visual aid to enhance proper use, care and inspection techniques. Sling and Tie Down Wall Charts feature information on: inspection, removal from service criteria, damage photos, mechanical and environmental considerations, rigging factors, storage recommendations, angles and tension, as well as useful protection information.

RiggSafe Solutions, Crane Wall Charts contain valuable information for Mobile and Overhead Crane Signals. Reinforce the important message of proper crane direction and operation through correct and effective communication. The visual message never takes a break and is present 24/7/365.

Web Sling	Stock No. WSWC-1
Roundsling	Stock No. RSWC-1
Twin-Path®	Stock No. TPWC-1
Tie Down	Stock No. TDWC-1
Mobile Crane	Stock No. MCWC-1
Overhead Crane	Stock No. OCWC-1



Reference Materials

Tired of spending hours on the phone or on line? After several minutes pressing innumerable keys, navigating through a "maze", you finally arrive at the "Twilight Zone". You are about to submit your order and "poof" the connection goes dead! Handbooks, Rigging Cards, Regulatory, Consensus and Association Standards are just a phone call or email away. One that won't leave you hanging!

REGULATIONS, CONSENSUS and INDUSTRY STANDARDS
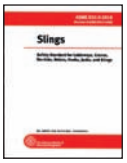
Purchase individual Standards or the Regulatory Resource Binder which includes all items depicted.



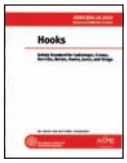
Regulatory Resource Binder
Order Code-RRB-1



WRTB Sling User Manual
Order Code-STD-1



ASME B30.9 Slings
Order Code-STD-2



ASME B30.10 Hooks
Order Code-STD-3



ASME B30.20 BTH Lifting Devices
Order Code-STD-4



ASME B30.26 Rigging Hardware
Order Code-STD-5



WSTDA-WS-1 Web Sling Std.
Order Code-STD-6



WSTDA-RS-1 Roundsling Std.
Order Code-STD-7



WSTDA-T-1 Tie Down Std.
Order Code-STD-8



WSTDA-UV-1 UV Sling Report
Order Code-STD-9

RIGGING AND CRANE REFERENCE CARDS

Rigging and Crane Reference Cards are multi-colored and laminated. They can be folded down for pockets or wallets and contain a wealth of instant access information.



Wallet Size Pocket Size



Bob's Rigging Card
English B4
Spanish SB4



Rigging Card
by Mike Riggs
Order Code SRC1



Journeyman Rigger
by Mike Parnell
English Wallet R49
English Pocket R49P
Spanish Wallet SR49



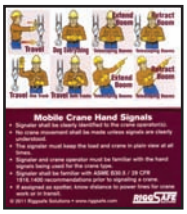
Lineman Rigger
by Mike Parnell
English Wallet LR105



Rigging with the Big Stuff
by Mike Parnell
English Pocket RBS1P



Crane Card
by Don Pellow
English B5
Spanish SB5



Crane Hand Signals
by Mike Riggs
Order Code CHS1



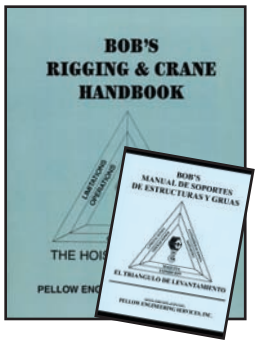
Master Rigger
by Mike Parnell
English Wallet M6
English Pocket M6P



Rigging Gear Inspection
by Mike Parnell
English Wallet V11
English Pocket V11P
Spanish Wallet SV10

RIGGING AND CRANE HANDBOOKS

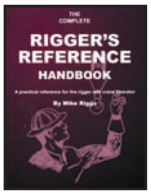
Handbooks contain information on: rigging, crane operations, sling information, inspection criteria, weight calculations, center of gravity determinations, critical lift parameters, regulatory and industry standards and other information for responsible riggers, crane operators, engineers, safety or training personnel.



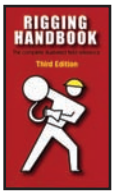
Bob's Crane Handbook
English Pocket - B3
English Desk - B6
Spanish Pocket - SB3
Spanish Desk - SB6
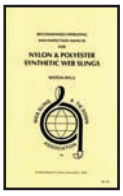


Bob's Rigging & Crane Handbook
English Pocket - B2
English Desk - B1
Spanish Pocket - SB2
Spanish Desk - SB1



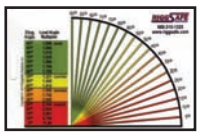
Rigger's Bible
by Mike Riggs
English Pocket - RBL



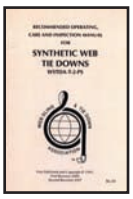
Rigging Handbook
by Jerry Klinke
Order Code - RHJK1



Operating Manual for Web Slings
by WSTDA
Desk - WS2
Pocket - WS2P



Sling Angle Protractor
by Mike Riggs
Order Code - SAP1



Operating Manual for Tie Downs
by WSTDA
Desk - TD2
Pocket - TD2P



Operating Manual for Roundslings
by WSTDA
Desk - RS2
Pocket - RS2P

INSPECTOR/TRAINER KIT

Safety professionals, who participated in the Lift-It® Sling Safety Program requested a Training Kit that would assist in training and accident prevention presentations. Slings, Sling Protection, Webbing and Tag Samples are conveniently carried in a sling tote bag.

Also enclosed is a disc featuring several, destruction tests. The cornerstone of the Inspector/Trainer Kit is the "Defect" Sling, which features various forms of damage. The Defect Sling and roundsling (pulled to destruction) are effective tools to aid in reinforcing the need for visual and tactile inspection techniques. **(Inspector/Trainer Kit Order Code- ITK-1)**

TRAINER KIT CONTENTS

SAMPLE SLINGS:
Defect Sling
Endless EN1-902
Eye & Eye EE1-902
Reversed Eye RE1-601
Twin Path® TP 600FO
Roundsling RS 60
Roundsling RS 60
(Pulled to Destruction)

DOCUMENTS:
OSHA –Guidance on Safe Sling Use
Inspection Log Sheet
Inspection Schematic
Lift-It® Catalog
Safety Program Overview
Destruction Test Disc

SLING PROTECTION SAMPLES:
Sleeve
Wear Pad
Edge Wrap
Body Wrap
Secutex Sleeve
CornerMax® Pad
Magnetic Corner Protector

WEBBING SAMPLES:
Sling Web
Tie Down Web

TAG SAMPLES:
Endless
Eye & Eye
Tie Down



SLING INSPECTOR KNIFE

Designated sling inspectors have come to know and love the "Big Mike-Big Knife." The pocket clip makes retrieval, quick and easy. The serrated edge renders damaged slings unusable.

⚠ WARNING Sharp objects can cut, resulting is blood loss, injury or death.



Plastic Body
Order Code-BM-PB



Metal Body
Order Code-BM-MB

SLING TOTE BAG

Lift-It® Sling Tote Bags are made from heavy duty nylon materials. All seams are over lock stitched and sewn together with nylon binding tape. Additional features include heavy duty zippers and comfortable webbing handles. The 1-3/4 in. webbing which forms the handle is sewn completely around the bag for additional strength and support. The perfect solution for the age old problem of grouping and transporting "dedicated" slings for specific rigging applications.



Order Code	Size	W	H	L
		(Dimensions in Inches)		
TBL-S	Small	6	7	11
TBL-M	Medium	6	9	17
TBL-L	Large	13	15	24
TBL-XL	X Large	15	16	34

Regulatory & Association Resources

U.S. Department of Labor - O.S.H.A.
200 Construction Ave. N.W. Rm-N3101
Washington, DC 20210
Phone 202.523-1452
www.osha.gov

National Safety Council
1121 Spring Lake Drive
Itasca, Illinois 60143-3201
Phone 630.285-1121
Fax 630.285-1315
www.nsc.org

American Society of Mechanical Engineers
22 Law Drive
Fairfield, New Jersey 07007-2300
Phone 800.843-2763
Fax 973.882-1717
www.asme.org

Associated Wire Rope Fabricators
P.O. Box 748
Walled Lake, MI. 48390-0748
Phone 248.994-7753
Fax 248.994-7754
www.awrf.org

Web Sling and Tie Down Association, Inc.
2105 Laural Bush Road, Suite 200
Bel Air, Maryland 21015
Phone 443.640-1070
Fax 443.640-1031
www.wstda.com

American Petroleum Institute
Publications Department
1220 L. Street N.W.
Washington, DC 20005
Phone 202.682-8375
www.api.org

Wire Rope Technical Board
801 N. Fairfax St.- Suite 211
Alexandria, Virginia 22314-1757
Phone 703.299-8550
Fax 703. 299-9233
E-Mail wrtb@usa.net

Infrastructure Health & Safety Association
21 Voyager Court South
Etobicoke Ontario, Canada M9W5M7
Phone 416.674-2726
Fax 416.674-8866
www.ihsa.ca

Association of Crane & Rigging Professionals
28175 Haggerty Road
Novi, MI. 48377
Phone 800.690-3291
Fax 248.994-4313
www.acrp.net

Cordage Institute
994 Old Eagle School Road, Suite 1019
Wayne, PA. 19087
Phone 610.971-4854
Fax 610.971-4859
www.ropecord.com

Associations We Support

SLINGMAX®

NATE National Association of Tower Erectors

S&RA

ASME SETTING THE STANDARD 1880 2005

WEB SLING & TIE DOWN ASSOCIATION MEMBER

REC

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA AGC

American Wind Energy Association

IFA

ASSE

ASSOCIATED WIRE ROPE FABRICATORS

NWPPA

ACRP Association of Crane & Rigging Professionals

USA

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Since our first day of operation, we had a stringent, quality management system.

Only the finest materials are used in every product we manufacture. Only qualified vendors, with products liability insurance, supply components which meet or exceed our discriminating standards.

Samples from every lot of thread and load carrying yarn are pulled to destruction, prior to use to ensure that quality expectations are realized.

All products are initialed by the fabrication specialist and stamped by the quality inspector.

Our material traceability system begins with the assignment of a unique "container" number for materials and components. The container number is recorded on the fabrication order. The key to our traceability system is the unique invoice and associated serial number assigned to each product. Serial numbers are recorded on the product tag for the purposes of identifying input materials and quality standards compliance.

Stringent material and production standards, written quality control procedures and inspection records demonstrate the ultimate in corporate responsibility. We are committed to quality that is generally not seen, but makes a significant difference between the best and all the rest.



CERTIFICATE OF REGISTRATION

This is to certify that

Lift-It Manufacturing Co., Inc.
4780 Corona Avenue, Los Angeles, California 90058 USA

operates a

Quality Management System

which complies with the requirements of

ISO 9001:2008 + AS9100B

for the following scope of registration

The registration covers the Quality Management System for the Manufacture of Rigging Related Slings and Hardware.

Certificate No.: CERT-0051644
File No.: 1501396
Issue Date: June 27, 2011

Original Certification Date: June 24, 2011
Current Certification Date: June 24, 2011
Certificate Expiry Date: June 23, 2014

Chris Jouppi
President,
QMI-SAI Canada Limited

Alex Ezrakhovich
General Manager,
SAI Global Certification Services Pty Ltd

AS9100B

SAI GLOBAL

The decision to take the step from an internally developed quality system to one that would be "world class" was an easy one. The many steps necessary to obtain and maintain registration require much dedication, time, resources and money. After completing the process, we asked ourselves, why would anyone want to work with a manufacturer that is not ISO registered?

ISO 9001 is a generic product standard that provides quality assurance requirements and quality management guidance. Essentially, ISO 9001:2008 requires a company to document what it does and do what it has documented.

To establish an ISO program a company works with a consultant to provide a blueprint for the many, necessary documents that must be created. Everything that a corporation does is written into administrative, quality and implementation procedures. When this is completed and all parties are trained to fulfill their duties as specified by the procedures, the company is audited for compliance by an independent registrar. If the audit is successfully accomplished the company is then registered and issued a certificate indicating official ISO Quality Registration. Audits of the program occur annually to maintain a current certificate of registration.

In January 2002, Michael Gelskey, Jr. was appointed the Lift-It® Quality Manager and began working with Steven Guydos, SG Consulting. In November 2002, the registration audit was performed by Gregory A. Patrissi of SAI Global, Inc. Mr. Patrissi verified that Lift-It® Mfg. had in place a well maintained quality program. He also commented that after auditing Lift-It®, it would become the benchmark by which other rigging shops would be evaluated.

Lift-It® Manufacturing is proud to join the growing number of elite companies that meet the quality standards established by the International Standards Organization. SAI Global registered our initial compliance in 2003 and every subsequent year to the present ISO 9001:2008 standard.

We now have the distinction of our upgraded registration to the prestigious AS9100B:2009, Quality Management Systems-Regulations for Aviation, Space and Defense Organizations. AS9100 defines additional requirements within an aerospace quality management system when operating to an ISO9001 Quality System and is traceable to the Code of Federal Regulations (CFR), Title 14, Part 21.

Mike Gelskey, Jr. commented, "We know that the implementation of this program will make us an even better manufacturer and supplier for our customers. Our documented quality management systems demonstrate our commitment to continuous process improvements and complete customer satisfaction".

Excellence is our standard, not our goal.

Lift Planning and Evaluation

Before using any rigging device it is important to "plan your work and work your plan". The "front end" time required to develop a successful lift plan may seem unnecessary for small or "non-consequential" loads. There's always enough time to pre-plan "critical" lifts. After an incident involving what seemed to be a "non-consequential" amount of weight, the time required to mitigate the mess will dwarf the time spent on what was thought to be an unnecessary lift planning session. There's always enough time to do the job right, the second time. We encourage you to make the "front end" investment in lift planning and successful rigging, before each and every lift.

A trained, qualified and knowledgeable user must take into account the following factors and issues and consider all relevant factors not addressed. Among the factors related specifically to slings and rigging, users must perform several activities, including (but not limited to) the following items:

ENVIRONMENTAL CONSIDERATIONS

- Wind
- Weather
- Visibility
- Object Temperature
- Environmental Temperature
- Chemical Conditions and Exposure
- Stability of the Ground
- Underground Installations

LOAD CONSIDERATIONS

- Weight
- Dimensions
- Center of Gravity (CG)
- Attachment Point Integrity
- Structural Stability: Bend and Flex
- Susceptibility to Crushing or Compression
- Loose Parts that could fall from the Load
- Combination Loads-Drain Fluids
- Damaging Surfaces and/or Edges

EQUIPMENT AND LIFT CRITERIA

- Single or Multiple Crane/Hoists
- Maximum/Planned Operating Radius
- Allowable Load (From Load Chart)
- Ratio of Lift to Allowable Load
- Clearance between Boom and Lift
- Clearance to Surrounding Facilities
- Power Lines and Environmental Hazards
- Ensure a Clear Load Path
- Emergency/Contingency Set Down Area
- Thorough Equipment Inspection

RIGGING CONSIDERATIONS

- Sling selection: Type and Capacity
- Load Control
- Lift Point over the CG
- Appropriate Hitch for CG and Load Control
- Coordination of Multiple Slings
- Positive Sling to Load Engagement
- Coefficient of Friction: Sling to Load
- Load is Free to Move and is not Snagged
- Sling Capacity is Adequate (Angle and Tension)
- Adequate Sling Protection

PERSONNEL CONSIDERATIONS

- Area Clear of Unnecessary Personnel
- Personnel are Trained and Qualified
- Pre-Lift Plan and Meeting
- Signals: Visual, Audible, Electronic, etc.
- Tag Lines and Spotter Requirements
- Personnel Away from Load and Other Dangers

ENGINEERING SERVICES

Fee based engineering services, including analysis and consideration of the above variables is available. Please contact us for details.

SLING SELECTION – Prior to selection, read and understand the information contained in our catalog and your responsibilities as detailed in all applicable regulations and standards. Select the sling with suitable characteristics for the load, environment and configuration of lift.

RIGGING FACTORS

LOAD WEIGHT: Is the weight of the load within the Work Load Limit of the sling(s)?

WEIGHT DISTRIBUTION: Uneven load weight distribution imposes disproportionate loading on the individual sling legs.

ADEQUATE SLING LENGTH: Slings must be long enough to ensure the Work Load Limit is adequate, when the sling-to-load angle is taken into account. Inadequate consideration has caused "under-rated" slings to fail.

LOAD CONTROL: The sling user is responsible for load control. Slings must be rigged in a manner that provides for control of the load. Balancing and supporting the load, from the sides above the center of gravity is critical. Use more than one sling to balance the load so it will not tilt when lifted.

CENTER OF GRAVITY: The lifting mechanism must be positioned directly over the center of gravity, before the load is lifted. If this is not done, the load will "change out" and the center of gravity will end up under the lifting fixture. The center of gravity must be addressed and determined through careful experimentation or calculation.

POSITIVE LOAD ENGAGEMENT: Poor or inadequate sling-to-load engagement results in the sling "skipping" across load edges. This movement can result in catastrophic sling failure and uncontrolled load descent. Slings equipped with protection have also been cut because of poor sling-to-load engagement.

TRAINING

All sling users must be trained on the proper use of slings.

The American Society of Mechanical Engineers, in the ASME B30.9 Sling Safety Standard, clearly establishes the requirement for training. Section 9-X.1-Training states, "Sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter."

DOL/OSHA Guidance on Safe Sling Use (29 CFR 1910.184) states that a qualified person is one: "who by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work."

It is important that all sling users be knowledgeable about the safe and proper use and application of slings and be thoroughly familiar with manufacturer's recommendations and all safety information provided with products. In addition, sling users need to be aware of their responsibilities as outlined in all applicable standards and regulations. If you are unsure whether you are properly trained or knowledgeable, **DO NOT** use slings or rigging devices until you are absolutely sure of what you are doing.

SLING PROTECTION

Slings must be protected from damaging edges, corners, protrusions or abrasive surfaces by materials of sufficient strength, thickness and construction to prevent sling damage and failure.

There are a variety of ways to employ sling protection and prevent sling damage. Regardless of the particular method chosen, the goal is to ensure that the sling maintains its ability to securely lift the load while avoiding contact with damaging or abrasive surfaces under tension. A qualified person must carefully consider the appropriate means to accomplish this goal by selecting sling protection appropriate for the types of exposure damage. Sling protection should not be makeshift (i.e., selecting and using cardboard, work gloves or other such items that were not designed to serve as protection devices).

⚠ WARNING Sling protection may not prevent cutting or other forms of damage. To avoid severe personal injury or death, personnel should be kept away from the load and never be under or near the load, while it is being lifted or suspended. Personnel should never be next to rigging under tension.

CHEMICAL FACTORS

Chemically active environments can affect the strength of rigging products in varying degrees from moderate to total degradation. The materials used in the construction of slings and components must be compatible with the mechanical and environmental requirements imposed. Fumes, sprays, mists, vapors and liquids of acids or alkalis can degrade rigging products. The chemical agents must be identified. Specific time, temperature and concentration factors will assist the user and manufacturer in the selection of the appropriate sling material components.

It may be necessary to conduct an on-site suitability test. A sample would be subjected to exposure, under no load. The length of exposure must be determined by the qualified person. After exposure, the sample would be pulled to destruction to determine the retention of tensile strength and evaluated, comparing test results with the strength of an unexposed, "control" sample. We prefer "application" testing to chemical analysis of independent chemical agents done by referencing various charts or technical bulletins. Application testing (where the rubber meets the road) will also provide more accurate information on the cumulative effects of multiple chemical agents. We will match your efforts and assist you in determining the most suitable materials for your specific application.

ENVIRONMENTAL CONSIDERATIONS

TEMPERATURE:

Conventional synthetic products cannot be used in environmental or contact temperatures exceeding 194˚F/90˚C or below -40˚F/-40˚C. Applications outside those parameters can be addressed by consulting us for specific recommendations.

ULTRAVIOLET (UV) LIGHT DEGRADATION:

Exposure to sources of ultraviolet (UV) light affects the strength of synthetic products in varying degrees from slight to total degradation. Factors which play a part in the degree of strength loss are length of exposure, sling construction and design. Other environmental factors such as weather conditions, elevation and geographic location also affect the degree of degradation.

The Web Sling and Tie Down Association (WSTDA) conducted tests to determine the affects of strength loss, as a result of ultraviolet (UV) exposure. The report, WSTDA-UV-Sling-2003 is available at www.wstda.com

Many different variables were analyzed in slings that were exposed for a period of 36 months. Nylon and polyester endless slings featuring: treated and untreated webbing, 6800 Lbs. (class 5) and 9800 Lbs. (class 7) materials and single and double ply constructions were evaluated.

Initially, nylon web slings lost strength at a slower rate, when compared to polyester slings, but continued to lose strength as exposure time was extended. The loss of strength for nylon slings can be 40 to 60% after exposure periods ranging from 12 to 36 months.

In the first year of the study, polyester web slings lost strength at a greater rate, when compared to nylon slings. Loss in strength for polyester slings was approximately 30% after 12 months exposure. Polyester sling strength loss seemed to subside and level off after the initial 12 month period.

When slings are not in use, store them in a dark, cool, dry location, free from mechanical and environmental damage.

MOISTURE ABSORPTION:

When nylon products are "wet" there is an approximate strength loss of 15%. This loss of strength is documented in the 1988 DuPont Technical Information Multifiber Bulletin X272, page 6. Nylon sling strength returns when the sling dries completely. Polyester and High Performance Fiber strength is unaffected by moisture absorption.

Sling Hitches

Slings carry their loads in one of three primary sling hitches. Most slings can be used in all three sling hitches, but some slings are designed for use in only one hitch. Slings have the largest Work Load Limit when used in a basket hitch. The vertical hitch Work Load Limit is 50% of the basket hitch. The synthetic choker hitch Work Load Limit is a maximum of 80% of the vertical hitch Work Load Limit.

Slings must be securely attached to the load and rigged in a manner to provide for load control to prevent slipping, sliding and/or loss of the load. A trained, qualified and knowledgeable user must determine the most appropriate method of rigging to help ensure load control and a safe lift.



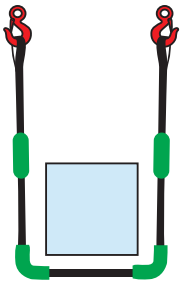
CHOKER HITCH

Sling passes through one end around the load, while the other end is placed on the hook. Load control is limited with only one sling rigged in a choker hitch. A choker hitch will never provide full 360 degree contact. For full contact use a Double Wrap Choke Hitch. See page 24. The Choke Point should always be on the sling body, not on the sling eye, fitting, base of the eye or fitting, splice or tag.



VERTICAL HITCH

One end is on the hook, while the other end is attached directly to the load. Use a tagline to prevent load rotation.



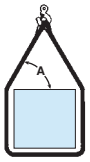
BASKET HITCH

The sling cradles the load while both eyes are attached overhead. As with the choker hitch, more than one sling may be necessary to help ensure load control.

Sling-To-Load Angle

The Sling-to-Load Angle is the angle formed between a horizontal line and the sling leg or body. The Sling-to-Load Angle has a dramatic effect on sling Work Load Limits. Slings with adequate capacity to handle the "scale" weight of the load have catastrophically failed because the Sling-to-Load Angle and increased tension were not taken into account.

This principle applies in a number of conditions, including when one sling is used to lift at an angle and when a basket hitch or multi-leg bridle sling is used. When selecting a sling, always consider the Sling-to-Load Angle and the tension that will be applied to the sling. As the Sling-To-Load Angle decreases, the tension on the sling leg(s) increases.



SLING-TO-LOAD ANGLE

The horizontal angle formed between the sling leg and the "top" of the load.





Illustrated left- Increased tension is magnified by any change from vertical to horizontal lifting. Increased tension is imposed on the sling leg(s) when the legs are used at angles less than 90°.

SLING ANGLE - REDUCED WORK LOAD METHOD

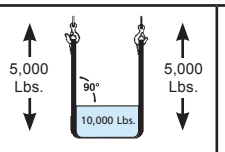
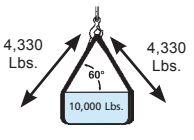
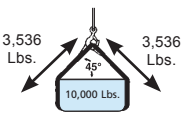
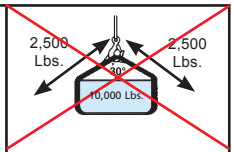
For years sling users have used angles to determine sling adequacy. One approach has been to determine the Sling-to-Load Angle and multiply the Work Load Limit by the Loss Factor for the specific angle. The result is the REDUCED WORK LOAD LIMIT.

1. Calculate the Sling to Load Angle.
2. Determine the corresponding Loss Factor.
3. Multiply the Work Load Limit (per leg) by the Loss Factor to determine the reduced Work Load Limit (per Leg).

The result is the reduced Work Load Limit.

Sling angles less than 30° should not be used, unless approved by a qualified person.

LOSS FACTOR CHART			
Angle "A" Degrees	**Loss Factor**	**Angle "A" Degrees**	**Loss Factor**
90	1.000	55	.8192
85	.9962	50	.7660
80	.9848	45	.7071
75	.9659	40	.6428
70	.9397	35	.5736
65	.9063	30	.5000
60	.8660	25	.4226

A BASKET WORK LOAD LIMIT OF 10,000 LBS. CHANGES AS THE SLING TO LOAD ANGLE CHANGES AT 90° - WORK LOAD LIMIT = 5,000 LBS. PER LEG AT 60° - WORK LOAD LIMIT = 4,330 LBS. PER LEG AT 45° - WORK LOAD LIMIT = 3,536 LBS. PER LEG AT 30° - WORK LOAD LIMIT = 2,500 LBS. PER LEG				
SLING-TO-LOAD ANGLE (DEGREES)	90°	60°	45°	30°
WORK LOAD LIMIT X LOSS FACTOR	10,000 Lbs. x 1.000	10,000 Lbs. x .8660	10,000 Lbs. x .7071	10,000 Lbs. x .5000
REDUCED WORK LOAD LIMIT	10,000 Lbs.	8660 Lbs.	7071 Lbs.	5000 Lbs.

Sling-To-Load Angle

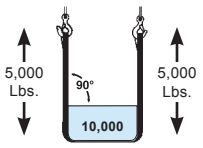
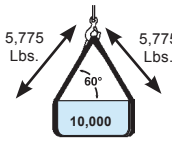
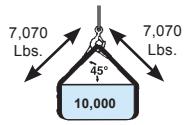
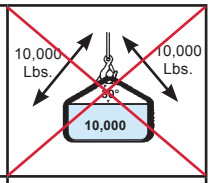
SLING ANGLE – INCREASED TENSION METHOD

A more salient approach to determine sling adequacy is the calculation of INCREASED TENSION resulting from the Sling-to-Load Angle. This approach has the distinct advantage of enabling the sling user to determine the required sling strength requirement. The user must first determine the angle and multiply the load weight (per leg) by the tension factor for the specific angle. The result is the INCREASED TENSION or actual loading on the sling leg(s).

1. Calculate the Sling to Load Angle.
2. Determine the corresponding Tension Factor.
3. Multiply the load weight (per leg) by the Tension Factor to determine the increased tension on the sling leg(s).

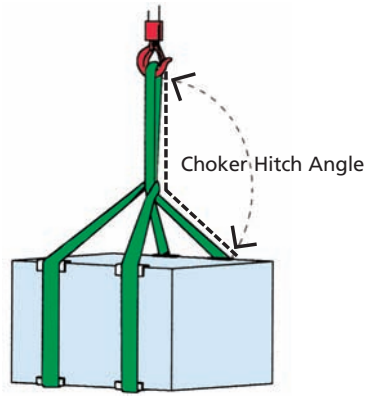
TENSION FACTOR CHART			
ANGLE "A" DEGREES	TENSION FACTOR	ANGLE "A" DEGREES	TENSION FACTOR
90	1.000	55	1.221
85	1.004	50	1.305
80	1.015	45	1.414
75	1.035	40	1.555
70	1.064	35	1.742
65	1.104	30	2.000
60	1.155	25	2.364

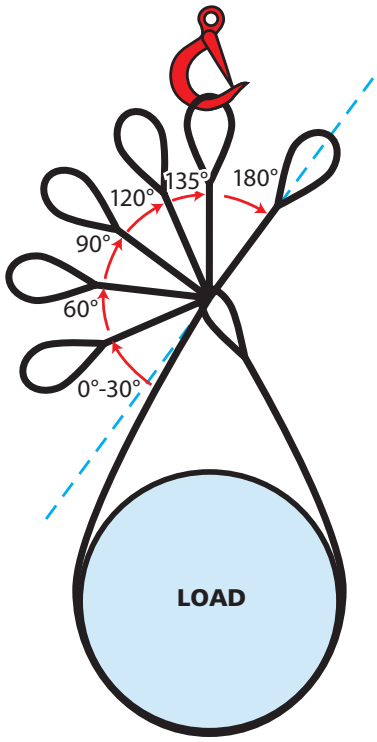
Sling angles less than 30° should not be used, unless approved by a qualified person.

SLING TENSION INCREASES AS THE SLING-TO-LOAD ANGLE DECREASES AT 90° - SLING TENSION = 5,000 PER LEG AT 60° - SLING TENSION = 5,775 PER LEG AT 45° - SLING TENSION = 7,070 PER LEG AT 30° - SLING TENSION = 10,000 PER LEG				
SLING-TO-LOAD ANGLE (DEGREES)	90°	60°	45°	30°
LOAD WEIGHT X TENSION FACTOR	10,000 Lbs. X 1.000	10,000 Lbs. X 1.155	10,000 Lbs. X 1.414	10,000 Lbs. X 2.000
INCREASED SLING TENSION	10,000 Lbs.	11,550 Lbs.	14,140 Lbs.	20,000 Lbs.

Choker Hitch Angle

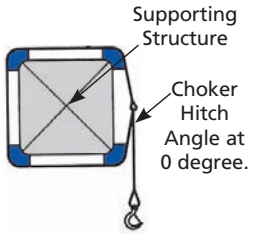
Whenever a sling is used in a choker hitch and results in a Choker Hitch Angle less than 120 degrees, Choker Work Load Limits must be adjusted. Determine the Choker Hitch Angle and multiply the Choker Hitch Work Load Limit by the appropriate Reduction Factor. The result is the actual, reduced Choker Work Load Limit.



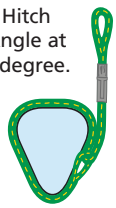


CHOKER HITCH ANGLE REDUCTION CHART	
Choker Hitch Angle (Degrees)	Reduction Factor
120 - 180	1.00
105 - 120	.82
90 - 105	.71
60 - 90	.58
0 - 60	.50

Two examples of slings used at 0 degree Choker Hitch Angle.



Rigging from a Supporting Structure.



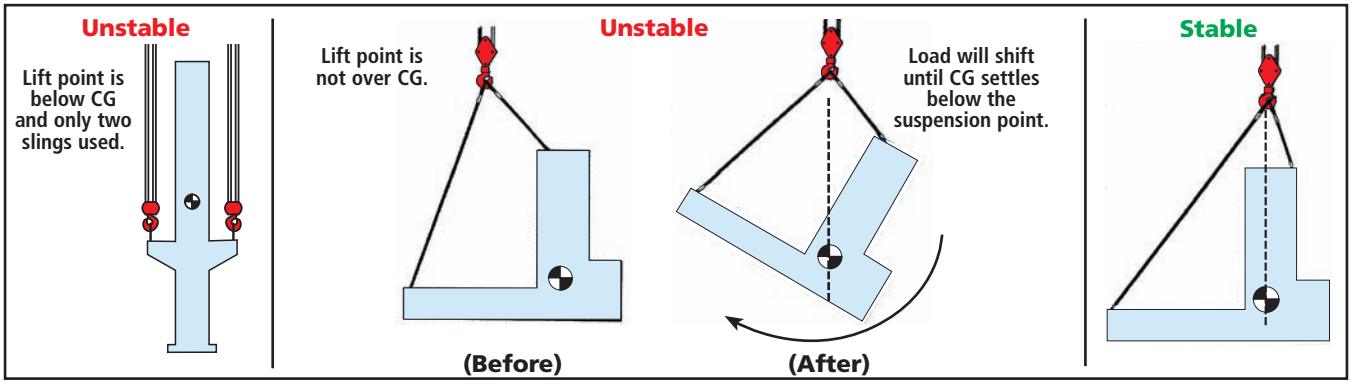
Controlling a load with a high center of gravity.

Center of Gravity (CG)

It is always important to rig and control the load so that stability is achieved. Determining the location of the Center of Gravity (CG) is vital to achieving load control. The CG is the point where the load weight is concentrated and is the balance point for an object. The Center of Gravity when suspended will:

1. Unless restrained, the CG will move directly under the suspension point.
2. The CG will move to the lowest point possible.

For best control, attach the slings above the CG. When this is not possible keep the CG contained with three or four sling legs or use basket or choker hitches with wraps. These measures may not guarantee load control. The user must be assured, based upon the specific application that selected methods are suitable and comply with all applicable standards and regulations.



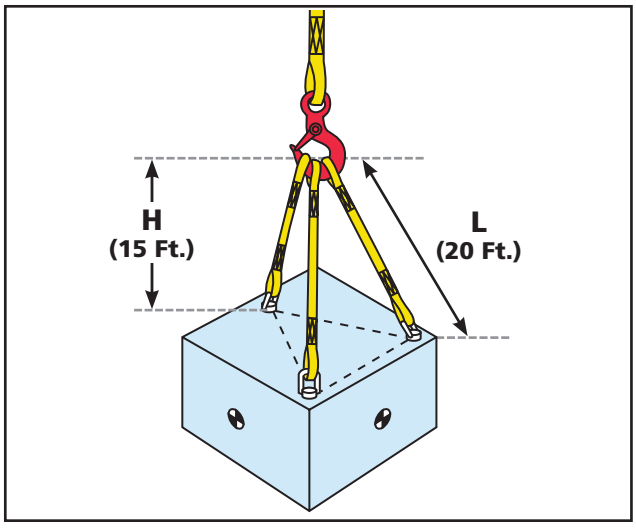
⚠ WARNING Multiple factors must be taken into consideration to ensure that load control and stability are attained. A load with a "high" center of gravity can rotate in certain sling hitches.

Sling Tension - Leg Length/Headroom

Calculating the tension imposed on slings or individual legs of a multi-part sling system will enable the sling user to select slings with adequate Work Load Limits.

Use the following steps to calculate the tension imposed upon the individual sling legs, when you know the leg Length (L) and Headroom (H).

1) Determine the Load Angle Factor (LAF):
   Divide the leg Length (L) by the Headroom (H)
   L ÷ H = LAF
   Example: 20 ÷ 15 = 1.33 Load Angle Factor (LAF)
2) Determine the Share of the Load (SOL) for the individual sling legs:
   Divide the load weight by the number of sling legs.
   Load weight ÷ number of legs = Share of the Load (SOL)
   Example: 12,000 Lbs. ÷ 3 legs = 4,000 Lbs. (SOL)
3) Multiply Load Angle Factor by the Share of the Load to determine Sling Tension.
   Load Angle Factor x Share of the Load = Tension
   LAF x SOL = Tension
   Example: 1.33 x 4,000 = 5,320 Lbs.



Please Note: Tension calculations are based upon:
1) Sling attachment points being equidistant from the center of gravity.
2) Sling attachment points being equidistant to each other.
3) Sling attachment points being on the same horizontal plane.
4) Equal sling leg lengths.

SLING TENSION - PROPORTIONAL SHARE OF THE LOAD

More complex calculations are required when the slings are not placed equidistantly from the center of gravity or when the Center of Gravity is not equidistant from the sling attachment points. The PROPORTIONAL SHARE OF THE LOAD (SOL) must be determined and multiplied by the LOAD ANGLE FACTOR (LAF) to determine SLING TENSION.

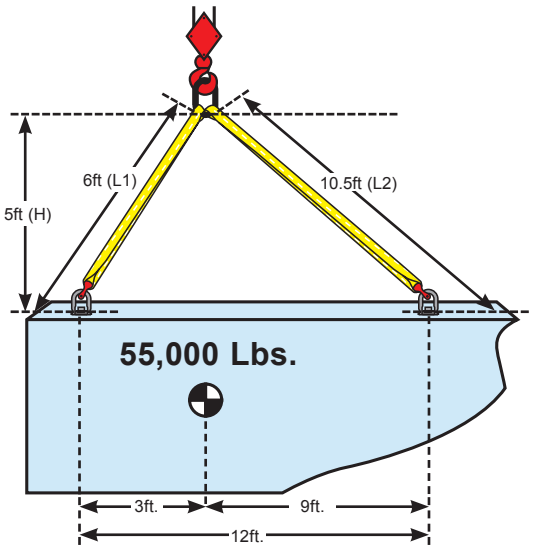
Sling tension is a function of sling length, distance between the sling attachment points and the spatial relationship between the sling attachment points and the Center of Gravity. An inverse proportional relationship exists between Distance and Share of the Load. If a sling is attached 25% of the distance from the Center of Gravity, that sling will carry 75% of the load weight. Likewise, if a sling is attached 75% of the distance from the Center of Gravity, that sling will carry 25% of the load weight.

6 FT. LEG

Proportional Share of the Load	$\frac{3}{12}$ = .25 Distance from CG .75 Share of the Load
	.75 x 55,000 = 41,250 Lbs.
x	x
Load Angle Factor	$\frac{L1}{H} = \frac{6}{5} = 1.20$
Sling Tension	**49,500 Lbs.**

10.5 FT. LEG

Proportional Share of the Load	$\frac{9}{12}$ = .75 Distance from CG .25 Share of the Load
	.25 x 55,000 = 13,750 Lbs.
x	x
Load Angle Factor	$\frac{L2}{H} = \frac{10.5}{5} = 2.10$
Sling Tension	**28,875 Lbs.**



SLING TENSION - DIFFERENT HORIZONTAL PLANES

Different, complex calculations are required to determine sling tension when the slings are attached at different horizontal planes. (Please note: Twin-Path® Adjustable Bridle is depicted).

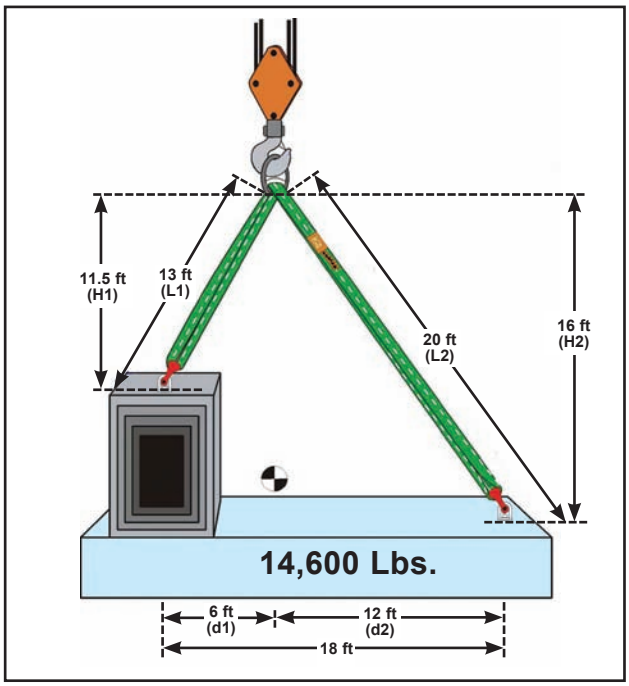
13 FT. LEG (L1) SLING TENSION

$$\frac{W \times d2 \times L1}{(d2 \times H1) + (d1 \times H2)}$$

$$\frac{14{,}600 \times 12 \times 13}{(12 \times 11.5) + (6 \times 16)}$$

$$\frac{2{,}277{,}600}{234}$$

9,733 Lbs. TENSION



20 FT. LEG (L2) SLING TENSION

$$\frac{W \times d1 \times L2}{(d2 \times H1) + (d1 \times H2)}$$

$$\frac{14{,}600 \times 6 \times 20}{(12 \times 11.5) + (6 \times 16)}$$

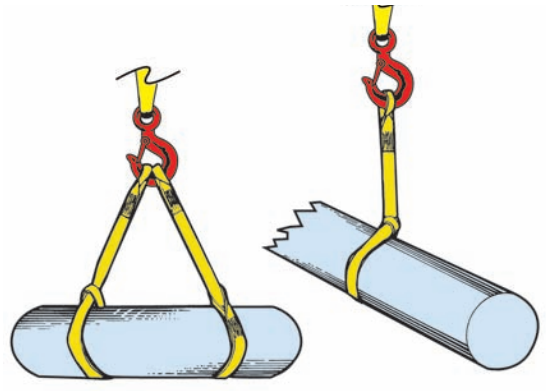
$$\frac{1{,}752{,}000}{234}$$

7,487 Lbs. TENSION

GENERAL INFORMATION

Slings should be rigged in a manner that provides proper load control. It is dangerous to use only one sling to lift a load which tends to shift and slide out.

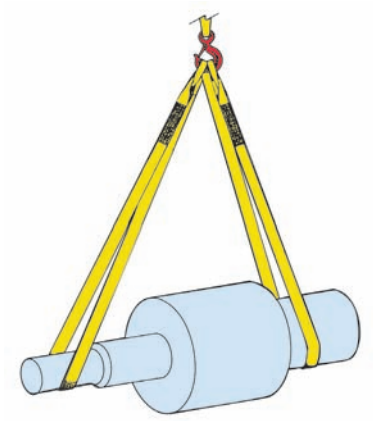
(One sling is depicted for illustrative purposes only).



Ensure that lifting devices are directly over the center of gravity. If this is difficult to determine, it must be discovered by cautious experimentation or calculation. Raise the load carefully. If the load is not level, lower and correct the position of the slings until the balance point is achieved and the load does not tilt.

ADJUSTABLE BASKET HITCH

The adjustable basket hitch allows the sling user to adjust the length of the legs to raise the load level. Adjustable hitches are particularly useful with loads having uneven load weight distribution resulting in an off-set center of gravity.



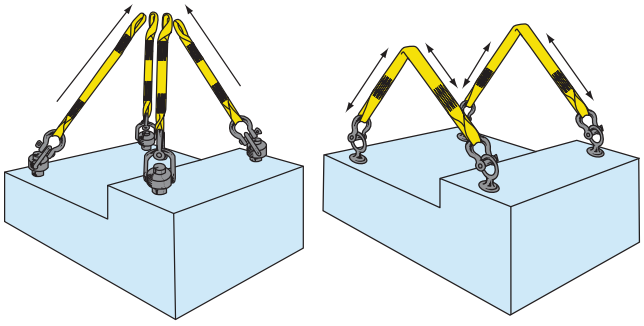
The Adjustable Basket Hitch Work Load Limit is identical to the "regular" basket hitch rating. The rating must be adjusted for the Sling-to-Load Angle. Another effective solution is an Adjustable Rope Sling featured on pages 127 and 128.

BASKET HITCHES

Inverted basket hitches are referred to as equalizing hitches because the sling is free to slip through the hook based upon the load weight distribution. Be sure to employ the "four ends down", North to South, load engagement system.

Right
Eye & Eye Slings
(North to South)

Wrong
Inverted Basket
(East to West)

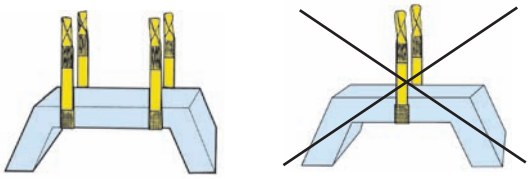


⚠WARNING Slings "skipping" through hardware components can become damaged. Balancing the load is critical and necessary to prevent sling damage and failure.

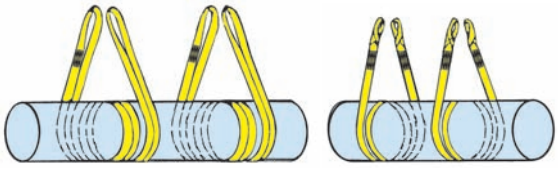
Extra care should be taken when using slings in a basket hitch to balance the load to prevent slippage.

As with the choker hitch, more than one sling may be necessary to control the load.

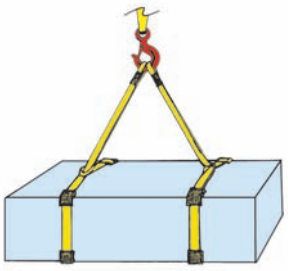
Right **Wrong**



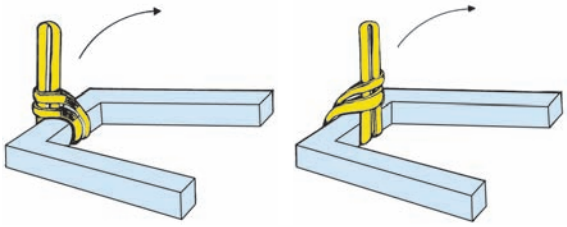
If practical, take a full wrap around the load to grip it firmly; be sure when using multiple slings that they do not cross over each other. Wrapping the load is a legitimate method of minimizing excessive sling length. Other methods, such as, twisting and knotting radically reduce sling Work Load Limits. When the load is "wrapped" the sling Work Load Limit is not increased, but load control is.



CHOKER HITCHES

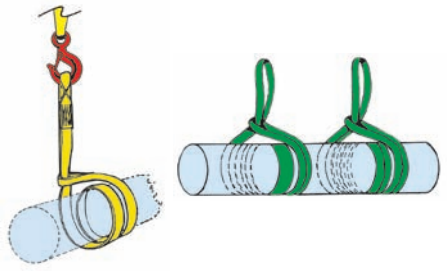


The choke hitch should always be pulled tight before the lift is made, not pulled down during the lift. A sling rigged in a choker hitch (not double wrapped) does not make full contact with the load. Use multiple slings to balance the load, and wrap the load to ensure full contact. Ensure multiple slings do not cross. Choke on opposite sides of the load, if this action will not damage the load and maintain load control.



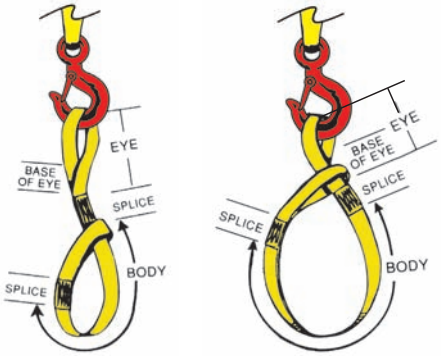
Right **Wrong**

Always use a choker hitch when turning a load. If the sling is not rigged properly, the turning action will loosen the hitch, resulting in load slippage. Place sling eyes on top of the load, pointing the opposite direction of the turn. The body is then passed under the load and through both eyes. Blocking should be used to protect the sling and facilitate removal. Basket hitches should not be used to turn a load. Always downgrade the choker Work Load Limit when the angle of choke is less than 120°, see page 20.



For a tighter choke hitch, which provides full, 360° contact with the load, take a full wrap around the load before choking the sling. Ensure that multiple slings do not cross. When the load is "wrapped" the sling Work Load Limit does not increase, but load control does.

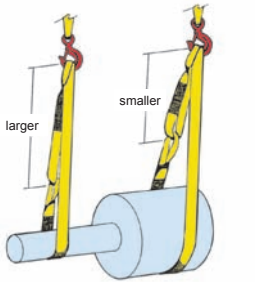
Please note:
One sling is depicted for illustrative purposes only.



Right **Wrong**

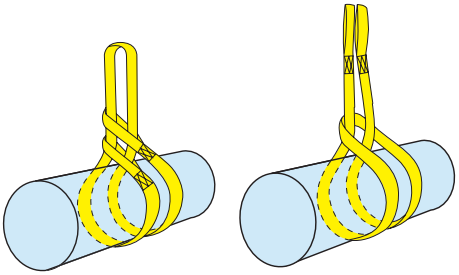
The sling should be of sufficient length to ensure that the choke action is on the sling body, never on the sling splice, fittings, tag, eye or at the base of the sling eye or fitting.

ADJUSTABLE HITCH



The Adjustable Hitch allows the sling user to adjust the length of the legs to raise the load level. Adjustable hitches are particularly useful with loads having uneven load weight distribution resulting in an off-set center of gravity. The Work Load Limit for the Adjustable Hitch is identical to the "normal" Vertical Work Load Limit. The Adjustable Hitch works reasonably well on narrow web slings (1 and 2 in. widths) and roundslings rated at less than 7000 Lbs. choker.

DOUBLE CHOKER HITCH



Right **Wrong**

The Double Choker Hitch if applied properly will facilitate equalization of the loading on the sling legs over the lifting hardware. If applied improperly, one of the legs will share a greater portion of the load and equalization will not occur. The Double Choker Hitch Work Load Limit is twice the regular Choker Hitch Work Load Limit.

SYNTHETIC WEB SLING SAFETY BULLETIN

Synthetic Web Sling Safety Bulletin

⚠ WARNING



This bulletin contains important safety information about the use of synthetic web slings. However, it **DOES NOT** contain all the information you need to know about handling, lifting and manipulating materials and loads safely. Sling use is only one part of a lifting system and it is your responsibility to consider all risk factors prior to using any rigging device or product. Failure to do this may result in severe **INJURY** or **DEATH** due to sling failure and/or loss of load.

The following six points briefly summarize some important safety issues:

1. **All users must be trained** in sling selection, use and inspection, cautions to personnel, environmental effects and rigging practices.
2. **Inspect sling for damage** regularly, if the sling is damaged, remove it from service.
3. **Protect sling from damage.** ALWAYS protect slings in contact with edges, corners, protrusions, or abrasive surfaces with materials of sufficient strength, thickness and construction to prevent damage.
4. **Do not exceed a sling's rated capacity**. Always consider the effect of sling angle and tension on the sling's rated capacity.
5. **Do not stand on, under or near a load** with the sling under tension. All personnel should be alert to dangers of falling and/or uncontrolled loads, sling tension and the potential for snagging.
6. **Maintain and store slings properly**. Slings should be protected from mechanical, chemical and environmental damage.

1. All Sling Users Must be Trained and Knowledgeable

All web sling users must be trained on the proper use of web slings. The American Society of Mechanical Engineers, Safety Standard for Slings (ASME B30.9) states:

> *"Synthetic webbing sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices as covered" by Chapter 9-5.*

OSHA Guidance on Safe Sling Use (29 CFR 1910.184) states that a "qualified person" is one:

> *"who, by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work."*

It is important that all sling users be knowledgeable about the safe and proper use and application of slings and be thoroughly familiar with the manufacturer's recommendations and safety materials provided with each product. In addition, all sling users need to be aware of their responsibilities as outlined in all applicable standards and regulations.

If you are unsure whether you are properly trained and knowledgeable, or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training—**DO NOT** use web slings until you are absolutely sure of what you are doing. Remember, when it comes to using web slings, lack of skill, knowledge and care can result in severe **INJURY** or **DEATH** to you and others.

2. Slings Must Be Regularly and Properly Inspected

Even seemingly "minor" damage to a web sling can significantly reduce its capacity to hold or lift objects and increases the chance that the sling will fail during use. For example, one sling manufacturer has shown that a 3/8" (9.5mm) cut (much smaller than the cut shown in Table 2) caused a sling to break under load at almost half its non-damaged capacity. Therefore, it is very important that web slings are regularly and properly inspected. If you are not sure whether a sling is damaged, **DO NOT USE IT**.

2a. How to inspect slings

To detect possible damage, you should perform a visual inspection of the entire sling and also feel along its entire length, as some damage may be felt more than seen. You should look and feel for any of the types of conditions listed in Table 1. Table 2 shows examples of some of these types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

2b. What to do if you identify damage in a sling

If you identify ANY of these types of damage in a sling, **remove it from service immediately** even if the damage you feel or see is not as extensive as shown in the pictures in Table 2. Slings that are removed from service must be destroyed and rendered completely unusable unless they can be repaired and proof-tested by the sling's manufacturer or other qualified person. You should never ignore sling damage or attempt to perform temporary field repairs of damaged slings (e.g., tie knots in the webbing, etc.).

Table 1. Web sling removal from service criteria

The entire web sling must be **inspected regularly** and it shall be **removed from service** if ANY of the following are detected:

- If sling identification tag is missing or not readable.
- Holes, tears, cuts, snags or embedded materials.
- Broken or worn stitches in the load bearing splices.
- Knots in any part of the sling webbing.
- Acid or alkali burns.
- Melting, charring or weld spatter on any part of the web sling.
- Excessive abrasive wear or crushed webbing.
- Signs of Ultraviolet (UV) light degradation.
- Distortion, excessive pitting, corrosion or other damage to fitting(s).
- If provided, exposed red core yarn. However if damage is present and red yarns are not exposed DO NOT USE the sling.
- Any conditions which cause doubt as to the strength of the web sling.

SYNTHETIC WEB SLING SAFETY BULLETIN

2c. How often to inspect slings

A three-stage procedure is recommended to help ensure that web slings are inspected with appropriate frequency:

Initial Inspection—Whenever a sling is initially received, it must be inspected by a designated person to help ensure that the correct web sling has been received and is undamaged and that the web sling meets applicable requirements for its intended use.

Frequent Inspection—The entire sling must be **inspected before each shift or day in Normal service and before each use in Severe service applications.**

Periodic Inspection—Every sling must be inspected "periodically" by a qualified and designated person. In order to validate the frequent level of inspection, the periodic inspection should be performed by someone other than the individual(s) who most commonly performs the frequent inspection. The frequency of periodic inspections is based on the sling's actual or expected frequency of use, severity of service conditions, the nature of the work performed with the sling and experience gained during the inspection of other slings used in similar circumstances. General guidelines for the frequency of periodic inspections are:

- Normal service—yearly
- Severe service—monthly to quarterly
- Special service—as recommended by a qualified person

Periodic inspections intervals must not exceed one year.

Written records are not required for frequent inspections, but WSTDA WS-1 or ASME B30.9 require that a written record of the most recent periodic inspection be maintained. See WSTDA WS-1 or ASME B30.9 for more information about definitions of Normal, Severe and Special service conditions.

3. Slings Must be Adequately Protected from Damage

3a. Avoid environmental degradation

Environmental factors such as an exposure to sunlight, dirt or gritty-type matter and cyclical changes in temperature and humidity, can result in an accelerated deterioration of web slings. The rate of this deterioration will vary with the level of exposure to these conditions and with the thickness of the sling material. For example, single ply slings will generally degrade more rapidly with this exposure than multiple ply slings. Web slings that are used outdoors regularly should generally be permanently removed from service within a period of 2 to 4 years. All web slings that are exposed to these conditions should be highly scrutinized during their inspections.

Visible indications of such deterioration can include the following:

- Fading of webbing color.
- Uneven or disoriented surface yarn of the webbing.
- Shortening of the sling length.
- Reduction in elasticity and strength of the sling material due to an exposure to sunlight, often evident by an accelerated abrasive damage to the surface yarn of the sling.
- Breakage or damage to yarn fibers, often evident by a fuzzy appearance of the web.
- Stiffening of the web, which can become particularly evident when web slings are exposed to outdoor conditions without being used or cyclically tensioned.

3b. Avoid actions that cause damage to slings

You should always avoid any action that causes the types of damage identified in the previous section of this Safety Bulletin, including (but not limited to):

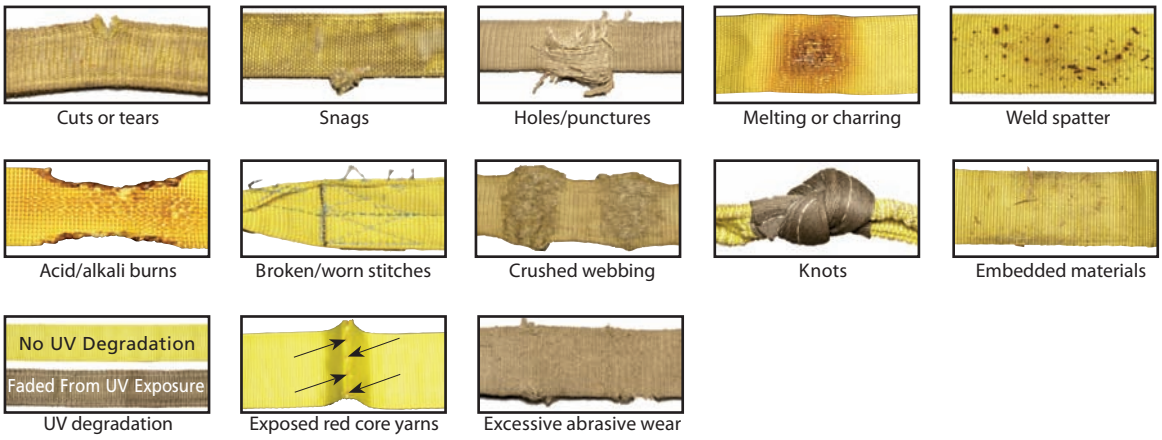
- Dropping or dragging slings on the ground, floor or over abrasive surfaces.
- Pulling slings from under loads when the load is resting on the sling—place blocks under load if feasible.
- Shortening or adjusting sling using methods not approved by the sling manufacturer or qualified person.
- Twisting, kinking or knotting the sling.
- Exposing slings to damaging acids or alkalis.
- Exposing slings to sources of heat damage or weld spatter.
- Using slings or allowing exposure to temperatures above 194°F (90°C) or below -40°F (-40°C).
- "Tip loading" a sling on a hook instead of centering it in the base or "bowl" of the hook.
- Using hooks, shackles or other hardware that have edges or surfaces that could damage sling.
- Running/driving over slings with a vehicle or other equipment.

Synthetic slings are affected by some chemicals ranging from little to total degradation. Time, temperature and concentration factors affect the degradation. For specific applications, consult the manufacturer. In addition, water absorption can decrease the strength of nylon web slings by as much as 10–15% (its strength returns when the sling dries completely). For specific applications, consult the manufacturer.

3c. Safeguard slings with sufficient protection

Synthetic web slings can be damaged, abraded or cut as tension and compression between the sling, the connection points and the load develops. Surfaces in contact with the sling do not have to be very

Table 2. Types of damage you should look and feel for in web slings



Cuts or tears | Snags | Holes/punctures | Melting or charring | Weld spatter

Acid/alkali burns | Broken/worn stitches | Crushed webbing | Knots | Embedded materials

UV degradation | Exposed red core yarns | Excessive abrasive wear

SYNTHETIC WEB SLING SAFETY BULLETIN

abrasive or have "razor" sharp edges in order to create the conditions for sling failure. Therefore, web slings must ALWAYS **be protected from being cut or damaged by corners, edges, protrusions or abrasive surfaces with protection sufficient for the intended purpose.**

There are a variety of types of ways to protect slings from such damage. A qualified person might select and use appropriate engineered protectors/softeners—commercially available products (e.g., sleeves, wear pads, edge wraps, body wraps, corner protectors, etc.) specifically designed to protect slings from damage. A qualified person might also design and construct their own methods of protection so long as the sling is adequately protected from and/or kept off of the damaging edge surface.

Regardless of the particular method chosen, the goal is to ensure that the sling, under tension, maintains its ability to securely lift the load while avoiding contact with damaging or abrasive surfaces under tension. A qualified person must carefully consider the most appropriate means to accomplish this goal. The protection used should not be makeshift (i.e., selecting and using cardboard, work gloves or other such items based solely on convenience or availability).

Regardless of the approach taken, a qualified person must ensure that the protection method chosen is appropriate for the types of damage to which the slings will be exposed. For instance, some protection provides abrasion resistance, but offers virtually no protection against cuts. Several "test" lifts, done in a non-consequence setting, may be necessary to determine the suitability of the protection device(s). After each "test" lift, the protection device(s) and sling(s) need to be inspected for damage and suitability. You should keep in mind that no protection is "cut proof" and you should always operate within the specified limits of the sling and its accessories (e.g., fixtures, hardware, protection, etc.).

4. Always Use Slings Properly

When lifting loads, a trained, qualified and knowledgeable user must take into account the factors and issues addressed in this bulletin, as well as considering any other relevant factors not addressed herein (see Table 4). Among the factors related specifically to web slings, users must perform several activities, including (but not limited to) those discussed in the following subsections.

4a. Assess the load

Determine the weight of the load and make sure it does not exceed the sling's rated capacity or the capacity of any of the components of the rigging system. Users must also determine the load's center of gravity (CG) to make sure the rigging system used will be able to retain and control the load once lifted.

4b. Select an appropriate sling/configuration

Select a sling having suitable characteristics for the type, size and weight of the load, the type of hitch (see Table 3) and the environment. The sling must be securely attached to the load and rigged in a manner to provide for load control to prevent slipping, sliding and/or loss of the load. A trained, qualified and knowledgeable user must determine the most appropriate method of rigging to help ensure a safe lift and control of the load.

Table 3. Common types of sling hitches

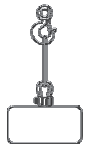
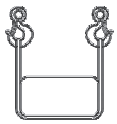
Hitch		Comments
Vertical Hitch		One end is placed on the hook, while the other end is attached directly to the load. A tagline should be used to prevent load rotation.
Choker Hitch		Sling passes through one end around the load and the other end is placed on the hook. Rated capacity is normally 80% of that for a vertical hitch. Load control is limited with only one sling rigged in a choker hitch. Also, the choke point should always be on the sling body–not on the sling eye, fitting, base of the eye or fitting, splice or tag.
Basket Hitch		The sling cradles the load while both ends are attached overhead. The rated capacity for a basket hitch is twice that for a vertical hitch. As with the choker hitch, more than one sling rigged in a basket hitch (or some other means) may be necessary to help ensure load control.

Table 4. Issues and Factors to consider when handling, lifting and manipulating materials and loads

Safe handling, lifting and manipulation of materials and loads requires consideration of a number of factors and issues, including (but not limited to):

Categories	Issues/ Factors to Consider		
Environment	Wind Weather Visibility	Environmental temperature Object temperature Chemical conditions and exposure	Ground stability Underground installations
Load	Weight Dimensions Center of Gravity (CG)	Attachment point integrity Susceptibility to crushing/compression Loose parts that could fall from load	Combination loads Damaging surfaces/edges Structural stability (bend/flex)
Equipment/Lift	Single/multiple cranes/hoists Maximum/planned operating radius Allowable load Ratio of lift to allowable load	Clearance to surrounding facilities Power lines and other environmental hazards Clearance between boom and lift Emergency/contingency set down area	Equipment inspection Ensure a clear load path
Rigging	Sling selection Load control Lift point (over the CG) Positive sling-to-load engagement	Coefficient of friction: Sling-to-load Appropriate hitch (for CG and load control) Load is free to move and is not snagged Coordination of multiple slings	Suitable wear protection Sling capacity is adequate for angle and tension
Personnel	Area clear of unnecessary personnel Personnel are trained and qualified	Signals: Visual, audible, electronic, etc. Personnel away from load and other dangers	Pre-lift plan and meeting Tag lines/spotter requirements

SYNTHETIC WEB SLING SAFETY BULLETIN

Another important consideration is the sling-to-load angle—the angle formed between a horizontal line and the sling leg or body. This angle is very important and can have a dramatic effect on the rated capacity of the sling. When the sling-to-load angle decreases, the load on each leg increases. This principle applies in a number of conditions, including when one sling is used to lift at an angle and when a basket hitch or multi-legged bridle sling is used. Table 5 provides information about increased tension as a function of sling-to-load angle (assuming equally-loaded sling legs). Sling angles of less than 30 degrees are not recommended.

Similarly, when the angle of choke is less than 120 degrees, the sling choker hitch capacity decreases. To determine the actual sling capacity at a given angle of choke, multiply the sling capacity rating (for a choker hitch) by the appropriate reduction factor determined from Table 6.

4c. Do not misuse the sling

Avoid accelerating or decelerating the load too quickly (i.e., "shock loading"). Do not use slings to pull on stuck or snagged objects and do not use slings for towing purposes. A web sling should only be used for lifting loads.

5. Make Sure All Personnel are Clear of Loads and Alert to Risks

Even if you account for all of the factors/issues discussed in this Safety Bulletin, things can still go wrong. Therefore, all personnel must stand clear of lifted loads and never be under, on or near suspended loads.

When using slings, no part of the body should be placed between the sling and load or between the sling and lifting hook. In addition, personnel must be alert to the potential for the sling to become snagged during a lift. Never use a web sling to pull on objects in a snagged or constrained condition.

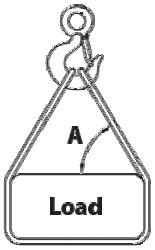
6. Properly Store and Maintain Slings

In order to prevent damage to slings when not in use, you should store slings in a cool, dry and dark location. Slings should be stored in an area free from environmental or mechanical sources of damage, such as: weld spatter, splinters from grinding or machining, heat sources, chemical exposure, etc. Also, keep slings clean and free of dirt, grime and foreign materials.

If slings are cleaned, use only mild soap and water. Rinse sling thoroughly and let it dry completely before placing the sling back into storage or use. Do not machine wash slings. Machine washing results in significant loss of sling strength.

Table 5. Increased sling tension as a function of sling-to-load angle

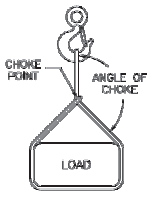
Angle "A" in degrees from horizontal	Tension Multiplier
90	1.000
85	1.004
80	1.015
75	1.035
70	1.064
65	1.104
60	1.155
55	1.221
50	1.305
45	1.414
40	1.555
35	1.742
30	2.000



Multiply the load weight (per leg) by the tension factor to determine the increased tension on the sling leg(s)

Table 6. Reduction in rated capacity as a function of angle of choke

Angle of Choke (degrees)		Angle of Choke Reduction Factor
= or >	<	
120	180	1.000
105	120	0.82
90	105	0.71
60	90	0.58
0	60	0.50



Actual Sling Capacity = Rated Capacity x Reduction Factor

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Where to Find Additional Information

This bulletin does not provide you with all the information you need to know in order to be considered trained and knowledgeable about rigging and lifting loads, but it does provide important information about the use of web slings within a rigging system. If you need more information about web slings and rigging practices or your responsibilities according to regulations and standards, talk to your employer. You and your employer can consult a number of sources of information to help ensure that you are properly trained and knowledgeable when using web slings, including (but not limited to):

- WSTDA-WS-1—Recommended Standard Specification for Synthetic Web Slings.
- ASME B30.9—Synthetic Webbing Slings: Selection, Use and Maintenance.
- OSHA 29 CFR 1910.184—Slings.
- Rigging handbooks.
- OSHA Guidance on Safe Sling Use. (http://www.osha.gov/dsg/guidance/slings/synth-web.html)
- Manufacturer's catalog, manual, website, bulletins, etc.
- Formal training provided by manufacturers or other outside entities.

WSTDA-WSSB-1 2010

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS

⚠ ADVERTENCIA



Este boletín contiene importante información acerca del uso de las eslingas de malla sintética. No obstante, **NO CONTIENE** toda la información que usted necesita para poder manejar, elevar y manipular con seguridad los materiales y cargas. El uso de la eslinga sólo es una parte de un sistema de elevación, y es su responsabilidad considerar todos los factores de riesgo antes de emplear cualquier dispositivo o producto de aparejo. El no hacer esto podría resultar en **LESIONES** graves o **MUERTE** debido a una falla de la eslinga o pérdida de la carga.

Los seis puntos a continuación dan un resumen breve de importantes consideraciones de seguridad:

1. **Es necesario capacitar a todos** los usuarios en la selección, el uso y la manera de inspeccionar la eslinga, así como en las precauciones al personal, los efectos ambientales y las prácticas de aparejo.
2. **Inspeccionar la eslinga** con regularidad para detectar daños, y si se descubren, retirar la eslinga de servicio.
3. **Proteger la eslinga de daño**. SIEMPRE proteja las eslingas en contacto con bordes, esquinas, salientes o superficies abrasivas con materiales dotados de suficiente resistencia y espesor, al igual que una construcción adecuada para prevenir el daño.
4. **No sobrepasar la capacidad nominal** de la eslinga. Siempre tenga en cuenta el efecto del ángulo de la eslinga y la tensión de la misma sobre su capacidad nominal.
5. **No pararse encima, debajo o cerca** de una carga con la eslinga bajo tensión. Se debe informar a todo el personal de posibles daños por caídas y/o el descontrol de cargas, la tensión de eslinga y la posibilidad de enganchones.
6. **Mantener y almacenar las eslingas** correctamente. Se debe proteger las eslingas de daños mecánicos, químicos y ambientales.

1. Todos los usuarios de eslingas deben ser capacitados y poseer los conocimientos necesarios

Todos los usuarios de eslingas deben ser capacitados en el uso apropiado de las mismas. La Sociedad Americana de Ingenieros Mecánicos en sus Normas de Seguridad para Eslingas (ASME B30.9), dice lo siguiente:

> "Se capacitarán a los usuarios de eslingas de malla sintética en la selección, inspección, precauciones para el personal, efectos del medio ambiente y prácticas de aparejo según se cubran" en el Capítulo 9-5.

En las recomendaciones de la Administración de Salud y Seguridad Ocupacional (OSHA) sobre el Uso Seguro de las Eslingas (29 CFR 1910.184) se hace constar que una "persona calificada" es:

> "quien, en virtud de poseer un título reconocido o certificado de profesionalismo en un campo aplicable, o quien, por sus amplios conocimientos, capacitación y experiencia, ha demostrado con éxito la capacidad de resolver problemas relacionados con la temática y el trabajo".

Es importante que todos los usuarios de eslingas tengan conocimientos sobre el uso seguro y correcto, así como la aplicación de las eslingas, y estar totalmente familiarizados con las recomendaciones del fabricante y los materiales de seguridad provistos con cada producto. Además, todos los usuarios de eslingas necesitan estar conscientes de sus responsabilidades según su delineación en todas las normas y reglamentos aplicables.

Si usted no está seguro si está correctamente capacitado o si tiene los conocimientos necesarios, o si no está seguro de lo que le requieren las normas y reglamentos, pídale información y/o capacitación a su empleador—**NO UTILICE** las eslingas sintéticas hasta que esté absolutamente seguro de lo que está haciendo. Recuerde, cuando se trata del uso de las eslingas sintéticas, la falta de habilidad, conocimientos y cuidado puede resultar en graves **LESIONES** o **MUERTE** para usted y otras personas.

2. Se debe inspeccionar las eslingas adecuadamente y con regularidad.

Hasta los daños aparentemente "menores" sufridos por una eslinga sintética pueden reducir significativamente su capacidad de sujetar o elevar los objetos, y así se aumenta la posibilidad de que la eslinga se caiga durante el uso. Por ejemplo, un fabricante de eslingas ha mostrado que un corte de 3/8 de pulgada (9.5mm) (mucho menor que el corte mostrado en la Tabla 2) hace que una eslinga se rompa bajo una carga de casi la mitad de su capacidad no dañada. Por eso, es muy importante que se inspeccionen las eslingas sintéticas con regularidad y en la forma apropiada. Si usted no está seguro si está dañada una eslinga, **NO LA USE**.

2a. Manera de inspeccionar las eslingas

Para detectar posibles daños, se debe realizar una inspección tanto visual como táctil de toda la eslinga, puesto que algunos daños se perciben más por el toque que por la vista. Inspeccione y toque la eslinga para la presencia de cualquier tipo de condiciones que figuran en la lista de la Tabla 1. La Tabla 2 presenta cualquier tipo de daño pero cabe notar que son ejemplos relativamente al extremo que damos únicamente a modo de ilustración

2b. ¿Qué es lo que se hace si se identifica algún daño en una eslinga?

Si descubre CUALQUIERA de estos tipos de daño en una eslinga, **retírela de servicio inmediatamente**, aún si el daño que usted siente o ve no es tan extensivo como el de las fotografías en la Tabla 2. Se debe destruir o imposibilitar por completo el uso posterior de cualquier eslinga retirada de servicio, a no ser que su fabricante u otra persona calificada pueda repararla y realizar las pruebas necesarias para poder usarla de nuevo. Nunca permita que se pase por alto el daño de una eslinga ni tampoco trate de realizarle reparaciones provisionales en campo (p. ej., hacer nudos en la malla, etc.).

Tabla 1. Criterios para el retiro del servicio de una eslinga sintética.

Toda la eslinga sintética debe **inspeccionarse con regularidad** y hay **que retirarla de servicio** si se descubre CUALQUIERA de los siguientes problemas:

- Si falta el albarán o etiqueta de identificación de la eslinga o si es ilegible.
- Agujeros, roturas, cortes, enganchones o materiales incrustados.
- Costuras rotas o gastadas en los empalmes que sostienen la carga.
- Nudos en cualquier parte de la malla de la eslinga.
- Quemaduras ácidas o alcalinas.
- Derretimiento, carbonización o salpicaduras de la soldadura en cualquier parte de la eslinga sintética.
- Excesivo desgaste abrasivo o aplastamiento de la malla.
- Señales de deterioro por luz ultravioleta (UV).
- Deformación, picaduras en exceso, corrosión u otros daños a los accesorios.
- Si está provisto, hilo de núcleo rojo expuesto. No obstante, si el daño está presente, y los hilos rojos no estén expuestos, NO UTILIZAR la eslinga.
- Cualquier condición que haga dudar de la resistencia de la eslinga sintética.

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS

2c. Frecuencia de inspección de las eslingas

Se recomienda un procedimiento de tres etapas para estar seguro de que se inspeccionan las eslingas con la debida frecuencia.

Inspección inicial — A la recepción inicial de una eslinga, la persona designada debe inspeccionarla para poder asegurarse que se ha recibido la eslinga correcta y sin daños, y que ésta satisface los requisitos aplicables para el uso destinado.

Inspección frecuente — Se debe inspeccionar toda la eslinga antes de cada turno o día de servicio normal y antes de usarse bajo condiciones de servicio intensivo.

Inspección periódica — Una persona designada y calificada debe realizar la inspección "periódica" de cada eslinga. Para validar la frecuencia de inspección, la inspección periódica debe llevarse a cabo por una persona que no sea el individuo más comúnmente encargado de la inspección frecuente. La frecuencia de las inspecciones periódicas se basa en la frecuencia de uso real o anticipada, la intensidad de las condiciones de servicio, la naturaleza del trabajo realizado con la eslinga y la experiencia obtenida durante la inspección de otras eslingas empleadas en circunstancias semejantes. A continuación se presentan las directrices generales sobre la frecuencia de las inspecciones periódicas:

- Servicio normal—anualmente
- Servicio bajo condiciones intensivas— mensual a trimestralmente
- Servicio especial—según las recomendaciones de una persona calificada

Los intervalos de inspección periódica no deben de exceder un año.

No hace falta tener constancias de las inspecciones frecuentes, pero la norma WSTDA WS-1 o la ASME B30.9 requieren que se guarde constancia de la inspección periódica más reciente. Ver la norma WSTDA WS-1 o ASME B30.9 para más información sobre definiciones de lo que significa Normal, Intensivo y Especial en el contexto de condiciones de servicio.

3. Se debe proteger las eslingas adecuadamente de cualquier daño

3a. Evitar el deterioro ambiental

Los factores ambientales, tales como la exposición al sol, a la suciedad o materia abrasiva y los cambios cíclicos de temperatura y humedad, pueden resultar en una aceleración del deterioro de las eslingas sintéticas. La tasa de este deterioro variará conforme al grado de exposición a estas condiciones y al espesor del material de la eslinga. Por regla general, las eslingas de una sola capa se deterioran más rápidamente que las de capas múltiples. Generalmente, las eslingas sintéticas utilizadas al aire libre deben retirarse del servicio permanentemente dentro de un plazo de 2 a 4 años. Todas las eslingas sintéticas expuestas a estas condiciones deben examinarse a fondo durante la inspección.

Tabla 2. Esté alerta a estos tipos de daños durante una inspección visual y táctil de las eslingas.

Indicaciones visuales del deterioro mencionado pueden comprender:

- Decoloración de la malla.
- Hilo desparejo y desalineado en la superficie de la malla.
- Longitud acortada de la eslinga.
- Reducción en elasticidad y resistencia del material de la eslinga por haberse expuesto al sol, a menudo evidente por una aceleración en el daño abrasivo al tejido superficial de la eslinga.
- Fibras de hilo rotas o dañadas, a menudo evidente por la presencia de pelusa en la malla.
- Rigidez de la malla, la cual puede llegar a ser bastante evidente cuando las eslingas de malla se exponen al aire libre sin usarse ni someterse al ciclo de tensionado.

3b. Evitar acciones capaces de dañar las eslingas

Se debe evitar siempre acciones que produzcan las clases de daños identificados en la sección anterior de este Boletín de Seguridad, incluyendo (pero sin limitarse a):

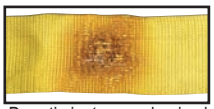
- Eslingas que se caen al suelo o piso o que se arrastran sobre superficies rugosas.
- Estirar a la fuerza aquellas eslingas debajo de una carga, cuando ésta descansa sobre la eslinga; de ser factible, se colocan bloques debajo de la carga.
- Acortar o ajustar la eslinga, usándose métodos no aprobados por el fabricante de la eslinga o una persona calificada.
- Torcer, enredar o hacer nudos en la eslinga.
- Exponer las eslingas a ácidos o álcalis con el daño concomitante.
- Exponer las eslingas a fuentes de calor o salpicaduras de soldadura con el daño concomitante.
- Usar las eslingas o permitir que se usen cuando la temperatura sube por encima de 194°F (90°C) o baja por debajo de -40°F (-40°C).
- "Cargar sobre la punta" significa que el peso de la eslinga recae sobre la punta de enganche en lugar de centrarse sobre la base o "asiento" del gancho.
- Usar ganchos, cadenas u otros accesorios con bordes o superficies que podrían dañar la eslinga.
- Conducir o pasar por encima de las eslingas con un vehículo u otro equipo.

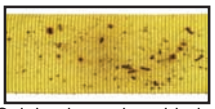
Debido a algunos productos químicos que entran en contacto con las eslingas sintéticas, éstas experimentan desde un leve deterioro hasta una degradación total. Los factores de tiempo, temperatura y grado de concentración afectan el deterioro. Para usos específicos, comuníquese con el fabricante. Además, la absorción de agua puede reducir la resistencia de una eslinga de malla de nailon hasta entre el 10 y el 15% (la resistencia se recupera cuando la eslinga se seca por completo). Para usos específicos, comuníquese con el fabricante.


Cortes o roturas

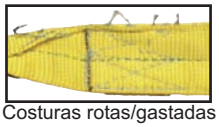

Enganchones


Agujeros/perforaciones


Derretimiento o carbonizado


Salpicaduras de soldadura

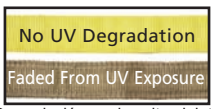

Quemaduras ácidas o alcalinas


Costuras rotas/gastadas

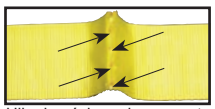

Malla aplastada


Nudos


Materiales incrustados



Degradación por luz ultravioleta


Hilo de núcleo rojo expuesto


Excesivo desgaste abrasivo

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS

3c. Dar suficiente protección a las eslingas

Las eslingas sintéticas se pueden dañar, desgastar o cortar al desarrollarse la tensión y compresión entre la eslinga, los puntos de unión y la carga. Las superficies en contacto con la eslinga no necesitan ser muy abrasivas o tener bordes muy filosos (parecidos al filo de una navaja) para crear las condiciones de falla de la eslinga. Por eso, las eslingas sintéticas SIEMPRE **deben protegerse de cortes o daños provocados por esquinas, bordes, salientes y superficies abrasivas, así como protegerse suficientemente para el propósito o uso destinado**.

Existe una variedad de maneras para proteger las eslingas de los daños mencionados. Una persona calificada podría escoger y utilizar los protectores/suavizadores técnicos apropiados, o sea, productos comercialmente disponibles (p.ej. mangas protectoras para eslingas planas y tubulares, almohadillas contra el desgaste, cantoneras, envolturas del cuerpo, esquineras, etc.), los cuales han sido diseñados específicamente para proteger las eslingas contra daños. Asimismo, una persona calificada podría diseñar y construir sus propios métodos de protección siempre y cuando la eslinga esté protegida adecuadamente y alejada de la superficie del borde dañado.

Independientemente del método elegido en particular, la meta es la de asegurar que la eslinga bajo tensión mantiene la capacidad de elevar la carga en forma segura mientras evita el contacto con las superficies dañinas o abrasivas bajo tensión. Una persona calificada debe considerar con cuidado la manera más apropiada de lograr esta meta. La protección utilizada no debe ser precaria, p.ej., la selección y utilización de cartón, guantes industriales u otros artículos afines, únicamente debido a consideraciones de comodidad o disponibilidad.

Independientemente del método elegido, una persona calificada debe asegurar que el método de protección elegido sea apropiado para los tipos de daños a los que estarán expuestos las eslingas. Por ejemplo, cierta protección brinda resistencia a la abrasión aunque virtualmente no brinda protección alguna contra cortes. Varias "pruebas" de elevación efectuadas en un entorno sin consecuencias adversas tal vez sean necesarias para determinar la idoneidad del dispositivo(s) de protección. Hace falta inspeccionar el dispositivo(s) de protección y la eslinga(s) para detectar daños y determinar el grado de adecuación después de cada "prueba" de elevación. Se debe tener en cuenta que no existe protección total "a prueba de cortes", por lo que se debe operar siempre dentro de los límites específicos de la eslinga y sus accesorios (p.ej., dispositivos, piezas y protección, etc.).

4. Siempre usar las eslingas correctamente

En las operaciones de levantar las cargas, un usuario calificado y capacitado con los conocimientos necesarios debe tomar en cuenta los temas, problemas y factores tratados en este boletín, al igual que cualesquier otros factores pertinentes no tratados en el presente (ver la Tabla 6). Entre los factores especialmente pertinentes a las eslingas sintéticas, los usuarios deben realizar varias actividades, incluyendo (pero sin limitarse a) aquellas tratadas en los siguientes apartados.

4a. Evaluar la carga

En las operaciones de levantar las cargas, un usuario calificado y capacitado con los conocimientos necesarios debe tomar en cuenta los temas, problemas y factores tratados en este boletín, al igual que cualesquier otros factores pertinentes no tratados en el presente (ver la Tabla 6). Entre los factores especialmente pertinentes a las eslingas sintéticas, los usuarios deben realizar varias actividades, incluyendo (pero sin limitarse a) aquellas tratadas en los siguientes apartados.

4b. Seleccionar una eslinga/configuración apropiada

Seleccione una eslinga con las características apropiadas para el tipo, tamaño y peso de la carga, el tipo de enganche (ver la Tabla7) y el entorno. Se debe unir la eslinga con seguridad y cuidado a la carga y aparejarla de tal forma que permita controlar la carga y evitar el desplazamiento, el deslizamiento y/o la pérdida de la carga. Un usuario calificado, capacitado y con los conocimientos necesarios debe determinar el método más apropiado de aparejo para lograr el levantamiento seguro y el buen control de la carga.

Tabla 3. Tipos de enganches de eslinga comunes

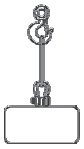
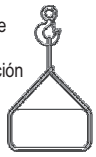
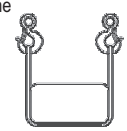
Enganche	Observaciones
Enganche Vertical 	Se coloca un extremo en el gancho mientras que se une el otro extremo directamente a la carga. Se debe usar un cable de maniobra para prevenir la rotación de la carga.
Enganche de Estrangulación 	La eslinga pasa por un extremo, alrededor de la carga, y el otro extremo se coloca en el gancho. La capacidad nominal normalmente es del 80% de aquélla usada para un enganche vertical. El control de la carga es un problema potencial con sólo una eslinga aparejada en un enganche de estrangulación. Así también, el punto de estrangulación siempre debe estar en el cuerpo de la eslinga—no en los accesorios, la base del accesorio o albarán o etiqueta.
Enganche de Cesta 	La eslinga actúa como cuna para la carga mientras que se sujetan ambos extremos por encima. La capacidad nominal para un enganche de cesta es dos veces la de un enganche vertical. Al igual que con el enganche de estrangulación, es posible que sea necesaria más de una eslinga aparejada en un enganche de cesta (o por algún otro medio) para asegurar el control de la carga.

Tabla 4. El manejo, levantamiento y manipulación seguros de los materiales y las cargas requieren que se considere un número de temas, problemas y factores

El manejo, levantamiento y manipulación seguros de los materiales y las cargas requieren que se considere un número de temas, problemas y factores, incluyendo (pero sin limitarse a):

Categorías	Un Número de Temas, Problemas y Factores a Tener en Cuenta		
Ambiente	Viento Clima Visibilidad	Temperatura ambiente. Temperatura objeto. Condiciones y exposición químicas.	Estabilidad del suelo. Instalaciones subterráneas.
Carga	Peso Dimensiones Centro de Gravedad (CG)	Integridad del punto de unión. Susceptibilidad a aplastamiento/compresión. Piezas sueltas que podrían caerse de la carga.	Cargas mixtas. Superficies/bordes dañinos. Estabilidad estructural (dobladura/flexión).
Equipo/ Elevación	Grúas/malacates Sencillos/múltiples Radio de operación máxima/planeada Carga permisible Relación de elevación a carga permisible	Paso libre a edificios adyacentes. Peligros a líneas de distribución y otros peligros ambientales. Espacio entre la pluma y equipo elevador. Área de colocación de emergencia/contingencia.	Inspección de equipo. Asegurar un trayecto despejado para la carga.
Aparejo	Selección de eslinga Control de carga Centro de elevación (sobre el CG) Dinámica positiva eslinga-carga	Coeficiente de fricción eslinga-carga. Enganche apropiado (control de CG y carga). Movimiento libre sin enganchones de la carga. Coordinación de eslingas múltiples.	Ropa de protección adecuada. Capacidad de eslinga adecuada para ángulo y tensión.
Personal	Área libre de personal innecesario Personal capacitado y calificado	Señales: visuales, audibles, electrónicas, etc. Personal alejado de la carga y otros daños.	Reunión y plan de elevación previos. Requisitos para vigilar el trayecto y la carga/ cable de maniobra.

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS

Otra consideración importante es el ángulo eslinga-carga, o sea, el ángulo formado entre una línea horizontal y la pata o cuerpo de la eslinga. Este ángulo es muy importante y puede tener un efecto dramático sobre la capacidad nominal de la eslinga. Una disminución en el ángulo eslinga-carga produce un aumento de carga sobre cada pata. Este principio se aplica a numerosas condiciones, incluyendo el uso de una eslinga para elevar en ángulo o con enganche de cesta o brida multipatas. La Tabla 5 brinda información acerca de un aumento de tensión como función del ángulo eslinga-carga (se supone una distribución uniforme de la carga sobre cada pata de la eslinga). No se recomiendan ángulos de eslinga menores de 30 grados.

Así también, cuando el ángulo de estrangulación es menor de 120 grados, se reduce la capacidad de resistencia de la vuelta estranguladora. Para determinar la capacidad real de la eslinga a un ángulo dado de estrangulación, multiplicar la capacidad nominal de la eslinga (para vuelta de estrangulación) por el factor de reducción apropiado, usándose la Tabla 6 para determinarlo.

4c. No someter la eslinga a usos indebidos

Procure no acelerar ni desacelerar la carga con demasiada rapidez (acción denominada "carga de choque"). No use las eslingas para arrastrar ni para estirar objetos trabados o enganchados; tampoco use las eslingas para el remolque. Una eslinga sintética sólo debe usarse para levantar cargas.

5. Asegurar que todo el personal esté alejado de las cargas y alerta a los riesgos

Aun teniendo en cuenta todos los factores, temas o situaciones que se han tratado en este Boletín de Seguridad, pueden presentarse problemas. Por eso, todo el personal debe alejarse de las cargas levantadas y nunca ponerse encima, debajo o cerca de ellas.

Cuando se usa la eslinga, ninguna parte del cuerpo humano debe colocarse entre la carga y la eslinga, ni entre ésta y el gancho de elevar. Además, el personal deber estar alerta a la posibilidad de que la eslinga se enganche durante la elevación. Nunca utilice una eslinga sintética para estirar o arrastrar los objetos enganchados o de otra manera difíciles de levantar.

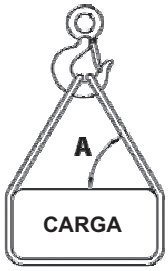
6. Manera correcta de almacenar y mantener las eslingas

Para prevenir el daño a las eslingas cuando no se usan, hay que almacenarlas en un lugar fresco, seco y oscuro. Las eslingas deben almacenarse en un área libre de fuentes de daño ambiental o mecánico, tales como: salpicaduras de soldadura, astillas de esmerilado o fresado, fuentes de calor, exposiciones a productos químicos, etc. Así también, mantenga las eslingas limpias sin suciedad, residuos y materiales extraños.

Si hace falta limpiar las eslingas sintéticas, solamente utilice agua y un jabón suave. Enjuague bien la eslinga y déjela secar completamente antes de usarla o almacenarla de nuevo. No lave las eslingas a máquina. El lavado a máquina resulta en una pérdida significativa de resistencia de la eslinga.

Tabla 5. Aumento en la tensión de eslinga en función del ángulo eslinga-carga

Ángulo "A" en grados desde horizontal	Multiplicador de tensión
90	1.000
85	1.004
80	1.015
75	1.035
70	1.064
65	1.104
60	1.155
55	1.221
50	1.305
45	1.414
40	1.555
35	1.742
30	2.000

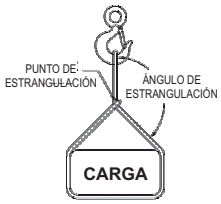


Se multiplica el peso de carga (por pata) por el factor de tensión para determinar el aumento de la tensión sobre la pata o patas de la eslinga.

Tabla 6. Reducción en la capacidad nominal en función del ángulo de estrangulación

Ángulo de Estrangulación (grados)		Ángulo de Estrangulación Factor de Reducción
= o >	<	
120	180	1.000
105	120	0.82
90	105	0.71
60	90	0.58
0	60	0.50

Capacidad real de eslinga = Capacidad Nominal x Factor de Reducción



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Dónde Encontrar Información Adicional

Este boletín no pretende darle toda la información que necesita saber para considerarse capacitado y con los conocimientos necesarios sobre aparejos y elevación de cargas, pero sí presenta información importante sobre el uso de las eslingas sintéticas dentro de un sistema de aparejo. En caso de necesitar más información sobre las eslingas redondas y las prácticas de aparejo o sus responsabilidades según los reglamentos y normativas, consulte con su empleador. Usted y su empleador pueden consultar un número de fuentes informativas para poder asegurarse que usted ha sido correctamente capacitado y con los conocimientos necesarios para el uso de las eslingas sintéticas, incluyendo (pero sin limitarse a):

- WSTDA-WS-1 – Especificación normalizada recomendada para eslingas de malla sintética de poliéster
- ASME B30.9 – Eslingas de malla sintética: selección, uso y mantenimiento
- OSHA 29 CFR 1910.184-Eslingas
- Manuales de aparejos
- Recomendaciones de OSHA sobre el uso seguro de las eslingas (http://www.osha.gov/dsg/guidance/slings/synth-web.html)
- Catálogo, manual, sitio web, boletines, etc. del fabricante
- Capacitación formal provista por los fabricantes u otras entidades externas

WSTDA-WSSB-1 2010 SP

Web Sling Inspection

A specific procedure for sling inspection is the best safeguard against injury, death and property damage. It is important that you employ a three stage, level of inspection to ensure that slings are inspected with the appropriate frequency. It is also important that all inspections must be done by trained and qualified personnel.

To detect possible damage, you should perform a visual inspection of the entire sling and also feel along its entire length, as some damage may be felt more than seen. You should look and feel for any of the types of conditions listed in the Removal from Service Criteria, see page 34. Page 35 depicts examples of some of the types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

If you identify ANY of these types of damage in a sling, remove it from service immediately, even if the damage you see or feel is not as extensive as shown on page 35. Slings that are removed from service must be destroyed and rendered completely unusable unless they can be repaired and proof tested by the manufacturer. Never ignore sling damage or attempt to perform temporary field repairs of damaged slings, (i.e., tie knots in the sling, etc.). It is very important that slings are regularly and properly inspected. If you are not sure whether or not a sling is damaged, DO NOT USE IT.

SLING INSPECTION SYSTEMS

INITIAL INSPECTION

The Web Sling and Tie Down Association defines the initial level of inspection as, "Before any new or repaired sling is placed in service, it shall be inspected by a qualified person to ensure that the correct sling is being used, as well as to determine that the sling meets the applicable requirements".

The American Society of Mechanical Engineers also states in the initial inspection that, "prior to use, all new, altered, modified or repaired slings shall be inspected by a designated person to verify compliance to all applicable standards".

The initial level of inspection is done upon receipt to ensure that no damage has occurred during transit. The products must also be verified to be correct, as ordered and they comply with the manufacturer's specifications. Without printed product specifications this comparison cannot be accomplished. If written records for individual slings are to be maintained, the documentation should be initiated at this level of inspection. Recordkeeping at the initial level of inspection is not required.

FREQUENT INSPECTION

The Web Sling and Tie Down Association defines the frequent level of inspection as one that is done by the user or other designated person daily or before each shift in NORMAL service conditions. When SEVERE service conditions exist, the sling must be inspected before each use. See page 476, Sling Service for definitions of Normal, Severe and Special Service. The entire sling shall be thoroughly examined and removed from service if damage is detected. OSHA and ASME stipulate that, "before each day or shift, the sling and all fastenings and attachments shall be inspected for damage and defects by a competent person designated by the employer".

If you are unsure if the daily or pre-shift inspection has been done, take the time to inspect the sling before you use it. WSTDA, OSHA and ASME provide minimum guidelines. Never assume that slings have been inspected by others.

A qualified person must also determine that the sling is proper for the intended use, hitch, load and environment. Any condition that may result in a hazard shall cause the sling to be removed from service. Written inspection records are not required for frequent inspections.

PERIODIC INSPECTION

All slings must be inspected "periodically" by designated personnel at regular intervals. In order to validate the Frequent Level of Inspection, the Periodic Inspection should be done by someone other than the individual(s) who performs the Frequent Inspection. The interval is based upon: the frequency of use, severity of the service conditions, the nature of the work being performed and experience gained during the inspection of slings used in similar circumstances. Recommendations to prevent damage must be evaluated to improve the service life of the replacement slings. Periodic Inspection intervals shall not exceed one year intervals.

ASME stipulates the following time interval guidelines for Periodic Inspections:

Normal Service - Yearly

Severe Service - Monthly to Quarterly

Special Service - As recommended by a Qualified Person

Written records of the most recent periodic inspection shall be maintained. Reference to a unique, sling identification number is not required. If your employer or industry requires recording the condition of individual slings, continue the practice. The important point to realize is the ASME recordkeeping requirement mandates that the event be documented not the condition of individual slings.

Irrespective of the recordkeeping requirements that govern your actions, it is important that slings inspected "periodically" be identified or tracked to validate that the Periodic Inspection occurred. Lift-It® Slings can be equipped with an Inspection Loop™, Inspection Tag or RFID chipped for easy, visual verification of Periodic Inspections (See pages 54 and 55).

Designated Person: Selected or assigned by the employer or employer's representative as being competent to perform specific duties.

Qualified Person: A person, who by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

DOL-OSHA 29 CFR 1910.184 AND GUIDANCE ON SAFE SLING USE

Make a thorough inspection of slings and attachments. Items to look for include:

- Missing or illegible sling identification.
- Acid or caustic burns.
- Melting or charring of any part of the sling.
- Holes, tears, cuts or snags.
- Broken or worn stitching in load bearing splices.
- Excessive abrasive wear.
- Knots in any part of the sling.
- Discoloration and brittle or stiff areas on any part of the sling.
- Pitted, corroded, cracked, bent, twisted, gouged or broken fittings.
- Other conditions that cause doubt as to continued use of a sling.

Where any such damage or deterioration is present, remove the sling or attachment from service immediately.

ASME B30.9 REMOVAL FROM SERVICE CRITERIA

a) Missing or illegible sling identification.
   Section 9-5.7.1 requires that each sling be marked to show the following:
   1) name or trademark of the manufacturer
   2) manufacturer's code or stock number
   3) rated load for at least one hitch type and the angle upon which it is based
   4) type of synthetic material
   5) number of legs, if more than one

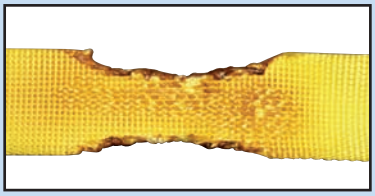
b) Acid or caustic burns.
c) Melting or charring of any part of the sling.
d) Holes, tears, cuts or snags.
e) Broken or worn stitching in the load bearing splices.
f) Excessive abrasive wear.
g) Knots in any part of the sling.
h) Discoloration and brittle or stiff areas on any part of the sling, which may mean chemical or ultraviolet/ sunlight damage.
i) Fittings that are pitted, corroded, cracked, bent, twisted, gouged or broken.
j) For hooks, removal criteria as stated in ASME B30.10
k) For other applicable hardware, removal criteria as stated in ASME B30.26
l) Other conditions, including visible damage, that cause doubt as to the continued use of the sling.

WEB SLING AND TIE DOWN ASSOCIATION REMOVAL FROM SERVICE CRITERIA SYNTHETIC WEB SLING SAFETY BULLETIN (WSSB-1) 2010

The entire web sling must be inspected regularly and it shall be removed from service if ANY of the following are detected:

- If sling identification tag is missing or not readable.
- Holes, tears, cuts, snags or embedded materials.
- Broken or worn stitches in the load bearing splices.
- Knots in any part of the sling webbing.
- Acid or alkali burns.
- Melting, charring or weld spatter on any part of the web sling.
- Excessive abrasive wear or crushed webbing.
- Signs of ultraviolet (UV) light degradation.
- Distortion, excessive pitting, corrosion or other damage to fitting(s).
- If provided, exposed red core yarn. However, if damage is present and red yarns are not exposed, DO NOT USE the sling.
- Any conditions that cause doubt as to the strength of the web sling.

⚠ WARNING **If any damage such as the following is visible, the sling shall be removed from service immediately. Photos depict examples of sling damage, but note they are extreme examples provided for illustration purposes only.**



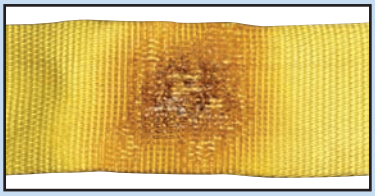
ACID OR CAUSTIC BURNS



CUT



EDGE CUT



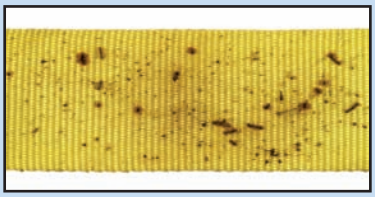
MELTING OR CHARRING



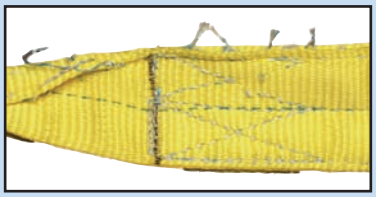
ABRASIONS



PUNCTURE



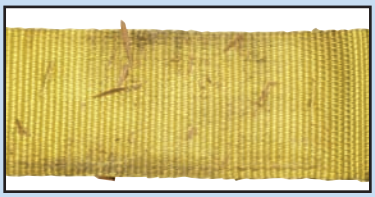
WELD SPATTER



BROKEN OR WORN STITCHES



DAMAGED EYE



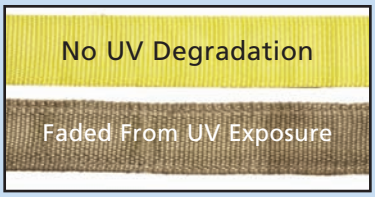
EMBEDDED MATERIALS



TENSILE BREAK



MISSING OR ILLEGIBLE TAG



UV DEGRADATION



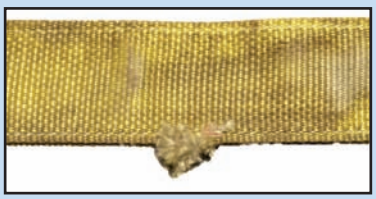
RED CORE YARN



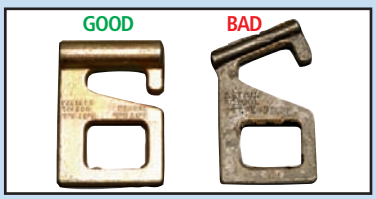
KNOT



CRUSHED WEBBING



SNAG



DAMAGED HARDWARE

SLING INSPECTION MADE EASY

Factory trained professionals inspect all types of slings, hoists, below the hook lifting equipment and tie downs. Each item is thoroughly inspected per OSHA and/or ASME criteria, industry standards and/or manufacturer recommendation.

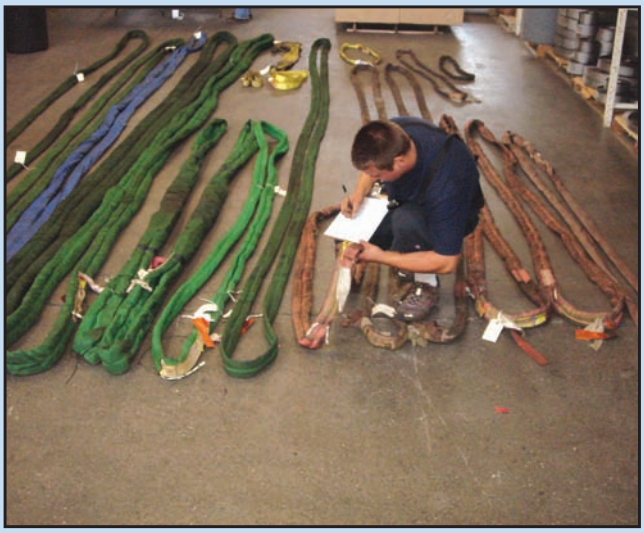
A detailed report identifying each item, the condition and approval or removal from service criteria will be provided. This report will also include recommendations to enhance sling service life and employee safety.

If you wish to repair or replace damaged slings, we will provide replacement costs. Generally if repair activity exceeds 50% of replacement cost, the repair activity is not recommended.

Items that pass visual inspection will be proof tested and certified.



BEFORE REPAIR



INSPECTION



PROOF TESTING



REPAIRS COMPLETE



Mr. Welk was born to immigrant parents in a sod farm house near Strasburg, North Dakota on March 11, 1903. He left the farm when he was 21 to pursue his dream, a love for music and a desire to share it with others. During the early years he played at barn dances and weddings. Eventually his band would play to an audience of over 30 million on his weekly television broadcast where adults were entertained and children remained silent. He would become one of the wealthiest men in Hollywood and attributed his success to the opportunities made available to him by the country he so loved, his determination to succeed and his faith in the Dear Lord. Mr. Welk passed peacefully on May 17, 1992 with his loving wife, Fern Renner Welk and his children by his side. Lawrence Welk is the TRUE American Idol.

As you look down upon us from heaven, Mr. Welk, thank you for the countless hours of entertainment pleasure you provided for millions of us over the years and for the example and quest for excellence you inspired in me.

Sling repair must be economically feasible and must be done by a recognized sling manufacturer. Tent, awning, shoe and saddle shops are not equipped to test repaired products and generally are not proficient in sling fabrication or repair techniques.

Recycle sling hardware. Generally, the hardware components are reusable and utilization will substantially reduce overall sling costs. When we receive your components they are degreased and carefully inspected.

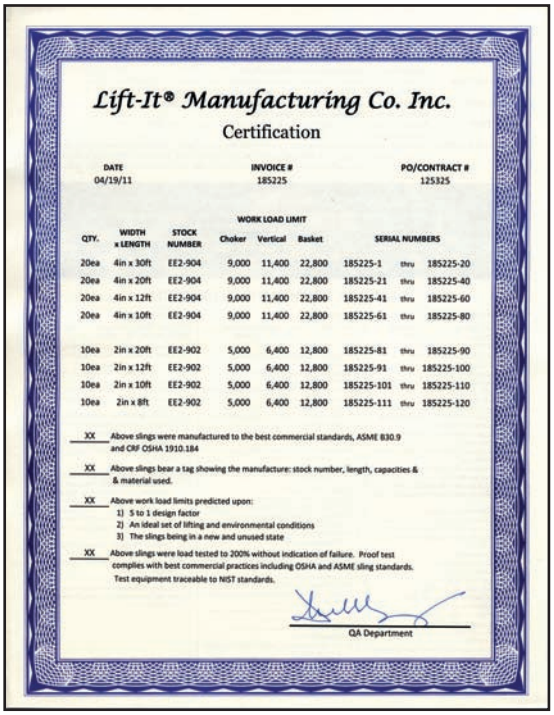
Repaired items are proof tested to twice the assigned Work Load Limit, per OSHA, ASME and WSTDA requirements. Our test machines are annually certified to ASTM E4 standards and produce a machine generated record for each test. Beware of "testing" facilities that do not have the capabilities to offer a "machine" generated certificate of test.

An additional tag is attached to all repaired items identifying Lift-It® as the repair agent. Test certificates are enclosed with the return shipment and your inspection records must be updated to reflect the repair activity, per OSHA requirement.

Lift-It® will provide certification of conformance for materials, strengths and Work Load Limits for any of our products. A nominal charge will be applied if proof testing and certification are required.



Our 600,000 pound test machine will accommodate sling lengths up to 120 ft.



Lift-It® Manufacturing Co. Inc.

Certification

DATE 04/19/11 | INVOICE # 185225 | PO/CONTRACT # 125325

QTY.	WIDTH x LENGTH	STOCK NUMBER	WORK LOAD LIMIT Choker	Vertical	Basket	SERIAL NUMBERS		
20ea	4in x 30ft	EE2-904	9,000	11,400	22,800	185225-1	thru	185225-20
20ea	4in x 20ft	EE2-904	9,000	11,400	22,800	185225-21	thru	185225-40
20ea	4in x 12ft	EE2-904	9,000	11,400	22,800	185225-41	thru	185225-60
20ea	4in x 10ft	EE2-904	9,000	11,400	22,800	185225-61	thru	185225-80
10ea	2in x 20ft	EE2-902	5,000	6,400	12,800	185225-81	thru	185225-90
10ea	2in x 12ft	EE2-902	5,000	6,400	12,800	185225-91	thru	185225-100
10ea	2in x 10ft	EE2-902	5,000	6,400	12,800	185225-101	thru	185225-110
10ea	2in x 8ft	EE2-902	5,000	6,400	12,800	185225-111	thru	185225-120

XX Above slings were manufactured to the best commercial standards, ASME B30.9 and CRF OSHA 1910.184

XX Above slings bear a tag showing the manufacture: stock number, length, capacities & & material used.

XX Above work load limits predicted upon:
1) 5 to 1 design factor
2) An ideal set of lifting and environmental conditions
3) The slings being in a new and unused state

XX Above slings were load tested to 200% without indication of failure. Proof test complies with best commercial practices including OSHA and ASME sling standards. Test equipment traceable to NIST standards.

QA Department

Care • Storage • Cleaning

In order to prevent damage to slings, when not in use, we recommend that they be stored in a proper location. Make sure the location is:

- **COOL** To prevent damage resulting from exposure to excessive temperatures.
- **DRY** To prevent the growth of mold and mildew, which can degrade synthetic fibers.
- **DARK** To prevent the deleterious effects of prolonged exposure to sources of ultraviolet light.
- **FREE OF ENVIRONMENTAL/MECHANICAL DAMAGE**
  Ventilated and not exposed to heat and chemical exposure, sunlight, weld spatter or grit and splinters from grinding or machining.

Slings should also be kept clean and free of dirt, grime and foreign material. Mild soap and water can be used for this purpose. Hard bristle brushes damage webbing, consider using a sponge. Soaking slings in mild soap and water for short periods of time is non-damaging. After cleaning, rinse slings thoroughly and allow them to completely dry before returning them to storage. A clean sling, free of dirt and grime is easier to inspect for damage. Consider replacing slings, instead of attempting to clean. The time, energy and resources necessary to be a sling launderer may exceed the purchase price of replacement slings.

⚠WARNING Steam cleaning at temperatures in excess of 194°F/90°C can damage the sling.

Power or pressure washing can force residue inside web and yarn fibers. The foreign material can cause internal yarn and fiber damage.

Web and roundslings are severely damaged by machine washing, resulting in a serious loss of sling strength.

ENVIRONMENTAL CONSIDERATIONS

⚠ WARNING

Avoid environmental degradation. Environmental factors such as an exposure to sunlight, dirt or gritty type matter and cyclical changes in temperature and humidity can result in an accelerated deterioration of synthetic slings. The rate of the deterioration will vary with the level of exposure to these conditions and with the thickness of the sling material. For example, single ply slings will generally degrade more rapidly with this exposure than multiple ply slings.

Visible indications of such deterioration can include the following:

- Fading of webbing color.
- Uneven or distorted surface yarn of the webbing.
- Shortening of the sling length.
- Reduction in elasticity and stretch of the sling material due to exposure to sunlight, often evident by an appearance of an accelerated, abrasive damage to the surface yarn of the sling.
- Breakage or damage to yarn fibers, often evident by a fuzzy appearance of the web.
- Stiffening of the web, which can become particularly evident when web slings are exposed to outdoor conditions without being used or cyclically tensioned.

Web slings that are used outdoors regularly should generally be permanently removed from service within a period of 2 to 4 years. All slings that are exposed to environmental degradation should be highly scrutinized during their inspections.

Slings used in environments where they are subject to continuous exposure to ultraviolet light or excessive environmental degradation, as determined by a qualified person should be proof tested to two times the Work Load Limit, semi-annually or more frequently depending on the severity of exposure.

TEMPERATURE

Conventional synthetic products should never be used at temperatures above 194˚F/90˚C or below -40˚F/-40˚C. Temperature exposure outside the acceptable range must be considered and evaluated by a qualified person.

ULTRAVIOLET (UV) LIGHT

Continuous exposure to sources of ultraviolet light affect the strength of synthetic products in varying degrees from slight to total degradation. Factors which play a part in the degree of strength loss are length of exposure, sling construction and design. Other environmental factors such as: weather conditions, elevation and geographic location also affect the degree of degradation. (See page 18 for additional information).

STORAGE

When not in use, store slings in a cool, dry, dark location, free of mechanical and environmental damage. The storage location should be ventilated and not exposed to heat sources, chemical exposure, weld spatter, grit, grime, foreign materials and splinters from grinding or machining.

CHEMICAL

Chemically active environments can affect the strength of synthetic products in varying degrees ranging from moderate to total degradation. Before slings are used, the chemical compatibility between the sling and the environment must be considered. Aluminum fittings should never be exposed to chlorine environments or cleaned with chlorine based cleaning solutions. Consult the sling manufacturer before purchase to evaluate chemical compatibility between slings, their components and the environment.

MOISTURE ABSORPTION:

When nylon products are "wet" there is an approximate strength loss of 15%. This loss of strength is documented in the 1988 DuPont Technical Information Multifiber Bulletin X272, page 6. Nylon sling strength returns when the sling dries completely. Polyester and High Performance Fiber strength is unaffected by moisture absorption.

MECHANICAL CONSIDERATIONS

⚠ WARNING

- Synthetic sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices.
- Select the sling having the most suitable characteristics for the type of load, hitch and environment.
- Slings that are damaged or defective shall not be used. Slings removed from service that are not capable of repair should be destroyed and rendered completely unfit for any future use.
- Slings shall be permanently marked. Slings with missing tags or illegible tag information shall not be used.
- The sling manufacturer shall complete and install the sling tag. The replacement of the sling tag is considered a repair, but will not require proof testing and certification.
- The sling tag should be maintained and kept legible during the life cycle of the sling by the sling user.
- Determine the weight of the load and make sure it does not exceed the sling's Work Load Limit or the capacity of any component in the rigging system.
- Slings shall not be loaded in excess of the Work Load Limits. Consideration should be given to the sling-to-load angle which affects sling Work Load Limits.
- Work Load Limits are based upon: material strength, design factor, type of hitch, angle of loading, the diameter and curvature that the sling contacts, and destruction testing done in laboratory controlled, testing conditions, which will never be duplicated during actual usage. Work Load Limits are also based on a moderately dynamic lifting or pulling operation. Instantaneous changes (rapid acceleration or sudden stopping) constitute hazardous shock loading and **WORK LOAD LIMITS AS STATED, DO NOT APPLY.**
- Work Load Limits for basket hitches and multi-leg bridle slings are based upon symmetrical loading of the individual legs. For non-symmetrical loads an analysis by a qualified person shall be done to avoid overloading any part of the sling system.
- Horizontal angles less than 30 degrees shall not be used, except as recommended and approved by a qualified person.
- The sling shall be securely attached to the load and rigged in a manner to provide load control. The sling must be rigged to prevent slipping and sliding across load edges.
- Basket hitches used at angles less than 60 degrees can cause slings to slip under tension, creating an unbalanced condition. Slings used in any hitch shall have the load balanced to prevent slippage.
- Sling users must determine the load's Center of Gravity (CG) to ensure the rigging system will be able to retain and control the load once lifted. Sling legs should contain or support the load from the sides above the Center of Gravity when using a basket hitch so the load will not tilt when lifted.
- Slings shall not be shortened, lengthened, tied in knots or joined by knotting. Methods not approved by the manufacture or qualified person shall not be used.
- Twisting and kinking the sling legs shall be avoided.
- Slings used in a choker hitch must be of adequate length for the choke action to occur on the sling body. The choke action should not occur on: the fitting or eye, at the base of the fitting or eye, on the load carrying splice or the sling tag.
- Slings used in a choker hitch shall not be forced to tighten around the load by pounding with hammers or other objects. Choker hitches are the least efficient way to use a sling based on Work Load Limit. Two slings should be used to balance the load. One sling used in a choker hitch may result in a situation where an unbalanced load could lead to an accident.
- A sling rigged in a choke hitch (not double wrapped) does not make full contact with the load. Use multiple slings and wrap the load, when practical to ensure full contact. Do not allow the slings to cross over each other.
- Keep the sling tags and labels away from the load, the hook and the choke action of the sling. Do not place the load carrying splice in a connection point to the load or in the lifting mechanism.
- Avoid side loading or edge loading slings. Ensure that both paths are loaded equally for Twin-Path® slings.

MECHANICAL CONSIDERATIONS

⚠ WARNING

- Slings shall always be protected from being cut or damaged by corners, edges, protrusions or abrasive surfaces by materials of sufficient strength, thickness and construction. Sling protection may not prevent cutting or other forms of sling damage. See pages 43-52 for additional information.
- Synthetic products stretch when the load is applied. Stretching can be reduced by using polyester slings, slings with larger Work Load Limits or by selecting a low elongation, High Performance Fiber, Twin-Path® Extra Sling.
- Do not accelerate or decelerate the load too fast. The "G" force on a dropped load could surpass the ultimate strength of the sling. A load picked up too fast can develop a stretch/friction/surface heat that can surpass the melting temperature of the sling.
- Synthetic slings shall not be constricted or bunched between the ears of a clevis or shackle or in a hook. When synthetic slings are used with a shackle, it is recommended that they be used (rigged) in the bow of the shackle. Placing synthetic slings on the pin should be avoided, unless the sling is protected.
- All hooks, shackles and other fittings must be free of damaging edges that could harm the sling.
- All loads applied to the lifting hook should be centered in the "bowl" of the hook to prevent point or tip loading.
- Avoid contacting and bending sling fittings over or across load edges.
- The opening in fittings should be of the proper shape and size to ensure that the fitting will seat properly in the lifting hook or other points of attachment.
- Fittings used in any sling system must be compatible, i.e., proper shape, size and diameter to prevent damage to the sling. The "sling-fitting" relationship must be proper to ensure that slings will "seat" properly and, in doing so, derive the greatest Work Load Limit. The overall assembly capacity shall be established as the lowest strength of any assembly component (sling, fitting, attachment, etc.)
- The use of improper fittings and/or materials may result in severe personal injury or death.
- Sling hardware or any object in the sling eye should not be wider than one-third the length of the sling eye.
- Slings shall not be dragged on the ground or floor, or drawn over abrasive surfaces.
- Slings shall not be pulled from under loads when the load is resting on the sling. If feasible, place blocks under the load to allow for removal of the sling.
- Loads resting on the sling could damage the sling.
- Synthetic slings should never be used to pull an object in a snagged or constrained condition or used for towing. Synthetic slings are designed to stretch; the recoil caused by any sudden release of a lifting constraint could result in a dangerous projection of the load.
- During the lift, with or without load, personnel shall be alert for possible snagging.
- Do not drop objects on slings or slings equipped with metal fittings.
- Do not run over slings with trucks or other equipment.
- Personnel should stand clear of the load and shall not ride the load.
- Personnel should never be under, next to or on a suspended load. Even if you take in account all factors and issues, things can still go wrong.
- Portions of the human body shall not be placed between the sling and load or between the sling and lifting hook.
- Synthetic slings shall not be used as bridles on suspended personnel platforms.
- Synthetic lifting slings shall not be used for fall prevention applications.

It is important to select slings and components possessing proper chemical characteristics, making them compatible with their environment. Nylon, Polyester, Aramid, Nomex®, Poly-Arylate (Liquid Crystal), Ultra High Molecular Polyethylene (UHMwPE) and K-Spec® fibers are ideal materials for synthetic slings because they offer varying degrees of resistance and compatibility with different chemical agents.

PERFORMANCE CHARACTERISTICS OF SYNTHETIC FIBERS

NYLON

Nylon is popular and general purpose synthetic fiber which is unaffected by common grease and oil. Nylon products have good resistance to aldehydes, hydrocarbons, ethers and some alkalis, while degradation ranging from none to moderate occurs with exposure to certain alkalis. Nylon products are not suitable for use with acids and bleaching agents. Exposure can result in degradation from none to total. Dilute acids, such as, hydrochloric and sulfuric in 10% concentrations at room temperature cause significant strength loss in 10 hours.

Solvents for nylon include: concentrated formic acid, phenolic compounds and calcium chloride in methanol at room temperature, hot solutions of zinc chloride in methanol, benzyl alcohol at the boil, hot solutions of calcium chloride in: glacial acetic acid, ethylene chlorohydrins and ethylene glycol.

Nylon is not significantly affected by compounds of the following classes: alcohols, dry cleaning solvents, halogenated hydrocarbons, ketones, soaps and synthetic detergents or water (including sea water).

Nylon products lose 15% of their Work Load Limit when wet. The acceptable temperature exposure range is -40˚F/-40˚C to a maximum of 194˚F/90˚C. Stretch at Work Load Limit is approximately 8-10% for slings with treated webbing.

All webbing will become shorter, over time. Nylon webbing placed on a table, with no use, will shrink up to 5% in length after six months, as a result of the weave configuration. Dense weave webbing shrinks less than loose weave webbing. Nylon webbing will shrink more than polyester webbing. Other factors that affect shrinkage are humidity, temperature and usage.

POLYESTER

Polyester is not significantly affected by most compounds of the following classes: alcohols, dry cleaning solvents, halogenated hydrocarbons, ketones, soaps and synthetic detergents or water (including sea water). Polyester also has good to excellent resistance to aqueous solutions of most weak acids at the boil and to most acids at room temperature, but is disintegrated by concentrated sulfuric acid (95%) at room temperature and exposure to alkalis. Polyester products also have some resistance to most aqueous solutions at room temperature, but are degraded by the same solution at the boil. Oxidizing agents and bleaching treatments ordinarily used by the textile industry do not degrade polyester fiber. Stretch at Work Load Limit is approximately 5-7% for slings with treated webbing. Polyester does not lose strength as a result of moisture absorption. The acceptable temperature exposure range is -40˚F/-40˚C to a maximum of 194˚F/90˚C.

ARAMID

Aramid fibers are resistant to most weak acids, alkalis, ketones, alcohols, hydrocarbons, oils and dry cleaning solvents. Strong acids, bases and sodium hypo-chlorite bleach attack Aramid fibers, particularly at elevated temperatures and/or high concentrations. Stretch at Work Load Limit is approximately 1%.

K-SPEC®

K-Spec® is a combination of High Molecular Polyethylene and Aramid fibers. Stretch at Work Load Limit is approximately 1% and the acceptable temperature exposure range is -40˚F/-40˚C to a maximum of 180˚F/82˚C. K-Spec® core yarn strength retention is based on test results of components at 150°F/65°C (or less) for 6 months. K-Spec® has a 100% strength retention when exposed to: age, 10% detergent solution, rot and mildew, sunlight and toluene; 99% retention when exposed to: acetic acid, gasoline, hydrochloric acid 1m, hydraulic fluid, kerosene and sea water; 98% retention when exposed to: 25% ammonium hydroxide, 10% hypophosphite solution, and 40% phosphoric acid; 97% retention when exposed to sodium hydroxide 5m; 95% retention when exposed to Portland cement, and 88% retention when exposed to Clorox® bleach and nitric acid.

PERFORMANCE CHARACTERISTICS OF SYNTHETIC FIBERS

ULTRA HIGH MOLECULAR POLYETHYLENE (UHMwPE)

Resists many chemical agents and retained 100% of the original fiber strength when immersed for 6 months in the following:

- 1M Hydrochloric acid
- 5M Sodium Hydroxide
- Perchloroethylene
- Glacial acetic acid
- Ammonium Hydroxide (29%)
- Gasoline
- Toluene
- Kerosene
- Hypophosphite solution (10%)
- Sea water
- 10% detergent solution
- Hydraulic fluid

Clorox® degraded UHMwPE by approximately 10% after a 6 month immersion test.
Stretch at Work Load Limit is approximately 1% and maximum temperature exposure is 140˚F/60˚C.

NOMEX®

Nomex® is resistant to most ketones, alcohols, dry cleaning solvents and many other organic solvents. Its acid resistance is superior to nylon, but is not as good as polyester. Nomex® shows good resistance to alkalis at room temperature, but is degraded by strong alkalis at higher temperatures.

Nomex® is compatible with fluorine-containing elastomers, resins and refrigerants at high temperatures and is resistant to fluorine compounds in concentrations usually encountered in stack gases from metallurgical and rock-processing operations.

The resistance of Nomex® to oxides of sulfur at temperatures above the acid dew point is superior to polyester. Below the dew point, concentrated sulfuric acid may condense on the fiber and cause a progressive loss of strength.

FIBER CHARACTERISTICS

	Nylon	Polyester	Aramid	Poly-Arylate	UHMwPE	K-Spec®
Fiber Properties						
Tenacity - Dry G/D	7.5 - 10.5	7.0 - 10.0	28	26 - 29	35 - 40	35
Tensile 000 psi	113 - 158	123 - 176	90	424 - 525	397 - 546	472.5
Elongation at Break %	15 - 28	12 - 18	4.6	3.8	3.5 - 3.8	3.8
Moisture Regain %	4.0 - 6.0	<0.5	2	<0.10	0	0
Specific Gravity	1.14	1.38	1.38	1.41	.97	1.11
Bulk Strength	1.0	0.9	2.7	2.8	2.8	2.8
Chemical Resistance						
Solvents	Good	Good	Excellent	Excellent	Excellent	Excellent
Acids						
Dilute:	Good	Good	Good	Excellent	Excellent	Excellent
Concentrated:	Fair	Fair	Good	<90%	Excellent	Excellent
Alkalis						
Dilute:	Excellent	Good	Good	Excellent	Excellent	Excellent
Concentrated:	Excellent	Fair	Good	<30%	Excellent	Excellent
Temperature Tolerance						
Melt Point	425°F 218°C	490°F 254°C	900°F 482°C	625°F 330°C	300°F 149°C	320°F 160°C

Please Note: Conventional Synthetics are not to be used at temperatures exceeding 194°(F)/90°(C).

ALWAYS FOLLOW RECOMMENDATIONS ON SLING WARNING TAG.

Reflections on Sling Protection

By Michael J. Gelskey, Sr.

Slings exposed to abrasion and cutting are the single greatest source of accidents, injuries, death and destruction. Synthetic slings are not the absolute solution for all rigging applications. The proper approach should always be to use the "right" sling for the job to minimize risk and exposure.

All slings have limitations. Synthetic slings are susceptible to heat damage and damage from cutting and abrasion. One may improperly rationalize and conclude that chain, wire rope and/or wire mesh slings should be used in all harsh situations, which preclude the use of synthetics. Chain, wire rope and wire mesh slings are not totally "bullet" proof in all applications and can also be damaged.

ASME B30.9-2006, Section, 9.X.10.4(d), Rigging Practices, Chapters 1, 2 and 3 stated that Chain, Wire Rope and Wire Mesh slings ***should*** be padded with adequate materials to protect the sling. The sling protection language in the ASME Sling Safety Standard-Rigging Practice section is similiar in Chapters 4, 5 and 6 for synthetic rope, web and roundslings, except, ***should*** (a recommendation to be considered in Chapters 1, 2, and 3), was changed to **shall**, a mandatory rule of the standard for all synthetic slings. The ASME B30.9-2010 Sling Safety Standard requires that all synthetic slings **shall** be protected from damage.

"Sharp" was removed from the ASME B30.9-2006 Sling Safety Standard and had previously been removed from the Web Sling and Tie Down Association- Recommended Standard Specification for Synthetic Web Slings (WSTDA-WS-1-2004). The ASME B30.9 subcommittee and the WSTDA-Web Sling committee removed sharp from their publications because the edge need not be "razor" sharp to damage any type of sling. Compression and tension combined with a "moderate" edge and non-positive sling to load engagement, i.e., the sling skipping across the load edge, can result in sling damage and failure. It is important that responsible parties protect all slings from damaging load edges and surfaces with protection materials sufficient for the application and rig to properly control the load.

Another common misconception is sling protection devices will perform equally well when subjected to abrasion and/or cutting. It is important to realize that abrasion protection materials, designs and technology work differently from those methods taken to provide protection from cutting.

Web slings can have a 12,800 pound per inch, basket Work Load. Twin-Path® Extra, High Performance Fiber Slings can have a 25,000 pound per inch, basket Work Load. Testing conducted by Slingmax®, Unirope® and Lift-It® evaluated various sling protection materials and constructions. The results are featured on page 44. Four protection devices provided a sling protection "performance design factor" above the maximum 25,000 pound requirement: CornerMax® Pads, CornerMax® Sleeves, Mesh Guard® and Magnetic Corner Protectors.

I believe the initial steps of developing performance ratings for sling protection devices by visionaries: Dennis St. Germain, Gary O'Rourke, Knut Buschmann and the author will profoundly influence the direction of the sling and rigging industry. The Web Sling and Tie Down Association, has completed testing to determine the effects of various sized edge radii on web and roundsling strength. The results for roundslings are included in WSTDA-RS-1(2010) Recommended Standard Specification for Roundslings. The results for web slings are being evaluated by the Web and Testing committees of the WSTDA. The aforementioned radii tests and test protocol under consideration by the WSTDA may provide the basis for establishing protection ratings for various forms of engineered protection devices.

The sling user, inspector, loss control, safety and qualified person(s) must continue to be responsible and be involved in the selection, evaluation and proper application of protection devices. There is no form of protection that is cut proof; poor load control can render the best protection impotent.

We encourage all sling users to act responsibly and to evaluate sling protection devices and slings in a non-consequence set of circumstances. Test lifts can easily be made at minimum heights to determine sling protection adequacy. Slings and protection must be removed, inspected and evaluated after each test lift. Several "test" lifts may be necessary to determine the best sling, method of rigging for load control and sling protection devices to ensure success.

Remember, Successful Rigging = Successful Living.

Any sling can be damaged, abraded or cut as tension and compression develops between the sling, connection points and/or the load. Slings must ALWAYS be protected from cutting and damage by edges, corners, protrusions and abrasive surfaces in contact with the sling with materials of sufficient strength, thickness and construction to prevent damage and catastrophic sling failure.

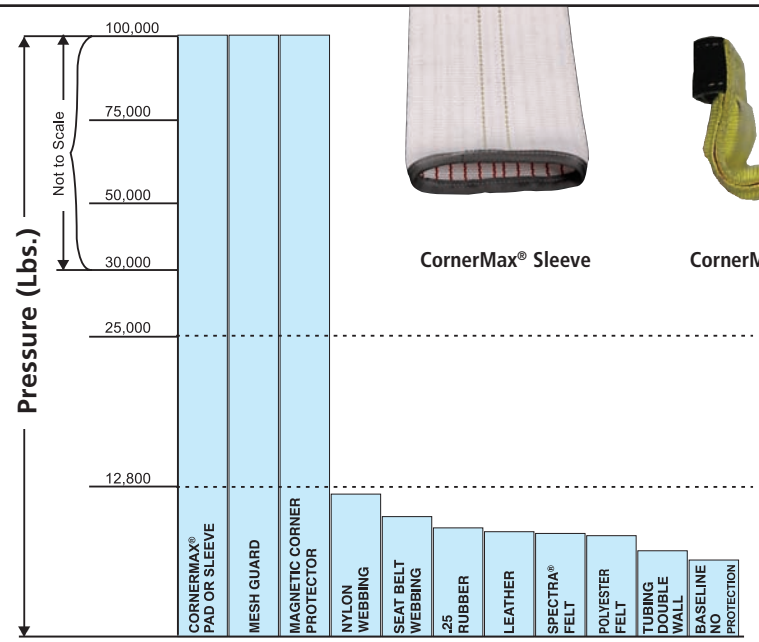
The edge of the load does not have to be "razor" sharp to create the conditions for sling failure. A combination of non-positive sling to load contact (sling slipping across the load) and inadequate sling protection materials may result in sling protection damage and failure. Sling protection may not prevent cutting or other forms of sling damage, for this reason personnel should never be under or on the load, while the load is lifted or suspended.

"Cut proof" sling protection does not exist. Materials must be evaluated and selected based upon the application and type of exposure. Some materials are suitable for abrasion resistance, but offer virtually no protection against the effects of cutting. You should always operate within the specified sling and protection device limits. Twin-Path® Extra High Performance Slings can develop 25,000 Lbs. per Inch Work Load Limits. Web slings can develop 12,800 Lbs. per Inch Work Load Limits.

Certain materials used in sling protection have been evaluated for cut resistance. Magnetic Corner Protectors, CornerMax® Pads, CornerMax® Sleeves and Meshguard® sling protectors are rated for cut resistance.

Regardless of the particular method chosen, the goal is to ensure that the sling maintains its ability to securely lift the load while avoiding contact with damaging or abrasive surfaces under tension. A qualified person must carefully consider the appropriate means to accomplish this goal by selecting sling protection appropriate for the types of exposure damage. The protection used should not be makeshift (i.e., selecting and using cardboard, work gloves or other such items that were not designed to serve as protection devices).

SLING PROTECTION TESTING RESULTS



CornerMax® Sleeve



CornerMax® Pad



Mesh Guard



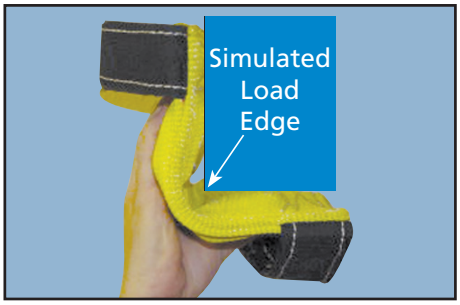
Magnetic Corner Protectors

⚠ WARNING Sling protection must be installed and evaluated for suitability by raising the load slightly and then lowering the load for an inspection of the sling and the protection devices. Several "test" lifts, inspections and evaluations may be necessary to determine the proper form of protection for a successful lift. Damaged or misused sling protection can result in sling failure. Inspect the sling protection before each use and remove if damaged. Be sure sling protection is the correct type and size to protect the sling. The length of the sleeve or protection material(s) must not interfere with the sling closing to the full gripping position on the load. Sling protection may not prevent cutting or other forms of damage. To avoid severe personal injury or death, personnel should be kept away from the load and never be under or near the load, while it is being lifted or suspended. Personnel should never be next to rigging that is under tension.

CORNERMAX® PADS

To be effective, conventional forms of sling protection must be of sufficient strength, thickness and construction. Traditional sling protection has always relied on these attributes to prevent damage to the sling because of direct contact with damaging load edges, corners or surfaces.

Patented CornerMax® Pads are truly remarkable because of the tunnel or "no touch zone" that is formed between the load corner and the CornerMax® Pad. The no touch zone greatly reduces the possibility of cutting. "Cut proof" sling protection does not exist. Note that the sides of the load must completely support CornerMax® Pads in order to create and maintain "the tunnel". CornerMax® Pad ratings are only valid if the 90 degree, CORNERED load fully engages the internal walls of the protector. US Patent No. 7,744,138.

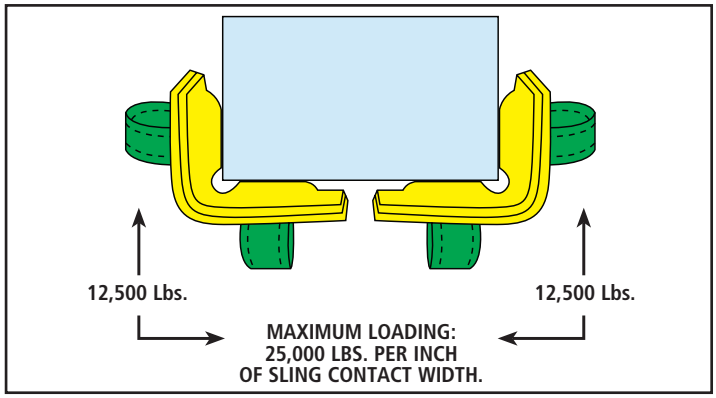


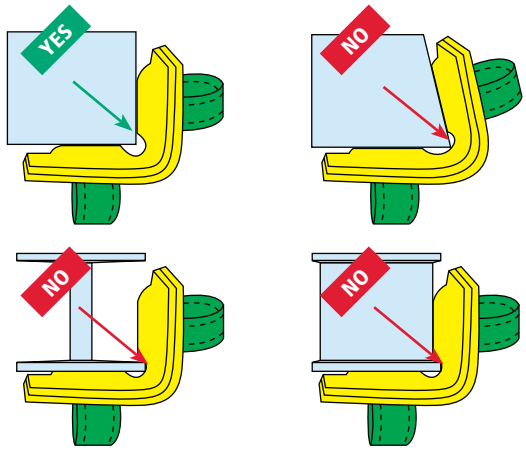
A TUNNEL or "NO TOUCH ZONE" IS FORMED BETWEEN THE PAD AND LOAD CORNER.

CORNERMAX® PAD STOCK NUMBER	OVERALL WIDTH (Inches)	ROD WIDTH * (Inches)	SLING WIDTH (Inches)	UNIT WEIGHT (Lbs.)
CM-4	4	2	1 to 2 in.	1.10
CM-5	5	3	3 in.	1.35
CM-6	6	4	4 in.	1.65
CM-8	8	6	Up to 5 in.	2.10
CM-8	8	6	Up to 6 in.	2.10
CM-10	10	8	Up to 8 in.	2.70
CM-12	12	10	Up to 10 in.	3.35
CM-14	15	12	Up to 12 in.	5.50
CM-16	17	14	Up to 14 in.	6.50

*** Use Rod Width for determining maximum loading. DO NOT use Pad Width.**

Please Note: CornerMax® Pads are 10.25 inches in length, unless otherwise specified.



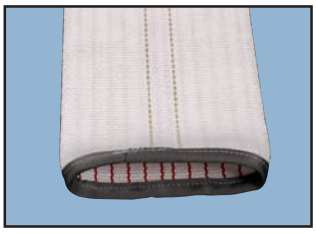


⚠ WARNING DO NOT EXCEED 25,000 LBS. PER INCH OF SLING CONTACT WIDTH. CORNERMAX® PADS ARE FOR USE ON 90 DEGREE CORNERED LOADS.

CORNERMAX® SLEEVES

CornerMax® Sleeves are an ideal solution to protect slings from cutting when it is not practical to use protection that is based upon full, 90º, corner contact. CornerMax® Sleeves conform to the curvature of the load and are manufactured from "high tech" fibers. CornerMax® Sleeves have been tested in independent laboratory and field applications and have proven to be extremely cut resistant.

⚠ WARNING DO NOT EXCEED 25,000 LBS. PER INCH OF SLING CONTACT WIDTH.



Narrower and Wider Sleeves are available

CORNERMAX® SLEEVE STOCK NUMBER	INTERNAL SLEEVE WIDTH
CMSDF-10	10 In.
CMSDF-8	8 In.
CMSDF-6	6 In.
CMSDF-4	4.5 In.
CMSDF-2*	2.5 In.
*DO NOT EXCEED 12,500 Lbs. per inch of sling contact width	



Increase productivity and decrease discharge time with Lift-It® Coil Handler Slings. 10 Times lighter than steel sling alternatives, Coil Handler Slings are easy to pull and "fish" through coils and are non-damaging and repairable.

Stock No. CHTUFXKS 4000 x 13 Ft. Basket at 90 Deg.- 80,000 Lbs. Sleeve Length- 8 Ft.

⚠ WARNING Inspect the sling and sleeve before each use.

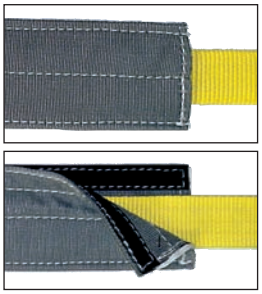
Do Not Use if Red Yarn is Visible in CornerMax® Sleeve.

CornerMax® Sleeve must always cover coil edge.

Damaged or misused sling protection can result in sling failure. Inspect sling protection before each use and remove if damaged. Be sure the Sling Protection is the correct type and size to protect the sling. Prevent sling protection and slings from slipping or sliding across load edges. DEATH or INJURY can occur from improper use, maintenance and/or inspection.

FELT SLEEVES - ABRASION PROTECTION

Lift-It® Felt Sleeves blend two wear protection materials: Polyester Felt covered by Bulked Nylon. Felt Sleeves provide protection from abrasion damage caused by contact with rough surfaces. Felt Sleeves can be made to fit any sling and are available in long lengths which can be cut into suitable sizes at the job site. Double or triple thickness Felt Sleeves are also available, depending upon the severity of the application. Quick Felt Sleeves are available with hook and loop tape, making installation and removal, quick and easy.

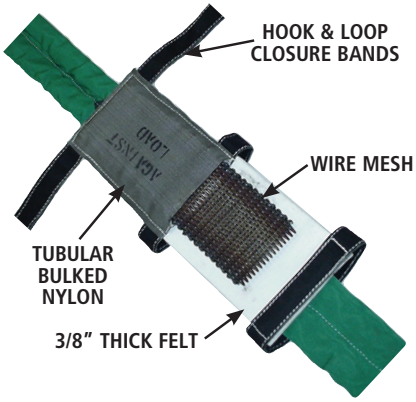


Always Specify:
Sleeve Length
See page 52 for ordering information.

MESH GUARD®

Lift-It® Mesh Guard® features a unique combination of Sling Protection materials. A layer of felt buffers the sling while carbon steel wire mesh covers the load edge. Hook and loop closure bands make attachment and removal quick and easy.

MESH GUARD® STOCK NUMBER	SLING WIDTH (Inches)	MESH GUARD® OVERALL WIDTH (Inches)	PROTECTION RATING (Lbs.)	WEIGHT (Lbs./Ft.)
MG-3	2	5	20,000	2.00
MG-4	3	6	20,000	2.50
MG-6	4 - 5	8	40,000	4.00
MG-8	6	10	40,000	5.25
MG-10	8	12	60,000	6.50
MG-12	10	14	60,000	8.00



⚠ WARNING Mesh Guard® is for use on 90 degree cornered loads. Sling must not be allowed to run off the edge of the wire mesh.

MAGNETIC CORNER PROTECTORS

MCP STOCK NUMBER	STYLE	SLING WIDTH (Inches)	UNIT WEIGHT (Lbs.)	CORNER PROTECTOR O.A.L. (Inches)
MCP-6	Regular	UP TO 4	1.25	6-1/2
MCP-9	Regular	UP TO 7	1.65	9-1/2
MCP-12	Regular	UP TO 10	2.00	12-1/4
MCP-18	Regular	UP TO 16	3.00	18-1/4
MCP-9HD	Heavy Duty	UP TO 7	6.75	9-1/2
MCP-12HD	Heavy Duty	UP TO 10	8.75	12-1/4
MCP-18HD	Heavy Duty	UP TO 16	13.00	18-1/4
MCP-SL-6	Slotted-Regular	UP TO 4	2.00	6-1/2
MCP-SL-9	Slotted-Regular	UP TO 7	2.75	9-1/2
MCP-SL-12	Slotted-Regular	UP TO 10	4.25	12-1/4
MCP-SL-18	Slotted-Regular	UP TO 16	5.50	18-1/4
MCP-SL-6HD	Slotted-Hvy. Duty	UP TO 4	5.50	6-1/2
MCP-SL-9HD	Slotted-Hvy. Duty	UP TO 7	8.00	9-1/2
MCP-SL-12HD	Slotted-Hvy. Duty	UP TO 10	11.00	12-1/4
MCP-SL-18HD	Slotted-Hvy. Duty	UP TO 16	16.50	18-1/4
MCP-CURVE*	Curved			
* You must specify inside diameter of coil and sling width				

Magnetic Corner Protectors are fabricated from a durable synthetic material that protects synthetic and wire rope slings from damage. Magnetic Corner Protectors are for use on 90 degree, "cornered" loads and keep the sling from contacting load edges.

⚠ WARNING Magnetic Corner Protector ratings are valid if the 90 degree, CORNERED load fully engages the internal walls of the protector.

Magnetic Corner Protectors are "protection rated" at 12,500 Lbs. per inch of sling contact width. Heavy Duty Magnetic Protectors provide a larger contact diameter, but are not rated higher than Regular Magnetic Corner Protectors. Magnetic Corner Protectors can be used at temperatures from -20°F/-29°C to 220°F/104°C.

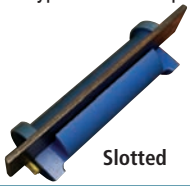
Slotted Magnetic Corner Protectors are available. Please specify flange thickness and width.

Curved Magnetic Corner Protectors are custom made to fit the exact curvature of your load. Spacer Protectors are necessary in applications where slings are not perpendicular (sling-to-load angles less than 90 degrees).

⚠ WARNING Magnets are designed to keep Magnetic Corner Protectors from falling from metallic loads and are not intended to prevent the protector or sling from sliding. Slings and protectors should be vertical or perpendicular to the load. The farther from vertical slings and protectors are, the more likely the protectors and slings will slide to become vertical, resulting in load instability and uncontrolled load descent. Keep magnets clean and free of debris. Damaged or misused sling protection can result in sling failure. Inspect sling protection before each use and remove if damaged. Be sure sling protection is the correct type and size to protect the sling.


Heavy Duty


Regular


Slotted


Curved

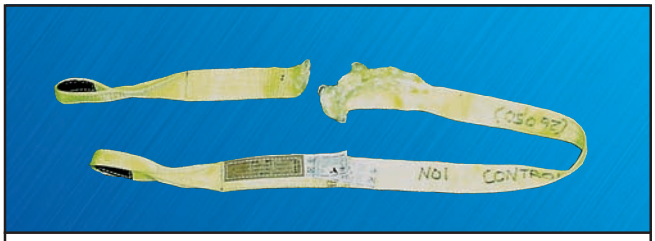

Retainer Strap

Effects of "Minor" Edge Damage

Four, identical, single ply slings were fabricated from a single roll of webbing. All independent variables were controlled, as the same thread, machine and fabricator were used for this experiment. The slings (EE1-903) are rated at 4800 Lbs. vertical and we would expect 24,000 Lbs. break strength. The slings were pulled to destruction. The control sling broke at 26,050 Lbs. The other three slings were deliberately cut on one edge to simulate: 1/8 inch, 1/4 inch and 3/8 inch cuts. This seemingly "minor" damage resulted in very significant strength loss.

⚠ WARNING "Minor" damage is extremely serious and damaged slings must be removed from service, immediately and not used for other applications. Remember, there is ZERO tolerance for sling damage. Be pro-active and prevent sling damage from occurring by employing suitable Sling Protection.

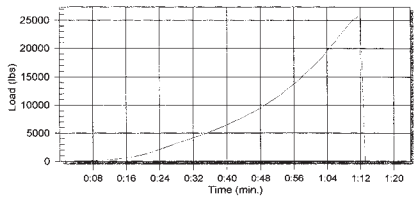
CONTROL BREAK - 26,050 LBS.



Certificate of Test

Customer: DESTRUCTION TESTINS
Serial No.: 1
Order No.: 131018 - 1
PO number:
Part No.: EE1-903 HT
Length: 8 ft.

Test Number: 7497
Test Date: 04/17/02
Description: VERTICAL BREAK TEST
Test Method: Break
Peak Load: 26,050 lbs.
Test Duration: 1.4 Minutes



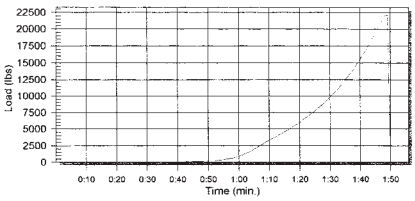
1/8 IN. CUT – 22,150 LBS.



Certificate of Test

Customer: DESTRUCTION TESTINS
Serial No.: 2
Order No.: 131018 - 2
PO number:
Part No.: EE1-903 HT
Length: 8 ft.

Test Number: 7498
Test Date: 04/17/02
Description: VERTICAL BREAK TEST
Test Method: Break
Peak Load: 22,150 lbs.
Test Duration: 1.9 Minutes



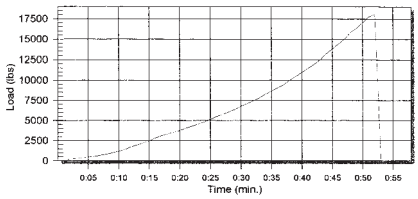
1/4 IN. CUT – 18,090 LBS.



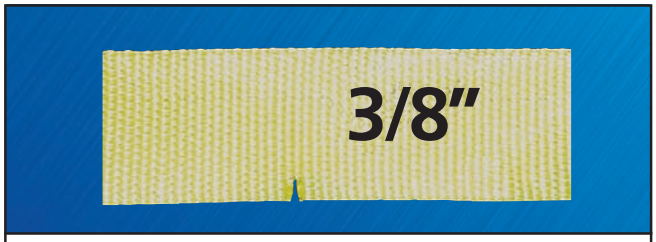
Certificate of Test

Customer: DESTRUCTION TESTINS
Serial No.: 3
Order No.: 131018 - 3
PO number:
Part No.: EE1-903 HT
Length: 8 ft.

Test Number: 7499
Test Date: 04/17/02
Description: VERTICAL BREAK TEST
Test Method: Break
Peak Load: 18,090 lbs.
Test Duration: 0.9 Minutes



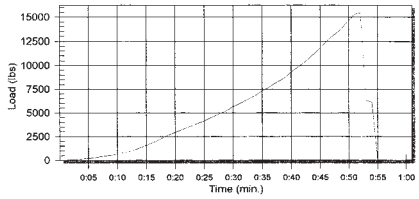
3/8 IN. CUT – 15,480 LBS.



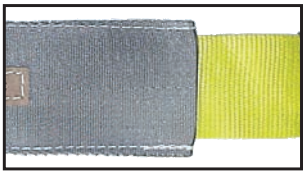
Certificate of Test

Customer: DESTRUCTION TESTINS
Serial No.: 4
Order No.: 131018 - 4
PO number:
Part No.: EE1-903 HT
Length: 8 ft.

Test Number: 7500
Test Date: 04/17/02
Description: VERTICAL BREAK TEST
Test Method: Break
Peak Load: 15,480 lbs.
Test Duration: 1.0 Minutes



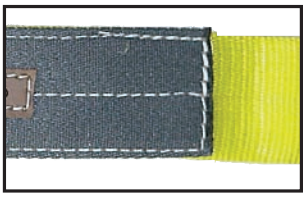
SLEEVES
Sleeves cover both sides of the sling and can be moved to a specific location. Sleeves can also be re-positioned for quick and easy inspection of the sling.



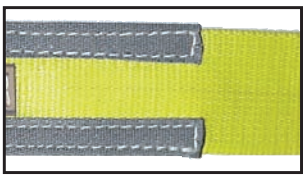
Available in six different materials:
Bulked Nylon, Nylon, Leather, Neoprene, CornerMax® and Felt.

Available in sewn edge, tubular and quick-sleeve constructions.

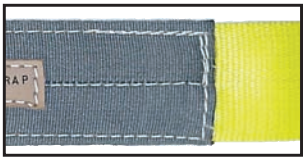
WEAR PADS
Wear pads are sewn to the sling for protection at specific wear areas. Wear Pads can be sewn at any location, in single or multiple layers and can be attached to one or both sides of the sling. Leather Wear Pads in excess of 5 feet are not recommended.



EDGE WRAP
Bulked Nylon or leather is sewn around the edge of the sling. Edge Wrap may be necessary in applications where abrasion damage occurs. Consider using Polyester Max Edge™ webbing. (See pages 69 and 70).



BODY WRAP
Body Wrap is similar to the sleeve, but is sewn to a specific location. Body Wrap covers the webbing surface and the edges.





EYE WRAP
Eye Wrap at the bearing point is standard eye protection offered by Lift-It®. Sling eyes are wrapped with Bulked Nylon. Full length Eye Wrap is also available.
See page 56 for ordering information.



EYE BUFFER
If specified, Sling Eyes can be lined with Eye Buffers at the bearing point. The eye buffer can also be full length.
See page 56 for ordering information.



EYE SLEEVE
When additional protection is needed, consider Eye Sleeves. Hook and loop tape makes installation effortless and removal is quick and easy for inspection.
Please specify:
- Eye width and thickness
- Sleeve material
- Sleeve length

SHACKLE PIN PROTECTOR PADS







Shackle Nominal Diameter (Inches)	Shackle Pin Protector Pad Stock Number
5/8	SPPP-580
3/4	SPPP-750
1	SPPP-1000
1-1/4	SPPP-1025
1-3/8 & 1-1/2	SPPP-1500
1-3/4	SPPP-1750
2	SPPP-2000
2-1/2	SPPP-2500

- **Full length protection, including ear seams.**
- **Three connection points secure pad to shackle.**
- **Installation and removal in seconds.**

⚠WARNING Placing synthetic slings on shackle pins should be avoided. Even a new shackle can have damaging, exposed threads. If synthetic slings contact this area, they can be cut and fail catastrophically. If you must rig on the pin, protect your sling with a Shackle Pin Protector Pad or use a Bolt Type Anchor Shackle. See Page 218.

Damaged or misused sling protection can result in sling failure. Inspect sling protection before each use and remove if damaged. Be sure the Sling Protection is the correct type and size to protect the sling.

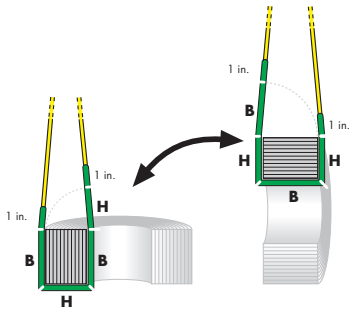
SECUTEX SLEEVES

Secutex Sleeves are made of transparent, reinforced material. The entire sling body can easily be inspected by removing Secutex Sleeves from the sling; when finished re-install. For use with single ply slings.

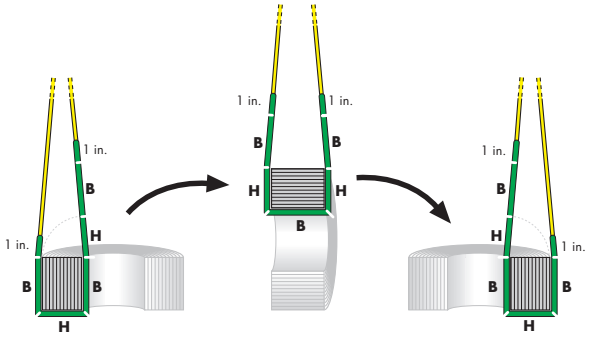
Available for: 2, 3, 4, 6, 8 10 and 12 inch web widths.
Sold only in 16 ft. lengths that may be cut into the specific lengths.
Stock Number Designation for Secutex Sleeves:
SECS-2: 16 Ft. Secutex Sleeve for 2 inch sling width.
SECS-6: 16 Ft. Secutex Sleeve for 6 inch sling width.



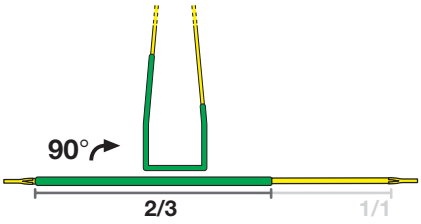
90 Degree Coil Turn
Necessary length of Secutex Sleeve=
2 x Height + 2 x Width + 2 x Overhang (1 in.)



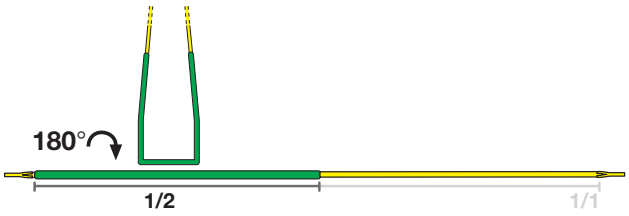
180 Degree Coil Turn
Necessary length of Secutex Sleeve=
3 x Height + 2 x Width + 2 x Overhang (1 in.)



90 Degree Turn
Necessary length of Secutex Sleeve=
2/3 of the body length.



180 Degree Turn
Necessary length of Secutex Sleeve=
1/2 of the body length.



⚠ WARNING Maximum loading: 2500 lbs. per inch of web width. Use only with single ply rated slings.

- Do not use an oversized Secutex on a sling having inadequate width for Secutex Sleeves. Match size to size.
- Make sure that the length of the sleeve does not interfere with the sling closing to the full gripping position on the load.
- Secutex Sleeves must be reinforced if the load edge radius is less than .078" (2mm). See page 103. Coil edges must not be broken or contain any burrs.
- All load edges must be covered by the Secutex Sleeve during use.
- Start slowly so that the Secutex Sleeve and sling can be positioned correctly.
- The sling must be firmly positioned against the load edge and the sling must be free to slide inside the Secutex Sleeve.
- Only use with single, unpacked and cleanly wound coils.
- Use a non-slip base, i.e., rubber mat or Secutex turning mat.
- Ensure that the coil cannot roll away or slip sideways onto the sling and sleeve. Do not pull coils "out" at an angle.

Chaffing Gear

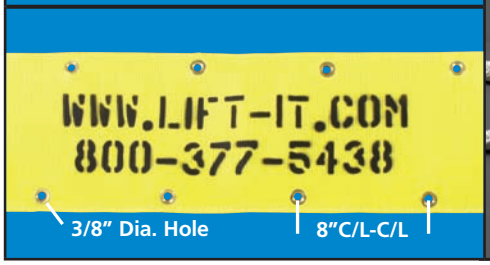
Lift-It® Chaffing Gear protects expensive mooring and tow lines from damage. Easy to install and remove, Chaffing Gear works equally as well with chain and wire rope assemblies.

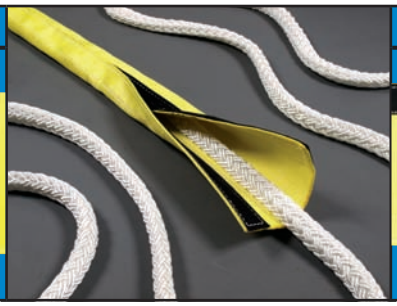
Chaffing Gear is available in three materials: Web, Bulked Nylon or Felt.
Chaffing Gear made with Web (3/16"thickness) is the most popular.
Chaffing Gear with Bulked Nylon (3/32"thickness) is four times more abrasion resistant than Web Chaffing Gear.
Felt Chaffing Gear (1/4" thickness-high density felt) provides a "cushion" effect.

Material selection should be based upon: application, abrasion resistance and/or material thickness requirements.

Chaffing gear is available in any width and length. Chaffing Gear can be supplied in a single length for on-site cutting of custom lengths.

TYPE "A" BRASS GROMMETS





TYPE "B" HOOK & LOOP TAPE



CHAFFING GEAR SPECIFICATIONS

Overall Pad Width (Inches)	Stock Number	Material	Type	Type "B"		Rope Diameter (Inches)	Rope Circumference (Inches)
				Velcro® Width (In.)	Effective Width (In.)		
8	CGA-8-W	Web	A	N/A	N/A	1-1/2 to 1-3/4	4-3/4 to 5-1/2
8	CGA-8-C	Bulked Nylon	A	N/A	N/A	1-1/2 to 1-3/4	4-3/4 to 5-1/2
8	CGA-8-F	Felt	A	N/A	N/A	1-1/2 to 1-3/4	4-3/4 to 5-1/2
8	CGB-8-W	Web	B	2	7	1-1/2 to 1-3/4	4-3/4 to 5-1/2
8	CGB-8-C	Bulked Nylon	B	2	7	1-1/2 to 1-3/4	4-3/4 to 5-1/2
8	CGB-8-F	Felt	B	2	7	1-1/2 to 1-3/4	4-3/4 to 5-1/2
10	CGA-10-W	Web	A	N/A	N/A	2	6-1/4
10	CGA-10-C	Bulked Nylon	A	N/A	N/A	2	6-1/4
10	CGA-10-F	Felt	A	N/A	N/A	2	6-1/4
10	CGB-10-W	Web	B	2	8	2	6-1/4
10	CGB-10-C	Bulked Nylon	B	2	8	2	6-1/4
10	CGB-10-F	Felt	B	2	8	2	6-1/4
12	CGA-12-W	Web	A	N/A	N/A	2-1/2 to 2-3/4	7-3/4 to 8-5/8
12	CGA-12-C	Bulked Nylon	A	N/A	N/A	2-1/2 to 2-3/4	7-3/4 to 8-5/8
12	CGA-12-F	Felt	A	N/A	N/A	2-1/2 to 2-3/4	7-3/4 to 8-5/8
12	CGB-12-W	Web	B	2	10	2-1/2 to 2-3/4	7-3/4 to 8-5/8
12	CGB-12-C	Bulked Nylon	B	2	10	2-1/2 to 2-3/4	7-3/4 to 8-5/8
12	CGB-12-F	Felt	B	2	10	2-1/2 to 2-3/4	7-3/4 to 8-5/8
14	CGA-14-W	Web	A	N/A	N/A	3 to 3-1/2	9-1/2 to 11
14	CGA-14-C	Bulked Nylon	A	N/A	N/A	3 to 3-1/2	9-1/2 to 11
14	CGA-14-F	Felt	A	N/A	N/A	3 to 3-1/2	9-1/2 to 11
14	CGB-14-W	Web	B	2	12	3 to 3-1/2	9-1/2 to 11
14	CGB-14-C	Bulked Nylon	B	2	12	3 to 3-1/2	9-1/2 to 11
14	CGB-14-F	Felt	B	2	12	3 to 3-1/2	9-1/2 to 11
16	CGA-16-W	Web	A	N/A	N/A	4	12-1/2
16	CGA-16-C	Bulked Nylon	A	N/A	N/A	4	12-1/2
16	CGA-16-F	Felt	A	N/A	N/A	4	12-1/2
16	CGB-16-W	Web	B	2	14	4	12-1/2
16	CGB-16-C	Bulked Nylon	B	2	14	4	12-1/2
16	CGB-16-F	Felt	B	2	14	4	12-1/2

YOU MUST SPECIFY:

1) Gear Type:
Type "A" or "B"

2) Material Type:
Web, Bulked Nylon or Felt

3) Overall width and length

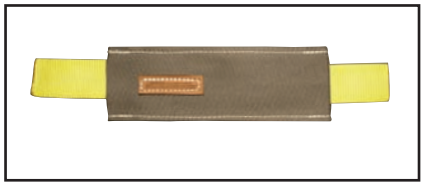
4) Always consider the effective width for TYPE "B" Chaffing Gear.

5) Allow extra width to compensate for line swelling.



ORDER CODE DESIGNATIONS

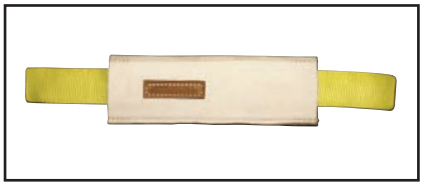
SEWN BULKED NYLON - CS



SEWN WEB - WS



SEWN FELT - FS



QUICK BULKED NYLON - CQS



QUICK WEB - WQS



QUICK FELT - FQS



SEWN & QUICK SLEEVES - BULKED NYLON AND WEB

SEWN SLEEVE DIMENSIONAL DATA AND INFORMATION								
Bulked Nylon Stock No.	Web Stock No.	Sleeve Width (Inches)	Web Sling Width (Inches)		Roundsling		Wire Rope Diameter (Inches)	Chain Size (Inches)
			1 & 2 Ply	3 & 4 Ply	Single Leg	Double Leg		
CS-3	WS-3	3	1		RS30-50-60		1/4 - 3/4	7/32
CS-4	WS-4	4	2	1	RS90	RS30-50-60	7/8 - 1-1/8	9/32 - 3/8
CS-5	WS-5	5	3	2	RS120-150-180	RS90-120	1-1/4 - 1-1/2	1/2
CS-6	WS-6	6	4	3	RS240-360	RS150-180	1-5/8 - 1-3/4	5/8
CS-8	WS-8	8	5 and 6	4 and 5	RS400-600	RS240-360	2 - 2-1/2	3/4 - 7/8
CS-10	WS-10	10	8	6	RS800	RS400		1
CS-12	WS-12	12	10	8	RS1000	RS600-800		1-1/4
CS-14	WS-14	14	12	10		RS1000		

For Leather Sleeves use the material code prefix- "LS". Example: Leather Sleeve for 3 in. web sling- Stock No. LS-5.

For Neoprene Sleeves use the material code prefix- "NS". Example: Neoprene Sleeve (single leg) for RS90- Stock No. NS-4.

Please Note: Single Leg, Sewn Sleeves for roundslings must be installed at the time of order.

QUICK SLEEVE DIMENSIONAL DATA AND INFORMATION										
Bulked Nylon Stock No.	Web Stock No.	Sleeve Width (Inches)	Web Sling Width (Inches)		Roundsling		Wire Rope Diameter (Inches)	Chain Size (Inches)	Velcro®- (Inches)	
			1 & 2 Ply	3 & 4 Ply	Single Leg	Double Leg			1-2 ply single leg	3-4 ply double leg
CQS-3	WQS-3	3	1				1/4 - 7/16		1	1
CQS-4	WQS-4	4	2	1	RS30-50-60-90	RS30-50	1/2 - 3/4	7/32 - 9/32	1	1
CQS-5	WQS-5	5	3	2	RS120-150	RS60-90	7/8 - 1-1/8	3/8	1	2
CQS-6	WQS-6	6	4	3	RS180-240	RS120-150	1-1/4 - 1-1/2	1/2	1	2
CQS-8	WQS-8	8	5	4	RS360-400	RS180-240	1-5/8 - 2-1/4	5/8	2	2
CQS-10	WQS-10	10	6	5 and 6	RS600-800	RS360-400	1-1/2	3/4 - 7/8	2	2
CQS-12	WQS-12	12	8	8	RS1000	RS600		1	2	2
CQS-14	WQS-14	14	10	10		RS800			2	2
CQS-16	WQS-16	16	12	12		RS1000			2	2

For Leather Quick Sleeves use the material code prefix- "LQS". Example: Leather Sleeve for 3 in. web sling- Stock No. LQS-5.

For Neoprene Quick Sleeves use the material code prefix- "NQS". Example: Neoprene Sleeve (single leg) for RS90- Stock No. NQS-4.

For roundslings we would recommend the use of tubular sleeves.

SEWN & QUICK SLEEVES - FELT

SEWN FELT SLEEVE DIMENSIONAL DATA AND INFORMATION									
Felt 1/8 In .125 thickness Stock No.	Felt 1/4 In .250 thickness Stock No.	Felt 3/8 In .380 thickness Stock No.	Sleeve Width (Inches)	Web Sling Width (Inches)		Roundsling		Wire Rope Diameter (Inches)	Chain Size (Inches)
				1 & 2 Ply	3 & 4 Ply	Single Leg	Double Leg		
FS125-3	FS250-3	FS380-3	3	1		RS30-50-60		1/4 - 3/4	7/32
FS125-4	FS250-4	FS380-4	4	2	1	RS90	RS30-50-60	7/8 - 1-1/8	9/32 - 3/8
FS125-5	FS250-5	FS380-5	5	3	2	RS120-150-180	RS90-120	1-1/4 - 1-1/2	1/2
FS125-6	FS250-6	FS380-6	6	4	3	RS240-360	RS150-180	1-5/8 - 1-3/4	5/8
FS125-8	FS250-8	FS380-8	8	5 and 6	4 and 5	RS400-600	RS240-360	2 - 2-1/2	3/4 - 7/8
FS125-10	FS250-10	FS380-10	10	8	6	RS800	RS400		1
FS125-12	FS250-12	FS380-12	12	10	8	RS1000	RS600-800		1-1/4
FS125-14	FS250-14	FS380-14	14	12	10		RS1000		

***For Sewn Felt Sleeves with Bulked Nylon covers, add "BN" as an order code prefix, i.e., BNFS250-6**

QUICK FELT SLEEVE DIMENSIONAL DATA AND INFORMATION									
Felt 1/8 In .125 thickness Stock No.	Felt 1/4 In .250 thickness Stock No.	Felt 3/8 In .380 thickness Stock No.	Sleeve Width (Inches)	Web Sling Width (Inches)		Roundsling		Wire Rope Diameter (Inches)	Chain Size (Inches)
				1 & 2 Ply	3 & 4 Ply	Single Leg	Double Leg		
FQS125-3	FQS-250-3	FQS380-3	3	1				1/4 - 7/16	
FQS125-4	FQS250-4	FQS380-4	4	2	1	RS30-50-60-90	RS30-50	1/2 - 3/4	7/32 - 9/32
FQS125-5	FQS250-5	FQS380-5	5	3	2	RS120-150	RS60-90	7/8 - 1-1/8	3/8
FQS125-6	FQS250-6	FQS380-6	6	4	3	RS180-240	RS120-150	1-1/4 - 1-1/2	1/2
FQS125-8	FQS250-8	FQS380-8	8	5	4	RS360-400	RS180-240	1-5/8 - 2-1/4	5/8
FQS125-10	FQS250-10	FQS380-10	10	6	5 and 6	RS600-800	RS360-400	2-1/2	3/4 - 7/8
FQS125-12	FQS250-12	FQS380-12	12	8	8	RS1000	RS600		1
FQS125-14	FQS250-14	FQS380-14	14	10	10		RS800		
FQS125-16	FQS250-16	FQS380-16	16	12	12		RS1000		

***For Quick Felt Sleeves with Bulked Nylon covers, add "BN" as an order code prefix, i.e., BNFQS380-8**

QUICK TUBULAR SLEEVES - BULKED NYLON, WEB AND FELT

QUICK TUBULAR SLEEVE DIMENSIONAL DATA AND INFORMATION								
Bulked Nylon Stock No.	Web Stock No.	Felt 1/8 In .125 thickness Stock No.	Felt 1/4 In .250 thickness Stock No.	Sleeve Width (Inches)	Chain Size (Inches)	Roundsling		Wire Rope Diameter (Inches)
						Single Leg	Double Leg	
CQTS-6	WQTS-6	FQTS125-6	FQTS250-6	6	9/32 - 3/8			1 - 1-1/2
CQTS-8	WQTS-8	FQTS125-8	FQTS250-8	8	1/2 - 5/8	RS30-50-60		1-3/4 - 2
CQTS-10	WQTS-10	FQTS125-10	FQTS250-10	10	3/4	RS90-120-150	RS30-50-60-90	2-1/4 - 2-1/2
CQTS-12	WQTS-12	FQTS125-12	FQTS250-12	12	7/8 - 1	RS180-240	RS120-150-180	
CQTS-14	WQTS-14	FQTS125-14	FQTS250-14	14	1 - 1-1/4	RS360	RS240	
CQTS-16	WQTS-16	FQTS125-16	FQTS250-16	16		RS400	RS360	
CQTS-18	WQTS-18	FQTS125-18	FQTS250-18	18		RS600-800	RS400	
CQTS-20	WQTS-20	FQTS125-20	FQTS250-20	20		RS1000	RS600	
CQTS-22	WQTS-22	FQTS125-22	FQTS250-22	22			RS800	

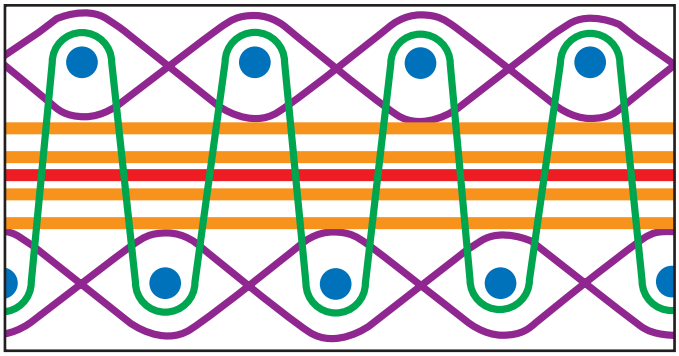
HOW TO ORDER

1. Select Construction:
   Sewn
   Quick
   Tubular
2. Select Material:
   Bulked Nylon
   Web
   Felt (Specify thickness)
3. Specify Stock Number
   (Based on sling width or model)
4. Specify Protection Length.

STOCK NUMBER DESIGNATIONS			
MATERIAL	CONSTRUCTION		
	SEWN	QUICK	TUBULAR
BULKED NYLON	CS	CQS	CQTS
WEB	WS	WQS	WQTS
FELT 1/8"	FS125	FQS125	FQTS125
FELT 1/4"	FS250	FQS250	FQTS250
FELT 3/8"	FS380	FQS380	N/A

SLING PROTECTION INFORMATION Lift-It® Sling Protection is constructed from the following materials:	
Materials	Thickness
Bulked Nylon	3/32"
Webbing (9)	3/16"
Webbing (6)	1/8"
Leather	3/32 or 1/8"
Neoprene	1/8"-3/16"-1/4"
Felt	1/8"-1/4"-3/8"

SLING WEBBING

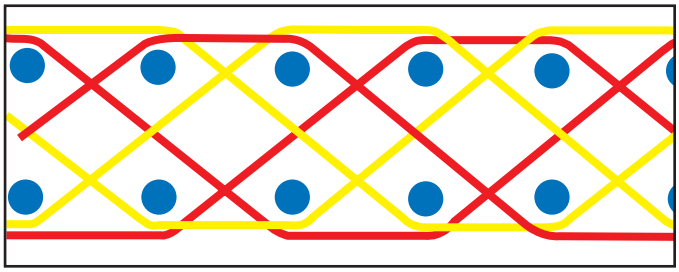


PURPLE: Surface (Weft) yarns carry a portion of the load.
ORANGE: Longitudinal (Warp) yarns carry the majority of the load.
RED: Red core yarns.
BLUE: Lateral yarns woven into the surface yarns.
GREEN: Binder yarns secure the surface and core yarns.

Lift-It® web slings are fabricated from sling webbing. Sling webbing features a "stuffer" weave design. The inner load carrying yarns are jacketed by an outer cover. The longitudinal (warp) load yarns carry approximately 70% of the load, while the remaining strength is derived from the cover, side-to-side (weft) yarns. Red core yarns are woven into the central load carrying yarn area. Red core yarns may become visible, as the outer cover is worn away or becomes damaged, providing a signal to users and inspectors to remove the sling from service.

⚠WARNING In many applications, slings become extremely dirty, making it difficult to see the red core yarns. Red core yarns cannot be used exclusively to determine the condition of the sling. Red core yarns must be used in conjunction with other removal from service criteria and visual/tactile inspection techniques to determine sling condition. If there is any doubt, do not use the sling.

"MIL-SPEC" WEBBING



RED: Load carrying surface yarns.
YELLOW: Load carrying surface yarns.
BLUE: Load carrying binder yarns.

Military specification or "Mil-Spec" webbing is not designed for lifting. Nothing prevents its use in lifting applications, but educated, informed sling purchasers, users and inspectors. "Mil-Spec" webbing does not feature red core yarns and does not employ a stuffer weave design. Since the load carrying yarns are surface exposed, the tensile strength of Mil-Spec webbing, subjected to minor surface damage is radically reduced.

Why would a manufacturer supply "MIL-SPEC" or tie down web for a lifting assembly? The answer is simple, to maximize profit margin. Our problem with that is your safety is compromised.

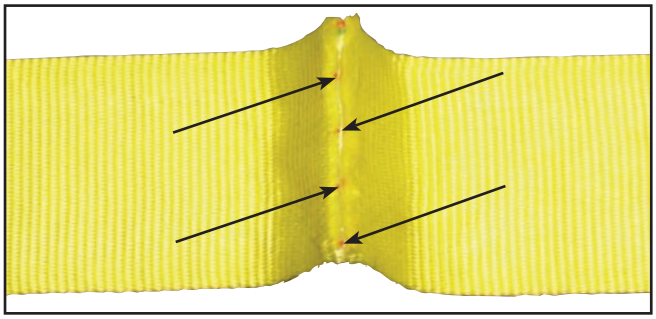
EFFECTS OF SURFACE ABRASION

DESCRIPTION	SLING WEBBING VS	"MIL-SPEC" WEBBING
MATERIAL	NYLON	NYLON
WIDTH	2 IN.	1-3/4 IN.
THICKNESS	.12 - .14	.15 - .18
RED CORE YARN	YES	NO
FINISH	PIGMENT DYE	CONDITION "U"
UNSEWN TENSILE STRENGTH	15,000 Lbs.	15,000 Lbs.
DAMAGE DESCRIPTION	HEAVY ABRASION	LIGHT ABRASION
TENSILE STRENGTH AFTER DAMAGE	7,000 Lbs.	1,900 Lbs.
% LOSS	53%	87%

⚠WARNING WEAR OR DAMAGE TO COVER YARNS OF SLING WEBBING RESULTS IN IMMEDIATE STRENGTH LOSS.

RED CORE YARN "SENSIBILITY"

Do not operate under the misconceptions, "If I see red, I'll be dead" or the red yarns "pop out at you" when the sling is not safe to use or during lifting to alert users of overloading. Pay attention to the many, other removal from service criteria and be a responsible user and inspector. See page 34.



⚠WARNING DO NOT USE SLINGS THAT ARE STRUCTURALLY DAMAGED, IF RED CORE YARNS ARE NOT VISIBLE.

MANUFACTURING TOLERANCE

All Lift-It® web slings are manufactured to the following tolerances. For Web slings wider than 6 inches, add 1/2" to the following values. For exact tolerances or matched slings, contact us.

Sling Thickness	Tolerance
1 Ply	1.5 Inches + 1.5% of Sling Length
2 Ply	2.0 Inches + 2% of Sling Length
3 & 4 Ply	3.0 Inches + 3% of Sling Length

TREATED WEBBING

Lift-It® slings are manufactured from industrial sling webbing that has been treated in the final stages of looming. The treatment helps seal out moisture and dirt, reducing the effects of abrasion, while enhancing sling service life. Untreated web slings are also available upon request.

DESIGN FACTOR

All NEW Lift-It® slings are designed and rated with a Design Factor of 5 to 1, unless otherwise stated. When specified, other Design Factors are available. Our slings can be used in compliance with OSHA and ASME specifications. The Design Factor does not allow the user to exceed the Work Load Limit. It is important for sling users to realize Work Load Limits are based upon: destruction testing done in laboratory controlled, testing conditions that will never be duplicated during actual usage and the sling being in a new or "as new" condition.

⚠ WARNING Any instantaneous change (sudden drops or rapid acceleration) constitutes hazardous shock loading and THE WORK LOAD LIMITS AS STATED, DO NOT APPLY.

SLING and WARNING TAGS

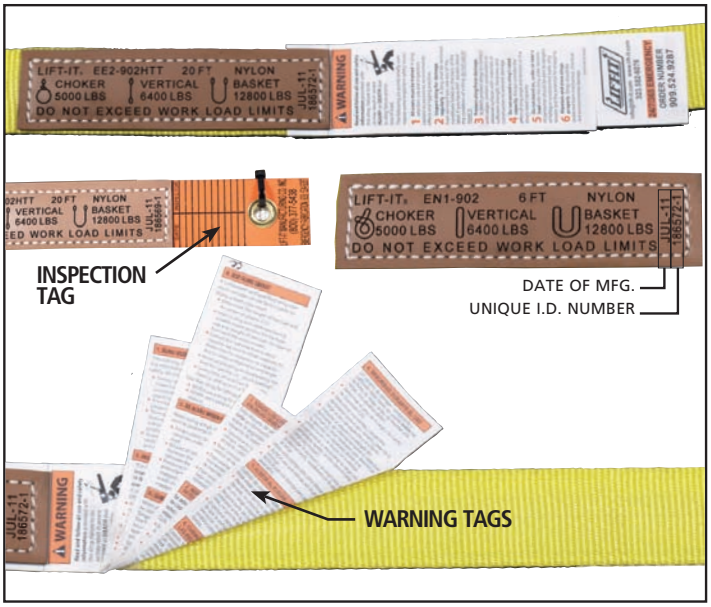
A heavy duty tag is attached to all slings. All necessary information required by the various regulatory agencies is laser imprinted into synthetic leather, resulting in the most durable tag available.

Hitch diagrams, date of manufacture and a unique sling identification number are also included. Custom tags can also be attached for a nominal charge.

In addition to the sling tag, a warning tag is also attached. Developed by the Web Sling and Tie Down Association, it contains important safety, use and inspection information, including removal from service criteria.

Durable, Synthetic Inspection Tags include a matrix for memorialization and visual verification of periodic sling inspections. Synthetic Inspection Tags are available on request for an additional charge.

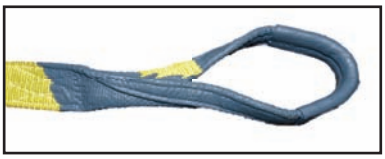
Proper use, care, inspection and accident prevention measures are enhanced by the Lift-It® Sling and Warning Tag System. If the Sling or Warning Tag becomes detached or illegible, return to us for re-labeling.



LIFT-IT® INSPECTION LOOP™



Metal tags are not only a hassle to make and maintain, but they can hang up and damage the sling.



Painting slings is not only a hassle, it's a messy hassle that can affect sling performance.



We supply the Inspection Loop™ and you supply the Zip Tie.

Slings must be inspected at different levels and at specified times. How does one visually validate that the periodic inspection, done at least annually, has been done?

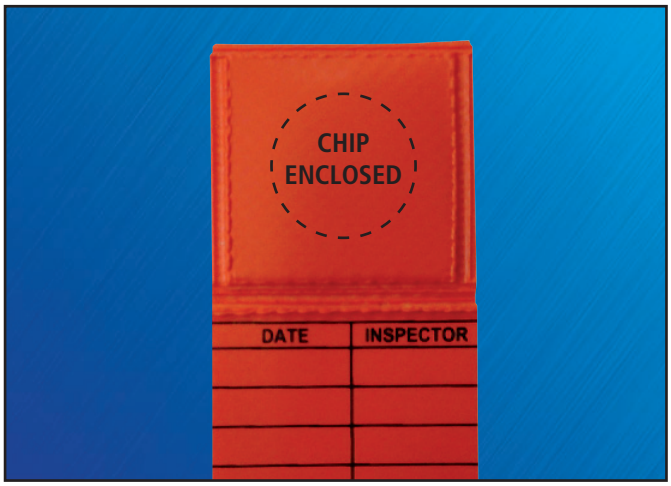
Sling Inspectors may meticulously track individual slings and rigging equipment, recording the condition. A unique identification number would be necessary to differentiate identical slings or equipment.

Some inspectors dip the sling into paint (not only a hassle, but a messy hassle) to "visually" signify that the periodic inspection was done. Others attach metal tags that are not only time consuming to make and attach, but could damage the sling by hanging up during use. Zip Ties and colored, electrical tape are also used, but if they are attached too snuggly, they too can cause damage and affect sling strength.

The Lift-It® Inspection Loop™ does not damage slings or components. We supply the Inspection Loop™ and you supply the colorized zip tie denoting the specific inspection interval (month, quarter or year). Imagine the simple beauty of visually surveying multiple slings and easily determining that slings had been inspected during a specific time period. All you need to do is specify, "Inspection Loop" on your order to take the first step to inspection efficiency.

SLING TAGS: INSPECTION, WARNING, CUSTOM AND RFID

In addition to the Lift-It® Inspection Loop there are several other ways to visually validate that the periodic inspection has been done. We also offer custom, engraved metal tags. Shackles and other fittings that have a flattened area can also be engraved.



RFID TAG



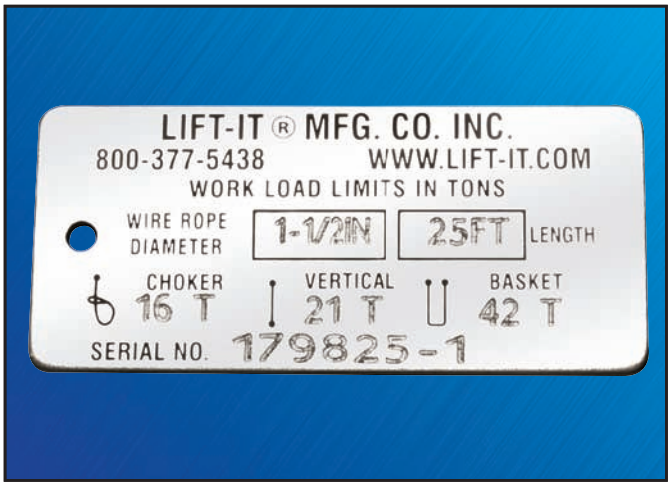
INSPECTION TAG



WARNING TAG



CUSTOM TAG



METAL TAG



ENGRAVING

How to Order

All orders must specify:

1. **Complete Stock Number.**
2. **Web Description, (if applicable): Polyester, Polyester Max Edge™, Nylon Max Edge™, Armor Jacket or Stone Handling Web. If regular Nylon web is desired, no suffix is required.**
3. **Eye Type and Eye Protection Description, (If applicable).**
   Standard eye protection is Option J and need not be included in the Stock Number.
   Options K, L or M are available and must be included in the Stock Number.
4. **Dimensional Information: Sling Width and Length.**
5. **Sling Protection:**
   Description, location, quantity and length of Protection Pads and/or Sleeves.
   (See pages 43-52).
6. **Attachments and Accessories**

Ordering instructions and warnings are featured in the individual catalog sections.

Please note: All items are custom made and non-returnable.

EE 2 9 02 PME HTT K X 20

Sling Type
EN = Endless
EE = Eye & Eye
RE = Reversed Eye
WBC = Wide Body Cargo
AEC = Attached Eye Cargo
ACH/SCH = Choker Hardware
ABH/SBH = Basket Hardware

Number of Plies
1, 2, 3 or 4

Web Strength
6 = 7,200 Lbs. M.U.T.S.*
7 = 7,000 Lbs. M.U.T.S.*
9 = 9,800 Lbs. M.U.T.S.*
12 = 12,000 Lbs. M.U.T.S.*
*__M__inimum __U__ltimate __T__ensile __S__trength (Lbs. per inch)

Sling Width expressed in Inches
* RE, WBC and AEC Stock Numbers express width from construction. Construction width of 2 in. web (side by side) yields a 4" sling width. (RE1-902 = 4 in. overall sling width).

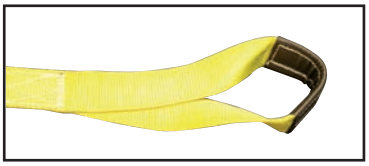
Web Material
N = NYLON
P = POLYESTER
NME = NYLON MAX EDGE™
PME = POLYESTER MAX EDGE™
AJ = ARMOR JACKET
SH = STONE HANDLING

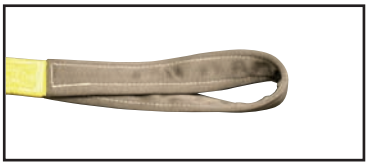
Eye Description
Flat Eyes - Type 3
FE = No Taper
FT = Tapered Eyes
Half Twist Eyes - Type 4
HT = No Taper
HTT = Tapered Eyes

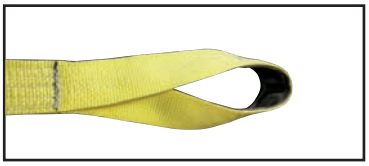
Sling Length (Feet)
(Pull to Pull or Reach)

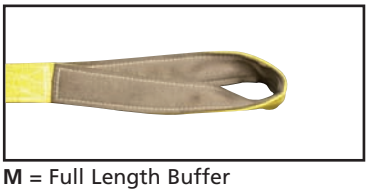
X Denotes separation between Eye Type and Sling Length.

Eye Protection
J = Standard Wrap at Bearing
K = Full Length Wrap
L = Buffer at Bearing
M = Full Length Buffer


J = Standard Wrap at Bearing


K = Full Length Wrap


L = Buffer at Bearing


M = Full Length Buffer

ENDLESS	EYE & EYE		REVERSED EYE		CARGO		CHOKER HARDWARE
	FLAT	HALF TWIST	STD.	FLAT	WIDE BODY	ATTACHED EYE	
							
EN TYPE 5	EE TYPE 3	EE TYPE 4	RE TYPE 6	RE TYPE 7	WBC	AEC	ACH/SCH TYPE 1

ENDLESS (Page 59)

Endless slings are versatile as hook and load contact points can be rotated. Endless slings can be used in choker, vertical and basket hitches.

EYE & EYE (Page 60)

FLAT EYE (TYPE 3): Eyes are formed as the material is folded back and sewn flat to the sling body. Flat Eye slings can be used in choker, vertical and basket hitches.

HALF TWIST EYE (TYPE 4): Eyes are formed by turning the webbing 180° before sewing the sling body. Half Twist Eyes provide for improved choking, when compared to flat eyes. Slings with Half Twist Eyes can be used in choker, vertical and basket hitches.

REVERSED EYE (Page 61)

STANDARD (TYPE 6): Reversed Eye slings feature sling eyes and bodies that are covered by Bulked Nylon wear pads. Bulked Nylon wear pad material is four times more abrasion resistant than regular sling webbing.

⚠ WARNING Bulked Nylon padding provides no protection against cutting.

FLAT (TYPE 7): Reversed Eye (Flat) slings feature the same abrasion resistant wear pads as the standard model. The Flat Reversed Eye web is turned 180° to form a "flat" eye, which lies in the same plane as the sling body.

CARGO SLINGS (Page 62)

WIDE BODY CARGO: Wide Body Cargo slings basket the load. Loads are distributed over a wide surface area, protecting load surfaces from damage.

⚠ WARNING For use in basket hitch only.

ATTACHED EYE CARGO: A lighter duty, cargo sling, which is more economical than wide body cargo slings. Attached Eye Cargo slings feature narrower eye widths to fit smaller hooks.

⚠ WARNING For use in basket hitch only.

CHOKER HARDWARE (page 63)

Steel or aluminum choker hardware provides for efficient choke hitching. Choker Hardware slings can also be used in vertical and basket hitches.

BASKET HARDWARE	BRIDLE SLINGS SINGLE & MULTI-LEG	SPECIAL PURPOSE SLINGS	ROUNDSLINGS	TWIN-PATH® SLINGS
				
ABH/SBH TYPE 2	SLB / MLB	DS / HH / CG	RS	TP / TUF TPXKS / TUFXKS

BASKET HARDWARE (Page 64)

Steel Basket Hardware (SBH) or Aluminum Basket Hardware (ABH) fittings are attached to Basket Hardware Slings. Basket Hardware Slings can be used in vertical and basket hitches.

BRIDLE SLINGS-SINGLE & MULTI-LEG (Pages 65-67)

Bridle Slings (Single and Multi-Leg) feature combinations of links, hooks and fabric eyes. Hardware and fabric connections provide for the efficient handling of loads with fixed lifting points.

SPECIAL PURPOSE SLINGS (Pages 71-86)

Special Purpose Slings are developed for unique applications and evaluated by sling users. Special Purpose Slings provide the security and convenience of custom designed products, eliminating the burden of creating improvised assemblies at the job site.

ROUNDSLINGS (Pages 105-110)

Single Path Roundslings feature polyester load carrying yarns covered by single or double covers. Other cover options are also available for additional abrasion resistance. Endless configuration Roundslings can be rotated to change hook and load contact points. Roundslings are ideal for choking and can be used in vertical and basket hitches.
⚠ WARNING **Abrasion resistant covers provide no protection against cutting.**

TWIN-PATH® EXTRA SLINGS (pages 111-122)

Endless in configuration, patented Twin-Path® slings feature conventional polyester load bearing core yarn. Twin-Path® Extra slings feature K-Spec® High Performance load bearing core yarn. Core yarns are encapsulated by Covermax® sleeves, which provide abrasion resistance. Patented inspection features and repairability make super strong, ultra light Twin-Path® Extra slings, the sling of choice.
⚠ WARNING **Abrasion resistant covers provide no protection against cutting.**

Endless Slings

Endless slings are a versatile sling as hook and load contact points can be rotated. For use in choker, vertical and basket hitches. Sling ends can be tapered and reinforced on request.



Width (Inches)	Stock Number	Optional End Taper		WORK LOAD LIMITS (Lbs.)					Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
				Choker	Vertical	Basket Hitches					
		Width	Length			90°	60°	45°	Base 8 Ft.	Adder/Ft.	
1″	EN1-601	-	-	1,900	2,400	4,800	4,150	3,390	.56	.06	2
1″	EN1-901	-	-	2,500	3,200	6,400	5,540	4,520	.95	.11	2
1″	EN2-601	-	-	3,800	4,800	9,600	8,310	6,780	1.15	.13	2
1″	EN2-901	-	-	5,000	6,400	12,800	11,080	9,050	1.96	.22	2
1″	EN3-901	-	-	7,600	9,600	19,200	16,620	13,570	2.97	.33	3
1-1/2″	EN1-915	-	-	3,700	4,650	9,300	8,050	6,570	1.58	.09	2
1-1/2″	EN2-915	-	-	7,400	9,300	18,600	16,100	13,150	3.26	.18	2
1-1/2″	EN3-915	-	-	11,000	13,950	27,900	24,160	19,720	4.93	.55	3
2″	EN1-602	1″	12″	3,800	4,800	9,600	8,310	6,780	1.36	.16	2
2″	EN1-902	1″	12″	5,000	6,400	12,800	11,080	9,050	1.90	.22	2
2″	EN2-602	1″	12″	7,600	9,600	19,200	16,620	13,570	2.80	.32	2
2″	EN2-902	1″	12″	10,000	12,500	25,000	21,650	17,670	3.92	.44	2
2″	EN3-902	-	-	14,000	17,500	35,000	30,310	24,740	5.94	.67	3
2″	EN4-902	-	-	18,000	23,500	47,000	40,700	33,230	7.95	.89	4
3″	EN1-603	1-1/2″	12″	5,700	7,200	14,400	12,470	10,180	2.38	.28	2
3″	EN1-903	1-1/2″	12″	7,600	9,600	19,200	16,620	13,570	2.99	.35	2
3″	EN2-603	1-1/2″	12″	10,000	12,500	25,000	21,650	17,670	4.90	.56	2
3″	EN2-903	1-1/2″	12″	14,000	17,500	35,000	30,310	24,740	6.16	.70	2
3″	EN3-903	-	-	21,000	26,500	53,000	45,890	37,470	9.33	1.05	3
3″	EN4-903	-	-	28,000	35,000	70,000	60,620	49,490	12.50	1.40	4
4″	EN1-604	1-1/2″	12″	7,600	9,600	19,200	16,620	13,570	2.92	.34	3
4″	EN1-904	1-1/2″	12″	10,000	12,500	25,000	21,650	17,670	3.74	.44	3
4″	EN2-604	2″	18″	14,000	17,500	35,000	30,310	24,740	6.02	.68	3
4″	EN2-904	2″	18″	18,000	23,500	47,000	40,700	33,230	7.70	.88	3
4″	EN3-904	-	-	28,000	35,000	70,000	60,620	49,490	11.66	1.32	4
4″	EN4-904	-	-	36,000	46,000	92,000	79,670	65,040	15.62	1.76	4
5″	EN1-905	1-3/4″	18″	12,800	16,000	32,000	27,710	22,620	4.56	.53	3
5″	EN2-905	2-1/2″	18″	22,000	27,500	55,000	47,630	38,880	9.38	1.07	4
5″	EN3-905	-	-	33,500	42,000	84,000	72,740	59,380	14.20	1.60	5
5″	EN4-905	-	-	44,800	56,000	112,000	96,900	79,180	19.03	2.14	5
6″	EN1-906	2″	18″	15,300	19,200	38,400	33,250	27,140	5.51	.64	3
6″	EN2-906	3″	24″	26,000	32,500	65,000	56,290	45,950	11.34	1.29	3
6″	EN3-906	-	-	39,000	48,900	97,800	84,690	69,140	17.17	1.94	5
6″	EN4-906	-	-	52,000	65,000	130,000	112,580	91,910	23.00	2.59	5
8″	EN1-908	3″	18″	20,000	25,600	51,200	44,330	36,190	7.62	.90	3
8″	EN2-908	4″	24″	32,700	40,960	81,920	70,940	57,910	15.68	1.79	4
8″	EN3-908	-	-	49,000	61,000	122,000	105,650	86,250	23.74	2.69	5
8″	EN4-908	-	-	65,500	81,900	163,800	158,230	141,850	31.81	3.58	6
10″	EN1-910	3-1/2″	24″	25,600	32,000	64,000	55,420	45,240	9.96	1.17	3
10″	EN2-910	5″	30″	38,400	48,000	96,000	83,130	67,870	20.51	2.34	4
10″	EN3-910	-	-	57,600	72,000	144,000	124,700	101,800	31.06	3.52	5
10″	EN4-910	-	-	76,800	96,000	192,000	166,270	135,740	41.61	4.69	6
12″	EN1-912	4″	30″	30,720	38,000	76,000	65,810	53,730	12.24	1.44	3
12″	EN2-912	6″	36″	43,000	53,000	106,000	91,790	74,940	25.20	2.88	5
12″	EN3-912	-	-	64,000	80,000	160,000	138,560	113,120	38.16	4.32	6
12″	EN4-912	-	-	86,000	107,000	214,000	185,324	151,298	51.12	5.76	8

Available in either nylon or polyester webbing.
Polyester webbing is available in (9) heavy web class only.
For Polyester Max Edge™ webbing add letters PME to Stock Number. (Example: EN2-904PME)
Consider using Twin-Path® Extra Slings in applications requiring 3 and 4 ply thick slings, wider than 4 inches.

WARNING DO NOT EXCEED WORK LOAD LIMITS

WARNING

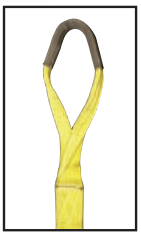
Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Eye & Eye Slings



Flat Tapered Code FT



Half Twist Tapered Code HTT



Flat No Taper Code FE



Half Twist No Taper Code HT

Eye and Eye slings can be used in choker, vertical and basket hitches. Slings with Half Twist (Type 4) eyes are furnished unless Flat (Type 3) eyes are specified. Sling eyes will be wrapped at the bearing point unless otherwise specified.

Tapered eyes are automatically furnished on slings over 2 inches wide to provide for a proper relationship between the sling and the lifting hardware. Eyes with no taper are available.

The bearing points of Half Twist (Type 4) eyes are oriented 90° to the sling body. The perpendicular relationship between the eye and body in Half Twist, Type 4 eyes results in a comparatively advantageous choke hitch, when compared to Flat (Type 3) eyes. Half Twist eyes perform equally well in vertical or basket hitches.

For **H**alf **T**wist Eyes with **T**aper, specify "**HTT**" (EE1-902 **HTT**) Eye Width-1"
For **H**alf **T**wist Eyes with no taper, specify "**HT**" (EE1-902 **HT**) Eye Width-2"
For **F**lat Eyes with **T**aper, specify "**FT**" (EE1-902 **FT**) Eye Width-1"
For **F**lat **E**yes with no taper, specify "**FE**" (EE1-902 **FE**) Eye Width-2"

Eyes depicted feature standard eye protection, Order Code "J" and does not need to be added to sling stock number. Other eye treatments are available. See page 56 for ordering information, eye protection options and material designations.

Width (Inches)	Stock Number	Eye Dimensions (Inches)		WORK LOAD LIMITS (Lbs.)					Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
				Choker	Vertical	Basket Hitches					
						90°	60°	45°			
		Width	Length						Base 8 Ft.	Adder / Ft.	
1"	EE1-601	1"	9"	900	1,200	2,400	2,070	1,690	.40	.03	4
1"	EE1-901	1"	9"	1,200	1,600	3,200	2,770	2,260	.67	.05	4
1"	EE2-601	1"	9"	1,900	2,400	4,800	4,150	3,390	.59	.06	3
1"	EE2-901	1"	9"	2,500	3,200	6,400	5,540	4,520	1.00	.11	3
1"	EE4-601	1"	12"	3,800	4,800	9,600	8,310	6,780	1.22	.13	4
1"	EE4-901	1"	12"	5,000	6,400	12,800	11,080	9,050	2.07	.22	4
1-1/2"	EE1-915	1-1/2"	9"	1,800	2,300	4,600	3,980	3,250	1.11	.09	4
1-1/2"	EE2-915	1-1/2"	9"	3,600	4,600	9,200	7,960	6,500	1.67	.19	3
1-1/2"	EE4-915	1-1/2"	12"	7,200	9,200	18,400	15,930	13,000	3.44	.37	4
2"	EE1-602	2"	12"	1,900	2,400	4,800	4,150	3,390	.96	.08	4
2"	EE1-902	2"	12"	2,500	3,200	6,400	5,540	4,520	1.34	.11	4
2"	EE2-602	2"	12"	3,800	4,800	9,600	8,310	6,780	1.44	.16	4
2"	EE2-902	2"	12"	5,000	6,400	12,800	11,080	9,050	2.02	.22	4
2"	EE4-602	2"	12"	7,000	8,860	17,720	15,340	12,530	2.96	.32	4
2"	EE4-902	2"	12"	9,000	11,400	22,800	19,740	16,120	4.14	.40	4
3"	EE1-603	1-1/2"	12"	2,700	3,600	7,200	6,230	5,090	1.82	.14	4
3"	EE1-903	1-1/2"	12"	3,800	4,800	9,600	8,310	6,780	2.29	.18	4
3"	EE2-603	1-1/2"	12"	5,300	6,600	13,200	11,430	9,330	2.52	.28	4
3"	EE2-903	1-1/2"	12"	7,000	8,860	17,720	15,340	12,530	3.24	.35	4
3"	EE4-603	1-1/2"	18"	9,000	11,400	22,800	19,740	16,120	5.18	.56	5
3"	EE4-903	1-1/2"	18"	13,000	17,000	34,000	29,440	24,040	6.60	.70	5
4"	EE1-604	1-1/2"	14"	3,800	4,800	9,600	8,310	6,780	2.24	.17	5
4"	EE1-904	1-1/2"	14"	5,000	6,400	12,800	11,080	9,050	2.86	.22	5
4"	EE2-604	1-1/2"	14"	7,000	8,860	17,720	15,340	12,530	3.10	.34	5
4"	EE2-904	1-1/2"	14"	9,000	11,400	22,800	19,740	16,120	3.96	.44	5
4"	EE4-604	2"	18"	12,000	15,000	30,000	25,980	21,210	6.54	.69	6
4"	EE4-904	2"	18"	18,000	22,800	45,600	39,480	32,240	8.36	.88	6
5"	EE1-905	1-3/4"	18"	6,000	8,000	16,000	13,850	11,310	3.48	.27	6
5"	EE2-905	1-3/4"	18"	11,400	14,250	28,500	24,680	20,150	4.82	.54	6
5"	EE4-905	2-1/2"	24"	19,000	24,000	48,000	41,560	33,940	10.18	1.07	8
6"	EE1-906	2"	24"	7,600	9,600	19,200	16,620	13,570	4.21	.32	8
6"	EE2-906	2"	24"	13,000	17,000	34,000	29,440	24,040	5.83	.65	8
6"	EE4-906	3"	24"	24,000	30,000	60,000	51,960	42,420	12.31	1.30	8
8"	EE1-908	3"	24"	10,250	12,800	25,600	22,170	18,100	6.27	.45	8
8"	EE2-908	3"	24"	18,000	22,800	45,600	39,490	32,240	8.51	.90	8
8"	EE4-908	4"	24"	32,000	40,000	80,000	69,280	56,560	17.47	1.79	8
10"	EE1-910	3-1/2"	24"	12,000	15,000	30,000	25,980	21,210	8.20	.59	8
10"	EE2-910	3-1/2"	24"	19,000	24,000	48,000	41,560	33,940	11.13	1.17	8
10"	EE4-910	5"	30"	36,000	45,000	90,000	77,940	63,630	22.85	2.34	10
12"	EE1-912	4"	30"	15,000	19,000	38,000	32,910	26,860	10.08	.72	10
12"	EE2-912	4"	30"	24,000	30,000	60,000	51,960	42,420	13.68	1.44	10
12"	EE4-912	6"	36"	43,000	53,000	106,000	91,790	74,940	28.80	2.88	12

Available in either nylon or polyester webbing.
Polyester webbing is available in (9) heavy web class only.
For Polyester Max Edge™ webbing add letters "PME" to Stock Number. (Example: EE2-904PME)
Consider using Twin-Path® Extra Slings in applications requiring 4 ply thick slings, wider than 6 inches.

WARNING DO NOT EXCEED WORK LOAD LIMITS

WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Reversed Eye Slings



RE (Standard) Type 6



REF (Flat) Type 7

Reversed Eye slings feature sling eyes and bodies that are covered by Bulked Nylon wear pads. Bulked Nylon wear pad material is four times more abrasion resistant than webbing, but provides no protection against cutting.

The bearing points of Reversed Eye-Standard (Type 6) eyes are 90° to the sling body. The perpendicular relationship between the eye and sling body in a Reversed Eye-Standard (Type 6) results in a comparatively advantageous choke hitch, when compared to the Reversed Eye-Flat (Type 7).

The Reversed Eye-Flat (Type 7) body is turned 180°, forming an eye, in the same plane as the sling body.

Type 6 and Type 7 Reversed Eye Slings can be used in choker, vertical or basket hitches.

Width (Inches)	Stock Number	Eye Dimensions (Inches)		WORK LOAD LIMITS (Lbs.)					Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
				Choker	Vertical	Basket Hitches					
						90°	60°	45°			
		Width	Length						Base 8 Ft.	Adder / Ft.	
2″	RE1-601	1″	9″	1,900	2,400	4,800	4,150	3,390	1.40	.16	3
2″	RE1-901	1″	9″	2,500	3,200	6,400	5,540	4,520	1.79	.21	3
2″	RE2-601	1″	12″	3,800	4,800	9,600	8,310	6,780	1.99	.23	4
2″	RE2-901	1″	12″	5,000	6,400	12,800	11,080	9,050	2.80	.32	4
3″	RE1-915	1-1/2″	12″	3,700	4,650	9,300	8,050	6,570	2.90	.23	4
3″	RE2-915	1-1/2″	12″	7,400	9,300	18,600	16,100	13,150	4.58	.32	4
3-1/2″	RE1-675	1-3/4″	12″	3,200	4,000	8,000	6,930	5,650	2.80	.32	4
3-1/2″	RE2-675	1-3/4″	12″	6,000	7,500	15,000	12,990	10,600	4.24	.48	4
4″	RE1-602	1″	12″	3,800	4,800	9,600	8,310	6,780	2.68	.34	4
4″	RE1-902	1″	12″	5,000	6,400	12,800	11,080	9,050	3.22	.40	4
4″	RE2-602	2″	12″	7,600	9,600	19,200	16,630	13,574	4.48	.50	4
4″	RE2-902	2″	18″	9,000	11,400	22,800	19,740	16,120	5.60	.62	6
4″	RE3-902	2″	18″	13,000	17,000	34,000	29,440	24,040	7.62	.85	6
4″	RE4-902	2″	18″	17,000	21,500	43,000	37,240	30,400	9.63	1.07	6
6″	RE1-603	1-1/2″	12″	5,700	7,200	14,400	12,470	10,180	4.54	.56	5
6″	RE1-903	1-1/2″	12″	7,600	9,600	19,200	16,630	13,570	5.15	.63	5
6″	RE2-603	1-1/2″	18″	9,000	11,400	22,800	19,740	16,120	7.06	.84	6
6″	RE2-903	1-1/2″	18″	13,000	17,000	34,000	29,440	24,040	8.32	.98	6
6″	RE3-603	3″	24″	16,000	20,000	40,000	34,640	28,280	10.40	1.12	8
6″	RE3-903	3″	24″	20,000	25,000	50,000	43,300	35,300	12.31	1.33	8
6″	RE4-903	3″	28″	27,000	34,000	68,000	58,890	48,080	15.48	1.68	11

Available in either nylon or polyester webbing.
Polyester webbing is available in (9) heavy web class only.
For Polyester Max Edge™ webbing add letters "PME" to Stock Number. (Example: RE2-901PME)
For Type 7-Flat eyes, Add "F" to Stock Number. (Example: REF2-901)
Reversed Eye stock numbers do not indicate overall sling width. They represent the sling width from construction. Construction width of 2 inch webbing, set (side by side) yields a 4" sling width. RE1-902 = 4 in. overall sling width.
Consider using Twin-Path® Extra Slings in applications requiring 3 and 4 ply thick slings, wider than 4 inches.

⚠ WARNING DO NOT EXCEED WORK LOAD LIMITS

⚠ WARNING Abrasion resistant covers provide no protection against cutting.

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Wide Body Cargo Slings

Wide Body Cargo slings are designed for use in stabilizing and protecting loads over a wide surface area.



⚠ WARNING For use in basket hitch only!

Width (Inches)	Stock Number	Eye Dimensions (Inches)		WORK LOAD LIMITS (Lbs.) Basket Hitches			Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
		Width	Length	90°	60°	45°	Base 8 Ft.	Adder / Ft.	
6″	WBC2-603	1-1/2″	12″	14,000	12,120	9,900	3.40	.37	4
6″	WBC2-903	1-1/2″	12″	19,000	16,450	13,430	4.12	.44	4
6″	WBC4-603	1-1/2″	15″	26,000	22,510	18,380	6.06	.65	5
6″	WBC4-903	1-1/2″	15″	35,000	30,310	24,740	7.54	.79	5
8″	WBC2-604	1-1/2″	12″	19,000	16,450	13,430	4.16	.43	4
8″	WBC2-904	1-1/2″	12″	25,000	21,650	17,680	5.02	.53	4
8″	WBC4-604	2″	15″	34,500	29,870	24,390	7.60	.78	5
8″	WBC4-904	2″	15″	46,000	39,830	32,520	9.42	.97	5
10″	WBC2-905	1-3/4″	15″	31,000	26,840	21,920	6.45	.69	5
10″	WBC4-905	2-1/2″	18″	57,000	49,360	40,300	11.81	1.22	6
12″	WBC2-906	2″	16″	37,000	32,040	26,160	7.46	.80	6
12″	WBC4-906	3″	20″	68,000	58,880	48,070	13.94	1.45	7
16″	WBC2-908	3″	20″	50,000	43,300	35,350	10.75	1.06	7
16″	WBC4-908	4″	24″	85,000	73,610	60,100	19.71	1.95	8
20″	WBC2-910	3-1/2″	24″	57,000	49,362	40,299	14.90	1.34	8
20″	WBC4-910	5″	30″	96,000	83,130	67,870	26.46	2.41	10
24″	WBC2-912	4″	30″	60,000	51,960	42,420	17.74	1.61	10
24″	WBC4-912	6″	36″	107,000	92,660	75,650	32.72	3.05	12

Attached Eye Cargo Slings

Attached Eye Cargo slings provide the same features as Wide Body Cargo slings. The special eye construction allows Attached Eye Cargo slings to be used with small hooks. The combination of small eye widths and wide sling widths provide for the efficient handling of light loads.



⚠ WARNING For use in basket hitch only!

Width (Inches)	Stock Number	Eye Dimensions (Inches)		WORK LOAD LIMITS (Lbs.) Basket Hitches			Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
		Width	Length	90°	60°	45°	Base 8 Ft.	Adder / Ft.	
6″	AEC-606	1″	9″	3,000	2,590	2,120	3.22	.36	4
6″	AEC-906	1″	9″	6,000	5,190	4,240	3.61	.36	4
8″	AEC-608	1″	12″	3,000	2,590	2,120	4.09	.49	4
8″	AEC-908	1″	12″	6,000	5,190	4,240	4.54	.49	4
10″	AEC-610	1″	15″	3,000	2,590	2,120	5.10	.66	5
10″	AEC-910	1″	15″	6,000	5,190	4,240	5.61	.66	5
12″	AEC-612	1″	15″	3,000	2,590	2,120	5.84	.80	5
12″	AEC-912	1″	15″	6,000	5,190	4,240	6.35	.80	5
16″	AEC-916	2″	18″	10,000	8,660	7,070	9.41	1.06	6
20″	AEC-920	2″	24″	10,000	8,660	7,070	11.84	1.34	8
24″	AEC-924	2″	24″	10,000	8,660	7,070	13.37	1.61	8
30″	AEC-930	2″	30″	10,000	8,660	7,070	17.15	1.92	10
36″	AEC-936	2″	30″	10,000	8,660	7,070	19.82	2.33	12

Available in either nylon or polyester webbing.
Polyester webbing is available in (9) heavy web class only.
For Polyester Max Edge™ add letters "PME" to Stock Number.
(Example: WBC2-903 PME)
Wide Body Eye Cargo Sling stock numbers do not indicate overall sling width. They represent sling width from construction. Construction width of 3 inch webbing, set (side by side) yields a 6" sling width.
WBC2-903 = 6 in. overall sling width.

⚠ WARNING DO NOT EXCEED WORK LOAD LIMITS

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Choker Hardware Slings

Aluminum and alloy steel choker fittings provide for the most efficient choke hitching available for webbing slings.



Steel fittings are automatically supplied on two and four ply slings. Recycle your fittings for cost savings. Exposure to acids, alkalis or other corrosive agents must be evaluated prior to use.

⚠ WARNING Fittings should never be used where exposure to sprays, mists, vapors, fumes or liquids of harmful acids, alkalis, chlorine or other corrosive agents are present. While aluminum fittings are non-sparking and do not rust, they are not as durable and cost more than steel hardware. Aluminum fittings are degraded by salt water and should not be cleaned with chlorine based solutions.

			WORK LOAD LIMITS (Lbs.)							
			Choker	Vertical	Basket Hitches			Sling Weight (Lbs.)		
	Width (Inches)	Stock Number			90° 	60° 	45° 	Base 8 Ft.	Adder / Ft.	Minimum Sling Length (Ft.)
ALUMINUM	2″	ACH1-602	1,900	2,400	4,800	4,150	3,390	2.44	.08	3
	2″	ACH1-902	2,500	3,200	6,400	5,540	4,520	2.66	.11	3
	3″	ACH1-603	2,700	3,600	7,200	6,230	5,090	4.00	.14	3
	3″	ACH1-903	3,800	4,800	9,600	8,310	6,780	4.55	.18	3
	4″	ACH1-604	3,800	4,800	9,600	8,310	6,780	5.48	.17	4
	4″	ACH1-904	5,000	6,400	12,800	11,080	9,050	6.20	.22	4
	6″	ACH1-906	7,600	9,600	19,200	16,620	13,570	12.00	.32	5
STEEL	2″	SCH1-602	1,900	2,400	4,800	4,150	3,390	4.20	.08	3
	2″	SCH1-902	2,500	3,200	6,400	5,540	4,520	4.42	.11	3
	2″	SCH2-602	3,800	4,800	9,600	8,310	6,780	4.56	.16	3
	2″	SCH2-902	5,000	6,400	12,800	11,080	9,050	5.26	.22	3
	2″	SCH4-602	7,000	8,860	17,720	15,340	12,530	8.10	.32	4
	2″	SCH4-902	9,000	11,400	22,800	19,740	16,120	9.76	.44	4
	3″	SCH1-603	2,700	3,600	7,200	6,230	5,090	6.60	.14	3
	3″	SCH1-903	3,800	4,800	9,600	8,310	6,780	7.15	.18	3
	3″	SCH2-603	5,300	6,600	13,200	11,430	9,330	7.59	.28	3
	3″	SCH2-903	6,900	8,600	17,720	15,346	12,530	8.44	.35	3
	3″	SCH4-603	9,000	11,400	22,800	19,740	16,120	14.92	.56	4
	3″	SCH4-903	13,000	17,000	34,000	29,440	24,040	16.36	.70	4
	4″	SCH1-604	3,800	4,800	9,600	8,310	6,780	9.38	.17	4
	4″	SCH1-904	5,000	6,400	12,800	11,080	9,050	10.10	.22	4
	4″	SCH2-604	7,000	8,860	17,720	15,340	12,530	10.46	.34	3
	4″	SCH2-904	9,000	11,400	22,800	19,740	16,120	11.64	.44	3
	4″	SCH4-604	12,000	15,000	30,000	25,980	21,210	19.20	.69	5
	4″	SCH4-904	18,000	22,800	45,600	39,480	32,240	21.18	.88	5
	5″	SCH1-905	6,000	8,000	16,000	13,850	11,310	13.23	.27	5
	5″	SCH2-905	11,400	14,250	28,500	24,680	20,150	15.10	.54	4
	6″	SCH1-906	7,600	9,600	19,200	16,620	13,570	16.15	.32	6
	6″	SCH2-906	13,400	16,800	33,600	29,098	23,759	17.80	.65	6
	6″	SCH4-906	27,000	34,000	68,000	58,890	48,080	40.66	1.30	6
	8″	SCH1-908	10,250	12,800	25,600	22,170	18,100	46.86	.45	6
	8″	SCH2-908	17,900	22,400	44,800	38,797	31,678	49.26	.90	6
	8″	SCH4-908	32,000	40,000	80,000	69,280	56,560	67.68	1.79	7
	10″	SCH1-910	12,000	15,000	30,000	25,980	21,210	53.61	.59	8
	10″	SCH2-910	19,000	24,000	48,000	41,560	33,940	55.96	1.17	6
	10″	SCH4-910	36,000	45,000	90,000	77,940	63,630	97.66	2.34	9
	12″	SCH1-912	15,000	19,000	38,000	32,910	26,860	66.44	.72	8
	12″	SCH2-912	24,000	30,000	60,000	51,960	42,420	69.44	1.44	6
	12″	SCH4-912	43,000	53,000	106,000	91,790	74,940	127.44	2.88	9

See page 199 for End Fittings Specifications
Available in either nylon or polyester webbing.
Polyester webbing is available in (9) heavy web class only.
For Polyester Max Edge™ webbing add letters "PME" to Stock Number. (Example: SCH2-904PME)

⚠ WARNING DO NOT EXCEED WORK LOAD LIMITS

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Basket Hardware Slings



Basket Hardware Slings feature fittings of aluminum (ABH) or alloy steel (SBH). Steel fittings are automatically supplied on two and four ply slings.

Recycle your fittings for cost savings. Exposure to acids, alkalis or other corrosive agents must be evaluated prior to use.

⚠ WARNING Fittings should never be used where exposure to sprays, mists, vapors, fumes or liquids of harmful acids, alkalis, chlorine or other corrosive agents are present. While aluminum fittings are non-sparking and do not rust, they are not as durable and cost more than steel hardware. Aluminum fittings are degraded by salt water and should not be cleaned with chlorine based solutions.

			WORK LOAD LIMITS (Lbs.)						
			Vertical	Basket Hitches			Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
	Width (Inches)	Stock Number		90°	60°	45°	Base 8 Ft.	Adder / Ft.	
ALUMINUM	2″	ABH1-602	2,400	4,800	4,150	3,390	2.04	.08	3
	2″	ABH1-902	3,200	6,400	5,540	4,520	2.26	.11	3
	3″	ABH1-603	3,600	7,200	6,230	5,090	3.50	.14	3
	3″	ABH1-903	4,800	9,600	8,310	6,780	4.05	.18	3
	4″	ABH1-604	4,800	9,600	8,310	6,780	4.78	.17	3
	4″	ABH1-904	6,400	12,800	11,080	9,050	5.50	.22	3
	6″	ABH1-906	9,600	19,200	16,620	13,570	9.85	.32	4
STEEL	2″	SBH1-602	2,400	4,800	4,150	3,390	3.40	.08	3
	2″	SBH1-902	3,200	6,400	5,540	4,520	3.62	.11	3
	2″	SBH2-602	4,800	9,600	8,310	6,780	3.76	.16	3
	2″	SBH2-902	6,400	12,800	11,080	9,050	4.46	.22	3
	2″	SBH4-602	8,860	17,720	15,340	12,530	6.60	.32	3
	2″	SBH4-902	11,400	22,800	19,740	16,120	8.26	.44	3
	3″	SBH1-603	3,600	7,200	6,230	5,090	5.30	.14	3
	3″	SBH1-903	4,800	9,600	8,310	6,780	5.85	.18	3
	3″	SBH2-603	6,600	13,200	11,430	9,330	6.29	.28	3
	3″	SBH2-903	8,600	17,720	15,346	12,530	7.14	.35	3
	3″	SBH4-603	11,400	22,800	19,740	16,120	11.92	.56	4
	3″	SBH4-903	17,000	34,000	29,440	24,040	13.36	.70	4
	4″	SBH1-604	4,800	9,600	8,310	6,780	7.38	.17	3
	4″	SBH1-904	6,400	12,800	11,080	9,050	8.10	.22	3
	4″	SBH2-604	8,860	17,720	15,340	12,530	8.46	.34	3
	4″	SBH2-904	11,400	22,800	19,740	16,120	9.64	.44	3
	4″	SBH4-604	15,000	30,000	25,980	21,210	15.20	.69	4
	4″	SBH4-904	22,800	45,600	39,480	32,240	17.18	.88	4
	5″	SBH1-905	8,000	16,000	13,850	11,310	10.43	.27	4
	5″	SBH2-905	14,250	28,500	24,680	20,150	12.30	.54	4
	6″	SBH1-906	9,600	19,200	16,620	13,570	12.75	.32	5
	6″	SBH2-906	16,800	33,600	29,098	23,759	14.40	.65	5
	6″	SBH4-906	34,000	68,000	58,890	48,080	33.66	1.30	6
	8″	SBH1-908	12,800	25,600	22,170	18,100	31.11	.45	6
	8″	SBH2-908	22,400	44,800	38,797	31,678	33.51	.90	6
	8″	SBH4-908	40,000	80,000	69,280	56,560	51.68	1.79	7
	10″	SBH1-910	15,000	30,000	25,980	21,210	39.71	.59	8
	10″	SBH2-910	24,000	48,000	41,560	33,940	42.06	1.17	6
	10″	SBH4-910	45,000	90,000	77,940	63,630	71.24	2.34	8
	12″	SBH1-912	19,000	38,000	32,910	26,860	45.64	.72	8
	12″	SBH2-912	30,000	60,000	51,960	42,420	48.64	1.44	6
	12″	SBH4-912	53,000	106,000	91,790	74,940	86.94	2.88	8

See page 199 for End Fittings Specifications
Available in either nylon or polyester webbing.
Polyester webbing is available in (9) heavy web class only.
For Polyester Max Edge™ webbing add letters "PME" to Stock Number. (Example: SBH2-904PME)

⚠ WARNING **DO NOT EXCEED WORK LOAD LIMITS**

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Bridle Assemblies

Lift-It® Bridle Assemblies feature combinations of links, fabric eyes and hooks for the efficient handling of loads with fixed lifting points. Synthetic Bridle Assemblies are lightweight and easy to handle when compared to wire and chain bridles.

Lift-It® Bridle Assemblies feature hardware that is substantially larger than other manufacturers. We take into account not only the strength requirements, but the spatial relationship between sling attachment points and interfacing hardware.

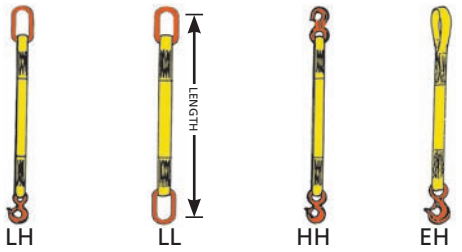
Lift-It® Bridle Assembly capacities are lower than our competitors. (MLB3)Three Leg Bridle Assembly capacities are based upon 2-1/2 legs carrying the assigned capacity. (MLB4) Four Leg Bridle Assembly capacities are based on three legs carrying the assigned capacity. Lower capacities and more expensive, larger hardware will never allow us to be the successful, low bidder. Our conservative approach is respected by conscientious users and appreciated by sophisticated purchasers. In this instance, spending more for less provides for increased safety and longer sling service.

Masterlinks are welded. Forged (non-welded) masterlinks are available upon request. All hooks are supplied with latches. Bottom fittings are placed in the same plane as the top lifting fixture, unless otherwise specified. All fittings are alloy steel and other types of materials and attachments are available.

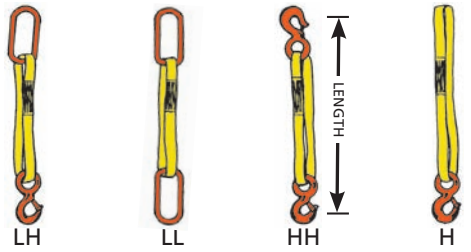
Endless bridle slings allow for sling rotation. Do not place load carrying splices in contact points with bridle masterlinks or fittings.

SINGLE LEG BRIDLES (SLB)

EYE & EYE



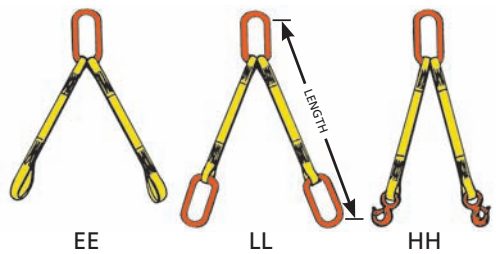
ENDLESS



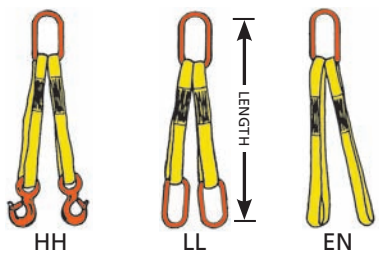
Stock Number	Web Width	Sling Type	Web Ply	Work Load Limits (Lbs.)		Top Master Link (Dia.)	BOTTOM ATTACHMENTS			Sling Weight** (Lbs.)		Minimum Sling Length (Ft.)
				Vertical	Basket		Eye Dimensions W" X L" (Code "E")	Hoist Hook (Tons) (Code "H")	Bottom Link Diameter (Code "L")	Base 8 Ft.	Adder Per Ft.	
SLB-EE2901	1"	Eye & Eye	2	3,200	6,400	1/2"	1" X 9"	2T	1/2"	1.82	.11	4
SLB-EE2902	2"	Eye & Eye	2	6,000	12,000	5/8"	1" X 9"	3T*	5/8"	3.54	.22	4
SLB-EE2903	3"	Eye & Eye	2	8,800	17,600	3/4"	1-1/2" X 12"	5T*	3/4"	5.31	.35	5
SLB-EN1901	1"	Endless	1	3,200	6,400	1/2"	-	2T	1/2"	1.77	.11	3
SLB-EN2901	1"	Endless	2	6,400	12,800	5/8"	-	5T*	5/8"	3.48	.22	3
SLB-EN2902	2"	Endless	2	12,500	25,000	1"	-	11T	1"	8.77	.44	4

MULTI-LEG BRIDLES (MLB2)

EYE & EYE



ENDLESS



Stock Number	Web Width	Sling Type	Web Ply	Work Load Limits (Lbs.) Horizontal Angle		Top Master Link (Dia.)	BOTTOM ATTACHMENTS			Sling Weight** (Lbs.)		Minimum Sling Length (Ft.)
				60°	45°		Eye Dimensions W" X L" (Code "E")	Hoist Hook (Tons) (Code "H")	Bottom Link Diameter (Code "L")	Base 8 Ft.	Adder Per Ft.	
MLB2-EE1901	1"	Eye & Eye	1	2,700	2,200	3/4"	1" X 9"	2T*	1/2"	3.41	.11	4
MLB2-EE2901	1"	Eye & Eye	2	5,400	4,400	3/4"	1" X 9"	2T*	1/2"	4.07	.22	4
MLB2-EE2902	2"	Eye & Eye	2	10,300	8,400	1"	1" X 9"	3T*	5/8"	8.89	.44	4
MLB2-EE2903	3"	Eye & Eye	2	15,000	12,500	1"	1-1/2" X 12"	5T*	3/4"	11.33	.70	5
MLB2-EE2904	4"	Eye & Eye	2	19,700	16,100	1"	1-1/2" X 14"	7T	3/4"	13	.88	7
MLB2-EE4903	3"	Eye & Eye	4	29,400	24,000	1-1/4"	1-1/2 x 18"	11T	1"	21	1.40	8
MLB2-EE4904	4"	Eye & Eye	4	39,400	32,200	1-1/2"	2" X 18"	15T	1"	36	1.76	9
MLB2-EN1901	1"	Endless	1	5,500	4,500	3/4"	-	2T*	1/2"	3.97	.22	3
MLB2-EN2901	1"	Endless	2	11,000	9,000	1"	-	5T*	5/8"	8.77	.44	4
MLB2-EN2902	2"	Endless	2	21,000	17,000	1-1/4"	-	11T	1"	17.41	.88	4

* Web Hook available, specify order code "W"

**Bottom attachment weight must be added to base weight for total sling weight. Base (8ft) assembly weights and minimum lengths are based upon Masterlinks. Weights and minimum lengths for Master Sub Assemblies must be calculated.

See page 67 for End Fittings Specifications

Available in either nylon or polyester webbing.

Polyester webbing is available in (9) heavy web class only.

For Polyester Max Edge™ webbing add letters "PME" to Stock Number. (Example: MLB2-EE2902-PME-HH)

⚠ WARNING DO NOT EXCEED WORK LOAD LIMITS

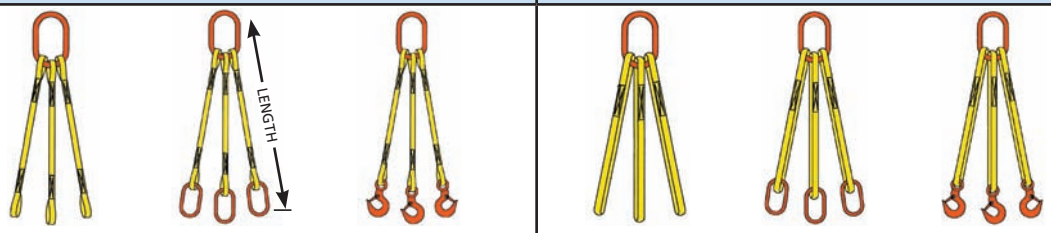
⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



MULTI LEG BRIDLES (MLB3)

EYE & EYE | ENDLESS

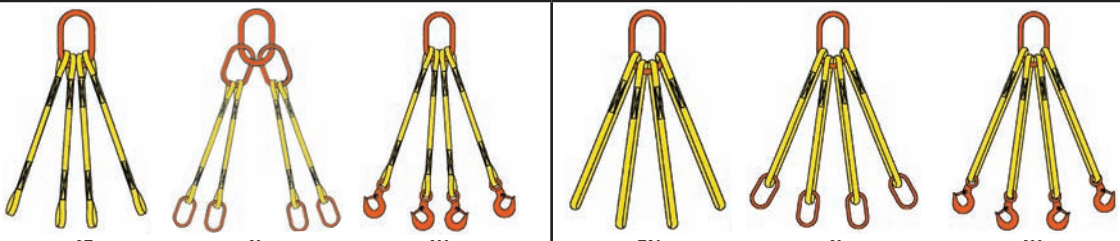


3E 3L 3H EN 3L 3H

Stock Number	Web Width	Sling Type	Web Ply	Work Load Limits (Lbs.) Horizontal Angle 60°	Work Load Limits (Lbs.) Horizontal Angle 45°	Top Master Link (Dia.)	Master Sub Assembly (Diameter)	BOTTOM ATTACHMENTS: Eye Dimensions W" X L" (Code "E")	BOTTOM ATTACHMENTS: Hoist Hook (Tons) (Code "H)	BOTTOM ATTACHMENTS: Bottom Link Diameter (Code "L")	Sling Weight** (Lbs.) Base 8 Ft.	Sling Weight** (Lbs.) Adder Per Ft.	Minimum Sling Length (Ft.)
MLB3-EE2901	1"	EE	2	6,900	5,600	1"	3/4"	1" X 9"	2T	1/2"	7.85	.34	4
MLB3-EE2902	2"	EE	2	12,900	10,600	1-1/4"	1"	1" X 9"	3T*	5/8"	15.63	.66	5
MLB3-EE2903	3"	EE	2	19,000	15,600	1-1/2"	1-1/4"	1-1/2" X 12"	5T*	3/4"	26.00	1.05	5
MLB3-EE2904	4"	EE	2	24,600	20,100	1-1/2"	1-1/2"	1-1/2" X 14"	7T	3/4"	28.00	1.32	8
MLB3-EE4903	3"	EE	4	36,800	30,000	1-1/2"	1-3/4"	1-1/2 X 18"	11T	1"	31.00	2.10	8
MLB3-EE4904	4"	EE	4	49,300	40,300	2"	2"	2" X 18"	15T	1"	68.00	2.64	10
MLB3-EN1901	1"	EN	1	6,900	5,600	1"	3/4"	-	2T	1/2"	7.70	.34	3
MLB3-EN2901	1"	EN	2	13,800	11,300	1"	1"	-	5T	5/8"	10.73	.66	3

MULTI LEG BRIDLES (MLB4)

EYE & EYE | ENDLESS



4E 4L 4H EN 4L 4H

Stock Number	Web Width	Sling Type	Web Ply	Work Load Limits (Lbs.) Horizontal Angle 60°	Work Load Limits (Lbs.) Horizontal Angle 45°	Top Master Link (Dia.)	Master Sub Assembly (Diameter)	BOTTOM ATTACHMENTS: Eye Dimensions W" X L" (Code "E")	BOTTOM ATTACHMENTS: Hoist Hook (Tons) (Code "H)	BOTTOM ATTACHMENTS: Bottom Link Diameter (Code "L")	Sling Weight** (Lbs.) Base 8 Ft.	Sling Weight** (Lbs.) Adder Per Ft.	Minimum Sling Length (Ft.)
MLB4-EE2901	1"	EE	2	8,300	6,700	1-1/4"	1"	1" X 12"	2T	1/2"	13.62	.45	4
MLB4-EE2902	2"	EE	2	15,500	12,700	1-1/4"	1-1/4"	1" X 12"	3T*	5/8"	17.70	.88	5
MLB4-EE2903	3"	EE	2	23,000	18,700	1-1/2"	1-1/4"	1-1/2" X 12"	5T*	3/4"	29.28	1.40	5
MLB4-EE2904	4"	EE	2	29,600	24,100	2"	1-1/2"	1-1/2" X 14"	7T	3/4"	54.00	1.76	8
MLB4-EE4903	3"	EE	4	44,100	36,000	2"	2"	1-1/2 X 18"	11T	1"	66.00	2.80	10
MLB4-EE4904	4"	EE	4	59,200	48,300	2-1/2"	2-1/4"	2" X 18"	15T	1"	115.00	3.50	10

*Web Hook available, specify order code "W"

**Bottom attachment weight must be added to base weight for total sling weight. Base (8ft) assembly weights and minimum lengths are based upon masterlinks. Weights and minimum lengths for Master Sub Assemblies must be calculated.

⚠ WARNING Work Load Limits for Multi-Leg Bridle Assemblies are based on the following conditions:

1. **Even load weight distribution on all legs.**
2. **Bridle legs being same length. If the legs are not sharing the load equally, the assembly design factor is reduced.**
3. **All bridle legs used at the same horizontal angle. If the conditions of the lift vary from those above, Work Load Limits must be recalculated.**

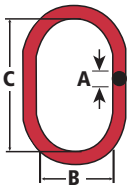
Lift-It® Bridle Sling fittings are substantially larger than those offered by our competitors. Larger fittings provide for a proper, spatial relationship, minimizing crowding and bunching at sling connection points. Consider using Masterlinks with Subassemblies (MSA) for Bridles with more than two legs, see page 67.

MLB4-EE2904

LIFT-IT® 2 IN. MASTERLINK 1-1/2 IN. EYE WIDTH	BRAND "X" 1-1/2 IN. MASTERLINK 2 IN. EYE WIDTH
	

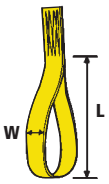
ATTACHMENT SPECIFICATIONS

CODE "L"



"A" STOCK DIA.	"B" INSIDE WIDTH	"C" INSIDE LENGTH	UNIT WEIGHT (Lbs.)
1/2"	2.68	4.83	.80
5/8"	2.97	5.29	1.34
3/4"	3.71	6.61	2.36
1"	4.30	7.52	5.20
1-1/4"	5.29	9.26	9.60
1-1/2"	6.30	11.02	16.20
1-3/4"	7.35	12.86	25.10
2"	8.40	14.70	38.40

CODE "E"



WEB WIDTH	PLY	"W" EYE WIDTH	"L" EYE LENGTH
1"	1 or 2	1"	9"
2"	1 or 2	1"	9"
3"	1 or 2	1-1/2"	12"
3"	4	1-1/2"	18"
4"	2	1-1/2"	14"
4"	4	2"	18"

CODE "H"



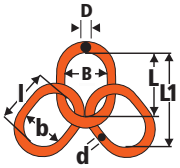
ALLOY HOOK SIZE (TONS)	OVERALL WIDTH (Inches) "D"	HOOK OPENING W/LATCH "E"	"F"	"G"	"H"	"J"	UNIT WEIGHT (Lbs.)
1	3.06	.93	.63	4.37	3.13	.75	.66
1.5	3.33	.97	.71	5.04	3.66	.87	1.12
2	3.67	1.06	.88	5.63	4.09	1.12	1.46
3	4.20	1.16	.94	6.55	4.66	1.25	2.42
5	5.11	1.41	1.31	7.97	5.78	1.56	4.10
7	6.24	1.69	1.68	10.07	7.31	2.00	8.16
11	7.89	2.19	1.88	12.41	9.03	2.43	15.60
15	8.37	2.30	2.19	14.05	10.03	2.83	21.58
22	10.19	3.12	2.69	17.37	12.81	3.50	39.89

CODE "W"



HOOK SIZE (TONS)	A	B	C	D	E	F	G	H	I	UNIT WEIGHT (Lbs.)
1-1/2	5.25	2.26	3.98	3.11	.84	.94	.71	1.50	0.91	1.10
3	7.11	3.66	5.31	3.97	1.13	1.32	.94	2.50	1.09	2.86
5	9.33	5.13	7.06	4.81	1.44	1.63	1.31	3.75	1.36	6.60

CODE "MSA"



DIAMETER (Inches)	WLL (Lbs.) 5/1	DIMENSIONS (Inches)							UNIT WEIGHT (Lbs.)
		L1	L	B	D	l	b	d	
1/2"	4,600	8.96	4.83	2.68	.56	4.13	2.29	.43	1.8
5/8"	7,200	10.13	5.29	2.97	.63	4.83	2.68	.51	2.9
3/4"	11,200	11.90	6.61	3.72	.75	5.29	2.98	.63	5.0
7/8"	13,840	12.64	7.35	4.14	.88	5.29	2.98	.63	6.3
1 "	21,200	14.14	7.53	4.30	1.02	6.61	3.72	.75	9.9
1-1/4"	29,920	16.79	9.26	5.29	1.26	7.53	4.30	1.00	19.9
1-1/2"	42,400	18.56	11.03	6.30	1.50	7.53	4.30	1.00	26.5
1-3/4"	57,720	22.12	12.86	7.35	1.75	9.26	5.29	1.25	44.0
2"	75,360	25.72	14.70	8.40	2.00	11.02	6.30	1.50	70.8
2-1/4"	95,360	29.40	16.54	9.45	2.25	12.86	7.35	1.75	104.8
2-1/2	117,720	31.24	18.38	10.50	2.50	12.86	7.35	1.75	125.2

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



HOW TO ORDER

ALWAYS SPECIFY:

1. Complete Stock Number

MLB2 - EE2903 HH X 10 Ft.

- **SLING CONFIGURATION** — SLB - Single Leg; MLB - Multi-Leg
- **NUMBER OF LEGS** — 1 - 1 Leg; 2 - 2 Legs; 3 - 3 Legs; 4 - 4 Legs
- **SLING TYPE** — EE - Eye & Eye; EN - Endless
- **WEB PLY (THICKNESS)** — 1 - Single Ply; 2 - Double Ply; 4 - Four Ply
- **WEB WIDTH (In.)** — 01 - 1"; 02 - 2"; 03 - 3"; 04 - 4"
- **WEB CODE** — 9 - Heavy Duty
- **BOTTOM ATTACHMENTS** — "E" - Fabric Eye; "H" - Eye Hook; "L" - Masterlink; "W" - Web Hook
- **ASSEMBLY LENGTH (Ft.)**

2. SLING LENGTH:

All assembly lengths are bearing hardware, unless otherwise specified.

3. MATERIAL:

Nylon or Polyester

Polyester webbing is available in (9) heavy duty web class only.

For Polyester Max Edge™ webbing, add letters "PME" to stock number.

(Example: MLB2-EE2902-PME-HH).

4. TOP FITTING:

Masterlinks are automatically supplied, unless you specify a Masterlink with Subassemblies, (MSA). For MSA option add letters MSA to the stock number. (Example: MLB2-EE2903-PME-HH-MSA).

5. SLING PROTECTION:

Description, location and quantity of wear pads and/or sleeves, see pages 43-52.

6. DESCRIPTION OF END FITTINGS:

Code "L"	Code "E"	Code "H"	Code "W"
			
Masterlink	Eye	Eye Hook	Web Hook

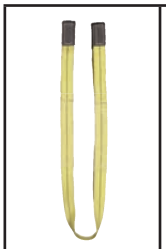
⚠ WARNING Slings can be damaged and cut when lifting on load edges, corners, protrusions or over abrasive surfaces. The sling must ALWAYS be protected with materials of sufficient strength, thickness and construction to prevent damage and catastrophic sling failure. Sling protection must be installed and evaluated for suitability by raising the load slightly, and then lowering the load for an inspection of the sling and the protection devices. Several "test" lifts, inspections and evaluations may be necessary to determine the proper form of protection for a successful lift. Damaged or misused sling protection can result in sling failure. Inspect the sling protection before each use and remove if damaged. Be sure the Sling Protection is the correct type and size to protect the sling. The length of the sleeve or protection material(s) must not interfere with the sling closing to the full gripping position on the load. Sling protection may not prevent cutting or other forms of sling damage. To avoid severe personal injury or death, personnel should be kept away from the load and never be under or near the load, while it is being lifted or suspended.

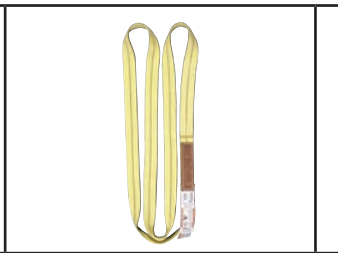
Nylon Armor Jacket Slings

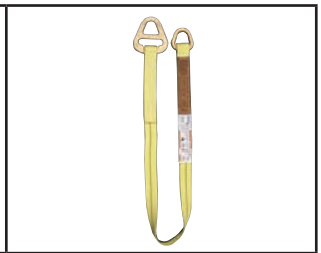
Lift-It® Nylon Armor Jacket slings are made from abrasion resistant, specialty webbing. Nylon Armor Jacket webbing features an external, bulked nylon, outer cover that protects all webbing surfaces from normal abrasion damage. Bulked Nylon protection is four times more abrasion resistant than regular webbing. Nylon Armor Jacket Slings are superior to slings with "sewn on", wear protection. "Sewn on" protection can become detached as thread is worn away.

⚠ WARNING Bulked nylon covers provide no protection against cutting.

- Eye & Eye slings 3 inches and wider are automatically tapered. Standard Code "J" Eye Protection is furnished, unless otherwise specified.
- Steel hardware fittings are automatically supplied, unless otherwise specified.
- See page 56 for How to Order Information.
- See page 199 for fitting specifications.







		EEFT			EEHT			EN			SBH			SCH		
Width (Inches)	Stock Number	WORK LOAD LIMITS (Lbs.)														
		Choker	Vertical	90° Basket	Choker	Vertical	90° Basket	Vertical	90° Basket		Choker	Vertical	90° Basket	Choker	Vertical	90° Basket
1"	XX1-701	800	1,000	2,000	1,600	2,000	4,000	-	-		-	-	-	-	-	-
1"	XX2-701	1,600	2,000	4,000	3,100	3,900	7,800	-	-		-	-	-	-	-	-
1"	XX4-701	3,200	4,000	8,000	6,200	7,800	15,600	-	-		-	-	-	-	-	-
2"	XX1-702	1,600	2,000	4,000	3,200	4,000	8,000	2,000	4,000		1,600	2,000	4,000	1,600	2,000	4,000
2"	XX2-702	3,200	4,000	8,000	6,100	7,600	15,200	4,000	8,000		3,200	4,000	8,000	3,200	4,000	8,000
2"	XX4-702	6,400	8,000	16,000	12,200	15,200	30,400	8,000	16,000		6,400	8,000	16,000	6,400	8,000	16,000
3"	XX1-703	2,400	3,000	6,000	4,800	6,000	12,000	3,000	6,000		2,400	3,000	6,000	2,400	3,000	6,000
3"	XX2-703	4,300	5,400	10,800	8,200	10,200	20,400	6,000	12,000		4,800	6,000	12,000	4,800	6,000	12,000
3"	XX4-703	8,600	10,800	21,600	16,300	20,400	40,800	12,000	24,000		9,600	12,000	24,000	9,600	12,000	24,000
4"	XX1-704	3,200	4,000	8,000	6,400	8,000	16,000	4,000	8,000		3,200	4,000	8,000	3,200	4,000	8,000
4"	XX2-704	5,700	7,200	14,400	10,300	12,900	25,800	8,000	16,000		6,400	8,000	16,000	6,400	8,000	16,000
4"	XX4-704	11,500	14,400	28,800	20,600	25,800	51,600	16,000	32,000		12,800	16,000	32,000	12,800	16,000	32,000
6"	XX1-706	4,800	6,000	12,000	9,600	12,000	24,000	6,000	12,000		4,800	6,000	12,000	4,800	6,000	12,000
6"	XX2-706	9,600	12,000	24,000	19,200	24,000	48,000	12,000	24,000		9,600	12,000	24,000	9,600	12,000	24,000
6"	XX4-706	19,200	24,000	48,000	37,400	48,000	96,000	24,000	48,000		19,200	24,000	48,000	19,200	24,000	48,000

Please Note: Insert Desired Prefix for Sling Configuration: EEFT, EEHT, EN, SBH or SCH to replace XX.

Stone Handling Slings



Lift-It® Stone Handling Slings are manufactured from nylon webbing, reinforced with a woven, abrasion resistant cover. Stone Handling Slings are specifically designed for use in handling stone, building panels and concrete forms.

Stone Handling Slings are white to prevent color rub-off and transfer.

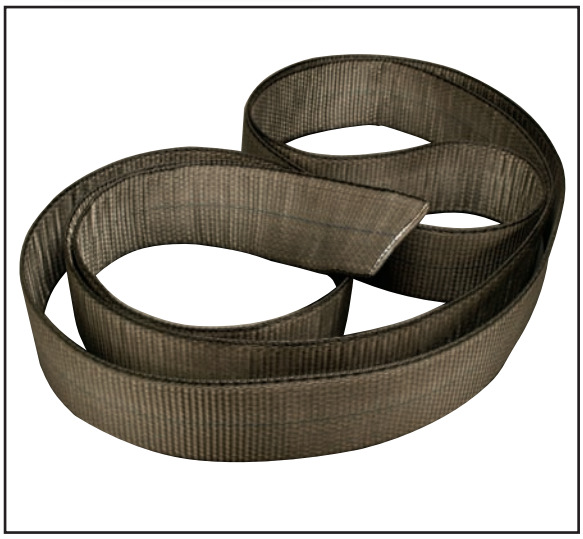
An application of Pozi-Grip provides additional abrasion resistance and increased gripping action. Pozi-Grip may be necessary when handling wet stone.

Stone Handling Slings are 4 inch wide. Single ply slings are not recommended. The abrasion resistant cover is woven to one side of the webbing and requires proper application by the user to ensure that the resistant cover is placed against the load.

		WORK LOAD LIMITS (Lbs.)					Sling Weight (Lbs.)	
		Choker	Vertical	Basket Hitches				
Stock Number	Ply			90°	60°	45°	Base 8 Ft.	Adder / Ft.
EN1-904-SH	1	8,000	10,000	20,000	17,320	14140	5.10	.60
EN2-904-SH	2	15,000	19,000	38,000	32,910	26860	10.50	1.20
EE1-904-SH*	1	4,000	5,000	10,000	8,660	7070	3.75	.30
EE2-904-SH*	2	7,000	9,000	18,000	15,590	12730	5.40	.60
SCH1-904-SH	1	4,000	5,000	10,000	8,660	7070	10.25	.30
SCH2-904-SH	2	7,000	9,000	18,000	15,590	12730	11.60	.60
SBH1-904-SH	1	-	5,000	10,000	8,660	7070	8.25	.30
SBH2-904-SH	2	-	9,000	18,000	15,590	12730	9.60	.60

"EN"-ENDLESS "EE"- EYE & EYE "SCH"-STEEL CHOKER HARDWARE "SBH"-STEEL BASKET HARDWARE
***(Standard Eye Dimensions - 2" X 14")**
See Page 56 for How to Order Information.

Polyester Max Edge™ Slings



Edge damage from abrasion is significantly reduced with the use of Polyester Max Edge™ Slings.

Polymer coated edge yarns are woven into Polyester Max Edge™ webbing, resulting in superior abrasion resistance.

Do not get the wrong impression. Polyester Max Edge™ Slings will not provide cut resistance. Slings must always be protected from cutting and other forms of damage by suitable materials. Polyester Max Edge™ Slings are a cost effective solution for premature sling retirement resulting from normal abrasion and wear.

Polyester webbing stretches at approximately half the rate of nylon webbing and does not lose strength when wet. Polyester webbing retains greater tensile strength, when compared to nylon webbing after prolonged exposure to ultraviolet light. See page 18.

Polyester Max Edge™ is available as a webbing component in any product featured in our catalog. Simply add PME as a suffix to the stock number to obtain Polyester Max Edge™ webbing, i.e., ACH1-904PME.

ENDLESS SLINGS

Endless slings are a versatile sling as hook and load contact points can be rotated. For use in choker, vertical and basket hitches. Sling ends can be tapered and reinforced on request.



Width (Inches)	Stock Number	Optional End Taper		WORK LOAD LIMITS (Lbs.)					Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
				Choker	Vertical	Basket Hitches					
						90°	60°	45°			
		Width	Length						Base 8 Ft.	Adder / Ft.	
1″	EN1-901PME	-	-	2,500	3,200	6,400	5,540	4,520	.95	.11	2
1″	EN2-901PME	-	-	5,000	6,400	12,800	11,080	9,050	1.96	.22	2
1″	EN3-901PME	-	-	7,600	9,600	19,200	16,620	13,570	2.97	.33	3
2″	EN1-902PME	1″	12″	5,000	6,400	12,800	11,080	9,050	1.90	.22	2
2″	EN2-902PME	1″	12″	10,000	12,500	25,000	21,650	17,670	3.92	.44	2
2″	EN3-902PME	-	-	14,000	17,500	35,000	30,310	24,740	5.94	.67	3
2″	EN4-902PME	-	-	18,000	23,500	47,000	40,700	33,230	7.95	.89	4
3″	EN1-903PME	1-1/2″	12″	7,600	9,600	19,200	16,620	13,570	2.99	.35	2
3″	EN2-903PME	1-1/2″	12″	14,000	17,500	35,000	30,310	24,740	6.16	.70	2
3″	EN3-903PME	-	-	21,000	26,500	53,000	45,890	37,470	9.33	1.05	3
3″	EN4-903PME	-	-	28,000	35,000	70,000	60,620	49,490	12.50	1.40	4
4″	EN1-904PME	1-1/2″	12″	10,000	12,500	25,000	21,650	17,670	3.74	.44	3
4″	EN2-904PME	2″	18″	18,000	23,500	47,000	40,700	33,230	7.70	.88	3
4″	EN3-904PME	-	-	28,000	35,000	70,000	60,620	49,490	11.66	1.32	4
4″	EN4-904PME	-	-	36,000	46,000	92,000	79,670	65,040	15.62	1.76	4

EYE & EYE SLINGS

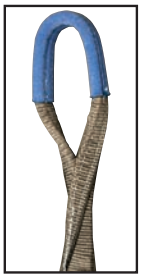


Flat Tapered
Code FT

Polyester Max Edge™ Eye and Eye slings can be used in choker, vertical and basket hitches. Slings with Half Twist (Type 4) eyes are furnished unless Flat (Type 3) eyes are specified. Sling eyes will be wrapped at the bearing point (Order Code J), unless otherwise specified.

Tapered eyes are automatically furnished on slings over 2 inches wide to provide for a proper relationship between the sling eyes and the lifting hardware. Eyes with no tapering are available.

The bearing points of Half Twist (Type 4) eyes are oriented 90° to the sling body. The perpendicular relationship between the eye and sling body in Half Twist, Type 4 eyes results in a comparatively advantageous choke hitch, when compared to Flat (Type 3) eyes. Half Twist eyes perform equally well in vertical or basket hitches.



Half Twist
Tapered
Code HTT



Flat
No Taper
Code FE

For **H**alf **T**wist Eyes with **T**aper, specify "**HTT**" (EE1-902PME **HTT**) Eye Width-1"
For **H**alf **T**wist Eyes with no taper, specify "**HT**" (EE1-902PME **HT**) Eye Width-2"

For **F**lat Eyes with **T**aper, specify "**FT**" (Example: EE1-902PME **FT**) Eye Width-1"
For **F**lat **E**yes with no taper, specify "**FE**" (Example: EE1-902PME **FE**) Eye Width-2"

Eyes depicted feature standard eye protection, Order Code "J" and does not need to be added to sling stock number. Other eye treatments are available. See page 56 for ordering information, eye protection options and material designations.



Half Twist
No Taper
Code HT



Width (Inches)	Stock Number	Eye Dimensions (Inches)		WORK LOAD LIMITS (Lbs.)					Sling Weight (Lbs.)		Minimum Sling Length (Ft.)
				Choker	Vertical	Basket Hitches					
						90° 	60° 	45° 			
		Width	Length						Base 8 Ft.	Adder / Ft.	
1"	EE1-901PME	1"	9"	1,200	1,600	3,200	2,770	2,260	.67	.056	4
1"	EE2-901PME	1"	9"	2,500	3,200	6,400	5,540	4,520	1.00	.112	3
1"	EE4-901PME	1"	12"	5,000	6,400	12,800	11,080	9,050	2.07	.220	4
2"	EE1-902PME	2"	12"	2,500	3,200	6,400	5,540	4,520	1.34	.112	4
2"	EE2-902PME	2"	12"	5,000	6,400	12,800	11,080	9,050	2.02	.220	4
2"	EE4-902PME	2"	12"	9,000	11,400	22,800	19,740	16,120	4.14	.440	4
3"	EE1-903PME	1-1/2"	12"	3,800	4,800	9,600	8,310	6,780	2.29	.180	4
3"	EE2-903PME	1-1/2"	12"	7,000	8,860	17,720	15,340	12,530	3.24	.350	4
3"	EE4-903PME	1-1/2"	18"	13,000	17,000	34,000	29,440	24,040	6.60	.700	5
4"	EE1-904PME	1-1/2"	14"	5,000	6,400	12,800	11,080	9,050	2.86	.220	5
4"	EE2-904PME	1-1/2"	14"	9,000	11,400	22,800	19,740	16,120	3.96	.440	5
4"	EE4-904PME	2"	18"	18,000	22,800	45,600	39,480	32,240	8.36	.880	5

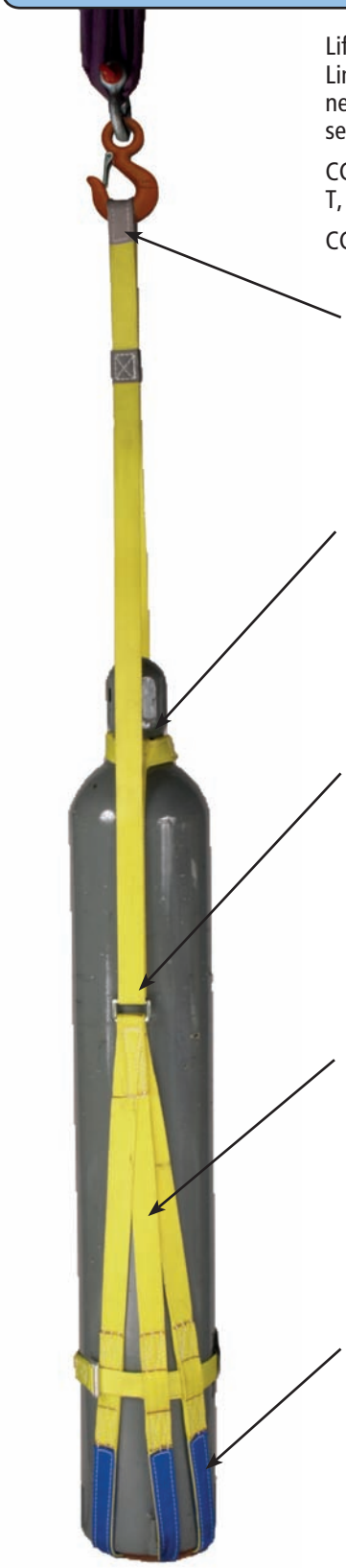
⚠ WARNING Slings can be damaged and cut when lifting on load edges, corners, protrusions or over abrasive surfaces. The sling must ALWAYS be protected with materials of sufficient strength, thickness and construction to prevent damage and catastrophic sling failure. Sling protection must be installed and evaluated for suitability by raising the load slightly, and then lowering the load for an inspection of the sling and the protection devices. Several "test" lifts, inspections and evaluations may be necessary to determine the proper form of protection for a successful lift. Damaged or misused sling protection can result in sling failure. Inspect the sling protection before each use and remove if damaged. Be sure the Sling Protection is the correct type and size to protect the sling. The length of the sleeve or protection material(s) must not interfere with the sling closing to the full gripping position on the load. Sling protection may not prevent cutting or other forms of sling damage. To avoid severe personal injury or death, personnel should be kept away from the load and never be under or near the load, while it is being lifted or suspended.

GAS CYLINDER CRADLES

Lift-It® Gas Cylinder Cradles are made from polyester webbing and rated at 1,000 Lbs. Work Load Limit. The cylinder base rests securely in a double ply, leather lined, nylon cradle while the bottle neck loop presses against the cylinder neck, securely holding the cylinder. A tightening band secures the cylinder to the assembly legs making transportation easy and efficient.

CG 10A adjusts to accommodate 9 to 20 inch (Diameter) by 40 to 65 inch (High) T, K and S cylinders.

CG 20A adjusts and conveniently handles oxygen and acetylene cylinders in tandem.



CG 20A	CUSTOM
	

STOCK NUMBER	DESCRIPTION	DIMENSIONAL INFORMATION: DIAMETER	DIMENSIONAL INFORMATION: CYLINDER HEIGHT
CG 10A	SINGLE OXYGEN	9" to 20"	40" - 64"
CG 20A	DOUBLE	9" OXYGEN	46" - 54"
	OXYGEN OR ACETYLENE	13" ACETYLENE	38" - 46"
CG 30A	SINGLE AMMONIA	13" to 16"	40" - 54"

Custom Cylinder Cradles are readily available.

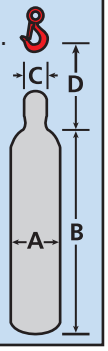
Please provide the following dimensions:

A) Cylinder Diameter.

B) Base to Shoulder.

C) Neck Diameter.

D) Shoulder to Lifting Eye. (Headroom)



⚠WARNING Do not directly expose Gas Cylinder Cradles to weld spatter and sparks. Protective measures must be taken.

DRUM HANDLING SLINGS

BOTTOM SUPPORT

Lift-It® Bottom Support Drum Slings handle non-metallic drums and drums that cannot be transported at a minimum height.

Bottom Support Drum Slings feature a top bridle assembly and a bottom support. The top bridle assembly includes a MSA100 Masterlink with Subassemblies (1"Dia.) and is permanently attached to circumferential tightening bands. Stable control and secure handling are achieved by connecting the top bridle assembly to the bottom support at four points around the drum perimeter.

Bottom Support Drum Slings are designed for handling 55 gallon drums (22 inch dia. X 34 inch tall). Custom Drum Slings are readily available.



⚠ WARNING
Extra consideration should be given when handling partially filled drums to ensure load control.

STOCK NUMBER	WORK LOAD LIMIT (LBS.)
DS-BS	2000

STANDARD & ADJUSTABLE

Lift-It® Nylon Drum Handling Slings are designed for the efficient handling of 55 gallon, metal drums with ribs. Drum Slings can be used on open drums or drums fitted with spigots or pumps.



Drum Handling Slings feature a 2-inch lift bridle and circumferential tightening band. The lift bridle features a Masterlink (1/2 In. Dia.) and is permanently attached to the tightening band, eliminating the need to position the bridle legs. The tightening band securely grips the drum below the first rib.

The circumferential tightening band is leather lined. Bridle legs feature sleeves for sling protection.

⚠ WARNING Keep drum handling elevation to a minimum. Extra consideration should be given when handling partially filled drums to ensure load control.

SLING BAND WIDTH	STOCK NUMBER	WORK LOAD LIMIT (Lbs.)
2 IN	DS1-602	850
2 IN	DS1-602 ADJ*	850

*DS1-602 ADJ, Adjustable Drum Slings handle drums of varying diameters. The DS1-602 ADJ has the same constructional features as the standard DS1-602 model, except only one bridle leg is attached to the circumferential tightening band. The unattached bridle leg must be positioned directly across from the attached leg. The leather wear pad attached to the tightening band for standard models is omitted on adjustable models to allow the band to pass through the ratchet buckle for smaller drum diameters.

VERTICAL DRUM HANDLING SLING

Vertical Drum Slings were initially developed for the US Department of Energy and have become very popular in many, industrial and commercial applications. Vertical Drum Slings are made from one inch, polyester webbing and are rated at 1500 Lbs.

A Masterlink (1 Inch dia.) provides a secure connection to the lifting device, while three drum hooks positively engage the drum lip. As the lift is made a collector ring provides a self tightening grip.

Stock No. VD-1



⚠ WARNING

- DO NOT EXCEED WORK LOAD LIMITS.
- For use on metal drums only.
- Damaged drum contact areas will not allow the drum hooks to seat properly.
- Keep drum handling elevation to a minimum.
- Extra consideration should be given when handling partially filled drums to ensure load control.
- Hooks must be evenly spaced 120° apart to ensure control.

HORIZONTAL DRUM SLING

Horizontal Drum Slings are ideal for efficiently handling steel drums in the horizontal position. Horizontal Drum Slings feature one inch webbing and are rated at 1000 Lbs. A Masterlink (1/2 in. dia.) connects the Drum Sling to the lifting mechanism and 2-7/8 inch, drum hooks positively engage the ends of the drum.
Stock No. HD-1



⚠ WARNING

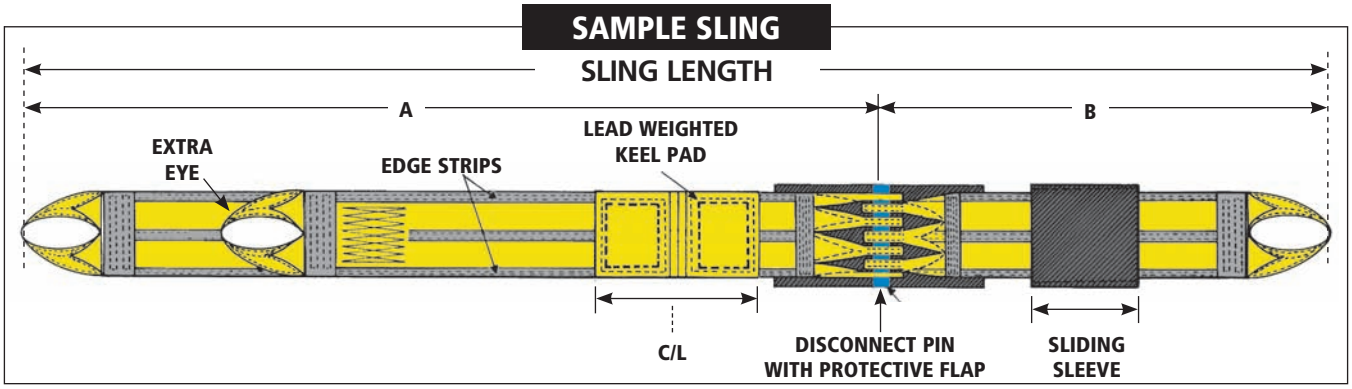
- DO NOT EXCEED WORK LOAD LIMITS.
- For use on metal drums only.
- Damaged drum contact areas will not allow the drum hooks to seat properly.
- Keep drum handling elevation to a minimum.
- Extra consideration should be given when handling partially filled drums to ensure load control.

⚠ WARNING
Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Marine Slings

Lift-It® Marine Slings set the "standard" for marine sling users, worldwide. Lift-It® Marine Slings are manufactured from nylon or polyester webbing that has been treated for abrasion resistance. Sling widths from 4 to 12 inches and available basket Work Load Limits of 9600 Lbs. to 60,000 Lbs. are featured. Wider Slings and greater Work Load Limits are readily available. For larger Work Load Limits, also consider using Twin-Path® Extra, High Performance Fiber Slings.



CHOICE OF MATERIALS:
Nylon or Polyester - Nylon stretches 6 to 8% at Work Load and loses approximately 15% Work Load when wet. Polyester stretches at 3% at Work Load and maintains 100% Work Load when wet. Polyester is the preferred sling material for Marine Slings.

COLOR CODED MATERIALS:
Polyester webbing has a continuous blue surface marker to differentiate it from nylon webbing.

TREATED WEBBING:
Resists degradation from rot, mold, seawater and basic crude or lubricating oil.

WIDE SLING WIDTHS:
The most delicate hull is gently cradled as vessel weight is distributed over a wide surface area.

LARGE SELECTION:
Available sling options and corrosion resistant hardware.

FLEXIBLE AND LIGHTWEIGHT:
Lift-It® Marine Slings adjust to contours of all types and sizes of hull configurations. Easy to store and handle.

GENTLE:
Non-marring and non-abrasive.

PROOF TEST AND CERTIFICATION:
Slings that are subjected to continuous ultraviolet/sunlight exposure lose strength, dramatically and should be proof tested semi-annually or more frequently, depending upon the degree of exposure. (See page 18 for the effects of UV degradation).

Lift-It® will design and fabricate Marine Slings to meet your specific requirements.
All slings are as strong as their weakest component. Certain accessories (Loosepin Hardware and Extra Eyes) are not available options for two ply sling capacities.

SPECIFICATIONS

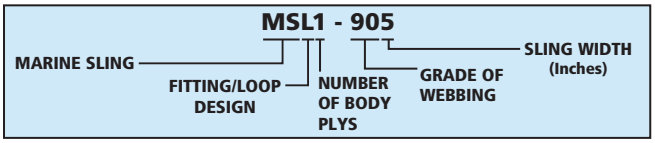
				FABRIC EYE DIMENSIONS (Inches)		
WIDTH (Inches)	PLY	90° BASKET WLL (Lbs.)	SLING STOCK NUMBER	CODE T TWISTED EYE (W x L)**	CODE C CARGO TYPE (W x L)**	CODE F FLAT EYE (W x L)**
4	1	9,600	MS_1-604	1-1/2 X 14	-	4 X 6
4	1	12,800	MS_1-904	1-1/2 X 14	-	4 X 6
4	2	17,720	MS_2-604	1-1/2 X 14	-	4 X 6
4	2	22,800	MS_2-904*	1-1/2 X 14	-	4 X 6
5	1	16,000	MS_1-905	1-3/4 X 18	-	5 X 6
5	2	28,500	MS_2-905*	1-3/4 X 18	-	5 X 6
6	1	14,400	MS_1-606	2 X 24	1-1/2 X 12	6 X 6
6	1	19,200	MS_1-906	2 X 24	1-1/2 X 12	6 X 6
6	2	24,480	MS_2-606	2 X 24	1-1/2 X 15	6 X 6
6	2	34,000	MS_2-906	2 X 24	1-1/2 X 15	6 X 6
8	1	25,600	MS_1-908	3 X 24	1-1/2 X 12	6 X 18
8	2	45,600	MS_2-908*	3 X 24	2 X 15	6 X 18
10	1	30,000	MS_1-910	3-1/2 X 24	1-3/4 X 15	6 X 18
10	2	48,000	MS_2-910*	3-1/2 X 24	2-1/2 X 18	6 X 18
12	1	38,000	MS_1-912	4 X 30	2 X 16	6 X 18
12	2	60,000	MS_2-912*	4 X 30	3 X 20	6 X 24

*Loosepin Hardware is not available to match basket Work Load Limit.
** (WIDTH X LENGTH)

HOW TO ORDER

SPECIFY ON EVERY ORDER:

1. Complete Sling Stock Number:



2. Sling Material: Nylon or Polyester.
For Polyester Marine Slings add letter "P" to Stock Number. Example: MSB2-906P

3. Sling Dimensions: Width x Length



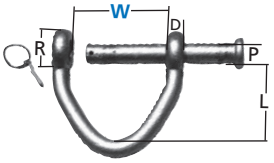
4. Optional Equipment:
A. Length and location of sleeves, pads, edge wrap or disconnect.
B. The location and type of extra eyes.

It is helpful if the length and locations for options and accessories are indicated by reference points shown in the sample sling diagram.

OPTIONAL EQUIPMENT

CODE L – LOOSEPIN HARDWARE

Loosepin Hardware allows removal of fittings from the sling. Hot dip galvanized for corrosion resistance.



STOCK NO. WIDTH (W)	VERTICAL* WLL (Lbs.)	L	D	P	R
LPH-2 in.	6,400	2-1/4"	5/8"	3/4"	1-5/8"
LPH-3 in.	10,400	3-1/4"	3/4"	7/8"	1-7/8"
LPH-4 in.	8,600	3-3/4"	3/4"	7/8"	1-7/8"
LPH-5 in.	14,000	4-1/4"	7/8"	1"	2-1/8"
LPH-6 in.	19,000	4-3/4"	1-1/8"	1-1/4"	2-5/8"

* VERTICAL WLL BASED UPON 5 TO 1 DESIGN FACTOR

CODE B – BASKET HARDWARE

Alloy steel fittings are permanently attached to the sling and plated for corrosion resistance. (See page 199 for fitting specifications).



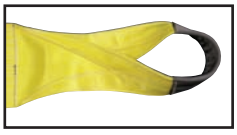
CODE F – FLAT EYE

Flat Eyes are oriented flat to the sling body. Please specify eye width if Flat Eyes are to be used with existing shackles.



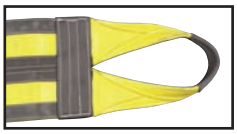
CODE T – TWISTED EYE

Twisted Eyes are formed by being turned 180° before the sling body is sewn.



CODE C – CARGO EYE

Cargo Eyes are formed by tapering webbing to a narrower eye width than other eye designs. Cargo eyes are oriented 90° to the sling body.

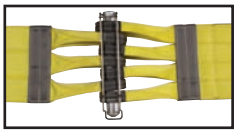


⚠ WARNING **For use in basket hitch only.**

DISCONNECT

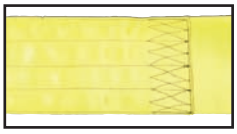
Disconnects allow removal of the sling from the boat, without detaching slings from lifting fixtures. Protective flap is automatically included.

*Please specify location per diagram.



KEEL PAD

Webbing is sewn at sling centerline to protect it from wear and abrasion. Standard Keel Pad length – 4 Feet



LEAD WEIGHTS

Lead Weights help Marine Slings sink and stay underwater for easier positioning.



MARINE SLING APPLICATIONS



Twin-Path® Extra Slings with High Performance Fiber made handling the 550 ton bow section a breeze.



EDGE WRAP

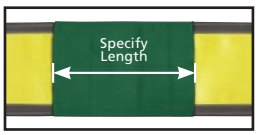
Bulked Nylon is sewn around sling edge. Edge Wrap can be attached at any location to ensure a useful service life.

*Please specify length and location for the edge wrap.



SLIDING CHINE AND RUBRAIL SLEEVES

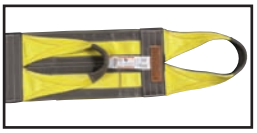
Sliding Chine and Rub Rail Sleeves can be positioned to prevent damage to the boat and sling.



EXTRA EYES

Extra Eyes allow a single sling to adjust to varying hull dimensions.

Extra Eyes are available options for single ply slings.



Extra Eyes are not available options for two ply slings.

⚠ WARNING Extra Eyes must always be rigged "in line" with load path. Pulling against stitching shall never be permitted and could result in sling failure, injury and/or death.

You must always specify:

1. Number and location of Extra Eyes.
2. Eye type: Cargo (Code "C")
   Twisted (Code "T")
   Flat (Code "F")

Lift-It® Manufacturing constantly provides the best products and service available. We are responsive to the needs of our customers and devote countless hours to ensure complete customer satisfaction. We will meet or exceed any effort to provide efficiency and safety in developing specialized products. The combined efforts of sling users and product engineers have resulted in the development of specific products for the power generation, transmission, distribution and utility industries.

POLE HANDLING SLINGS

Lift-It® Pole Handling Slings combine Polyester Max Edge® webbing with a Special Gripper Pad for handling and abrasion resistance. Rated at 5,000 Lbs. choker.

Stock Number- PHS2-902PME
Recommended lengths are 8 to 12 Ft. You must specify sling length. Be sure to account for the additional length required to apply a double wrap choker hitch. See Page 24.

⚠ WARNING For use in Double Wrap Choke Hitch ONLY.





Lift-It® Pole Handling Sling in Action. Tough and dependable, just like the folks who use them.
(Photo courtesy of Grant County PUD.)

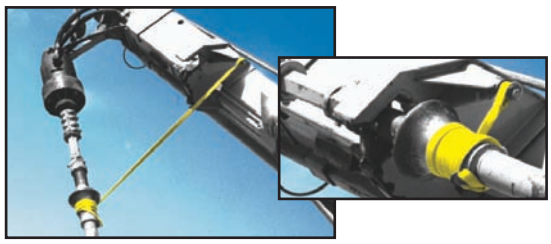
⚠ WARNING
- Pole must be double wrapped
- Blue Gripper Pad against Pole
- Web to Web Contact at Choker Eye NOT PAD TO EYE

⚠ WARNING Responsible users must take all factors into consideration. Wet, frozen or alternative material poles may handle differently than those depicted. Do not use damaged slings of any type. Improperly used slings or damaged slings can result in injury, death and/or property damage.

AUGER SLINGS

Lift-It® Auger Slings are used to lift and secure drilling augers to the truck boom and are non-marring and non-kinking. Auger Slings are double ply construction and feature flat, leather reinforced eyes. Auger Sling webbing is treated for abrasion resistance. Nylon Auger Slings (AS2-901) are made with yellow webbing. Polyester Max Edge™ (PME), Auger Slings are gray and feature patented, Polyester Max Edge™ protection.

Most popular lengths: 102 , 108 and 120 inches
Other lengths are available.



		WORK LOAD LIMITS (Lbs.)		
SLING WIDTH	STOCK NUMBER	CHOKER	VERTICAL	90° BASKET
1 IN	AS2-901	2,500	3,200	6,400
1 IN	AS2-901PME	2,500	3,200	6,400

REMOTE RELEASE SLINGS



Lift-It® Remote Release Slings are used in the erection of wood beams and trusses. Remote Release Slings feature six inch, webbing. A steel choker fitting is attached to one end and the remote release clamp is attached to the opposite end. The release clamp facilitates quick and easy release of the sling from the load, eliminating the need to climb ladders or walk beams to disengage.

Full length, Bulked Nylon Body Wrap is automatically provided on Lift-It® Remote Release Slings to enhance safety and sling longevity.

Sling Material, Length and additional Sling Protection options must be specified.

For use in Choke Hitch Only.

SLING WIDTH	STOCK NUMBER	PLY (THICKNESS)	FITTING TYPE	WLL CHOKER (Lbs.)
6 IN	RRS1-906	1	STEEL	7,600
6 IN	RRS2-906	2	STEEL	13,000

BUSHING SLINGS

Lift-It® Bushing Slings are used in the installation and/or removal of transformer bushings and can be used to uncrate and rack bushings.

Nylon webbing protects the glass as the sling is attached to the inner diameter of the bushing. Lift-It® Bushing Slings provide damage free handling, installation and/or removal.



SLING WIDTH	SLING LENGTH	STOCK NUMBER	WORK LOAD LIMIT (Lbs.)
1 IN	10 Ft.	BS-901-SM	1,000
1 IN	12 Ft.	BS-901-MD	1,000
2 IN	12 Ft.	BS-902-LG	2,000

ULTIMATE POLE SLING





- Does not kink like cable or fray like rope.
- Slides for better descent than cable or rope.
- All fittings-Grade 8 Alloy.
- Durable Tag with Certificate of Proof Test.
- 4 to 1 Design Factor.
- Requires Annual Inspection and Recordkeeping.
  See Page 168 for Important Safety Information.

STOCK NUMBER	CHOKER WORK LOAD LIMIT	WEIGHT (Lbs.)
UPS-14-5*	3,500 Lbs.	6
UPS-38-5*	7,100 Lbs.	12
UPS-12-5*	12,000 Lbs.	22
UPS-58-5*	18,100 Lbs.	32

*Standard length - 5 Ft. Other lengths are available.

DIRT SLING

- Saves Time and Labor
- Replaces Rock Boxes and Barrels
- Easily Folds and Stores
- Holds Soil and Transports Fill
- Eliminates Back Injuries
- Available in Two Sizes:

Stock Number DSL-6X6
6 Ft. x 6 Ft.
700 Lbs. Work Load

Stock Number DSL-8X8
8 Ft. x 8 Ft.
1400 Lbs. Work Load



WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



REEL LIFTING SLING





Stock Number RL-1
Work Load Limit
6,000 Lbs. at 60 Deg.

- **Efficiently handles wood reels.**
- **Durable Tag with Serial Number**
- **Standard length: 6 ft.**
- **Other Lengths are Available**

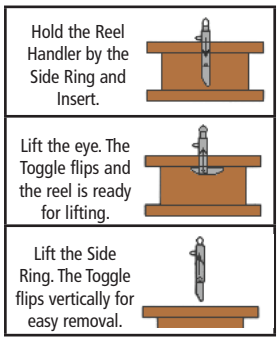
POLE CHOKER SLING

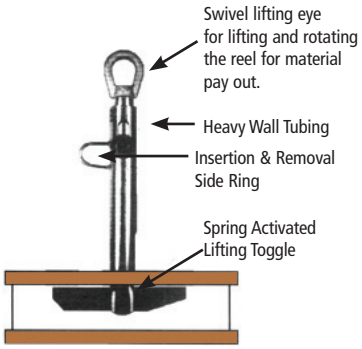


Stock Number PC1-602.
Choker-1200 Vertical-1500 90º Basket-3000

- Lightweight for easier ascent.
- Forged End Fittings.
- Durable Sling Tag.
- Standard Lengths: 2 , 3 , 4 , 5 and 6 ft.
- Other Lengths are Available.
- Ideal for Gear and Equipment Suspension.

REEL HANDLER





STOCK NO.	DESCRIPTION
RH2500	2" ARBOR- 2500 Lbs. Rated
RH4500	4" ARBOR- 4500 Lbs. Rated

FOR THE RAIL INDUSTRY

Lift-It® product specialists worked closely with representatives of the railroad industry to develop lightweight, rigging solutions. Traditional, wire rope slings that once required multiple persons, just to manipulate have been replaced by Lift-It® Rail Slings. Drawbar Slings, Tanker Slings, Traction Motor Slings and Wheel Slings are efficiently handled injury free. Lift-It® Rail Slings are readily available, in standard or custom lengths.

All Lift-It® Rail Slings feature patented, Twin-Path®, High Performance Fiber Slings, with additional Sling Protection, automatically supplied. All Lift-It® Rail Slings are proof tested and certified. Beware of imitations!

DRAW BAR SLINGS

Supplied with or without arcs, you must specify stock number and assembly length.

Send us your distressed, single path Draw Bar Slings. Your arc may be recycled for substantial savings and the new Draw Bar Sling will be feature a genuine Twin-Path® Sling.



Work Load Limit* (Lbs.)	Stock Number		Sling Length (Brg. to Brg.)
	With Arc	Without Arc	
60,000	DB30AS	DB30	9'-6", 11' or 13'
120,000	DB60AS	DB60	13', 14' or 15'
150,000	DB75AS	DB75	13'
200,000	DB100S	DB100	13'

*Work Load Limits are based upon a 3.5/1 Design Factor

Arc Materials:
AS - Aluminum with Steel Protector Plate
S - Steel

TRACTION MOTOR SLINGS

Traction Motor Slings feature: Masterlinks with Subassemblies, Sling Saver Shackles, 7 ton Eye Hoist Hooks and Sling Protection as standard features.

Traction Motor Slings can also be furnished with non-removable, Swivel Hooks.



Work Load Limit (Lbs.)	Stock Number		Masterlink Diameter
	Eye Hooks	Swivel Hooks	
16,000	TM-RH	TM-SH	1-1/2 in.

Assy. Work Load Limit- 16,000 Lbs. at 45 degrees.

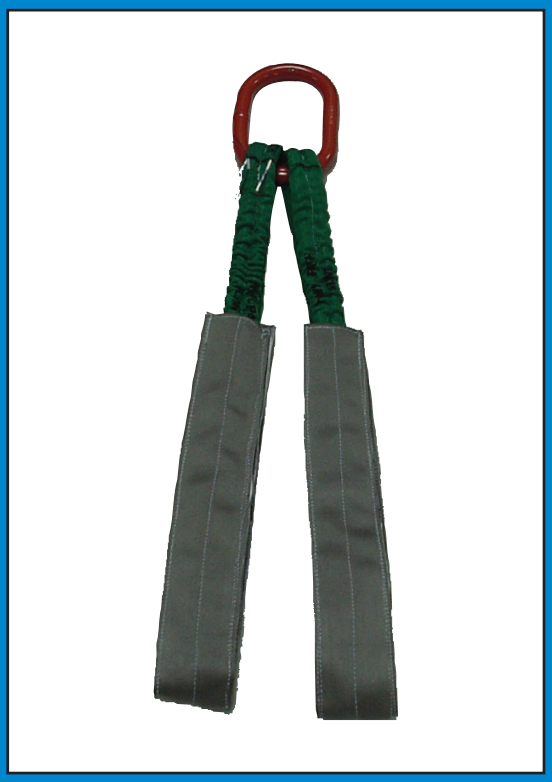
Photo courtesy of BNSF-Havre, Mt.

⚠WARNING Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. Observe and do not exceed Work Load Limits. DEATH and INJURY can occur from improper use or maintenance. See pages 113-118 for Important Safety, Use and Inspection Information.

FOR THE RAIL INDUSTRY

WHEEL SLINGS

Wheel Slings are a bridle configuration and incorporate the same special sling protection, provided on Traction Motor Slings.



Stock Number RP-WS
Assy. Work Load Limit: 21,200 Lbs. (45° horizontal)
Masterlink Diameter – 1-1/2 inches
Standard Assembly Length – 10 ft Reach

RAIL TANKER SLINGS

Super strong and ultra-light, Lift-It® Rail Tanker Slings are the perfect solution to minimize damage during re-railing or car shop operations.



Stock Number	Width (Inches)	90° Basket WLL (Lbs.)	Weight (Lbs./Ft.)
RTS-10000	6	200,000	1.84
RTS-15000	8	300,000	2.66
RTS-20000	10	400,000	3.45
RTS-25000	10	500,000	4.07
RTS-30000	12	600,000	4.92
RTS-40000	14	800,000	6.54
RTS-50000	16	1,000,000	8.15

Larger capacities are readily available.
See page 113.

You must specify sling length.

⚠ WARNING See pages 113-118 for Important Safety, Use and Inspection Information.

⚠ WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this publication and follow OSHA and ASME guidelines. Use by untrained persons is hazardous. Synthetic products will fail if damaged, abused, misused, overused or improperly maintained.

Do not exceed Work Load Limits. You are cautioned that all published Work Load Limits and break strengths apply to only new and unused slings, assemblies and hardware. Work Load Limits are based upon: destruction testing in controlled, laboratory conditions, which will never be duplicated during actual usage and a moderately dynamic lifting or pulling operation.

Synthetic products are damaged and cut when lifting on load edges. Edges in contact with the sling must be "padded" with materials of sufficient strength, thickness and construction to prevent damage and catastrophic sling failure. Sling protection may not prevent cutting or other forms of sling damage. To avoid severe personal injury or death, personnel should be kept away from the load and never be under, on, near or next to the load or sling, while it is under tension.

See pages 113-118 for Important Safety, Use and Inspection Information.

HAUL TRUCK DUMP BODY SLINGS

Service repairs require the dump body to be elevated. Twin-Path® Haul Truck Dump Body Slings are designed to share the load of the truck dump body in a raised position.

There are several benefits to using the Twin-Path® Haul Truck Dump Body Sling when compared to the traditional method utilizing wire rope slings.

Improved ergonomics are realized in the handling procedures of Twin-Path® Haul Truck Dump Body Slings due to the fact they are significantly lighter and more flexible than wire rope slings. Twin-Path® Haul Truck Dump Body Slings weigh approximately 23 pounds while a wire rope sling of comparable capacity and length weighs approximately 415 pounds.

Twin-Path® Haul Truck Dump Body Slings can easily be installed by one technician in a timely manner Try doing that with a wire rope sling and not end up with skinned knuckles or worse!



Photo courtesy of Barrick Goldstrike (One Classy Operation).

⚠ WARNING

Do not overload the sling. Avoid dragging the sling.
Inspect before each use. Do not use a damaged sling.
Do not tie into knots.

- Avoid contact with hot exhaust or damaging objects/surfaces.
- Attachment points must be suitable for the application; detached connection points can become deadly projectiles. Ensure the strength and condition of the attachment points are suitable for the Haul Truck Dump Body Sling.
- Store in a cool, dark, dry location, which is free of environmental and mechanical damage.

ALWAYS ROTATE THE SLING TO CHANGE CONNECTION POINTS.

HAUL TRUCK DUMP BODY SLING SPECIFICATIONS

Stock Number	Vertical Work Load (Lbs.)	Weight (Lbs./Ft.)	Width (Inches)
HTDB-2000	20,000	.51	3
HTDB-3000	30,000	.71	4
HTDB-4000	40,000	.83	4
HTDB-5000	50,000	1.14	5
HTDB-6000	60,000	1.27	5
HTDB-8500	85,000	1.65	6
HTDB-10000	100,000	1.84	6
HTDB-15000	150,000	2.66	8

Tattle Tails, Fiber Optics and Check-Fast® cannot be used exclusively to determine the condition of the load carrying fibers or sling. These patented, inspection devices must be used in conjunction with visual and tactile inspection techniques to determine sling condition. If there is any doubt, do not use this or any other rigging product and return the sling to the manufacturer for factory repair evaluation.

HAUL TRUCK DUMP BODY SLING INSPECTION

Haul Truck Dump Body Slings must be inspected thoroughly for damage. Visual, tactile and patented inspection systems such as Check-Fast®, Fiber Optics and Tattle Tails will assist inspectors in determining sling condition. Haul Truck Dump Body Slings shall be removed from service for an evaluation by the manufacturer if any of the following conditions are detected:

1. Check-Fast® Early Warning Indicator (EWI) and Tattle Tail indicators shall extend past the sling tag area. If slings are equipped with Check-Fast® and the EWI is not visible or both Tattle Tails are not visible, remove the sling from service and return to the manufacturer for repair evaluation.

2. If Haul Truck Dump Body Slings are equipped with the Fiber-Optic Inspection option, inspect by allowing light to enter the fiber optics. If fiber optics does not transmit light from end to end, remove the sling from service and return for repair evaluation.

3. If Haul Truck Dump Body Sling tags are missing or illegible, slings shall not be used and be returned for repair evaluation.

4. Inspect for evidence of heat damage, i.e., melting, charring or weld spatter. Haul Truck Dump Body Slings with K-Spec® core yarn shall not be exposed to temperatures above 180°F/ 82°C or below -40°F/- 40°C.

5. If any part of the Haul Truck Dump Body Sling is stiff or brittle, indicating heat or chemical damage, remove the sling from service. Return the sling to the manufacturer for repair evaluation.

6. Haul Truck Dump Body Slings shall be examined throughout their length for damage such as: holes, tears, cuts, embedded materials, abrasive wear or snags that expose the core yarn. If damage is detected, slings shall be removed from service for repair evaluation.

7. Damage to the cover may indicate a loss of core yarn strength. Slings with signs of cover damage shall not be used until evaluated by the manufacturer.

8. If core yarns are broken, cut or damaged, slings must be removed from service. If broken stitching in the cover exposes core yarn, slings must be removed from service for repair evaluation.

9. Haul Truck Dump Body Slings and attached fittings shall be regularly inspected. In addition to the initial inspection and periodic inspections done by designated, competent inspectors, slings shall be visually inspected before each use.

10. Fittings determined to be elongated, damaged, corroded or not AMSE B30.10 and/or ASME B30.26 compliant shall be removed from service for repair evaluation.

11. Haul Truck Dump Body Slings that are tied in knots or joined by knotting shall not be used until evaluated by the manufacturer.

12. Inspections shall be performed as required by competent persons and inspection documentation shall be maintained. Inspections may be done more often based on: frequency of use, severity of conditions or experience gained on the service life of slings used in similar circumstances. Periodic inspection intervals must not exceed 1 Year.

13. Haul Truck Dump Body Slings removed from service that are not repairable shall be destroyed and rendered completely unfit for any future use.

⚠ WARNING

Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this publication and follow MSHA, OSHA and ASME guidelines. Use by untrained persons is hazardous. Synthetic products will fail if damaged, abused, misused, overused or improperly maintained.

Do not exceed Work Load Limits. You are cautioned that all published Work Load Limits and break strengths apply to only new and unused slings, assemblies and hardware. Work Load Limits are based upon: destruction testing in controlled, laboratory conditions, which will never be duplicated during actual usage and a moderately dynamic lifting or pulling operation.

Synthetic products are damaged and cut when lifting on load edges. Edges in contact with the sling must be "padded" with materials of sufficient strength, thickness and construction to prevent damage and catastrophic sling failure. Sling protection may not prevent cutting or other forms of sling damage. To avoid severe personal injury or death, personnel should be kept away from the load and never be under, on, near or next to the load or sling, while it is under tension.

See pages 113-118 for Important Safety, Use and Inspection Information.

MINE TOW STRAPS

Equipment recovery in surface mining operations has been improved dramatically, with the use of Lift-It® High Performance Fiber, Twin-Path® Mine Tow Straps. High modulus, low elongation, K-Spec® fiber does not store energy like wire and chain slings. Subsequently, High Performance Fiber Mine Tow Straps do not dissipate stored energy and have very little, if any whiplash at failure. Polyester Mine Tow Straps store energy and at failure dissipate it with whiplash. Mine Tow Straps include two sleeves for protection at the connection points. See Page 113 for larger Work Load Limits. You must specify sling length.



HIGH PERFORMANCE FIBER MINE TOW STRAP SPECIFICATIONS			
Stock Number	**Vertical Work Load (Lbs.)**	**Weight (Lbs./Ft.)**	**Width (Inches)**
MTS-2000	20,000	.51	3
MTS-3000	30,000	.71	4
MTS-4000	40,000	.83	4
MTS-5000	50,000	1.14	5
MTS-6000	60,000	1.27	5
MTS-8500	85,000	1.65	6
MTS-10000	100,000	1.84	6
MTS-15000	150,000	2.66	8
MTS-20000	200,000	3.45	10
MTS-30000	300,000	4.92	12

⚠ WARNING

Mine Tow Straps shall not be used for pulling, towing and/or vehicle recovery applications or be allowed to pull against stuck objects unless the user is qualified for this purpose and employs the following practices:

Attachment points must be suitable for the application; detached connection points can be deadly projectiles. Stand far away from the vehicle and strap while under tension. Ensure that connection points exceed the break strength of the Tow Strap.

The amount of tension applied to the Tow Strap shall never exceed Tow Strap Work Load Limits. Consideration shall be given to dynamic loading factors such as suction, incline, etc. Shock loading shall be avoided. If you are not capable of determining loading factors use load measuring devices or equipment controls to avoid overloading.

All applications shall ensure that control is maintained at all times over all components and materials. Planning shall involve the consideration of an uncontrolled release of any component or material. The release of tension and energy can result in serious injury or death.

Do not tie into knots. Avoid dragging the strap.
Inspect before each use. Do not use a damaged strap.
Do not overload the strap. Avoid contact with hot exhaust.

NEVER USE A TOW STRAP FOR ANY LIFTING APPLICATION.
ALWAYS ROTATE THE STRAP TO CHANGE CONNECTION POINTS.

MINE TOW STRAP INSPECTION

Mine Tow Straps must be inspected thoroughly for damage. Visual, tactile and patented inspection systems such as Check-Fast®, Fiber Optics and Tattle Tails will assist inspectors in determining sling condition. Mine Tow Straps shall be removed from service for an evaluation by the manufacturer if any of the following conditions are detected:

1. Check-Fast® Early Warning Indicator (EWI) and Tattle Tail indicators shall extend past the sling tag area. If slings are equipped with Check-Fast® and the EWI is not visible or both Tattle Tails are not visible, remove the sling from service and return to the manufacturer for repair evaluation.

2. If Mine Tow Straps are equipped with the Fiber-Optic Inspection option, inspect by allowing light to enter the fiber optics. If fiber optics does not transmit light from end to end, remove the sling from service and return for repair evaluation.

3. If Mine Tow Strap tags are missing or illegible, slings shall not be used and be returned for repair evaluation.

4. Inspect for evidence of heat damage, i.e., melting, charring or weld spatter. Mine Tow Straps with K-Spec® and polyester core yarn shall not be exposed to temperatures above 180°F/ 82°C or below -40°F/- 40°C.

5. If any part of the Mine Tow Strap is stiff or brittle, indicating heat or chemical damage, remove the sling from service. Return the sling to the manufacturer for repair evaluation.

6. Mine Tow Straps shall be examined throughout their length for damage such as: holes, tears, cuts, embedded materials, abrasive wear or snags that expose the core yarn. If damage is detected, slings shall be removed from service for repair evaluation.

7. Damage to the cover may indicate a loss of core yarn strength. Slings with signs of cover damage shall not be used until evaluated by the manufacturer.

8. If core yarns are broken, cut or damaged, slings must be removed from service. If broken stitching in the cover exposes core yarn, slings must be removed from service for repair evaluation.

9. Mine Tow Straps and attached fittings shall be regularly inspected. In addition to the initial inspection and periodic inspections done by designated, competent inspectors, slings shall be visually inspected before use.

10. Fittings determined to be elongated, damaged, corroded or not AMSE B30.10 and/or ASME B30.26 compliant shall be removed from service for repair evaluation.

11. Mine Tow Straps that are tied in knots or joined by knotting.

12. Inspections shall be performed as required by competent persons and inspection documentation shall be maintained. Inspections may be done more often based on: frequency of use, severity of conditions or experience gained on the service life of slings used in similar circumstances. Periodic inspection intervals must not exceed 1 Year.

13. Mine Tow Straps removed from service that are not repairable shall be destroyed and rendered completely unfit for any future use.

⚠ WARNING See pages 113-118 for Important Safety, Use and Inspection Information. Read and understand the information contained in this publication and that accompanies the product before use.

FIVE GALLON PAIL SLING

Lift-It® product engineers developed the Five Gallon Pail Sling at the request of sling users in the tower industry.

Five gallon pails (12 in. dia. x 14-1/4 in. tall) are securely and efficiently handled by the Lift-It® Five Gallon Pail Sling.

See Pages 16-55 for Important Safety, Use and Inspection Information.

STOCK NUMBER- FG-PS



BUNDLE STRAPS

Only the finest materials are used in Lift-It® Bundle Straps: treated nylon tie down webbing and zinc plated, 1A Adjusters.

See Pages 363-370 for Important Safety, Use and Inspection Information.

STOCK NUMBER- HB

You must specify length and stock number.
(For a 3 ft. assembly- HB-3)



OVERHEAD DOOR SLINGS

The difficult task of installing overhead doors is now done efficiently with Lift-It® Overhead Door Slings. Overhead Door Slings are available in five models. See pages 16-55 for Important Safety, Use and Inspection Information.



Stock No.	Width x Length	Vertical Work Load Limit
OD-5-7	5 in. x 7 ft.	500 Lbs.
OD-6-8	6 in. x 8 ft.	500 Lbs.
OD-6-12	6 in. x 12 ft.	500 Lbs.
OD-8-8	8 in. x 8 ft.	1250 Lbs.
OD-8-12	8 in. x 12 ft.	1250 Lbs.

AEROSPACE SLINGS

Aerospace Slings made from high strength, Technora® webbing can be used in some NDT applications (liquid penetrant, magnetic dye and plating) not compatible with conventional nylon or polyester slings. Aerospace Slings provide high tensile strength, high modulus and excellent resistance to: heat, sea water, steam and various chemicals, acids, alkalis and organic solvents.

Aerospace Slings have excellent fatigue resistance, low creep, stress relaxation and thermal shrinkage, resulting in good dimensional stability.

Aerospace Slings, featuring Technora® webbing, provide superior resistance in harsh environments and can be used at 392°F/200°C for extended periods of time.



⚠WARNING Aerospace Slings do not feature red core yarns.

AEROSPACE SLING SPECIFICATIONS			
Stock Number	Work Load Limits (Lbs.)		
	Choker	Vertical	90° Basket
EE1-AST	700	900	1800
EN1-AST	1400	1800	3600

⚠WARNING Read and understand the information contained in this publication and follow OSHA, ASME, Association, Industry and Manufacturer guidelines.

All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations.

Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable, or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

Our Catalog DOES NOT contain all the information you need to know about handling and manipulating materials and loads safely. Sling use is only one part of a lifting system and it is your responsibility to consider all risk factors prior to using any rigging device or product. Failure to do this may result in severe INJURY or DEATH due to sling or equipment failure and/or loss of the load.

RADOME SLINGS

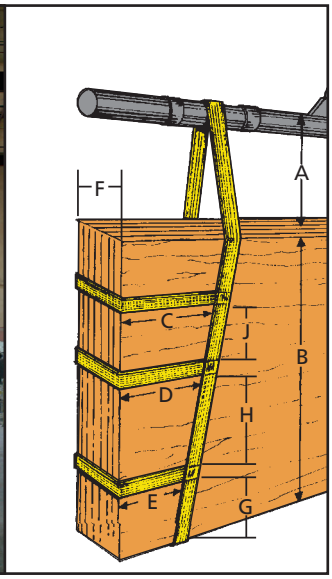


Lift-It® Radome Slings are fabricated from nylon or polyester webbing that is specifically made for lifting and features an alloy Masterlink with Subassemblies. The 5/8" Masterlink with Subassemblies provides an efficient and secure connection point between the Radome Sling and lifting mechanism. Proof testing is available for an additional charge and custom models are readily available.

Simply specify the COBHAM/SEATEL or INTELLIAN radome model number and the Radome Sling of your choice will be shipped expeditiously.

FLAT-PAK SLINGS





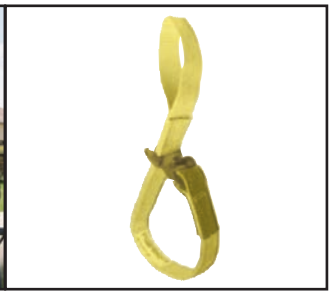
Lift-It® Flat-Pak Slings enable sling users to maneuver and stack glass panels or wood crates in tight areas.

Flat-Pak slings are protected from load edges by various types of protection materials and feature side bridles for additional load control.

Flat-Pak slings are specifically designed for your requirements. Contact us for further information.

PIPE LIFTING SLINGS





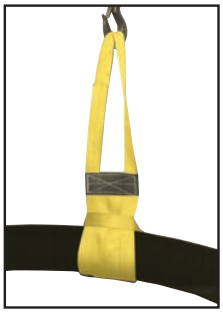
Lift-It® Pipe Lifting Slings are designed for quick and easy rigging. Specialty disconnect hardware allows for disengagement of slings from loads, without disconnecting slings from the lifting device.

Available in two models, Pipe Lifting Slings can be used in other applications. Custom sling lengths are readily available.

⚠ WARNING For use in choker hitch only.
A single sling may not control the load.

SLING STOCK NUMBER	CHOKER WLL (Lbs.)	WEB SLING	
		WIDTH	LENGTH
PL-2	2,500	2 IN	12 Ft.
PL-3	3,500	3 IN	12 Ft.

HOSE HANDLING SLINGS



Lift-It® Hose Handling Slings are used to prevent crushing, kinking and cutting of hoses. The weight of discharge hoses is distributed over the width of Hose Handling Slings.

⚠ WARNING Lift-It® Hose Handling Slings are for use in choker hitch only.

Nylon webbing is standard, unless otherwise specified.

HOSE DIA.	SLING STOCK NO.	SLING WIDTH	SLING LENGTH	WLL CHOKER (Lbs.)	SLING WEIGHT (Lbs.)
4 IN	HH1-904	4"	3 Ft.-6 In.	3,000	1.5
6 IN	HH1-906	6"	4 Ft.-6 In.	4,000	2
8 IN	HH1-908	8"	6 Ft.	5,000	3
10 IN	HH1-910	10"	9 Ft.	6,000	5
12 IN	HH1-912	12"	11 Ft.	7,000	8

⚠ WARNING See Pages 16-55 for Important Safety, Use and Inspection Information.

MANUAL DRUM TURNER



Manual Drum Turner Assemblies are a solution for handling and emptying drums where precise control is not required.

Manual Drum Turner (**Stock Number MDT**) accepts 18 to 24 inch drums and is rated at 1,000 Lbs. ASME B30.20 compliant, Manual Drum Turner assemblies can be proof tested to 1250 pounds on request.

24 in. top chain support bridle connects to spreader bar.

28 in., chain sling legs connect spreader bar to web band.

6 inch nylon webbing band will not damage the drum and is easily replaceable. The webbing band features a ratchet roller tensioning device to facilitate tightening.

Geared Drum Turners and Geared Tilters are also available.

⚠ WARNING See Pages 168 and 269-270 for Important Safety, Use and Inspection Information.

VEHICLE STRAPS

Lift-It® Vehicle Straps are manufactured from treated, nylon webbing. Strap eye bearing points are tapered and wrapped. Available in four standard models, custom straps are readily available. You must specify Vehicle Strap length.

Lift-It® will not fabricate Vehicle Straps with attached metal end fittings or components.



VS2-902

SPECIFICATIONS			
STOCK NUMBER	WORK LOAD LIMITS (Lbs.)*		
	Chocker	Vertical	90° Basket
VS1-902	2,500	3,200	6,400
VS2-902	5,000	6,400	12,800
VS2-904	9,000	11,400	22,800
VS2-906	13,000	17,000	34,000

*** Work Load Limits apply only to new and unused straps.**

⚠ WARNING
Never use a vehicle strap for any lifting application.



VS2-904

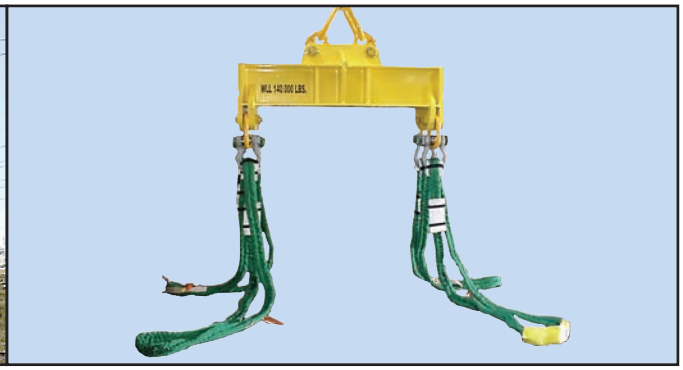
⚠ WARNING

Inspect before each use. Do not use a damaged strap. Avoid dragging the strap. Do not tie strap into knots. Do not attach strap to bumpers. Avoid contact with hot exhaust systems. Do not exceed Strap Work Load Limits. Attachment points must be suitable for the application and should exceed the break strength of the strap. Detached connection points can become deadly projectiles. Stand far away from the vehicle and strap while under tension. Never stand near or in line of a strap under tension. DO NOT SHOCK LOAD THE STRAP. You must take into account all factors such as suction and incline to ensure that you maintain control of all materials and components used for recovery, including dynamic loading and tension. If you are not capable of determining loading factors, use load measuring devices or equipment controls to avoid overloading. If these options are not available, DO NOT USE THE VEHICLE STRAP. IMPROPER USE MAY RESULT IN INJURY, DEATH AND/OR PROPERTY DAMAGE. Avoid edges or surfaces that could damage the strap. Use protection to prevent damage to the strap. Store strap in a cool, dark, dry location, free of environmental and mechanical damage.
Remove the strap from service and do not use for any application, if any of the following are visible:
Acid or Caustic Burns, Melting or Charring of any part of the strap, Ultraviolet/Sunlight Damage, Broken or worn stitching, Excessive Abrasive Wear, Holes, Tears, Cuts, Snags or Punctures and/or other visible damage that causes doubt as to the strength of the strap. See pages 16-55.

FOR THE WIND INDUSTRY

Lift-It® product specialists worked with the pioneers of the American Wind Industry to develop a sling handling system to replace heavy and damage inflicting, chain slings. Initially, our Synthetic Sling System was used in the manufacturing of wind turbines; High Performance Fiber, Twin-Path® Slings are now used extensively for field installation and maintenance operations. Level, non-damaging handling is achieved through precision sling lengths. Sling longevity is enhanced by special, sling protection at the connection points. These factors, combined with stellar service have made the Lift-It® Synthetic Sling System the standard for the industry. Whether you are handling 60 or 300 ton turbines, we have a Synthetic Sling System for your application. Complete Handling Systems are readily available. Existing beams can be modified to accept the improved, Lift-It® Synthetic Sling System.





BLADE SOCKS

Lift-It® Blade Socks were developed to replace expensive, European blade socks. Lift-It® Blade Socks facilitate handling and manipulation, with structural integrity, positive attachment points and no seams to rupture.
Work Load Limit- 1,000 lbs.



BLADE SOCK SPECIFICATIONS		
STOCK NUMBER	TURBINE MFG.	BLADE DETAILS
WPBS-2	GE	TECSIS 37C
WPBS-3	GE	LM34-P3
WPBS-4	GE	V47-77M
WPBS-9	GE	LM40-3P
WPBS-12	GE	FLUGEL-34M
WPBS-13	GE	34C
WPBS-16	GE	LM37.3P2-0164
WPBS-17	GE	XLE
WPBS-18	GE	TECSIS C96
WPBS-20	GE	TPI-20050-40M
WPBS-21	GE	34A
WPBS-24	GE	LM40
WPBS-22	DEWIND	
WPBS-449	SUZLON	V2 Tailing Crane
WPBS-495	SUZLON	V3 Tailing Crane
WPBS-448	SUZLON	V2 & V3 Tag Line
LMC100355-721	SIEMENS	
N30-881-0227 r2	MITSUBISHI	

TOOL BAG BRIDLE

Tool Bag Bridles were developed specially to meet the needs of the wind power industry. Lift-It Tool Bag Bridles feature a Masterlink and Hoist Hooks with latches or Stainless Steel Carabiners as connectors.



Stock No. TBB4-EE2901-4C
(MLO75) 3/4 in. Masterlink
2450-S13 Stainless Carabiners
Leg Lengths:
2 ft., 3 ft., 4 ft. and 5 ft.
Assembly Capacity - 400 Lbs.



Stock No. TBB4-EE2901-4H
(MLO75) 3/4 in. Masterlink
(EH150) 1-1/2 Ton Eye Hooks
Leg Lengths:
20 in., 32 in., 44 in. and 56 in.
Assembly Capacity - 1,000 Lbs.

⚠ WARNING See Pages 16-55 for Important Safety, Use and Inspection Information.

FOR THE WIND INDUSTRY

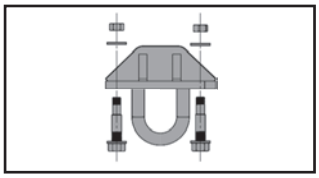
ADB, a leading manufacturer of Engineered Swivel Hoist Rings recognized the need to develop a handling system specifically for the erection of wind towers. Top and Bottom Tower Placement Rings make the Wind-Worker™ Tower Placement System "a breeze" to use as they eliminate sling binding and fit most towers. See pages 249-255 for Important Safety, Use and Inspection Information.

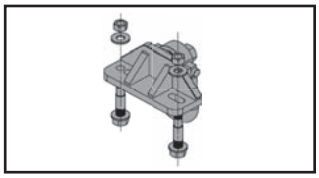


WIND-WORKER™ TOOL CONSIDERATIONS

1-3/4" STUD ASSEMBLY

For 36 mm holes use 1-1/2" socket head cap screws. For 45 mm holes use 1-3/4" stepped studs as shown in the example, below.

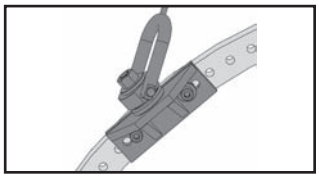




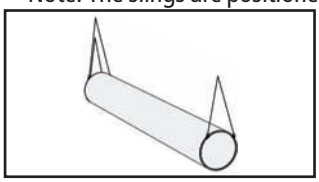
DIFFERENT STAGES OF THE LIFT

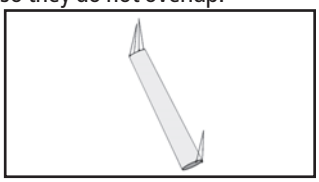
The following illustrations depict the tower and tools at varying stages of the lift.





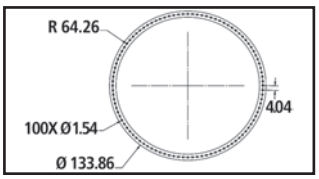
Note: The slings are positioned so they do not overlap.





CUSTOMIZED UPON REQUEST

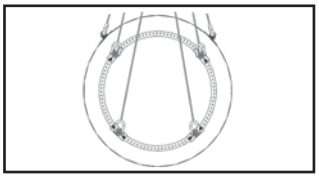
Wind-Worker™ Tower Tools are designed to fit bolt patterns that are 11-3/4 to 16 in. (center-to-center). Custom sizes are available on request.



LOADING AND UNLOADING

For loading and unloading operations it is necessary to install both Top and Bottom Lifting Tools to avoid overlapping the slings.





Install Top Lifting Tools at the following positions: 10.5, 1.5, 4.5 and 8.5 O'clock.

Install Bottom Tools at the following positions: 10.5 and 1.5 O'clock.

Always install a bolt or stud through a drilled hole before installation through the slotted side. This will keep the tool from sliding back and forth in the slot.

⚠ WARNING Do not put fingers in holes or slots, under any circumstance. For aligning holes, ADB® recommends the use of a locating pin or similar tool.

Tool Bags manufactured by Lift-It® feature the finest materials and the same heavy duty, fabrication skills required to make slings capable of carrying serious weight. Products rated at 100 Lbs. receive the same attention to detail as those rated at 100,000 Lbs.

Responsibility for any amount of weight from a manufacturing and/or handling perspective has always been predicated upon destruction testing. We are seriously committed in our dedication to excellence and operate 75 ton and 300 ton, in house, test machines certified annually to the ASTM E4 standard. We don't put the overweight, Portuguese fellow (that's me, so I can say that!) into the 150 Lbs. rated Tool Bag and lift via forklift to "proof test" Tool Bags.

We pioneered the concept of **Load Rated,** Tool Bags for other manufacturers, who previously made gloves, garments and pocket protectors. They now "fashion" themselves, riggers eager to expand and diversify their product line by making Tool Bags.

Other "novel" concepts introduced by us and adopted by others were labeling and the development of an inspection procedure for Tool Bags. Both concepts seemed natural given our extensive sling and rigging background.

Lift-It® Tool Bags provide the greatest value for your purchasing dollar. Lift-It® Tool Bags feature robust, vinyl materials that do not crack and break from being folded or creased. Heavy weight, 28 oz. materials are considerably more expensive than paper thin materials used by others. Rest assured, supposed savings from "economy" Tool Bags is easily overshadowed by the long lasting quality and durability of a Lift-It® Tool Bag.

Tool Bags are lifting devices. There are originators and imitators in the sling and "tool bag" businesses. Contact us for "original" solutions and custom designs to satisfy your unique applications. You don't have to worry about us making dresses or handbags, our customers and more importantly, we know our proficiencies and limitations. Beware of imitators!

TOOL BAG INSPECTION AND REMOVAL FROM SERVICE CRITERIA

Conscientious inspection of Tool Bags is essential to ensure proper product performance and the safety of the user.

- **Tool Bags should be inspected before each use.**
- **A formal inspection should be performed annually by a competent person.**

HARDWARE, RIM RINGS AND RIGID BOTTOM PLATES Check all Tool Bag components for damage such as: Distortion, Corrosion, Burrs, Cracks, Breaks and Worn Parts. Moving parts should move freely.	**WEBBING** Inspect webbing for: Frays, Cuts, Broken Fibers, Tears, Abrasion, Mold, Burns, UV Degradation, Heavy Soiling and Discoloration. Inspect all Stitching for Snags, Cut or Broken Stitches.
TOOL BAG MATERIAL Inspect for: Cuts, Tears, Abrasions, Mold, Burns, Corrosion, UV Degradation, Heat Damage and Chemical Damage.	**LABELS** All Labels must be present and legible.

If inspection or operation reveals damage, remove the product immediately from service and do not use.

⚠WARNING Do not fill Tool Bags with objects that could cut, pierce or damage the Tool Bag. Tool Bags can be damaged and cut by tools or other objects. Inspect before use. Always use Rigid Bottom Plates when furnished. Never stand under or near a suspended bag. Never use or allow contact with temperatures in excess of 194°(F)/90°(C) or below -40°(F)/-40°(C).Do not overload. **A cut, damaged or overloaded Tool Bag could release the contents causing serious personal injury or death.**








TOOL BAG SPECIFICATIONS					
Bag Description	**Small Wrench Bag**	**Large Wrench Bag**	**Pump Bag**	**First Aid Bag**	**Bucket Bag**
Stock Number	LMC-100355-522	LMC-100355-670	LMC-100355-671	LMC-100355-673	WP-BS
Material	No. 4 Canvas	1980D Cordura®	1980D Cordura®	1400D Cordura®	28 oz. Vinyl
Closure	None	None	Velcro & Clips	Inner & Outer Velcro	None
Steel Rim Ring	X	-	-	-	X
Rigid Bottom Plate		X	X	X	X
Exterior Bottom Protector	X	X	X		
Reflective Web		X	X	X	
Work Load Limit	80 Lbs.	200 Lbs.	200 Lbs.	100 Lbs.	100 Lbs.
Diameter	7″	13″			14″
Width			30″	20″	
Length			13″	12″	
Height	48″	59″	29″	29″	21″
Cubic Volume	1.06 Cu. Ft.	4.53 Cu. Ft.	6.55 Cu. Ft.	4.03 Cu. Ft.	1.87 Cu. Ft.
Bag Height with Bridle	63″	61″	36″	35″	34″



We don't put the overweight Portuguese fellow into the Tool Bag to perform the load test. **(That's me so I can say that!)**





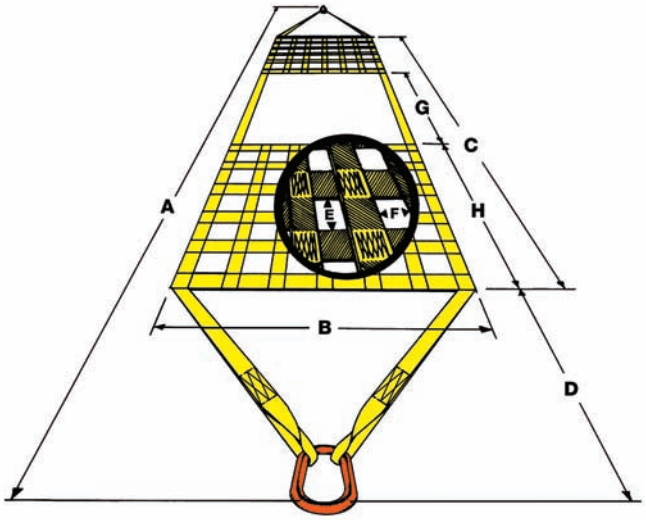

TOOL BAG SPECIFICATIONS				
Bag Description	**Large Cordura® Tool Bag**	**Large Vinyl Tool Bag**	**Large Canvas Tool Bag**	**Small Cordura® Tool Bag**
Stock Number	LMC-100355-672	LMC-100355-420	LMC-100355-545	LMC-100355-669
Material	1980D Cordura®	28 oz. Vinyl	No. 4 Canvas	1980D Cordura®
Closure	Inner & Outer Velcro	Inner & Outer Velcro	Inner & Outer Velcro	Inner & Outer Velcro
Steel Rim Ring	-	-	-	-
Rigid Bottom Plate	X	X	X	
Exterior Bottom Protector				X
Reflective Web	X	X	X	X
Work Load Limit	200 Lbs.	180 Lbs.	250 Lbs.	200 Lbs.
Diameter				
Width	19″	19″	19″	17″
Length	11″	11″	11″	4″
Height	29″	29″	29″	17″
Cubic Volume	3.51 Cu. Ft.	3.51 Cu. Ft.	3.51 Cu. Ft.	.67 Cu. Ft.
Bag Height with Bridle	33″	33″	33″	34″

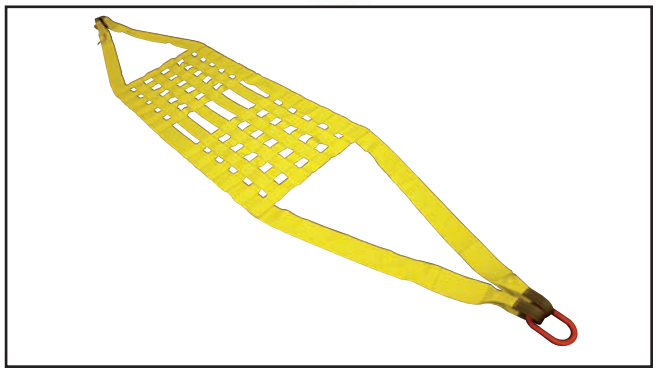
(Please note: TinTin is not operating the forklift.)

WHEEL NETS

Lift-It® Wheel Nets are used in pairs to handle vehicles of various sizes and weights. Standard models are offered for Style "R" Wheel Nets, but in many instances Wheel Nets are designed and fabricated to meet specific application requirements. Our design criterion dictates that a single net be capable of supporting 75% of the total load. Wheel Net Work Load Limits are based on the use of two nets. Wheel Nets must be large enough to encapsulate more than 50% of tire diameter without damage from wheel well, chassis or body protrusions.

"R" (RING) NET - OPEN BODY





STANDARD "R" (RING) - OPEN BODY NET SPECIFICATIONS			
Stock Number	**WN-5000**	**WN-17000**	**WN-30000**
Masterlink (diameter)	1-1/4 in.	1-1/2 in.	1-3/4 in.
Wheel Nets WLL per Pair	10,000 Lbs.	34,000 Lbs.	60,000 Lbs.
A-Overall Length (O.A.L)	184 in	208 in.	294 in.
B-Body Width	36 in.	48 in.	66 in.
C-Body O.A.L.	96 in.	120 in.	132 in.
D-Tail Length	44 in.	44 in.	81 in.
E-Mesh Height	4 in.	6 in.	13 in.
F-Mesh Width	4 in.	8 in.	10 in.
G-Gap	-	24 in.	24 in.
H-Pad Length	-	48 in.	54 in.

Please Specify:

1. Vehicle Weight
2. Overall Vehicle Width
3. Vehicle Tire Diameter
4. Overall Tire Tread Width
5. Net Type:
   "R" (Ring)
   "L" (Loop)
6. Pad Length "H" and Gap "G" for custom Open Net Body styles.
7. Net Body Style:
   Closed (No Gap)
   Open (With Gap)
8. Body Width "B" and Length "A"
9. Lifting Tail Length "D"

"R" (RING) NET - CLOSED BODY

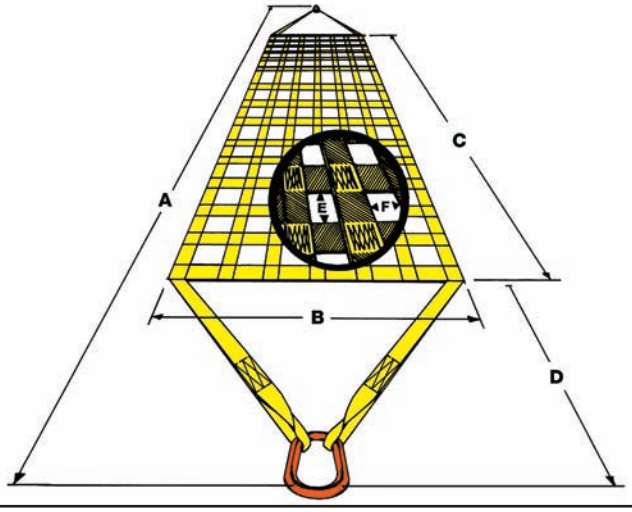
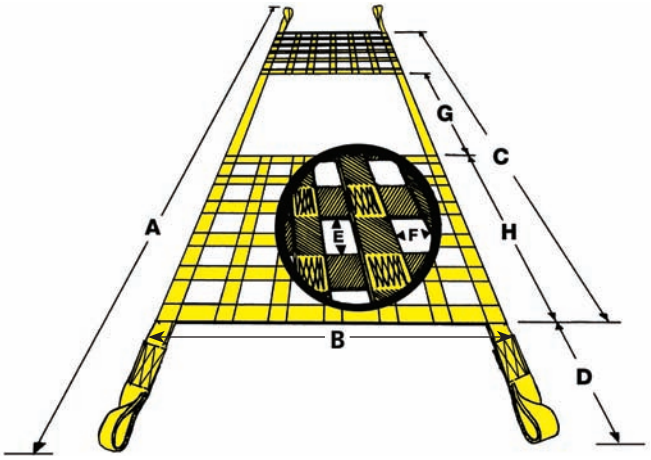




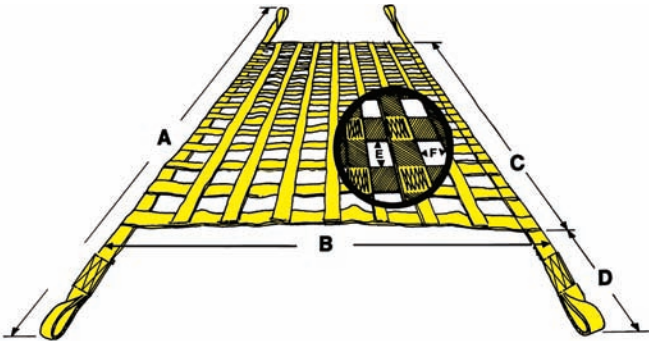
Photo courtesy of Mr. Larry Budica, MVP RV, Riverside, CA

WHEEL NETS

"L" (LOOP) NET - OPEN BODY



"L" (LOOP) NET - CLOSED BODY



REMOVAL FROM SERVICE CRITERIA

a) Missing or illegible sling identification.
Wheel Nets shall be marked to show the following:
   1) Name or trademark of the manufacturer
   2) Manufacturer's code or stock number
   3) Rated load for the wheel net
   4) Type of synthetic material

b) Acid or caustic burns.

c) Melting or charring of any part of the wheel net.

d) Holes, tears, cuts or snags.

e) Broken or worn stitching in the load bearing splices.

f) Excessive abrasive wear.

g) Knots in any part of the wheel net.

h) Discoloration and brittle or stiff areas on any part of the net, which may mean chemical or ultraviolet or sunlight damage.

i) Fittings that are pitted, corroded, cracked, bent, twisted, gouged or broken.

j) For hooks, removal criteria as stated in ASME B30.10.

k) For other applicable hardware, removal criteria as stated in ASME B30.26.

l) Other conditions, including visible damage, that cause doubt as to the continued use of Wheel Nets.

WHEEL NET SYSTEMS

Wheel Net Systems are available with a wide range of sizes and capacities. Wheel Net Systems feature a spreader bar, sling bridles and a pair of wheel nets. Reusable storage boxes can be supplied to provide storage and prevent damage.

⚠ WARNING Do not store heavy, metal objects on top of Wheel Nets.

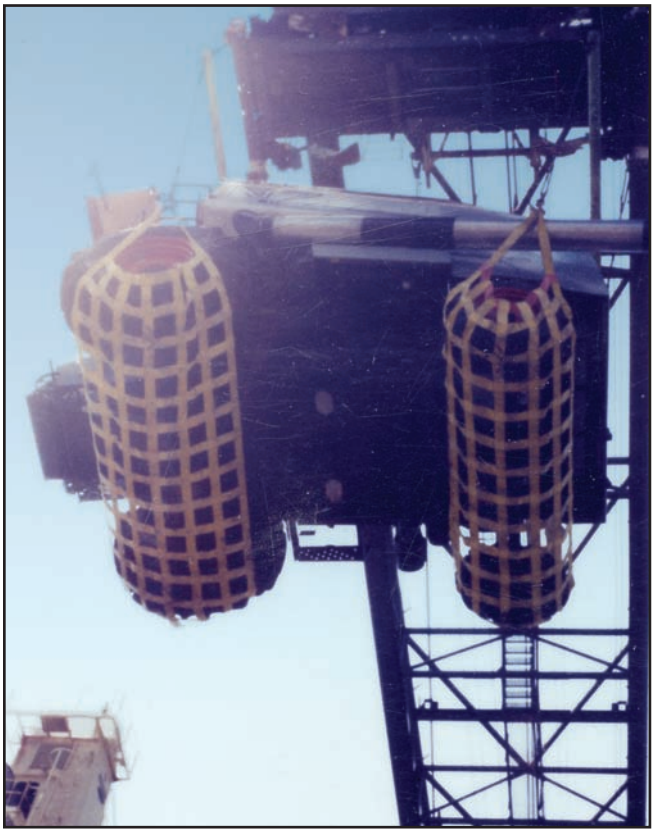


Photo provided by Scott Fishfader.

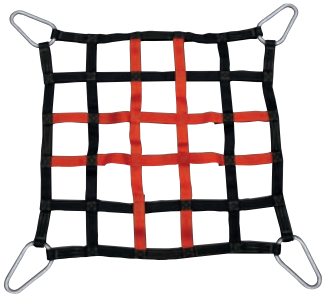


CARGO NETS

Web Cargo Nets are considerably more flexible, lightweight and compact than wire or manila rope nets. Military Specification Cargo Nets are manufactured to: Department of Defense specification-MIL-S-18313G and have a mesh opening size of approximately 6.25 inches square. Commercially produced Cargo Nets and non-standard sized nets are also readily available.

Cargo Nets must be square to function properly. Rectangular nets used for cargo handling will not properly encapsulate the load or distribute it over vertical and horizontal strength members within the net body. For inspection and removal from service criteria quidelines, see page 90.

Size Ft. x Ft.	Military Stock No.	Commercial Stock No.	Unit Weight (Lbs.)
4 x 4	CN4500-4-MIL	CN4500-4	14
6 x 6	CN4500-6-MIL	CN4500-6	17
8 x 8	CN4500-8-MIL	CN4500-8	22
10 x 10	CN4500-10-MIL	CN4500-10	30
12 x 12	CN4500-12-MIL	CN4500-12	40
14 x 14	CN4500-14-MIL	CN4500-14	48
16 x 16	CN4500-16-MIL	CN4500-16	57
18 x 18	CN4500-18-MIL	CN4500-18	73
20 x 20	CN4500-20-MIL	CN4500-20	88



TYPE	WORK LOAD	CLASS	FINISH
I	4500 Lbs.*	A	ANTI-STATIC

*Work Load Based upon a 5 to 1 Design Factor

FLIGHT DECK NETS



Lift-It® Flight Deck Nets are fabricated from slotted webbing with a standard haze gray latex finish. The webbing is certifiable to MIL-W-23223A, specification for slotted webbing.

Rectangular and triangular nets, as well as chock and causeway roller nets to NAV Ship Drawing Number 804-1363948, Revision 'G' and Drawing Number 803-5184097 are also available.



NYLON ROPE NETS

Lift-It Nylon Rope Nets are made to fit your dimensional requirements. Rope Net bodies feature a knotted diamond mesh with 2, 3.5 or 4 inch knot to knot openings. Rope borders are 5/16 in polypropylene. All materials are treated with a UV inhibitor to minimize degradation.



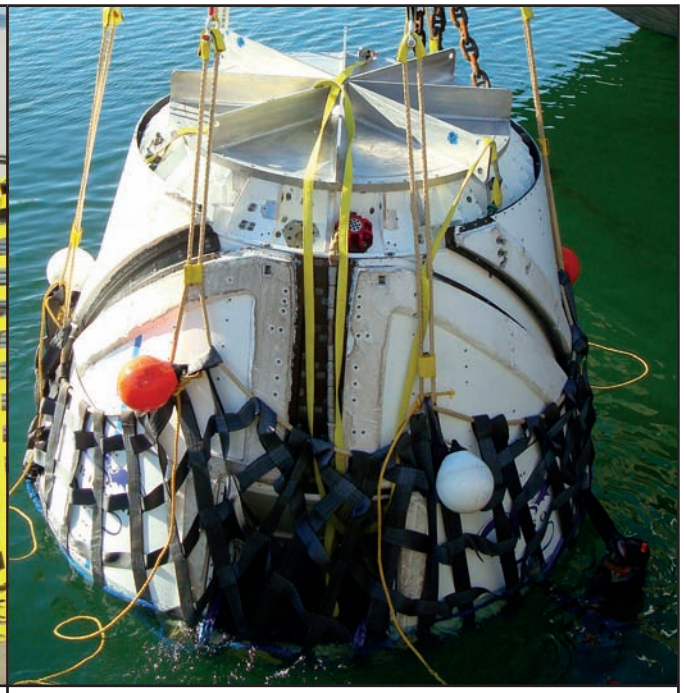
ROPE NET SPECIFICATIONS				
STOCK NUMBER	MATERIAL	MESH SIZE	WLL	COLOR
RN36-2W	#36 Nylon	2" x 2"	65 Lbs.	White
RN36-2B	#36 Nylon	2" x 2"	65 Lbs.	Black
RN96-2W	#96 Nylon	2" x 2"	180 Lbs.	White
RN96-2B	#96 Nylon	2" x 2"	180 Lbs.	Black
RN96-4W	#96 Nylon	4" X 4"	180 Lbs.	White
RN96-4B	#96 Nylon	4" X 4"	180 Lbs.	Black
RN120-2W	#120 Nylon	2" x 2"	225 Lbs.	White
RN120-2B	#120 Nylon	2" x 2"	225 Lbs.	Black
RN120-35W	#120 Nylon	3.5" x 3.5"	225 Lbs.	White
RN120-35B	#120 Nylon	3.5" x 3.5"	225 Lbs.	Black

CUSTOM DESIGN & FABRICATION

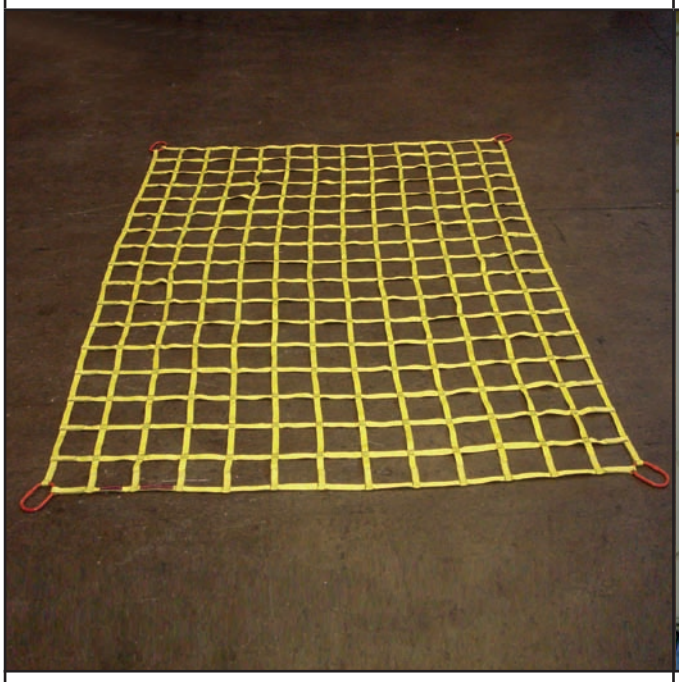
Custom designed nets are manufactured on a regular basis for specific applications. Material, fabrication and process guidelines are "not a problem" at Lift-It® and are "standard" operating procedures.



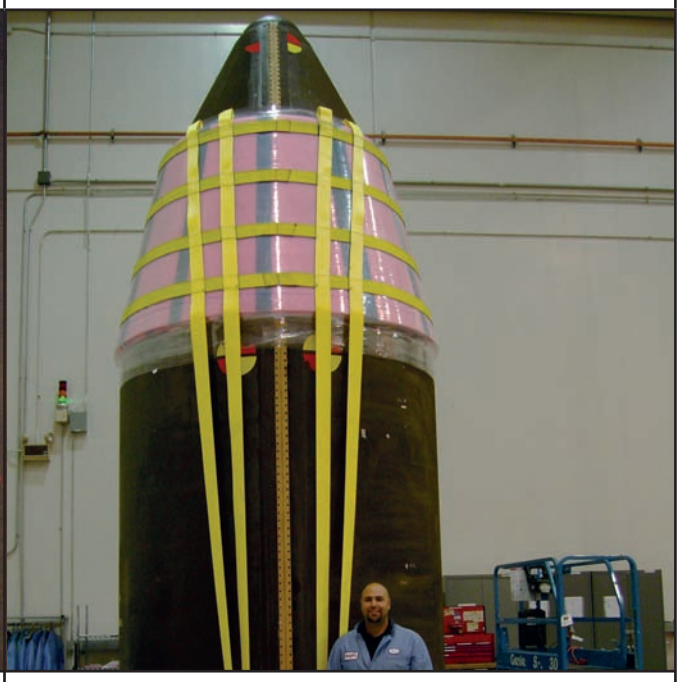
25 x 25 Ft Cargo Nets rated for 100,000 Lbs. were designed and fabricated to lift a historic and culturally sensitive item in Hawaii. 29 lbs of thread was used in each net! Superb job, Wolfgang and Misiafa!



Another example of demanding specifications for an extremely unique application depicted for your consideration. We cannot disclose any information of this historic moment as it would be a little cheesy!



Debarkation Nets of any size are readily available. The 8 Ft. x 12 Ft. Debarkation Net was fabricated with 1 in. sling web and featured 3/4 in. masterlinks attached to each corner. Every intersection was sewn with a sturdy, intense pattern and no detail was left unattended.



We cannot disclose the specific details, but we can say that Mike Gelskey, Jr. and Elias Rivas fabricated this custom net for an aerospace customer on location.

SYNTHETIC ROUNDSLING SAFETY BULLETIN

Synthetic Roundsling Safety Bulletin

⚠ WARNING



This bulletin contains important safety information about the use of synthetic roundslings. However, it **DOES NOT** contain all the information you need to know about handling, lifting and manipulating materials and loads safely. Sling use is only one part of a lifting system and it is your responsibility to consider all risk factors prior to using any rigging device or product. Failure to do this may result in severe **INJURY** or **DEATH** due to sling failure and/or loss of load.

The following six points briefly summarize some important safety issues:

1. **All users must be trained** in sling selection, use and inspection, cautions to personnel, environmental effects and rigging practices.
2. **Inspect sling for damage** regularly, if the sling is damaged, remove it from service.
3. **Protect sling from damage.** ALWAYS protect slings in contact with edges, corners, protrusions, or abrasive surfaces with materials of sufficient strength, thickness and construction to prevent damage.
4. **Do not exceed a sling's rated capacity.** Always consider the effect of sling angle and tension on the sling's rated capacity.
5. **Do not stand on, under or near a load** with the sling under tension. All personnel should be alert to danger of falling and/or uncontrolled load, sling tension and the potential for snagging.
6. **Maintain and store roundslings properly**. Slings should be protected from mechanical, chemical and environmental damage.

1. All Sling Users Must be Trained and Knowledgeable

All roundsling users must be trained on the proper use of roundslings. The American Society of Mechanical Engineers, Safety Standard for Slings (ASME B30.9) states:

> *"Synthetic roundsling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices as covered" by Chapter 9-6.*

OSHA Guidance on Safe Sling Use (29 CFR 1910.184) states that a "qualified person" is one:

> "who, by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work."

It is important that all sling users be trained and knowledgeable about the safe and proper use and application of slings and be thoroughly familiar with the manufacturer's recommendations and safety materials provided with each product. In addition, all sling users need to be aware of their responsibilities as outlined in all applicable standards and regulations.

If you are unsure whether you are properly knowledgeable or trained, or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training—**DO NOT** use roundslings until you are absolutely sure of what you are doing. Remember, when it comes to using roundslings, lack of skill, knowledge and care can result in severe **INJURY** or **DEATH** to you and others.

2. Slings Must Be Regularly and Properly Inspected

Even seemingly "minor" damage to a roundsling can significantly reduce its capacity to hold or lift objects and increases the chance that the sling will fail during use. Therefore, it is very important that roundslings are regularly and properly inspected. In reality, there simply is no such thing as "minor" damage. If you are not sure whether a sling is damaged, **DO NOT USE IT** .

2a. How to inspect slings

Generally, damage to roundslings can be detected visually. In some instances, internal load yarn damage can occur and not be visible. To detect possible damage, you should perform a visual inspection of the entire sling and also feel along its entire length, as some damage may be felt more than seen. You should look and feel for any of the types of conditions listed in Table 1. Table 2 shows examples of some of these types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

2b. What to do if you identify damage in a sling

If you identify ANY of these types of damage in a sling, **remove it from service immediately** even if the damage you feel or see is not as extensive as shown in the pictures in Table 2. Slings that are removed from service must be destroyed and rendered completely unusable unless they can be repaired and proof-tested by the sling's manufacturer or other qualified person. You should never ignore sling damage or attempt to perform temporary field repairs of damaged slings (e.g., tie knots in the sling, etc.).

Table 1. Roundsling removal from service criteria

The entire roundsling must be **inspected regularly** and it shall be **removed from service** if ANY of the following are detected:

- If roundsling identification tag is missing or not readable.
- Holes, tears, cuts, embedded materials, excessive abrasive wear, or snags that expose the core yarn of the roundsling.
- Broken or damaged core yarn.
- If roundsling has been tied into one or more knots.
- Acid or caustic burns of the roundsling.
- Melting, charring or weld spatter of any part of the roundsling.
- Distortion, excessive pitting, corrosion or other damage to fitting(s).
- Broken or worn stitching in the cover which exposes the core yarn.
- Any conditions which cause doubt as to the strength of the roundsling.

SYNTHETIC ROUNDSLING SAFETY BULLETIN

2c. How often to inspect slings

A three-stage procedure is recommended to help ensure that slings are inspected with appropriate frequency.

Initial Inspection—Whenever a sling is initially received, it must be inspected by a designated person to help ensure that the correct sling has been received and is undamaged, and that the sling meets applicable requirements for its intended use.

Frequent Inspection—The entire sling must be **inspected before each shift or day in Normal service and before each use in Severe service applications.**

Periodic Inspection—Every sling must be inspected "periodically" by a qualified and designated person. In order to validate the frequent level of inspection, the periodic inspection should be performed by someone other than the individual(s) who most commonly performs the frequent inspection. The frequency of periodic inspections is based on the sling's actual or expected frequency of use, severity of service conditions, the nature of the work performed with the sling and experience gained during the inspection of other slings used in similar circumstances. General guidelines for the frequency of periodic inspections are:

Normal service—yearly

Severe service—monthly to quarterly

Special service—as recommended by a qualified person

Periodic inspections intervals must not exceed one year.

Written records are not required for frequent inspections, but WSTDA RS-1 and ASME B30.9 require that a written record of the most recent periodic inspection be maintained. See WSTDA RS-1 for more information about definitions of Normal, Severe and Special service conditions.

3. Slings Must be Adequately Protected From Damage

3a. Avoid actions that cause damage to slings

You should always avoid any action that causes the types of damage identified in the previous section of the Safety Bulletin, including (but not limited to):

- Dropping or dragging slings on the ground, floor or over abrasive surfaces.
- Pulling slings from under loads when the load is resting on the sling—place blocks under the load if feasible.
- Shortening or adjusting sling using methods not approved by the sling manufacturer or qualified person.
- Twisting, kinking, or knotting the sling.
- Exposing slings to damaging acids or alkalis.
- Exposing slings to sources of heat damage or weld spatter.
- Using slings or allowing exposure to temperatures above 194°F (90°C) or below -40°F (-40°C).
- "Tip loading" a sling on a hook instead of centering it in the base or "bowl" of the hook.
- Using hooks, shackles or other hardware that have edges or surfaces that could damage sling.
- Running/driving over slings with a vehicle or other equipment.

Synthetic slings are affected by some chemicals ranging from little to total degradation. Time, temperature and concentration factors affect the degradation. For specific applications, consult the manufacturer.

3b. Safeguard slings with sufficient protection

Synthetic slings can be damaged, abraded or cut as tension and compression between the sling, the connection points and the cargo develops. Surfaces in contact with the sling do not have to be very abrasive or have "razor" sharp edges in order to create the conditions for sling failure. Therefore, **roundslings must ALWAYS be protected from being cut or damaged by corners, protrusions, or from contact with edges that are not smooth or well rounded with materials sufficient for the intended purpose**.

Roundslings should be protected from abrasive surfaces.

There are a variety of types of ways to protect slings from such damage. A qualified person might select and use appropriately engineered protectors/softeners—commercially available products (e.g., sleeves, wear pads, corner protectors, etc.) specifically designed to protect slings from damage. A qualified person might also design and construct their own methods of protection so long as the sling is adequately protected from and/or kept off of the damaging edge surface.

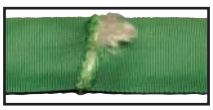
Regardless of the particular method chosen, the goal is to ensure that the sling, under tension, maintains its ability to securely lift the load while avoiding contact with damaging or abrasive surfaces under tension. A qualified person must carefully consider the most appropriate means to accomplish this goal. The protection used should not be makeshift (i.e. , selecting and using cardboard, work gloves or other such items based solely on convenience or availability).

Regardless of the approach taken, a qualified person must ensure that the protection method chosen is appropriate for the types of damage to which the slings will be exposed. For instance, some protection provides abrasion resistance, but offers virtually no protection against cuts. Several "test" lifts, done in a non-consequence setting, may be necessary to determine the suitability of the protection device(s). After each "test" lift, the protection device(s) and sling(s) need to be inspected for damage and suitability. You should keep in mind that no protection is "cut proof" and you should always operate within the specified limits of the sling and its accessories (e.g., fixtures, hardware, protection, etc.).

Roundslings must always be protected from coming into direct contact with any edges unless the contacting edges meet both of the following criteria:

- The edges must be smooth and well-rounded. Edges that are chamfered or flattened at an angle do not meet this criteria.
- The size of the edge radii must be adequately large. Table 3 shows the minimum edge radii suitable for contact with unprotected polyester roundslings.

Table 2. Types of damage you should look and feel for in roundslings

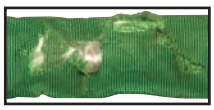

Holes/tears/cuts in cover; exposed/damaged yarns


Melting or charring


Weld spatter


Knots


Acid/alkali burns


Snags/punctures


Bunched/wadded yarns


Embedded materials

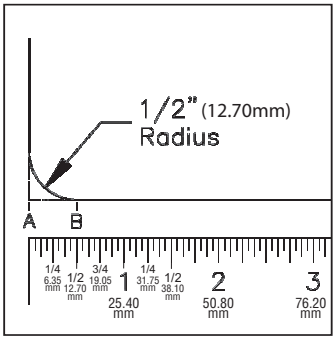
SYNTHETIC ROUNDSLING SAFETY BULLETIN

One way to measure an edge radius is to measure the distance between the leading edge of the radius that is being measured (Point A) and the point where the radius initiates from the bottom edge of the surface (Point B) (see Figure 1).

In order to protect the roundsling, it is also necessary to select and use proper connection hardware. Connection hardware should be selected so that either:

- it conforms to the size requirements listed in Table 4 (choker and vertical hitches) or Table 5 (basket hitch)
- the *bearing stress* value at the connection does not exceed 7,000 lbs./in^2 during sling loading (see WSTDA RS-1, Section 4.7 for the procedure for calculating bearing stress)

Figure 1



(*) The radii values apply to roundslings that are fully tensioned to their rated capacity regardless of the hitch.

When roundslings are tensioned to lower force values, the minimum radius values will reduce accordingly. (See WSTDA - RS-1 Appendix 1)

Fractional inches are rounded up to the nearest **1/16" (1.58mm)**.

Table 3. Minimum edge radii suitable for contact with unprotected polyester roundslings*

Sling Size	Vertical Rated Capacity lbs.	kgs.	Minimum Edge Radii inch	mm	Minimum Edge Radii inch	mm	Sling Width at Load inch	mm
1	2,600	1,200	0.14	3.55	3/16	4.76	.97	24.63
2	5,300	2,400	0.21	5.33	1/4	6.35	1.29	32.76
3	8,400	3,800	0.26	6.60	5/16	7.93	1.66	42.16
4	10,600	4,800	0.30	7.62	5/16	7.93	1.78	45.21
5	13,200	6,000	0.33	8.38	3/8	9.52	2.00	50.80
6	16,800	7,600	0.40	10.16	7/16	11.11	2.13	54.10
7	21,200	9,600	0.41	10.41	7/16	11.11	2.62	66.54
8	25,000	11,400	0.44	11.17	7/16	11.11	2.85	72.39
9	31,000	14,100	0.50	12.70	1/2	12.70	3.15	80.01
10	40,000	18,200	0.56	14.22	9/16	14.28	3.57	90.67
11	53,000	24,100	0.67	17.01	11/16	17.46	4.00	101.60
12	66,000	30,000	0.72	18.28	3/4	19.05	4.60	116.84
13	90,000	40,900	0.87	22.09	7/8	22.22	5.22	132.58

Table 4. Suitable connection hardware for polyester roundslings when used in choker and vertical hitches

Sling Size	Roundsling Rated Cap. Vert. Hitch lbs.	kgs.	Minimum Hardware Size Stock Diameter or Thickness inch	mm	inch	mm	Effective Contact Width inch	mm	inch	mm
1	2,600	1,200	.39	9.90	7/16	11.11	.97	24.63	1	25.40
2	5,300	2,400	.59	14.98	5/8	15.87	1.29	32.76	1 3/8	34.92
3	8,400	3,800	.72	18.28	3/4	19.05	1.66	42.16	1 3/4	44.45
4	10,600	4,800	.85	21.59	7/8	22.22	1.78	45.21	1 7/8	47.62
5	13,200	6,000	.95	24.13	1	25.40	2.00	50.80	2	50.80
6	16,800	7,600	1.12	28.44	1 1/8	28.57	2.13	54.10	2 1/8	53.97
7	21,200	9,600	1.15	29.21	1 3/16	30.16	2.62	66.54	2 5/8	66.67
8	25,000	11,400	1.25	31.75	1 1/4	31.75	2.85	72.39	2 7/8	73.02
9	31,000	14,100	1.41	35.81	1 1/2	38.10	3.15	80.01	3 1/4	82.55
10	40,000	18,200	1.60	40.64	1 5/8	41.27	3.57	90.67	3 5/8	92.07
11	53,000	24,100	1.90	48.26	2	50.80	4.00	101.60	4	101.60
12	66,000	30,000	2.05	52.07	2 1/8	53.97	4.60	116.84	4 5/8	117.47
13	90,000	40,900	2.46	62.48	2 1/2	63.50	5.22	132.58	5 1/4	133.35

4. Always Use Slings Properly

When lifting loads, a trained, qualified and knowledgeable user must take into account the factors and issues addressed in this bulletin, as well as considering any other relevant factors not addressed herein (see Table 6). Among the factors related specifically to roundslings, users must perform several activities, including (but not limited to) those discussed in the following subsections.

4a. Assess the load

Determine the weight of the load and make sure it does not exceed the sling's rated capacity or the capacity of any of the components of the rigging system. Users must also determine the load's center of gravity (CG) to make sure the rigging system used will be able to retain and control the load once lifted.

4b. Select an appropriate sling/configuration

Select a sling having suitable characteristics for the type, size and weight of the load, the type of hitch (see Table 7) and the environment. The sling must be securely attached to the load and rigged in a manner to provide for load control to prevent slipping, sliding and/or loss of the load. A trained, qualified and knowledgeable user must determine the most appropriate method of rigging to help ensure a safe lift and control of the load.

Another important consideration is the sling-to-load angle—the angle between a horizontal line and the sling leg or body. This angle is very important and can have a dramatic effect on the rated capacity of the sling. When the sling-to-load angle decreases, the load on each leg increases. This principle applies in a number of conditions, including when one sling is used to lift at an angle and when a basket hitch or multi-legged bridle sling is used. Table 8 provides information about increased tension as a function of sling-to-load angle (assuming equally loaded sling legs. Sling angles of less than 30 degrees are not recommended.

Similarly, when the angle of choke is less than 120 degrees, the sling choker hitch capacity decreases. To determine the actual sling capacity at a given angle of choke, multiply the sling capacity rating (for a choker hitch) by the appropriate reduction factor determined from Table 9.

4c. Do not misuse the sling

Avoid accelerating or decelerating the load too quickly (i.e. "shock loading"). Do not use slings to pull on stuck or snagged objects and do not use slings for towing purposes. A roundsling should only be used for lifting loads.

5. Make Sure All Personnel are Clear of Loads and Alert to Risks

Even if you account for all of the factors/issues discussed in this Safety Bulletin, things can still go wrong. Therefore, all personnel must stand clear of the lifted loads and never be under, on or near suspended loads.

When using slings, no part of the body should be placed between the sling and load, or between the sling and lifting hook. In addition, personnel must be alert to the potential for the sling to become snagged during a lift. Never use a roundsling to pull on objects in a snagged or constrained condition.

SYNTHETIC ROUNDSLING SAFETY BULLETIN

6. Properly Store and Maintain Slings

In order to prevent damage to slings when not in use, you should store slings in a cool, dry and dark location. Slings should be stored in an area free from environmental or mechanical sources of damage, such as: weld spatter, splinters from grinding or machining, heat sources, chemical exposure, etc. Also, keep slings clean and free of dirt, grime and foreign materials.

If roundslings are cleaned, use only mild soap and water. Rinse sling thoroughly and allow to dry completely before placing the sling back into storage or use. Do not machine wash slings. Machine washing results in significant loss of sling strength.

Table 5. Suitable connection hardware sizes for polyester roundslings when used in a basket hitch

Roundsling			Hardware Size - Single Hook or Connection Point							
Sling Size	Rated Cap. Basket Hitch		Minimum Stock Diameter or Thickness				Minimum Effective Contact Width			
	lbs.	kgs.	inch	mm	inch	mm	inch	mm	inch	mm
1	5,200	2,400	.54	13.71	9/16	14.28	1.37	34.79	1 3/8	34.92
2	10,600	4,800	.83	21.08	7/8	22.22	1.82	46.22	1 7/8	47.62
3	16,800	7,600	1.02	25.90	1 1/16	26.98	2.34	59.43	2 3/8	60.32
4	21,200	9,600	1.20	30.48	1 1/4	31.75	2.52	64.00	2 1/2	63.50
5	26,400	12,000	1.35	34.29	1 3/8	34.92	2.80	71.12	2 7/8	73.02
6	33,600	15,200	1.59	40.38	1 5/8	41.27	3.00	76.20	3	76.20
7	42,400	19,200	1.63	41.40	1 5/8	41.27	3.71	94.23	3 3/4	95.25
8	50,000	22,800	1.77	44.95	1 7/8	47.62	4.00	101.60	4	101.60
9	62,000	28,200	2.00	50.80	2	50.80	4.45	113.03	4 1/2	114.30
10	80,000	36,400	2.26	57.40	2 3/8	60.32	5.06	128.52	5	127.00
11	106,000	48,200	2.69	68.32	2 3/4	69.85	5.62	142.74	5 5/8	142.87
12	132,000	60,000	2.90	73.66	3	76.20	6.50	165.10	6 1/2	165.10
13	180,000	81,800	3.50	88.90	3 1/2	88.90	7.38	187.45	7 3/8	187.32

Table 7. Common types of sling hitches

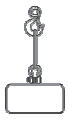
Hitch	Comments
Vertical Hitch 	One end is placed on the hook, while the other end is attached directly to the load. A tagline should be used to prevent load rotation.
Choker Hitch 	Sling passes through one end around the load and the other end is placed on the hook. Rated capacity is normally 80% of that for a vertical hitch. Load control is a potential problem with only one sling rigged in a choker hitch. Also, the choke point should always be on the sling body—not on the fittings, base of the fitting or tag.
Basket Hitch 	The sling cradles the load while both ends are attached overhead. The rated capacity for a basket hitch is twice that for a vertical hitch. As with the choker hitch, more than one sling rigged in a basket hitch (or some other means) may be necessary to help ensure load control.

Table 6. Issues and Factors to consider when handling, lifting and manipulating materials and loads

Safe handling, lifting and manipulation of materials and loads requires consideration of a number of factors and issues, including (but not limited to):

Categories	A Number of Issues/Factors to Consider		
Environment	Wind Weather Visibility	Environmental temperature Object temperature Chemical conditions and exposure	Ground stability Underground installations
Load	Weight Dimensions Center of Gravity (CG)	Attachment point integrity Susceptibility to crushing/compression Loose parts that could fall from load	Combination loads Damaging surfaces/edges Structural stability (bend/flex)
Equipment/Lift	Single/multiple cranes/hoists Maximum/planned operating radius Allowable load Ratio of lift to allowable load	Clearance to surrounding facilities Power lines and other environmental hazards Clearance between boom and lift Emergency/contingency set down area	Equipment inspection Ensure a clear load path
Rigging	Sling selection Load control Lift point (over the CG) Positive sling-to-load engagement	Coefficient of friction: Sling-to-load Appropriate hitch (for CG and load control) Load is free to move and is not snagged Coordination of multiple slings	Suitable wear protection Sling capacity is adequate for angle and tension
Personnel	Area clear of unnecessary personnel Personnel are trained and qualified	Signals: Visual, audible, electronic, etc. Personnel away from load and other dangers	Pre-lift plan and meeting Tag lines/spotter requirements

Table 8. Increased sling tension as a function of sling-to-load angle

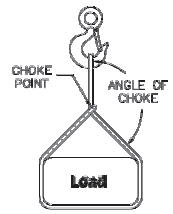
Angle "A" in degrees from horizontal	Tension Multiplier
90	1.000
85	1.004
80	1.015
75	1.035
70	1.064
65	1.104
60	1.155
55	1.221
50	1.305
45	1.414
40	1.555
35	1.742
30	2.000

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Table 9. Reductions in rated capacity as a function of angle of choke

Angle of Choke (degrees)		Angle of Choke Reduction Factor
= or >	<	
120	180	1.000
105	120	0.82
90	105	0.71
60	90	0.58
0	60	0.50

Actual Sling Capacity = Rated Capacity x Reduction Factor





Multiply the load weight (per leg) by the tension factor to determine the increased tension on the sling leg(s)

Where to Find Additional Information

This bulletin does not provide you with all the information you need to know in order to be considered trained and knowledgeable about rigging and lifting loads, but it does provide important information about the use of roundslings within a rigging system. If you need more information about roundslings and rigging practices or your responsibilities according to regulations and standards, talk to your employer. You and your employer can consult a number of sources of information to help ensure that you are properly trained and knowledgeable when using roundslings, including (but not limited to):

- WSTDA-RS-1—Recommended Standard Specification for Synthetic Polyester Roundslings
- WSTDA–RS-2—Recommended Operating and Inspection Manual for Synthetic Roundslings
- ASME B30.9—Synthetic Roundslings: Selection, Use, and Maintenance
- OSHA Guidance on Safe Sling Use [http://www.osha.gov/dsg/guidance/slings/synth-round.html]
- OSHA 29 CFR 1910.184-Slings
- Rigging handbooks
- Manufacturer's catalog, manual, website, bulletins, etc.
- Formal training provided by manufacturers or other entities

WSTDA-RSSB-1 2010

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS REDONDAS

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS REDONDAS

⚠ ADVERTENCIA



Este boletín contiene importante información acerca del uso de las eslingas sintéticas redondas. No obstante, **NO CONTIENE** toda la información que usted necesita para poder manejar, elevar y manipular con seguridad los materiales y cargas. El uso de la eslinga sólo es una parte de un sistema de elevación, y es su responsabilidad considerar todos los factores de riesgo antes de emplear cualquier dispositivo o producto de aparejo. El no hacer esto podría resultar en **LESIONES** graves o **MUERTE** debido a una falla de la eslinga o pérdida de la carga.

Los seis puntos a continuación dan un resumen breve de importantes consideraciones de seguridad:

1. **Es necesario capacitar a todos** los usuarios en la selección, el uso y la manera de inspeccionar la eslinga, así como en las precauciones al personal, los efectos ambientales y las prácticas de aparejo.
2. **Inspeccionar la eslinga** con regularidad para detectar daños, y si se descubren, retirar la eslinga de servicio.
3. **Proteger la eslinga de daño**. SIEMPRE proteja las eslingas en contacto con bordes, esquinas, salientes o superficies abrasivas con materiales dotados de suficiente resistencia y espesor, al igual que una construcción adecuada para prevenir el daño.
4. **No sobrepasar la capacidad nominal** de la eslinga. Siempre tenga en cuenta el efecto del ángulo de la eslinga y la tensión de la misma sobre su capacidad nominal.
5. **No pararse encima, debajo** o cerca de una carga con la eslinga bajo tensión. Se debe informar a todo el personal de posibles daños por caídas y/o el descontrol de cargas, la tensión de eslinga y la posibilidad de enganchones.
6. **Mantener y almacenar las eslingas** correctamente. Se debe proteger las eslingas de daños mecánicos, químicos y ambientales.

1. Todos los usuarios de eslingas deben ser capacitados y poseer los conocimientos necesarios

Todos los usuarios de eslingas redondas deben ser capacitados en el uso apropiado de las mismas. La Sociedad Americana de Ingenieros Mecánicos en sus Normas de Seguridad para Eslingas (ASME B30.9), dice lo siguiente:

"Se capacitarán a los usuarios de eslingas sintéticas redondas en la selección, inspección, precauciones para el personal, efectos del medio ambiente y prácticas de aparejo según se cubran" en el Capítulo 9-6.

En las recomendaciones de la Administración de Salud y Seguridad Ocupacional (OSHA) sobre el Uso Seguro de las Eslingas (29 CFR 1910.184) se hace constar que una "persona calificada" es:

> "quien, en virtud de poseer un título reconocido o certificado de profesionalismo en un campo aplicable, o quien, por sus amplios conocimientos, capacitación y experiencia, ha demostrado con éxito la capacidad de resolver problemas relacionados con la temática y el trabajo".

Es importante que todos los usuarios de eslingas tengan conocimientos sobre el uso seguro y correcto y la aplicación de las eslingas, y que estén totalmente familiarizados con las recomendaciones del fabricante y los materiales de seguridad provistos con cada producto. Además, todos los usuarios de eslingas necesitan estar conscientes de sus responsabilidades según su delineación en todas las normas y reglamentos aplicables.

Si usted no está seguro si está correctamente capacitado con los conocimientos necesarios, o si no está seguro de lo que le requieren las normas y reglamentos, pídale información y/o capacitación a su empleador—**NO UTILICE** las eslingas redondas hasta que esté absolutamente seguro de lo que está haciendo. Recuerde, cuando se trata del uso de las eslingas redondas, la falta de habilidad, conocimientos y cuidado puede resultar en **LESIONES** graves o **MUERTE** para usted y otras personas.

2. Se debe inspeccionar las eslingas adecuadamente y con regularidad

Hasta los daños aparentemente "menores" o leves sufridos por una eslinga redonda pueden reducir significativamente su capacidad de sujetar o elevar los objetos, y así se aumenta la posibilidad de que la eslinga se caiga durante el uso. Por eso, es muy importante que se inspeccionen las eslingas sintéticas con regularidad y en la forma apropiada. No existen en realidad daños "menores". Si usted no está seguro si una eslinga está dañada, **NO LA USE.**

2a. Manera de inspeccionar las eslingas

Por regla general, se puede detectar visualmente el daño a una eslinga redonda. En algunos casos, puede suceder sin ser visible el daño interior al hilo producido por la carga. Para detectar posibles daños, se debe realizar una inspección tanto visual como táctil de toda la eslinga, puesto que algunos daños se perciben más por el tacto que por la vista. Inspeccione y toque la eslinga para detectar la presencia de cualquier tipo de condiciones que figuran en la Tabla 1. La Tabla 2 presenta ejemplos de cualquier tipo de daños, pero cabe notar que son ejemplos relativamente extremos que damos únicamente a modo de ilustración.

2b. ¿Qué es lo que se hace si se identifica algún daño en una eslinga?

Si descubre CUALQUIERA de estos tipos de daños en una eslinga, **retírela de servicio inmediatamente**, aún si el daño que usted siente o ve no es tan extensivo como el de las fotografías en la Tabla 2. Se debe destruir o imposibilitar por completo el uso posterior de cualquier eslinga retirada de servicio, a no ser que su fabricante u otra persona calificada pueda repararla y realizar las pruebas necesarias para poder usarla de nuevo. Nunca permita que se pase por alto el daño de una eslinga, ni tampoco trate de realizarle reparaciones provisionales en campo (p. ej., hacer nudos en la malla, etc.).

Tabla 1. Criterios para el retiro del servicio de una eslinga sintética.

Toda la eslinga redonda debe **inspeccionarse con regularidad y** hay que **retirarla de servicio** si se descubre CUALQUIERA de los siguientes problemas:

- Si falta el albarán o la etiqueta de identificación de la eslinga, o si es ilegible.
- Agujeros, roturas, cortes, materiales incrustados, excesivo desgaste abrasivo o enganchones que dejan al descubierto el hilo de núcleo de la eslinga redonda.
- Hilo de núcleo roto o dañado.
- Nudos en cualquier parte de la malla de la eslinga redonda.
- Quemaduras ácidas o alcalinas cáusticas de la eslinga redonda.
- Derretimiento, carbonización o salpicaduras de la soldadura en cualquier parte de la eslinga redonda.
- Deformación, picaduras en exceso, corrosión u otros daños a los accesorios.
- Costuras rotas o gastadas en la envoltura, dejando el hilo de núcleo al descubierto.
- Cualquier condición que haga dudar de la resistencia de la eslinga redonda.

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS REDONDAS

2c. Frecuencia de inspección de las eslingas

Se recomienda un procedimiento de tres etapas para estar seguro de que se inspeccionan las eslingas con la debida frecuencia.

Inspección inicial — A la recepción inicial de una eslinga, la persona designada debe inspeccionarla para poder asegurarse que se ha recibido la eslinga correcta y sin daños, y que ésta satisface los requisitos aplicables para el uso destinado.

Inspección frecuente — Se debe **inspeccionar** toda la eslinga **antes de cada turno o día de servicio normal y antes de usarse bajo condiciones de servicio intensivo**.

Inspección periódica — Una persona designada y calificada debe realizar la inspección "periódica" de cada eslinga. Para validar la frecuencia de inspección, la inspección periódica debe llevarse a cabo por una persona que no sea el individuo más comúnmente encargado de la inspección frecuente. La frecuencia de las inspecciones periódicas se basa en la frecuencia de uso real o anticipada, la intensidad de las condiciones de servicio, la naturaleza del trabajo realizado con la eslinga y la experiencia obtenida durante la inspección de otras eslingas empleadas en circunstancias semejantes. A continuación se presentan las directrices generales sobre la frecuencia de las inspecciones periódicas:

Servicio normal—anualmente

Servicio bajo condiciones intensivas— mensual a trimestralmente

Servicio especial—según las recomendaciones de una persona calificada

Los intervalos de inspección periódica no deben de exceder un año.

No hace falta tener constancias de las inspecciones frecuentes, pero la norma WSTDA RS-1 y la ASME B30.9 requieren que se guarde constancia de la inspección periódica más reciente. Ver la norma WSTDA RS-1 para más información sobre definiciones de lo que significa Normal, Intensivo y Especial en el contexto de condiciones de servicio.

3. Se debe proteger las eslingas adecuadamente de cualquier daño

3a. Evitar acciones capaces de dañar las eslingas

Se debe evitar siempre acciones que produzcan las clases de daños identificados en la sección anterior de este Boletín de Seguridad, incluyendo (pero sin limitarse a):

- Dejar caer o arrastrar las eslingas en el suelo, piso o superficies rugosas.
- Estirar a la fuerza aquellas eslingas debajo de una carga, cuando ésta descansa sobre la eslinga; de ser factible, colocar bloques debajo de la carga
- Acortar o ajustar la eslinga, usándose métodos no aprobados por el fabricante de la eslinga o una persona calificada.
- Torcer, enredar o hacer nudos en la eslinga.
- Exponer las eslingas a ácidos o álcalis con el daño concomitante.
- Exponer las eslingas a fuentes de calor o salpicaduras de soldadura con el daño concomitante.
- Usar las eslingas o permitir que se usen cuando la temperatura sube por encima de 194°F (90°C) o baja por debajo de -40°F (-40°C).
- "Cargar sobre la punta" significa que el peso de la eslinga recae sobre la punta de enganche en lugar de centrarse sobre la base o "asiento" del gancho.
- Usar ganchos, cadenas u otros accesorios con bordes o superficies que podrían dañar la eslinga.
- Conducir o pasar por encima de las eslingas con un vehículo u otro equipo.

Debido a algunos productos químicos que entran en contacto con las eslingas sintéticas, éstas experimentan desde un leve deterioro hasta una degradación total. Los factores de tiempo, temperatura y grado de concentración afectan el deterioro. Para usos específicos, comuníquese con el fabricante.

3b. Medidas de seguridad para las eslingas

Las eslingas sintéticas se pueden dañar, desgastar o cortar al desarrollarse la tensión y compresión entre la eslinga, los puntos de unión y la carga. Las superficies en contacto con la eslinga no necesitan ser muy abrasivas o tener bordes muy filosos (parecidos al filo de una navaja) para crear las condiciones de falla de la eslinga. Por lo tanto, **las eslingas redondas SIEMPRE se deben proteger contra daños causados por esquinas, salientes, o el contacto con bordes que no sean lisos ni bien redondeados con suficiente material para el propósito destinado.**

Las eslingas redondas se deben proteger de superficies abrasivas.

Existe una variedad de maneras para proteger las eslingas de los daños mencionados. Una persona calificada podría escoger y utilizar los protectores/suavizadores técnicos apropiados, o sea, productos comercialmente disponibles (p.ej. mangas protectoras para eslingas planas y tubulares, almohadillas contra el desgaste, cantoneras, envolturas del cuerpo, esquineras, etc.), los cuales han sido diseñados específicamente para proteger las eslingas contra daños. Asimismo, una persona calificada podría diseñar y construir sus propios métodos de protección siempre y cuando la eslinga esté protegida adecuadamente y alejada de la superficie del borde dañado.

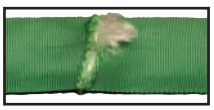
Independientemente del método elegido en particular, la meta es la de asegurar que la eslinga bajo tensión mantiene la capacidad de elevar la carga en forma segura mientras evita el contacto con las superficies dañinas o abrasivas bajo tensión. Una persona calificada debe considerar con cuidado la manera más apropiada de lograr esta meta. La protección utilizada no debe ser precaria, p.ej., la selección y utilización de cartón, guantes industriales u otros artículos afines, basándose únicamente en consideraciones de comodidad o disponibilidad.

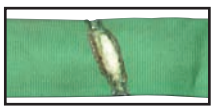
Independientemente del método elegido, una persona calificada debe asegurar que el método de protección elegido sea apropiado para los tipos de daños a los que estarán expuestos las eslingas. Por ejemplo, cierta protección brinda resistencia a la abrasión aunque virtualmente no brinda protección alguna contra cortes. Varias "pruebas" de elevación efectuadas en un entorno sin consecuencias adversas tal vez sean necesarias para determinar la idoneidad del dispositivo(s) de protección. Hace falta inspeccionar el dispositivo(s) de protección y la eslinga(s) para detectar daños y determinar el grado de adecuación después de cada "prueba" de elevación. Se debe tener en cuenta que no existe protección total "a prueba de cortes", por lo que se debe operar siempre dentro de los límites específicos de la eslinga y sus accesorios (p.ej., dispositivos, piezas y protección, etc.).

Se debe proteger las eslingas redondas contra el contacto directo con cualquier borde, a menos que los bordes en contacto cumplan con los siguientes criterios:

- Los bordes deben ser lisos y bien redondeados. No cumplen con estos criterios los bordes achaflanados o aplanados en ángulo.
- El tamaño de los radios de los bordes debe ser suficientemente grande. La Tabla 3 presenta los radios de borde mínimos que sean apropiados para contacto con las eslingas de poliéster redondas sin protección.

Tabla 2. Esté alerta a estos tipos de daños durante una inspección visual y táctil de las eslingas redondas.

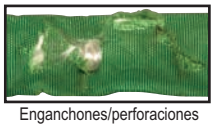

Agujeros/ roturas/cortes en la envoltura: Hilos expuestos/dañados


Derretimiento o carbonizado


Salpicadura de soldadura


Nudos


Quemaduras ácidas o alcalinas


Enganchones/perforaciones


Hilos abultados/encimados


Materiales incrustados

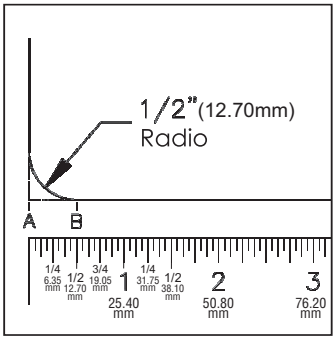
BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS REDONDAS

Una manera de medir un radio de borde consiste en medir la distancia entre el borde de ataque del radio que está siendo medido (Punto A) y el punto en donde el radio comienza desde el borde inferior de la superficie (Punto B) (ver la Figura 1).

Para proteger la eslinga redonda, también es necesario seleccionar y usar los accesorios de conexión indicados. Los accesorios de conexión deben seleccionarse para que:

- Estén en conformidad con los requisitos de tamaño de la Tabla 4 (enganches verticales y tipo vuelta de estrangulación) o la Tabla 5 (enganche de cesta)
- El valor del esfuerzo de apoyo en la conexión no exceda 7,000 libras/pulgada^3 durante la carga de la eslinga (ver WSTDA RS-1, Sección 4.7 para el procedimiento de calcular el esfuerzo de apoyo)

Figura 1



(*) Los valores de radio se aplican a las eslingas redondas completamente tensadas a capacidad nominal, independientemente del enganche.

Al tensar las eslingas redondas a valores de fuerza mínima, los valores mínimos de radio se reducen como corresponde. (Ver WSTDA -RS-1 Apéndice 1)

Las fracciones de pulgada están redondeadas al 1/16" (1.58mm) más próximo.

Tabla 3. Medidas mínimas de radio apropiadas para contacto con las eslingas redondas de poliéster no protegidas*

Tamaño de eslinga	Capacidad Nominal Vertical libras	kgs.	Radios de Borde Mínimos pulgadas	mm	Radios de Borde Mínimos pulgadas	mm	Ancho de Eslinga con Carga pulgadas	mm
1	2,600	1,200	0.14	3.55	3/16	4.76	.97	24.63
2	5,300	2,400	0.21	5.33	1/4	6.35	1.29	32.76
3	8,400	3,800	0.26	6.60	5/16	7.93	1.66	42.16
4	10,600	4,800	0.30	7.62	5/16	7.93	1.78	45.21
5	13,200	6,000	0.33	8.38	3/8	9.52	2.00	50.80
6	16,800	7,600	0.40	10.16	7/16	11.11	2.13	54.10
7	21,200	9,600	0.41	10.41	7/16	11.11	2.62	66.54
8	25,000	11,400	0.44	11.17	7/16	11.11	2.85	72.39
9	31,000	14,100	0.50	12.70	1/2	12.70	3.15	80.01
10	40,000	18,200	0.56	14.22	9/16	14.28	3.57	90.67
11	53,000	24,100	0.67	17.01	11/16	17.46	4.00	101.60
12	66,000	30,000	0.72	18.28	3/4	19.05	4.60	116.84
13	90,000	40,900	0.87	22.09	7/8	22.22	5.22	132.58

Tabla 4. Accesorios de conexión apropiados para las eslingas redondas de poliéster cuando se usan con enganches verticales y una vuelta de estrangulación

Tamaño de eslinga	Eslinga Redonda Capacidad Nominal Enganche Vertical libras	kgs.	Tamaño Mínimo- Accesorios Diámetro o Espesura en Existencia pulgadas	mm	pulgadas	mm	Ancho Efectivo de Contacto pulgadas	mm	pulgadas	mm
1	2,600	1,200	.39	9.90	7/16	11.11	.97	24.63	1	25.40
2	5,300	2,400	.59	14.98	5/8	15.87	1.29	32.76	1 3/8	34.92
3	8,400	3,800	.72	18.28	3/4	19.05	1.66	42.16	1 3/4	44.45
4	10,600	4,800	.85	21.59	7/8	22.22	1.78	45.21	1 7/8	47.62
5	13,200	6,000	.95	24.13	1	25.40	2.00	50.80	2	50.80
6	16,800	7,600	1.12	28.44	1 1/8	28.57	2.13	54.10	2 1/8	53.97
7	21,200	9,600	1.15	29.21	1 3/16	30.16	2.62	66.54	2 5/8	66.67
8	25,000	11,400	1.25	31.75	1 1/4	31.75	2.85	72.39	2 7/8	73.02
9	31,000	14,100	1.41	35.81	1 1/2	38.10	3.15	80.01	3 1/4	82.55
10	40,000	18,200	1.60	40.64	1 5/8	41.27	3.57	90.67	3 5/8	92.07
11	53,000	24,100	1.90	48.26	2	50.80	4.00	101.60	4	101.60
12	66,000	30,000	2.05	52.07	2 1/8	53.97	4.60	116.84	4 5/8	117.47
13	90,000	40,900	2.46	62.48	2 1/2	63.50	5.22	132.58	5 1/4	133.35

4. Siempre usar las eslingas correctamente

En las operaciones de levantar las cargas, un usuario calificado y capacitado con los conocimientos necesarios debe tomar en cuenta los temas, problemas y factores tratados en este boletín, al igual que cualesquier otros factores pertinentes no tratados en el presente (ver la Tabla 6). Entre los factores especialmente pertinentes a las eslingas redondas, los usuarios deben realizar varias actividades, incluyendo (pero sin limitarse a) aquellas tratadas en los siguientes apartados.

4a. Evaluar la carga

Es necesario determinar el peso de la carga y luego asegurarse que no excede la capacidad nominal de la eslinga ni tampoco la de cualquier componente del sistema de aparejo. Los usuarios también deben determinar el centro de gravedad (CG) de la carga para asegurar que el sistema de aparejo empleado es capaz de retener y controlar la carga después de elevarla.

4b. Seleccionar una eslinga/configuración apropiada

Seleccione una eslinga con las características apropiadas para el tipo, tamaño y peso de la carga, el tipo de enganche (ver la Tabla7) y el entorno. Se debe unir la eslinga con seguridad y cuidado a la carga y aparejarla de tal forma que permita controlar la carga y evitar el desplazamiento, el deslizamiento y/o la pérdida de la carga. Un usuario calificado, capacitado y con los conocimientos necesarios debe determinar el método más apropiado de aparejo para lograr el levantamiento seguro y el buen control de la carga.

Otra consideración importante es el ángulo eslinga-carga, o sea, el ángulo formado entre una línea horizontal y la pata o cuerpo de la eslinga. Este ángulo es muy importante y puede tener un efecto dramático sobre la capacidad nominal de la eslinga. Una disminución en el ángulo eslinga-carga produce un aumento de carga sobre cada pata. Este principio se aplica a numerosas condiciones, incluyendo el uso de una eslinga para elevar en ángulo o con enganche de cesta o brida multipatas. La Tabla 8 brinda información acerca de un aumento de tensión como función del ángulo eslinga-carga (se supone una distribución uniforme de la carga sobre cada pata de la eslinga). No se recomiendan ángulos de eslinga menores de 30 grados.

Así también, cuando el ángulo de estrangulación es menor de 120 grados, se reduce la capacidad de resistencia de la vuelta estranguladora. Para determinar la capacidad real de la eslinga a un ángulo dado de estrangulación, multiplicar la capacidad nominal de la eslinga (para vuelta de estrangulación) por el factor de reducción apropiado, usándose la Tabla 9 para determinarlo.

4c. No someter la eslinga a usos indebidos

Procure no acelerar ni desacelerar la carga con demasiada rapidez (acción denominada "carga de choque"). No use las eslingas para arrastrar ni para estirar objetos trabados o enganchados; tampoco use las eslingas para el remolque. Una eslinga redonda sólo debe usarse para levantar cargas.

5. Asegurar que todo el personal esté alejado de las cargas y alerta a los riesgos

Aun teniendo en cuenta todos los factores, temas o situaciones que se han tratado en este Boletín de Seguridad, pueden presentarse problemas. Por eso, todo el personal debe alejarse de las cargas levantadas y nunca ponerse encima, debajo ni cerca de ellas.

Cuando se usa la eslinga, ninguna parte del cuerpo humano debe colocarse entre la carga y la eslinga, ni entre ésta y el gancho de elevar. Además, el personal deber estar alerta a la posibilidad de que la eslinga se enganche durante la elevación. Nunca utilice una eslinga sintética para estirar o arrastrar los objetos enganchados o de otra manera difíciles de levantar.

BOLETÍN DE SEGURIDAD DE LAS ESLINGAS SINTÉTICAS REDONDAS

6. Manera correcta de almacenar y mantener las eslingas

Para prevenir el daño a las eslingas cuando no se usan, hay que almacenarlas en un lugar fresco, seco y oscuro. Las eslingas deben almacenarse en un área libre de fuentes de daño ambiental o mecánico, tales como: salpicaduras de soldadura, astillas de esmerilado o fresado, fuentes de calor, exposiciones a productos químicos, etc. Así también, mantenga las eslingas limpias sin suciedad, residuos y materiales extraños.

Si hace falta limpiar las eslingas redondas, solamente utilice agua y un jabón suave. Enjuague bien la eslinga y déjela secar completamente antes de usarla o almacenarla de nuevo. No lave las eslingas a máquina. El lavado a máquina resulta en una pérdida significativa de resistencia de la eslinga.

Tabla 5. Tamaño apropiado de los accesorios de conexión al usar las eslingas redondas de poliéster con el enganche de cesta.

Tamaño de Eslinga	Eslinga Redonda		Tamaño Accesorios - Gancho Sencillo o Punto de Conexión							
	Capacidad Nominal Enganche de Cesta		Diámetro o Espesor Mínimo en Existencia				Ancho Efectivo Mínimo de Contacto			
	libras	kgs.	pulgadas	mm	pulgadas	mm	pulgadas	mm	pulgadas	mm
1	5,200	2,400	.54	13.71	9/16	14.28	1.37	34.79	1 3/8	34.92
2	10,600	4,800	.83	21.08	7/8	22.22	1.82	46.22	1 7/8	47.62
3	16,800	7,600	1.02	25.90	1 1/16	26.98	2.34	59.43	2 3/8	60.32
4	21,200	9,600	1.20	30.48	1 1/4	31.75	2.52	64.00	2 1/2	63.50
5	26,400	12,000	1.35	34.29	1 3/8	34.92	2.80	71.12	2 7/8	73.02
6	33,600	15,200	1.59	40.38	1 5/8	41.27	3.00	76.20	3	76.20
7	42,400	19,200	1.63	41.40	1 5/8	41.27	3.71	94.23	3 3/4	95.25
8	50,000	22,800	1.77	44.95	1 7/8	47.62	4.00	101.60	4	101.60
9	62,000	28,200	2.00	50.80	2	50.80	4.45	113.03	4 1/2	114.30
10	80,000	36,400	2.26	57.40	2 3/8	60.32	5.06	128.52	5	127.00
11	106,000	48,200	2.69	68.32	2 3/4	69.85	5.62	142.74	5 5/8	142.87
12	132,000	60,000	2.90	73.66	3	76.20	6.50	165.10	6 1/2	165.10
13	180,000	81,800	3.50	88.90	3 1/2	88.90	7.38	187.45	7 3/8	187.32

Tabla 6. El manejo, levantamiento y manipulación seguros de los materiales y las cargas requieren que se considere un número de temas, problemas y factores

El manejo, levantamiento y manipulación seguros de los materiales y las cargas requieren que se considere un número de temas, problemas y factores, incluyendo (pero sin limitarse a):

Categorías	Un Número de Temas, Problemas y Factores a Tener en Cuenta		
Ambiente	Viento Clima Visibilidad	Temperatura ambiente. Temperatura objeto. Condiciones y exposición químicas.	Estabilidad del suelo. Instalaciones subterráneas.
Carga	Peso Dimensiones Centro de Gravedad (CG)	Integridad del punto de unión. Susceptibilidad a aplastamiento/compresión. Piezas sueltas que podrían caerse de la carga.	Cargas mixtas. Superficies/bordes dañinos. Estabilidad estructural (dobladura/flexión).
Equipo/ Elevación	Grúas/malacates Sencillos/múltiples Radio de operación máxima/planeada Carga permisible Relación de elevación a carga permisible	Paso libre a edificios adyacentes. Peligros a líneas de distribución y otros peligros ambientales. Espacio entre la pluma y equipo elevador. Área de colocación de emergencia/contingencia.	Inspección de equipo. Asegurar un trayecto despejado para la carga.
Aparejo	Selección de eslinga Control de carga Centro de elevación (sobre el CG) Dinámica positiva eslinga-carga	Coeficiente de fricción eslinga-carga. Enganche apropiado (control de CG y carga). Movimiento libre sin enganchones de la carga. Coordinación de eslingas múltiples.	Ropa de protección adecuada. Capacidad de eslinga adecuada para ángulo y tensión.
Personal	Área libre de personal innecesario Personal capacitado y calificado	Señales: visuales, audibles, electrónicas, etc. Personal alejado de la carga y otros daños.	Reunión y plan de elevación previos. Requisitos para vigilar el trayecto y la carga/ cable de maniobra.

Tabla 7. Tipos comunes de enganches de eslinga

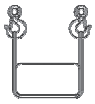
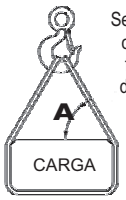
Enganche	Observaciones
Enganche Vertical 	Se coloca un extremo en el gancho mientras que se une el otro extremo directamente a la carga. Se debe usar un cable de maniobra para prevenir la rotación de la carga.
Enganche de Estrangulación 	La eslinga pasa por un extremo, alrededor de la carga, y el otro extremo se coloca en el gancho. La capacidad nominal normalmente es del 80% de aquélla usada para un enganche vertical. El control de la carga es un problema potencial con sólo una eslinga aparejada en un enganche de estrangulación. Así también, el punto de estrangulación siempre debe estar en el cuerpo de la eslinga—no en los accesorios, la base del accesorio o albarán o etiqueta.
Enganche de Cesta 	La eslinga actúa como cuna para la carga mientras que se sujetan ambos extremos por encima. La capacidad nominal para un enganche de cesta es dos veces la de un enganche vertical. Al igual que con el enganche de estrangulación, es posible que sea necesaria más de una eslinga aparejada en un enganche de cesta (o por algún otro medio) para asegurar el control de la carga.

Tabla 8. Aumento en la tensión de eslinga en función del ángulo eslinga-carga

Ángulo "A" en grados desde horizontal	Multiplicador de Tensión
90	1.000
85	1.004
80	1.015
75	1.035
70	1.064
65	1.104
60	1.155
55	1.221
50	1.305
45	1.414
40	1.555
35	1.742
30	2.000



Se multiplica el peso de carga (por pata) por el factor de tensión para determinar el aumento de la tensión sobre la pata o patas de la eslinga.

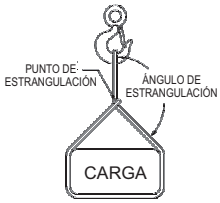
info@lift-it.com www.lift-it.com
909.469-2251
24/7/365 EMERGENCIA
NÚMERO DE ORDEN
909.524-9287

www.wstda.com
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Tabla 9. Reducción en la capacidad nominal en función del ángulo de estrangulación

Ángulo de Estrangulación (grados)		Ángulo de Estrangulación Factor de reducción
= o >	<	
120	180	1.000
105	120	0.82
90	105	0.71
60	90	0.58
0	60	0.50

Capacidad real de eslinga = Capacidad Nominal x Factor de Reducción



Dónde Encontrar Información Adicional

Este boletín no pretende darle toda la información que necesita saber para considerarse capacitado y con los conocimientos necesarios sobre aparejos y elevación de cargas, pero sí presenta información importante sobre el uso de las eslingas redondas dentro de un sistema de aparejo. En caso de necesitar más información sobre las eslingas redondas y las prácticas de aparejo o sus responsabilidades según los reglamentos y normativas, consulte con su empleador. Usted y su empleador pueden consultar un número de fuentes informativas para poder asegurarse que usted ha sido correctamente capacitado y con los conocimientos necesarios para el uso de las eslingas redondas, incluyendo (pero sin limitarse a):

- WSTDA-RS-1 – Especificación normalizada recomendada para eslingas sintéticas redondas de poliéster
- WSTDA-RS-2 – Manual de operación e inspección recomendado para eslingas sintéticas redondas
- ASME B30.9 – Eslingas sintéticas redondas: selección, uso y mantenimiento
- Recomendaciones de OSHA sobre el uso seguro de las eslingas (http://www.osha.gov/dsg/guidance/slings/synth-round.html)
- OSHA 29 CFR 1910.184-Eslingas
- Manuales de aparejos
- Catálogo, manual, sitio web, boletines, etc. del fabricante
- Capacitación formal provista por los fabricantes u otras entidades

WSTDA-RSSB-1 2010 SP

Roundsling Safety Information

⚠ WARNING Read and understand the important, safety information that follows and the information contained in this publication and follow OSHA, ASME, Association, Industry and Manufacturer guidelines. Rigging and manipulating loads involves more than attaching equipment and raising the load. There are certain hazards that cannot be mitigated by engineered features, but only by the exercise of intelligence, care, common sense and experience in anticipating the effects and results of rigging any load with any type of equipment. Use this guidance in conjunction with the warnings, cautions and safety instructions supplied with all products. If you do not receive this information, contact us for additional copies or visit www.lift-it.com

Lift-Planning & Evaluation: Page 16
Purchase & Use Considerations: Pages 17-18
Hitches, Angles and Tension: Pages 19-22
Chemical Information: Pages 41-42
Sling Protection: Pages 43-52
Rigging & Hitch Information: Pages 23-24
Sling Inspection Systems: Page 33
Examples of Sling Damage: Page 102
Repair and Testing: Page 37
Sling Care and Storage: Page 37
Sling Training: Pages 5-10
Environmental Considerations: Page 38
Mechanical Considerations: Pages 39-40
Recommended Diameters: Pages 104 and 106

⚠ WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations.

Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable, or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. **DO NOT** use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠ WARNING Our Catalog **DOES NOT** contain all the information you need to know about handling and manipulating materials and loads safely. Sling use is only one part of a lifting system and it is your responsibility to consider all risk factors prior to using any rigging device or product. Failure to do this may result in severe INJURY or DEATH due to sling or equipment failure and/or loss of the load.

⚠ WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and Rigging products will fail if damaged, abused, misused, overused or improperly maintained. Regular inspection must be conducted to determine if any product can be used at the assigned Work Load Limit (WLL) or whether the product shall be removed from service. OSHA and ASME stipulate that a visual inspection of the sling must be made daily or before each shift in **Normal** service conditions. In addition, Web Sling and Tie Down Association recommends that slings be inspected prior to each use in **Severe** service conditions. If you are unsure if the required inspection has been done for either service condition, take the time to inspect slings prior to use. Slings that are damaged or determined to be unsafe shall not be used for any application.

⚠ WARNING All Work Load Limits (WLL) indicated in our catalog are applicable only to new or "in as new" condition products. The Work Load Limits indicate the greatest force or load a device can carry under normal circumstances. Work Load Limits are based upon destruction testing, done in controlled, laboratory conditions, which will never be duplicated during actual usage. Any instantaneous change (sudden drops or rapid acceleration) constitutes hazardous shock loading and THE WORK LOAD LIMITS AS STATED, DO NOT APPLY. Shock loading, side loading and extraordinary or unique conditions must be taken into account when using any device in a rigging system.

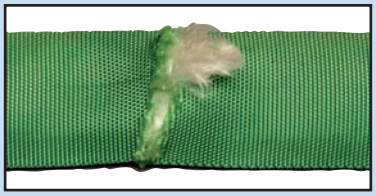
⚠ WARNING Our Products may contain chemicals known to cause cancer, birth defects and/or other reproductive harm.

Please note that information developed by the Web Sling and Tie Down Association (WSTDA) relative to warnings is included in our catalog with the permission of the WSTDA. This information is © WSTDA-2010.

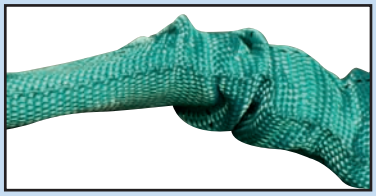
⚠ WARNING **If any damage such as the following is visible, the sling shall be removed from service immediately. Photos depict examples of sling damage, but note they are extreme examples provided for illustration purposes only.**



ACID OR CAUSTIC BURNS



CUT OR DAMAGED YARNS



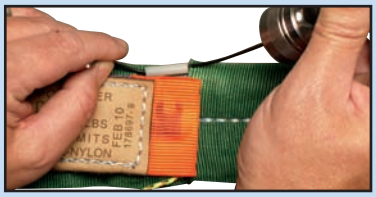
BUNCHED OR WADDED YARNS



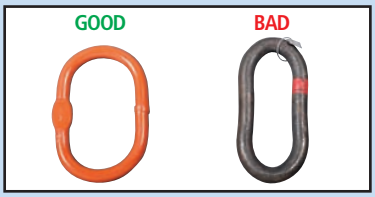
MELTING OR CHARRING



MISSING OR ILLEGIBLE TAG



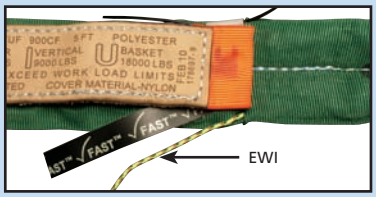
FIBER OPTIC
(Lack of light transfer - Sling Fails)



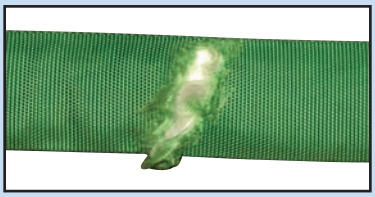
DISTORTED HARDWARE



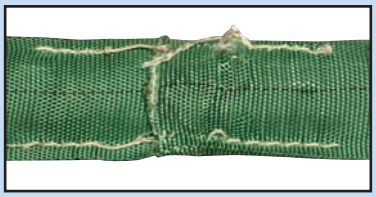
KNOTS



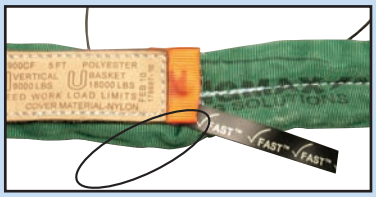
EXTERNAL WARNING INDICATOR
✔ CHECK FAST® EWI PRESENT
(Sling passes ✔ Check Fast® Criteria)



YARN VISIBILITY



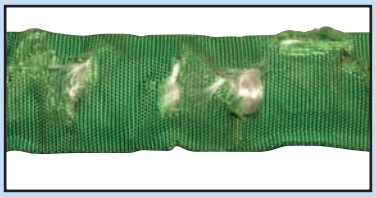
BROKEN STITCHES



EWI MISSING
(Sling fails ✔ Check Fast® Criteria)



EMBEDDED MATERIALS



SNAGS / PUNCTURES



TATTLE TAIL MISSING
(Sling fails)

Roundsling Protection Considerations

Slings can be damaged, abraded or cut as tension and compression between the sling, the connection points and the load develops. Surfaces in contact with the sling do not have to be very abrasive or have "razor" sharp edges in order to create the conditions for sling failure. Therefore, roundslings must ALWAYS be protected from being cut or damaged by corners, protrusions or from contact with edges that are not smooth or well-rounded with materials sufficient for the intended purpose.

There are a variety of ways to protect slings from such damage. A qualified person might select and use appropriately engineered protectors/softeners, commercially available products (i.e., sleeves, wear pads, corner protectors, etc.), specifically designed to protect slings from damage. A qualified person might also design and construct methods of protection so long as the sling is adequately protected from and/or kept off of the damaging edge surface.

Regardless of the particular method chosen, the goal is to ensure that the sling, under tension, maintains its ability to securely lift the load while avoiding contact with damaging or abrasive surfaces under tension. A qualified person must carefully consider the most appropriate means to accomplish this goal. The protection used should not be makeshift (i.e., selecting and using cardboard, work gloves or other such items based solely on convenience or availability).

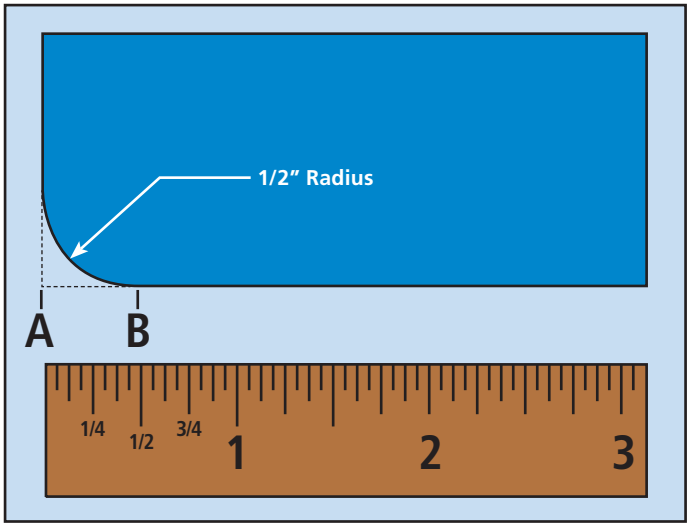
Regardless of the approach taken, a qualified person must ensure that the protection method chosen is appropriate for the types of damage to which the slings will be exposed. For instance, some protection provides abrasion resistance, but offers virtually no protection against cuts. Several "test" lifts, done in a non-consequence setting, may be necessary to determine the suitability of the protection device(s). After each "test" lift, the protection device(s) and sling(s) need to be inspected for damage and suitability. You should keep in mind that no protection is "cut proof" and you should always operate within the specified limits of the sling and its accessories (i.e., fixtures, hardware, protection, etc.).

The Web Sling and Tie Down Association has conducted testing to determine the effects of edge curvature on three sizes of roundslings over different radii. Hundreds of slings from five different manufacturers were pulled to destruction resulting in recommendations for minimum edge radii suitable for contact with unprotected polyester roundslings. Please consider that the testing was done in laboratory conditions under controlled circumstances, with full, perpendicular contact made between the sling and the simulated edge. If roundslings are used at angles where full, 90 degree, perpendicular contact between the load edge and sling is not made; the suggested recommendations may not apply. If there is any doubt, use protection and evaluate as specified above.

Roundslings must always be protected from coming into direct contact with any edges unless the contacting edges meet both of the following criteria:

- The edges must be smooth and well-rounded.
  Edges that are chamfered or flattened at an angle do not meet this criterion.
- The size of the edge radii must be adequately large.
  The following table shows the minimum edge radii suitable for contact with unprotected polyester roundslings.

One way to determine an edge radius is to measure the distance between the leading edge of the radius (Point A) and the point where the radius initiates from the bottom edge of the surface (Point B).



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MINIMUM EDGE RADII SUITABLE FOR CONTACT WITH UNPROTECTED POLYESTER ROUNDSLINGS

Sling Stock Number	Vertical WLL (Lbs.)	Choker, Vertical and Basket Minimum Edge Radii (Inches)	
		Decimal	Fractional
RS 30	2,650	.14	3/16
RS 50	4,000	.21	1/4
RS 60	5,300	.21	1/4
RS 90	8,400	.26	5/16
RS 120	10,600	.30	5/16
RS 150	13,200	.33	3/8
RS 180	16,800	.40	7/16
RS 240	21,200	.41	7/16
RS 360	31,000	.50	1/2
RS 400	40,000	.56	9/16
RS 600	53,000	.67	11/16
RS 800	66,000	.72	3/4
RS 1000	90,000	.87	7/8

Fractional Inches rounded up to the nearest 1/16".
Note: Values apply to roundslings that are fully loaded to their Work Load Limits.

Roundsling Bearing Stress

In order to protect the roundsling, it is necessary to select and use proper connection hardware. Connection hardware should be selected so that either:

- It conforms to the size requirements listed in the roundsling product specifications. (See page 106).
- The bearing stress value at the connection does not exceed 7,000 lbs. PSI during sling loading.

Lift-It® Roundsling product specifications reflect minimum hardware diameters for polyester roundslings. These recommendations are the result of testing and analysis done by the Roundsling Technical Committee, Web Sling and Tie Down Association. Minimum diameter recommendations and other important information can be found in the Recommended Standard Specification for Synthetic Polyester Roundslings (WSTDA- RS-1).

Another approach to determine the correct relationship between roundslings and connection hardware is also found in the abovementioned specification. This method establishes a maximum bearing stress at 7000 PSI and provides instruction in calculating bearing stress.

Slings are subjected to compression and tension during loading. Lower compressive forces result in higher sling breaking strengths. Likewise, higher compressive forces result in lower sling breaking strengths.

Damage at sling connection points is a result of pressures exceeding the maximum allowable compression limit per square unit of exposed surface area.

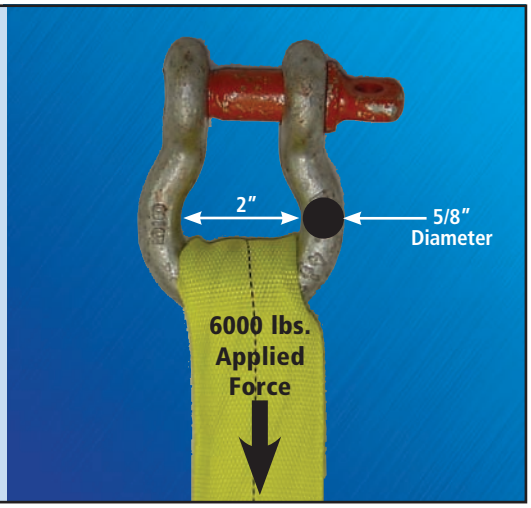
The first step to determine the bearing stress is to calculate the LOAD BEARING AREA. To accomplish this, the effective contact width must be calculated. The effective contact width for straight bearing surfaces equals 100% of the actual inside width of the connection point. The effective contact width for curved bearing surfaces is 75% of the overall inside width of the connection point.

Next multiply the effective contact width by the fitting diameter. The product obtained is the LOAD BEARING AREA. Once the LOAD BEARING AREA has been calculated, divide the APPLIED FORCE by the LOAD BEARING AREA to determine the BEARING STRESS.

A roundsling with a vertical Work Load of 8400 lbs. is connected to a round bow 5/8" anchor shackle. The shackle has an overall inside width of 2 inches and a diameter of .625.

The sling will be loaded (applied force) to 6,000 lbs.

Will the shackle be suitable, with a bearing stress less than 7,000 PSI?



1. Calculate Effective Contact Width

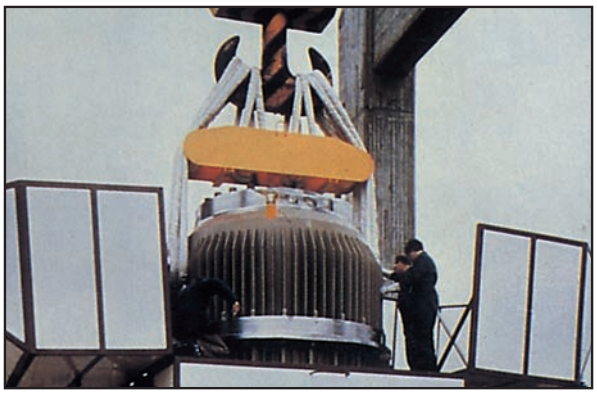
Overall Inside Width		Curved Adjustment		Effective Contact Width
2.0 Inch	X	.75	=	1.5 Inch

2. Calculate Load Bearing Area

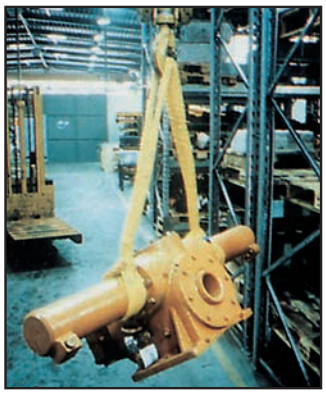
Effective Contact Width		Hardware Diameter		Load Bearing Area
1.5 Inch	X	.62	=	.93

3. Calculate Bearing Stress

Applied Force		Load Bearing Area		Bearing Stress
6000 lbs.	÷	.93	=	6,451 PSI







LIFT-IT® ROUNDSLING CONSTRUCTION AND FEATURES

Lift-It® Polyester Roundslings are made of polyester core yarn covered by a seamless, tubular cover. The seamless construction and tubular design of the cover helps to eliminate the premature rupturing of covers, characteristic of seamed roundslings.

Since the core yarns are not directly in contact with the load there is no loss of strength from abrasion to the sling cover.

Endless configurations enable the user to rotate hook and load contact points, resulting in increased sling longevity.

Because the sling body is soft and pliable, it will not choke lock, hindering removal.

Multiple polyester roundslings are manufactured simultaneously, resulting in increased production efficiency and cost savings, when compared to equivalent strength web slings.

It's important in a global economy to remain competitive without compromising safety. To that end we have established relationships with foreign partners and offer our import line of roundslings. Available with Double Polyester covers our imported roundslings are made to the same specifications and standards as our domestic products. On site management and supervision at our foreign facility, coupled with testing at our US locations ensures quality and cost efficiency for your bottom line. Our import line will feature the same tagging, tracability, unique serial numbers and all other features that you have come to expect as standard procedures at Lift-It®. One striking difference between us and others is that we will not sell you an import masquerading as a domestic product. Stock numbers indicate an imported product, i.e., RS90I.

LIFT-IT® ROUNDSLING COVER SELECTIONS

Depending upon your application, different, seamless, tubular covers are available.

Double Polyester - Stock No. RS 90	Single Bulked Nylon - Stock No. RS 90C	Double Contrasting - Stock No. RS 90DC
		
Polyester covers are suitable for many uses and applications.	Bulked Nylon Is four times more abrasion resistant than polyester.	Outer Cover-Bulked Nylon Inner Cover-Polyester

SUPERTECHLON™ Super Techlon Stock No. RS 90ST	Super Techlon covers utilize a reinforced, monofilament yarn combined with an innovative weave design. This combination results in a roundsling cover that is significantly more abrasion resistant than standard, polyester covers.	 Dyneema® Stock No. RS 90DS	Dyneema® covers utilize specialty yarns that are extremely abrasion and cut resistant. Dimensions reflected in product specifications do not apply to DS Roundslings.

HOW TO ORDER

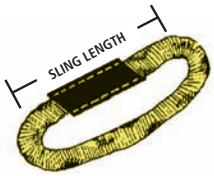
All orders must specify:

1. COMPLETE STOCK NUMBER

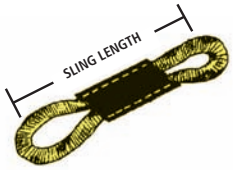
2. SLING LENGTH: Unless otherwise specified:
Sling lengths are measured as bearing to bearing lengths.
Assembly lengths are measured as bearing hardware.

3. FITTING DESCRIPTION

4. SLING PROTECTION:
Description, quantity and length of sling protection.
(See pages 43-52).



One strand sleeve
(non-removable)



Two strand sleeve
(removable)

Roundsling Specifications

ENDLESS CONFIGURATION

STOCK NUMBER	RS30	RS50	RS60	RS90	RS120	RS150	RS180	RS240
COLOR CODE	PURPLE	BLACK	GREEN	YELLOW	TAN	RED	WHITE	BLUE
CHOKER (WLL - LBS.)	2,120	3,200	4,240	6,720	8,500	10,560	13,400	17,000
VERTICAL (WLL - LBS.)	2,650	4,000	5,300	8,400	10,600	13,200	16,800	21,200
BASKET (WLL - LBS.) AT 90°	5,300	8,000	10,600	16,800	21,200	26,400	33,600	42,400
BASKET (WLL - LBS.) AT 60°	4,500	6,900	9,100	14,500	18,300	22,800	29,000	36,700
BASKET (WLL - LBS.) AT 45°	3,600	5,600	7,400	11,800	14,900	18,600	23,750	29,900
MINIMUM LENGTH	18"	18"	18"	3 Ft.	3 Ft.	3 Ft.	3 Ft.	3 Ft.
MINIMUM CONNECTION DIA. CHOKER or VERTICAL (Inches)	.50	.50	.62	.75	.87	1.00	1.00	1.38
MINIMUM CONNECTION DIAMETER BASKET (Inches)	.62	.62	.88	1.00	1.25	1.38	1.62	1.75
WEIGHT-LBS PER FOOT (BEARING to BEARING) (Inches)	.21	.30	.32	.45	.55	.60	.75	.90
BODY DIAMETER (RELAXED) (Inches)	1.04	1.11	1.11	1.27	1.32	1.43	1.59	1.75
THICKNESS WHEN LOADED (Inches)	.20	.25	.25	.30	.38	.38	.40	.50
WIDTH WHEN LOADED (Inches)	2.00	2.00	2.00	2.75	3.00	3.00	3.00	4.00

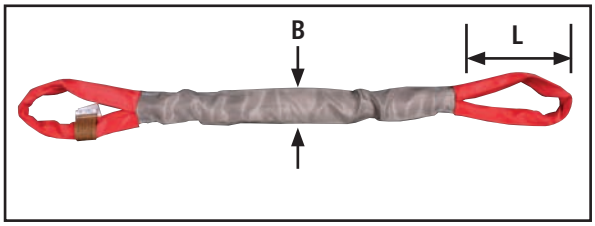
STOCK NUMBER	RS360DC	RS400DC	RS600DC	RS800DC	RS1000DC
COLOR CODE	GRAY	GRAY	GRAY	GRAY	GRAY
CHOKER (WLL - LBS.)	24,800	32,000	43,000	52,800	72,000
VERTICAL (WLL - LBS.)	31,000	40,000	53,000	66,000	90,000
BASKET (WLL - LBS.) AT 90°	62,000	80,000	106,000	132,000	180,000
BASKET (WLL - LBS.) AT 60°	53,600	69,280	91,796	114,312	155,880
BASKET (WLL - LBS.) AT 45°	43,800	56,568	74,942	93,324	127,260
MINIMUM LENGTH	3 Ft.	4 Ft.	4 Ft.	4 Ft.	6 Ft.
MINIMUM CONNECTION DIA. CHOKER or VERTICAL (Inches)	1.62	2.25	2.40	2.40	3.00
MINIMUM CONNECTION DIAMETER BASKET (Inches)	2.00	2.38	2.75	3.00	3.50
WEIGHT-LBS PER FOOT (BEARING to BEARING) (Inches)	1.50	2.00	2.85	3.60	4.60
BODY DIAMETER (RELAXED) (Inches)	2.39	2.55	3.03	3.50	3.82
THICKNESS WHEN LOADED (Inches)	.50	.75	.80	1.00	1.10
WIDTH WHEN LOADED (Inches)	4.25	5.00	5.25	6.00	8.00

⚠ WARNING

Polyester is adversely affected by aldehydes, ethers, concentrated sulfuric acid and alkalis at elevated temperatures. Nylon is adversely affected by acids and bleaching agents. RS360 and larger capacity roundslings feature a bulked nylon cover and polyester load yarns. In active chemical environments, where exposure could be deleterious to one or both yarn types, the sling user or competent person must make a hazard assessment.

Always refer to the sling tag for sling capacities and do not rely on color codification to determine sling strength.

EYE & EYE CONFIGURATION



Lift-It® Eye & Eye Round Slings are supplied with polyester, outer sleeves to encapsulate the strands of the endless sling. Polyester, Eye Sleeves are also furnished. For use in choker, vertical and basket hitches.

PLEASE NOTE: Bulked Nylon, Double Cover (DC) and single cover, Bulked Nylon (C) Eye and Eye Round Slings are gray in color. A color coded, tag patch is attached, adjacent to the Work Load Limit tag to signify color coded capacities. Always refer to sling tag for sling capacities.

Stock Number	Color Code	WORK LOAD LIMITS (Lbs.)			Minimum Length	DIMENSIONAL DATA and INFORMATION		
		Vertical	Choker	90° Basket		Weight Lbs./Ft.	"B" Body Width (Loaded)	"L" Std. Eye Length
RS30EE	PURPLE	2,650	2,120	5,300	4 Ft.	.4	2-1/4"	10"
RS60EE	GREEN	5,300	4,240	10,600	4 Ft.	.5	2-1/2"	10"
RS90EE	YELLOW	8,400	6,720	16,800	4 Ft.	.7	2-3/4"	12"
RS120EE	TAN	10,600	8,500	21,200	5 Ft.	1.0	3-1/2"	12"
RS150EE	RED	13,200	10,560	26,400	5 Ft.	1.2	3-1/2"	14"
RS180EE	WHITE	16,800	13,400	33,600	7 Ft.	1.7	3-1/2"	16"
RS240EE	BLUE	21,200	17,000	42,400	7 Ft.	1.9	4-1/4"	16"

Lift-It® Polyester Roundsling Bridle Assemblies feature sling and hardware combinations for the efficient handling of loads with fixed lifting points. Polyester Roundsling Bridle Assemblies are lightweight and easy to handle when compared to wire rope and chain bridles.

Lift-It® Polyester Roundsling Bridle Assemblies feature hardware that is substantially larger than other manufacturers. We take into account not only the strength requirements, but the spatial relationship between sling attachment points and interfacing hardware.

Lift-It® Polyester Roundsling Bridle Assembly capacities are lower than our competitors. (MLB3) Three Leg Bridle Assembly capacities are based upon 2-1/2 legs carrying the assigned capacity. (MLB4) Four Leg Bridle Assembly capacities are based on three legs carrying the assigned capacity.

Lower capacities and more expensive, larger hardware will never allow us to be the successful, low bidder. Our conservative approach is respected by conscientious users and appreciated by sophisticated purchasers. In this instance, spending more for less provides for increased safety and longer sling service.

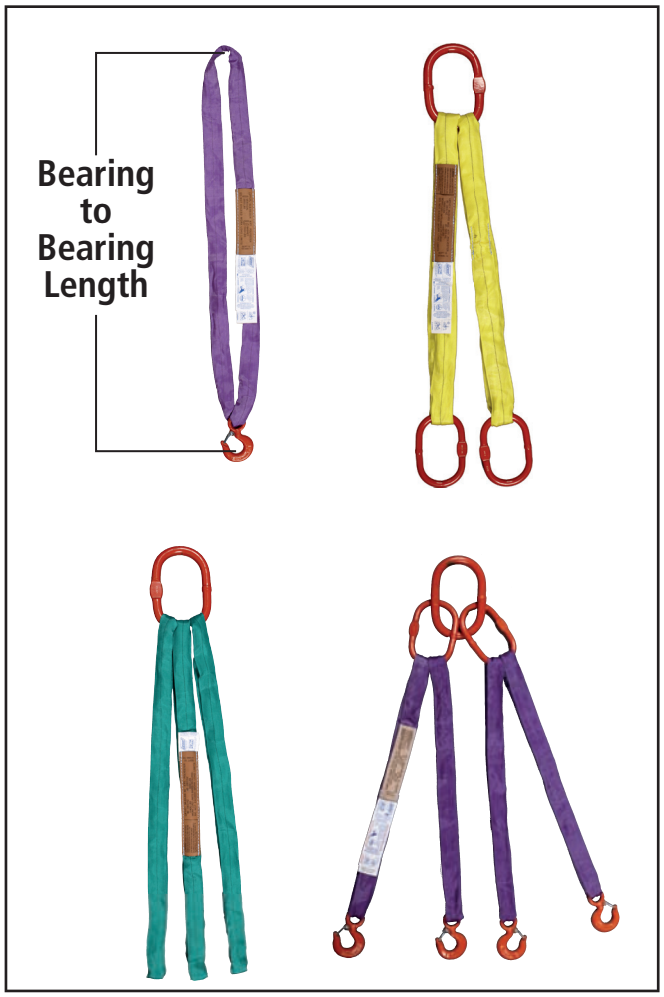
Masterlinks are welded. Forged (non-welded) masterlinks are available upon request. All hooks are supplied with latches. All fittings are alloy steel and other types of materials and attachments are available. Hardware specifications can be found on pages 240 and 241.

Endless bridle slings allow for sling rotation. Do not place the sling tag in a contact point with bridle masterlink or fittings.

⚠WARNING Work Load Limits for Multi-Leg Bridle Assemblies are based on the following conditions:

1. Even load weight distribution on all legs.
2. The bridle legs being same length. If the legs are not sharing the load equally, the assembly design factor is reduced.
3. All bridle legs used at the same horizontal angle.

If the conditions of the lift vary from those above, Work Load Limits must be recalculated.



⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Roundsling Bridle Specifications

SINGLE LEG BRIDLE (SLB) SPECIFICATIONS						
STOCK NUMBER	COLOR CODE	VERTICAL WLL (Lbs.)	BASKET WLL (Lbs.)	MINIMUM LENGTH (Bearing)	MASTER LINK (Diameter)	ALLOY HOOK SIZE (Tons)
SLB-RS30	PURPLE	2,650	5,300	4 ft.	1/2"	2 T*
SLB-RS60	GREEN	5,300	10,600	4 ft.	5/8"	5 T*
SLB-RS90	YELLOW	8,400	16,800	4 ft.	3/4"	7 T*
SLB-RS120	TAN	10,600	21,200	4 ft.	7/8"	11 T
SLB-RS150	RED	13,200	26,400	4 ft.	1"	11 T
SLB-RS180	WHITE	16,800	33,600	6 ft.	1-1/4"	15 T
SLB-RS240	BLUE	21,200	42,400	6 ft.	1-1/2"	15 T
SLB-RS360DC	GRAY	31,000	62,000	8 ft.	1-3/4"	22 T

TWO LEG BRIDLE (MLB2) SPECIFICATIONS								
STOCK NUMBER	COLOR CODE	Assembly Work Load (Lbs.) Horizontal Angle		MINIMUM LENGTH (Bearing)	TOP FITTING		BOTTOM FITTINGS	
		60°	45°		MASTER LINK (Diameter)	MASTER W/ SUB-ASSYS. (Diameter)	MASTER LINK (Diameter)	ALLOY HOOK SIZE (Tons)
MLB2-RS30	PURPLE	4,500	3,700	4 ft.	3/4"	3/4"	1/2"	2 T*
MLB2-RS60	GREEN	9,100	7,400	4 ft.	7/8"	1"	5/8"	5 T*
MLB2-RS90	YELLOW	14,500	11,800	4 ft.	1"	1-1/4"	3/4"	7 T*
MLB2-RS120	TAN	18,300	12,900	4 ft.	1-1/4"	1-1/2"	7/8"	11 T
MLB2-RS150	RED	22,800	18,600	4 ft.	1-1/2"	1-1/2"	1"	11 T
MLB2-RS180	WHITE	29,000	20,500	6 ft.	1-3/4"	2"	1-1/4"	15 T
MLB2-RS240	BLUE	36,700	29,900	6 ft.	1-3/4"	2"	1-1/2"	15 T
MLB2-RS360DC	GRAY	53,600	43,800	8 ft.	2"	2-1/4"	1-3/4"	22 T

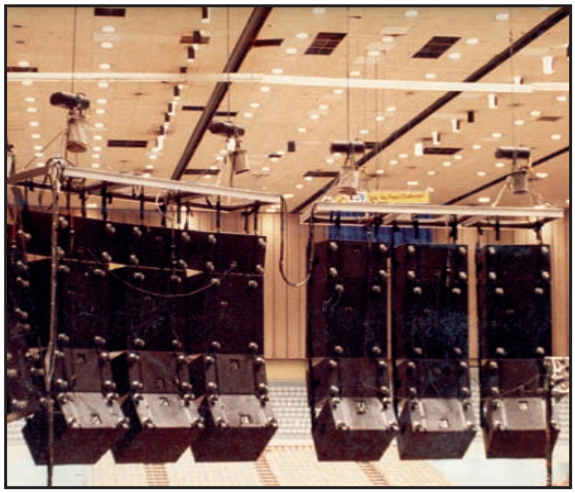
THREE LEG BRIDLE (MLB3) SPECIFICATIONS								
STOCK NUMBER	COLOR CODE	Assembly Work Load (Lbs.) Horizontal Angle		MINIMUM LENGTH (Bearing)	TOP FITTING		BOTTOM FITTINGS	
		60°	45°		MASTER LINK (Diameter)	MASTER W/ SUB-ASSYS. (Diameter)	MASTER LINK (Diameter)	ALLOY HOOK SIZE (Tons)
MLB3-RS30	PURPLE	5,700	4,600	4 ft.	1"	1"	1/2"	2 T*
MLB3-RS60	GREEN	11,400	9,300	4 ft.	1"	1"	5/8"	5 T*
MLB3-RS90	YELLOW	18,100	14,800	4 ft.	1-1/4"	1-1/4"	3/4"	7 T*
MLB3-RS120	TAN	22,900	18,700	4 ft.	1-1/2"	1-3/4"	7/8"	11 T
MLB3-RS150	RED	28,500	23,300	4 ft.	1-3/4"	1-3/4"	1"	11 T
MLB3-RS180	WHITE	36,300	29,600	6 ft.	2"	2-1/4"	1-1/4"	15 T
MLB3-RS240	BLUE	45,800	37,400	6 ft.	2"	2-1/4"	1-1/2"	15 T
MLB3-RS360DC	GRAY	67,100	54,800	8 ft.	2-1/2"	2-3/4"	1-3/4"	22 T

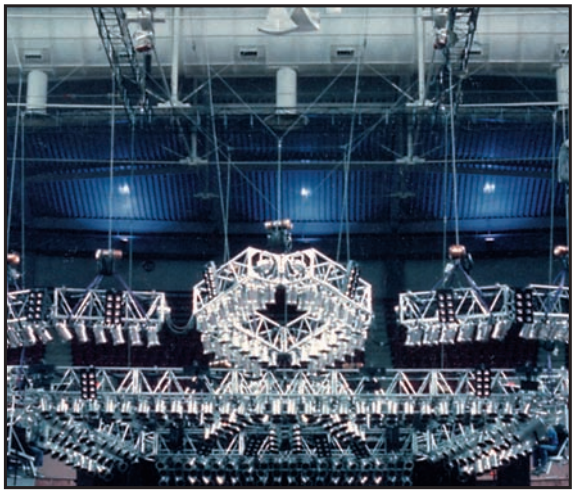
FOUR LEG BRIDLE (MLB4) SPECIFICATIONS								
STOCK NUMBER	COLOR CODE	Assembly Work Load (Lbs.) Horizontal Angle		MINIMUM LENGTH (Bearing)	TOP FITTING		BOTTOM FITTINGS	
		60°	45°		MASTER LINK (Diameter)	MASTER W/ SUB-ASSYS. (Diameter)	MASTER LINK (Diameter)	ALLOY HOOK SIZE (Tons)
MLB4-RS30	PURPLE	6,800	5,600	4 ft.	1"	1"	1/2"	2 T*
MLB4-RS60	GREEN	13,700	11,200	4 ft.	1-1/4"	1"	5/8"	5 T*
MLB4-RS90	YELLOW	21,800	17,800	4 ft.	1-1/2"	1-1/2"	3/4"	7 T*
MLB4-RS120	TAN	27,500	22,400	4 ft.	2"	1-3/4"	7/8"	11 T
MLB4-RS150	RED	34,200	27,900	4 ft.	2"	1-3/4"	1"	11 T
MLB4-RS180	WHITE	43,600	35,600	6 ft.	2-1/2"	2-1/4"	1-1/4"	15 T
MLB4-RS240	BLUE	55,000	44,900	6 ft.	2-1/2"	2-1/4"	1-1/2"	15 T
MLB4-RS360DC	GRAY	80,500	65,760	8 ft.	2-3/4"	2-3/4"	1-3/4"	22 T

*Available in Web Sling Hook design- Specify order code "W"

STAGE RIGGING

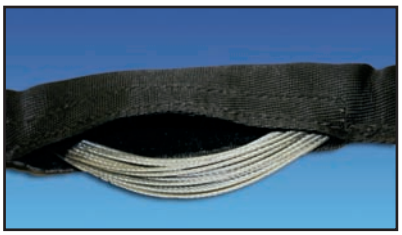
Assemblies incorporating color coordinated webbing and components are used to lift and suspend "flying" speakers. Critical tolerances result in the exact "pitch" of the speaker cabinet for optimum acoustical clarity. See page 120 for Stage Rigging Sparkeater® Slings, a perfect solution for pyrotechnical applications and page 106 for RS50 Polyester Stage Rigging Roundslings, when bright colors just won't do!





STEEL-TEX™ STAGE SLING®

Steel-Tex™ Stage Slings® feature a load bearing member made of galvanized steel, aircraft cable wound in an endless configuration. The wire core is encased in a heavy, black, polyester cover.



A convenient Inspection Window, with Velcro closure is located beside the capacity tag. The wide Inspection Window allows for easy inspection of the wire core for broken wires or corrosion. Steel-Tex™ Stage Slings® are flexible and comply with all, current, stage rigging codes and regulations.

FEATURES

- 400 degree (F) temperature rating.
- No wire rope back up is needed.
- Core Inspection Window-Standard.
- Flexibility makes rigging easy.
- Capacity Tag confirms Wire Core.
- Black Capacity Tag is inconspicuous.
- Maximum Length – 9 Ft.



Stock Number	Work Load Limits (Pounds)			Minimum Length (Ft.)	Approximate		
	Choker	Vertical	90° Basket		Weight (Lbs./Ft.)	Body Dia. Relaxed	Width at Load
ST-60	4,200	5,300	10,600	2	.70	1/2 In.	1-1/4 In.

⚠WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and Rigging products will fail if damaged, abused, misused, overused or improperly maintained. Regular inspection must be conducted to determine if any product can be used at the assigned Work Load Limit (WLL) or whether the product shall be removed from service. OSHA and ASME stipulate that a visual inspection of the sling must be made daily or before each shift in Normal service conditions. If you are unsure if the pre-shift or daily inspection has been done, take the time to inspect the sling. Slings that are damaged or determined to be unsafe shall not be used for any application.

All Work Load Limits (WLL) indicated in our catalog are applicable only to new or "in as new" condition products. The Work Load Limits indicate the greatest force or load a device can carry under normal circumstances. Work Load Limits are based upon destruction testing, done in controlled, laboratory conditions, which will never be duplicated during actual usage. Any instantaneous change (sudden drops or rapid acceleration) constitutes hazardous shock loading and THE WORK LOAD LIMITS AS STATED, DO NOT APPLY. Shock loading, side loading and extraordinary or unique conditions must be taken into account when using any device in a rigging system.

Braided Polyester Roundslings



Braided Polyester Roundslings are fabricated by joining 3 separate (for 6 part slings) or 4 separate (for 8 part slings) slings together. Braided Polyester Roundslings can be taken apart and the individual component slings used, if they are tagged properly. After the large capacity lift requirement has been satisfied, consider returning Braided Polyester Roundslings, for disassembly, inspection and re-tagging at our facility.

Braided Polyester Roundslings will stretch at a greater rate (9-11%) when compared to regular polyester roundslings. Sling length tolerances for Braided Polyester Roundslings are 5-10%. Consider ordering a Twin-Path® Extra, High Performance Fiber Sling for consistent, matched sling lengths. See page 113.

6 PART BRAIDED POLYESTER ROUNDSLING SPECIFICATIONS

STOCK NUMBER	COLOR CODE	WORK LOAD LIMITS (Lbs.)			MINIMUM LENGTH (Ft.)	STD. EYE LENGTH (Inches)	WEIGHT Lbs./Ft. (Bearing)	WIDTH LOADED (Inches)	MINIMUM HARDWARE* (Diameter)
		CHOKER	VERTICAL	90° BASKET					
6BR30	PURPLE	5,300	6,700	13,400	5 Ft.	14 In.	1.10	3-1/4"	5/8"
6BR60	GREEN	10,800	13,500	27,000	5 Ft.	15 In.	1.45	3-3/4"	1"
6BR90	YELLOW	17,100	21,400	42,800	6 Ft.	18 In.	1.90	4-1/4"	1-1/4"
6BR120	TAN	21,600	27,000	54,000	6 Ft.	18 In.	2.25	4-1/2"	1-3/8"
6BR150	RED	26,800	33,600	67,200	7 Ft.	25 In.	3.00	5-1/4"	1-1/2"
6BR180	WHITE	34,200	42,800	85,600	7 Ft.	25 In.	3.50	5-1/2"	1-3/4"
6BR240	BLUE	43,200	54,000	108,000	9 Ft.	30 In.	4.95	6-5/8"	1-3/4"
6BR360	GRAY	63,200	79,000	158,000	10 Ft.	38 In.	7.75	11"	2-1/2"

* Minimum recommended connection diameter to be used when slings are used in choker or vertical hitches.

8 PART BRAIDED POLYESTER ROUNDSLING SPECIFICATIONS

STOCK NUMBER	COLOR CODE	WORK LOAD LIMITS (Lbs.)			MINIMUM LENGTH (Ft.)	STD. EYE LENGTH (Inches)	WEIGHT Lbs./Ft. (Bearing)	WIDTH LOADED (Inches)	MINIMUM HARDWARE* (Diameter)
		CHOKER	VERTICAL	90° BASKET					
8BR30	PURPLE	7,200	9,000	18,000	5 Ft.	14 In.	1.40	3-1/2"	3/4"
8BR60	GREEN	14,400	18,000	36,000	5 Ft.	15 In.	1.85	4"	1-1/8"
8BR90	YELLOW	22,800	28,500	57,000	6 Ft.	18 In.	2.40	4-3/4"	1-1/2"
8BR120	TAN	28,800	36,000	72,000	6 Ft.	18 In.	2.85	5"	1-1/2"
8BR150	RED	35,900	44,900	89,800	7 Ft.	25 In.	3.80	6"	1-3/4"
8BR180	WHITE	45,600	57,100	114,200	7 Ft.	25 In.	4.40	6-1/4"	2"
8BR240	BLUE	57,600	72,000	144,000	9 Ft.	30 In.	6.25	7-1/2"	2"
8BR360	GRAY	84,200	105,300	210,600	10 Ft.	38 In.	9.75	13"	2-1/2"

* Minimum recommended connection diameter to be used when slings are used in choker or vertical hitches.

⚠ WARNING See Pages 93-104 for Important Safety, Use and Inspection Information.

⚠ WARNING **DO NOT EXCEED WORK LOAD LIMITS**

⚠ WARNING

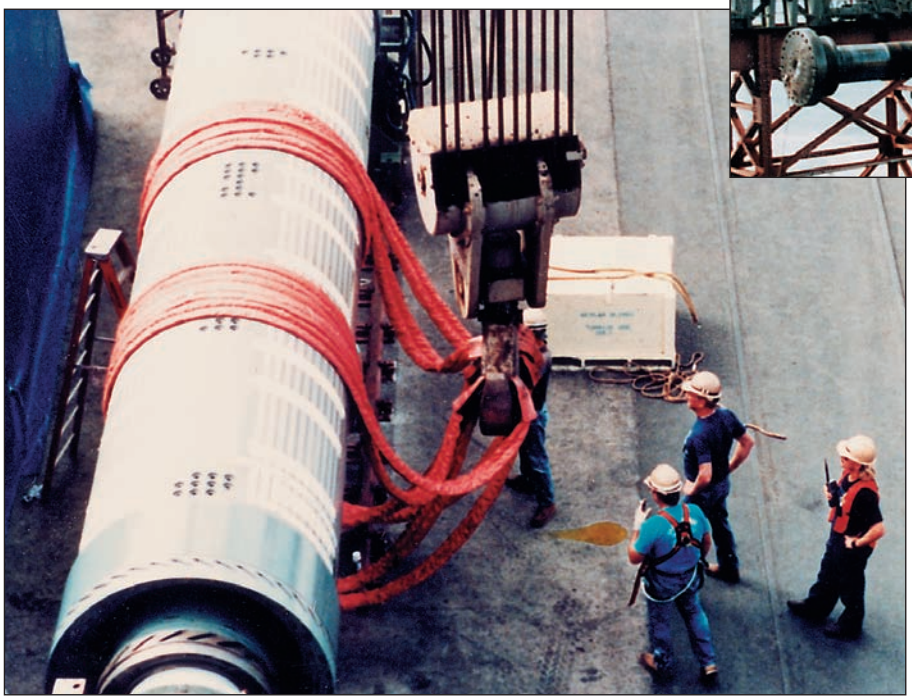
Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Twin-Path® Extra Slings in Action

Twin-Path® Extra Slings are the single greatest advance in the history of the rigging world. Leave the crushed fingers, back injuries, forklifts, transport vehicles and auxiliary cranes in the past. Super strong, ultra light, Twin-Path® Extra Slings allow sling users to do more, in less time, with less effort. Given the choice and the assumption of proper application, any informed rigger will select Twin-Path® Extra Slings.





The 200 ton generator rotor was easily handled with Twin-Path® Extra Slings. Each 56 ft. sling rated at 250,000 Lbs. Basket Work Load weighs a mere 169 pounds. One man rigged while three assistants viewed the process. The ease of handling reduced the normal two day procedure to several minutes. The improved process was heralded as one of the easiest ever performed by the rigging crew at the nuclear power generation facility.

60 TONS OF EXPLOSIVES - "I'LL NEVER BUY WIRE AGAIN".

DEFENSE AND LAUNCH VEHICLE DIVISION
P.O. BOX 689
BRIGHAM CITY, UT 84302-0689
801-863-3511

THIOKOL
SPACE • DEFENSE • FASTENING SYSTEMS

12 September 1995
Q512-FY96-067

Lift-It Manufacturing Co., Inc.
4780 Corona Avenue
Los Angeles, California 90058-3808

Attention Mike Gelskey

Subject: Twin-Path Extra Slings

Gentlemen:

In my job with 120,000 lbs. of explosives in the air you don't take chances with your equipment. In early 1994 we were challenged to develop a mobile handling system to deliver our product to our customers. Your slings were selected for several reasons:

* SAFETY - Two protective covers
  - Contrasting color
  - Tattle Tails
* MOBILE - Two each 17500 X 35' and eight 7000 x 8' slings fit in a 4'x4'x3' container with room to spare.
* RIGGERS DREAM - Back injuries, pinched fingers, holes poked in your hands are all history.
* CYCLE TIME - One man can rig as much as a crew in one eighth the time.

I'll never buy wire again.

Sincerely,

Ron Secrist



* Please note: Mr. Ron Secrist is no relation to Ryan Seacrist of American Idol fame.

Twin-Path® Extra Slings in Action

Lift-It® was one of the original Slingmax® Licensees and we have been fabricating Twin-Path® Slings for over twenty-four years. In the beginning, our competitors claimed that Twin-Path® Extra Slings were just a fad and a dangerous one at that. Twenty-four years later after thousands of lifts and millions of pounds safely handled, without incident, the same competitor now sells their version of "dangerous" high performance fiber slings they once warned against. The competition may now have high performance fiber slings, but they do not have patented and innovative Twin-Path® Inspection Features. We have revolutionized the rigging industry and set records as Slingmax® Dealer of the Year on many occasions. We are honored in our association with Slingmax® and thank the many successful riggers that are making world record lifts with Lift-It® Twin-Path® Extra Slings.



450 Ton Barge Section Rotation



207 Ton Power Turbine



200 Ton Refinery Vessel Installation



500 Ton Bow Section - Junior and Senior assisted professionals at Nassco, San Diego with rigging.

Twin-Path® Extra Slings



The first truly ergonomic sling, Twin-Path® Extra Slings are used worldwide in place of wire rope slings for heavy lifts. Twin-Path® Extra Slings weigh approximately 10% of comparable strength, steel slings. Super strong and ultra-light, Twin-Path® Extra Slings rated at 600,000 Lbs. vertical capacity are standard items and larger capacity slings are available.

The patented Twin-Path® design provides two connections between the hook and the load for redundant, back up protection. Twin-Path® Slings feature: Tattle Tails, Contrasting Colored Covers, Fiber Optic Inspection System and ✔Check-Fast® Inspection System. No other sling has these features which separate the best from all the rest. Stretch at Work Load Limit is approximately 1%.

K-Spec® load bearing core yarn gives Twin-Path Extra® Slings their incredible strength. K-Spec® Core Yarn has been determined to be the most resilient and abrasion resistant load bearing core yarn, confirmed by independent testing. Covermax®, a bulked nylon, outer, protective cover provides superior abrasion resistance. Covermax® is furnished for all Twin-Path® Slings rated greater than 40,000 vertical pounds.

K-Spec® Core Yarn durability combined with the abrasion resistance of Covermax® covers, makes Twin-Path®Extra Slings the first, repairable sling. Twin-Path® Extra Slings are definitely the slings of choice when ergonomics, productivity and safety are important considerations.

TWIN-PATH® EXTRA SPECIFICATIONS

Polyester Cover	Covermax® Cover	Work Load Limits (Lbs.) (5/1 Design Factor)					Approximate	
		Choker	Vertical	Basket Hitches				
				90˚	60˚	45˚		
Stock Number	Stock Number						Weight (Lbs. per Ft.) (Bearing- Bearing)	Body Width (Inches) Tube/Tapered
TPXKS 1000	TUFXKS 1000	8,000	10,000	20,000	17,320	14,140	.40	3" / 1.5"
TPXKS 1500	TUFXKS 1500	12,000	15,000	30,000	25,980	21,210	.45	3" / 1.5"
TPXKS 2000	TUFXKS 2000	16,000	20,000	40,000	34,640	28,280	.51	3" / 1.5"
TPXKS 2500	TUFXKS 2500	20,000	25,000	50,000	43,300	35,350	.57	4 / 2"
TPXKS 3000	TUFXKS 3000	24,000	30,000	60,000	51,960	42,420	.71	4 / 2"
TPXKS 4000	TUFXKS 4000	32,000	40,000	80,000	69,280	56,560	.83	4 / 2"
-	TUFXKS 5000	40,000	50,000	100,000	86,600	70,700	1.14	5 / 2.5"
-	TUFXKS 6000	48,000	60,000	120,000	103,920	84,840	1.27	5 / 2.5"
-	TUFXKS 7000	56,000	70,000	140,000	121,240	98,980	1.39	5 / 2.5"
-	TUFXKS 8500	68,000	85,000	170,000	147,220	120,190	1.65	6" / 3"
-	TUFXKS 10000	80,000	100,000	200,000	173,200	141,400	1.84	6" / 3"
-	TUFXKS 12500	100,000	125,000	250,000	216,500	176,750	2.35	8" / 4"
-	TUFXKS 15000	120,000	150,000	300,000	259,800	212,100	2.66	8" / 4"
-	TUFXKS 17500	140,000	175,000	350,000	303,100	247,450	3.14	8" / 4"
-	TUFXKS 20000	160,000	200,000	400,000	346,400	282,800	3.45	10" / 5"
-	TUFXKS 25000	200,000	250,000	500,000	433,000	353,500	4.07	10" / 5"
-	TUFXKS 27500	220,000	275,000	550,000	476,300	388,850	4.61	12" / 6"
-	TUFXKS 30000	240,000	300,000	600,000	519,600	424,200	4.92	12" / 6"
-	TUFXKS 40000	320,000	400,000	800,000	692,800	565,600	6.54	14" / 7"
-	TUFXKS 50000	400,000	500,000	1,000,000	866,000	707,000	8.15	14" / 7"
-	TUFXKS 60000	480,000	600,000	1,200,000	1,039,000	848,000	10.20	16" / 8"

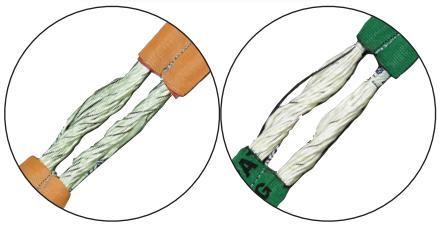
Please Note: Work Load Limits include both paths and are for one complete sling. Work Load Limits are based upon connection points that have equal or greater strength. Twin-Path® Extra Slings conform to the specifications and standards of: ASME B30-9, Chapter 6, Web Sling and Tie Down Association, WSTDA-RS-1, US Navy, NAVFAC P307, Section 14.6.4.3 and Cordage Institute Roundsling Standard, CI-1905.

Dimensions can vary according to the hardware or bearing points used with Twin-Path® Extra Slings.

US Patent Nos. 7,661,737 and 5,651,572
EP Nos. 07851663 and 1,899,255
Japanese Patent No. 2929431
Canadian Patent No. 2,195,393
Australian Patent No. 707924

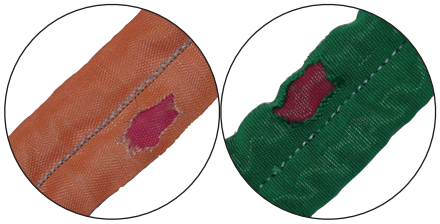
PATENTED BACK-UP PROTECTION

Twin-Path® slings are actually two complete yet separate slings in one. Each path accounts for 50% of the total sling Work Load and makes its own separate connection between the hook and the load. Twin-Path® slings provide sling users redundant, back up protection.



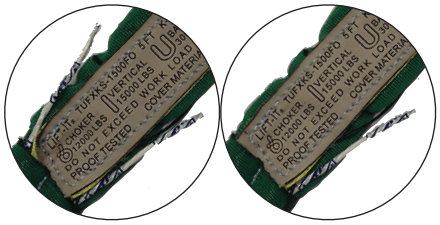
EASY INSPECTION

Twin-Path® slings provide sling users with an early warning inspection system. The load bearing core yarn is encapsulated by Covermax® or polyester covers and does not contact the load. Cornermax® is made from a double layer industrial nylon material. If you see the inner, red cover, remove the sling from service and return it for repair evaluation.



TATTLE TAILS

Before each use, inspect the entire sling. Tattle Tails are not a precision force measurement device. Tattle tails are an extension of the load bearing core yarns. Tattle Tails will retract and eventually disappear as the sling is severely overloaded. Tattle Tails must extend past the tag area of the sling. Both Tattle Tails must be visible; if not, remove the sling from service for repair evaluation. If Tattle Tails or any part of the sling shows evidence of chemical degradation, remove it from service for repair evaluation.



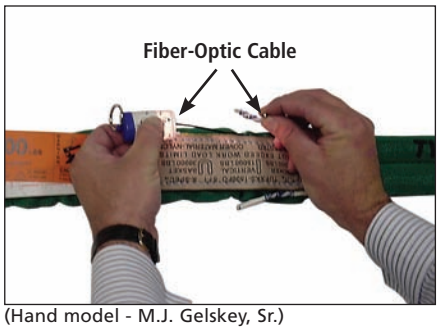
TAILS PRESENT
PASS

TAIL MISSING
FAIL

FIBER-OPTIC INSPECTION SYSTEM

Only Twin-Path® Slings have a Fiber-Optic Inspection System. Fiber Optic Inspection assists sling users and inspectors in evaluating the condition of the load bearing core yarns. Core Yarn condition can be inspected by checking Fiber Optic cable conductivity. If Core Yarn has suffered chemical, heat or crushing damage, fiber optic cables will lose the ability to transmit light from one end to the other. Lack of light conductivity gives the inspector a reason to remove the sling from service and return it for repair evaluation. Fiber Optic cables will conduct light from overhead sources or flashlights. The inspector simply covers and removes a finger from one cable end and watches the other cable end for blinking, indicating conductivity. Fiber Optic Inspection combined with thorough visual and hand over hand inspection techniques provides inspectors the assurance slings are acceptable for use.

US Patent No. 5,651,572

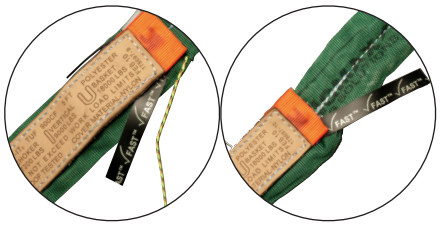


(Hand model - M.J. Gelskey, Sr.)

✔CHECK -FAST® INSPECTION SYSTEM

✔Check-Fast® Inspection provides users and inspectors a pass/fail inspection system for evaluating load bearing core yarn condition. Damage to core yarn from fiber on fiber abrasion, UV degradation and severe overload can be detected. The ✔Check-Fast® tag and External Warning Indicator (EWI) make up the ✔Check-Fast® Inspection System. If accidental overload beyond rated capacity occurs, the External Warning Indicator (EWI) will disappear before the sling fails. Sling users and inspectors now have an objective pass/fail inspection system that is not subjective. The ✔Check-Fast® Inspection System combined with visual and tactile inspection techniques provides improved job site safety. Specify Check-Fast® by adding CF to the stock number, i.e., TUFXKS 4000 CF.

US Patent No. 7,661,737



EWI PRESENT
PASS

EWI MISSING
FAIL



EWI External Warning Indicator

⚠ WARNING

Slings can fail if damaged, misused, or overloaded. Inspect before use. Damaged slings shall not be used. Do Not Exceed Rated Capacity. Protect sling from being cut by load edges, protrusions, corners and abrasive surfaces. Avoid exposure to damaging chemicals and temperatures over 180 degrees (F). DEATH or INJURY can occur from improper use or maintenance.

TREMENDOUS SAVINGS: Time is money and the ease of handling ultra-light, Twin-Path® Extra Slings adds up to substantial, cumulative savings. TUFXKS 7000 x 35 ft. weighs a mere 49 Lbs. and is rated at 140,000 Lbs. Basket WLL. A wire rope sling of equal length and strength weighs 588 Lbs. Extra cranes, forklifts, transport vehicles and personnel are no longer required for Twin-Path® Extra Slings. They have documented savings and prove to be the least expensive sling you will buy and use.

USER FRIENDLY: Twin-Path® Extra Slings are easy to handle and will not "choke lock", inhibiting sling removal from the load. Lightweight, Twin-Path® Extra Slings help eliminate typical and prevalent back, hand, foot and head injuries when using heavy, awkward, cumbersome wire rope and chain slings.

LOAD FRIENDLY: Twin-Path® Slings provide load protection and will not mar, scratch or deface the most delicate metallic surface. Twin-Path® Slings are equally gentle on non-metallic loads.

LOW ELONGATION: A Twin-Path® Extra Sling (TUFXKS 11000 x 328 in.), with High Performance, K-Spec® Core Yarn was vertically proof tested to 220,000 Lbs. After ten minutes, total elongation of 2 inches was recorded. Low elongation extends sling longevity as scraping over load surfaces is minimized.

PULLING AND TOWING: Destruction testing demonstrates that Twin-Path® Extra Slings, featuring K-Spec® Core Yarn recoil very little at break. High modulus, low stretch materials eliminate most of the devastating whiplash effects, characteristic of chain, wire rope, nylon and polyester slings.

⚠ WARNING

NEVER STAND UNDER, ON, NEAR or IN LINE WITH A SLING, TOW or VEHICLE STRAP UNDER TENSION.
NEVER USE A SLING FOR LIFTING AFTER USE IN A TOWING OR RECOVERY OPERATION.
NEVER USE A TOW STRAP FOR LIFTING.

SUPERIOR ABRASION RESISTANCE: Twin-Path® Slings feature polyester or Covermax® covers. Seamless, Covermax® covers are specifically woven to provide abrasion resistance and are approximately four times more abrasion resistant than polyester covers.

MATCHED SLING LENGTHS: Twin-Path® Extra Slings are made to matched lengths on a consistent basis. The accuracy of our products is unparalleled.

SPACE SAVER: Storage problems are easily resolved as Twin-Path® Extra Slings require substantially less space than bulky, cumbersome wire rope and chain slings.

ENVIRONMENTALLY SENSITIVE: Twin-Path® Slings do not require lubrication and will not corrode, thereby eliminating the harmful release of chemical agents or by-products. Twin-Path® Slings with Covermax® covers are more resistant to UV degradation than unprotected slings or slings equipped with covers that are not genuine Covermax® covers. Twin-Path® Slings do not lose strength when wet.

CYCLIC TESTING: Repeated, vertical, fatigue testing was performed on Twin-Path® Extra Slings with K-Spec® Core Yarn. After 50,000 cycles to 150% Work Load, the independent test facility confirmed an 85 % retention of the original tensile strength. Twin-Path® Extra Slings with Covermax® covers will outlast and outperform other synthetic and wire rope slings.

REPAIRABILITY: The abrasion resistance of Covermax® covers facilitates repair to Twin-Path® Slings, when Core Yarns are not damaged. Slings that appeared to be extremely distressed have been successfully repaired for a fraction of the original price. Trained, factory professionals carefully inspect every area of damage. If Core Yarns are undamaged, covers are repaired and the sling is proof tested to 200% Work Load. When abrasion resistance and longevity are considerations and when only the best is good enough, choose Twin-Path® Extra Slings with Covermax® covers.

EXPOSURE TEMPERATURES: Twin-Path® Slings should not be exposed to temperatures above 180˚F/82˚C or below -40˚F/-40˚C. Twin-Path® Sparkeater® Slings should not be exposed to temperatures above 300˚F/149˚C or below -40˚F/-40˚C.

COLD WEATHER EXPOSURE: Twin-Path® Extra Slings with K-Spec® Core Yarns have been used successfully in Northern Canada and Alaska for many years, without incident. The same yarn components used in K-Spec® Core Yarn are also used in deep space exploration applications. Twin-Path® Extra Slings with K-Spec® Core Yarns are a viable alternative for cold weather applications.

LOAD MANIPULATION: When Twin-Path® Slings are used to change the orientation of an object, from a vertical to horizontal attitude, or vice versa, the cross over point on the sling paths, becomes a "hinge" point. Even Covermax® covers will become damaged at the "hinge" point. If Core Yarns become visible, do not use the sling. Remove it from service for repair evaluation.

TATTLE TAILS: Twin-Path® Extra Slings have been extensively used and tested in all possible hitch configurations. In normal use, tattle tails perform as expected. When slings are used as load manipulators, i.e., used to turn or rotate loads, tattle tales will malfunction. The malfunction results from the difference in the external friction between the sling cover material and the manipulated object and the internal friction between the Core Yarns and sling cover material. Simply stated, the sling cover renders to the load, while the load carrying yarns rotate within the sling cover.

PATH ORIENTATION: Twin-Path® Slings feature two paths that must be kept side by side. Folding one path on top of the other produces differential path lengths. The top path will see more tension than the lower path. In this scenario, sling Work Load Limits are reduced by 50%. It is also extremely important to load both paths of Twin-Path® Slings equally. DO NOT side load or edge load Twin-Path® Slings. When placing multiple slings into a lifting fixture, DO NOT "stair step" paths partially over each other. Place the paths directly on top of each other. Ensure the TAG PATCH portion of the sling is above the load and below the lifting fixture.



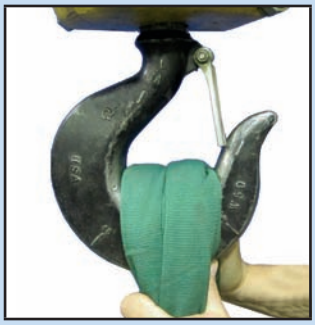
Keep folds and wrinkles off the hook, hardware and/or load.



Milk folds and wrinkles out of the cover.



DO NOT fold one path over the other path to make the sling "fit".



Squeeze both paths together to fit sling into hooks and fittings.



When rigging a basket hitch, DO NOT pull slack out of the hitch with the crane.



Sling users must take the slack out, before lifting.



DO NOT allow the sling to roll over itself and twist at the bite of the choker hitch.



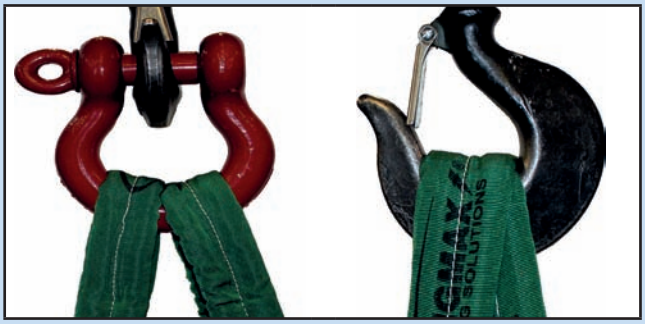
Make sure the paths of the sling run smooth in the bite of the choker hitch without twisting.



DO NOT place the sling tag in the hook, shackle or connection hardware.



The sling tag should be placed 18-24 inches away from connection hardware.



When placing multiple Twin-Path® slings in hardware, place the slings directly on top of each other or side by side. DO NOT stair-step paths partially over each other.

COMPONENT HARDWARE: When synthetic slings are used with a shackle, it is recommended that the slings be rigged in the bow of the shackle and not on the pin. Shackle pins can damage synthetic slings, resulting in sling failure. Placing slings on shackle pins should be avoided, unless the sling is protected. Component manufacturers are using stronger materials to produce smaller, stronger fittings. Twin-Path® Slings forced into a hook or improperly sized fitting may be damaged. The sling/fitting relationship must be proper to ensure that the sling will seat properly, deriving the greatest strength and longevity.

PROOF TESTING: All newly manufactured and repaired Twin-Path® slings are proof tested. Slings are pulled to twice Work Load Limit and held for a minimum of 15 seconds. Our proof test machine is certified annually to meet or exceed ASTM-E4 or other equivalent standards.

SLING INSPECTION SYSTEMS

A specific procedure for sling inspection is the best safeguard against injury, death and property damage. It is important that you employ a three stage level of inspection to ensure that slings are inspected with the appropriate frequency. It is also important that all inspections must be done by trained and qualified personnel.

To detect possible damage, you should perform a visual inspection of the entire sling and also feel along its entire length, as some damage may be felt more than seen. You should look and feel for any of the types of conditions listed in the Removal from Service Criteria. Pages 102 and 118 depict examples of some of the types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

If you identify ANY of these types of damage in a sling, remove it from service immediately, even if the damage you see or feel is not as extensive as shown on pages 102 and 118. Slings that are removed from service must be destroyed and rendered completely unusable unless they can be repaired and proof tested by the manufacturer. Never ignore sling damage or attempt to perform temporary field repairs of damaged slings, (i.e., tie knots in the sling, etc.). It is very important that slings are regularly and properly inspected. If you are not sure whether or not a sling is damaged, **DO NOT USE IT**.

INITIAL INSPECTION

The Web Sling and Tie Down Association defines the initial level of inspection as, "Before any new or repaired sling is placed in service, it shall be inspected by a qualified person to ensure that the correct sling is being used, as well as to determine that the sling meets the applicable requirements".

The American Society of Mechanical Engineers also states in the initial inspection that, "prior to use, all new, altered, modified or repaired slings shall be inspected by a designated person to verify compliance to all applicable standards".

The initial level of inspection is done upon receipt to ensure that no damage has occurred during transit. The products must also be verified to be correct, as ordered and they comply with the manufacturer's specifications. Without printed product specifications this comparison cannot be accomplished. If written records for individual slings are to be maintained, the documentation should be initiated at this level of inspection. Recordkeeping at the initial level of inspection is not required.

FREQUENT INSPECTION

The Web Sling and Tie Down Association defines the frequent level of inspection as one that is done by the user or other designated person daily or before each shift in NORMAL service conditions. When SEVERE service conditions exist, the sling must be inspected before each use. See page 476 for definitions of Normal, Severe and Special Service. The entire sling shall be thoroughly examined and removed from service if damage is detected. OSHA and ASME stipulate that, "before each day or shift, the sling and all fastenings and attachments shall be inspected for damage and defects by a competent person designated by the employer".

If you are unsure if the daily or pre-shift inspection has been done, take the time to inspect the sling before you use it. WSTDA, OSHA and ASME provide minimum guidelines. Never assume that slings have been inspected by others.

A qualified person must also determine that the sling is proper for the intended use, hitch, load and environment. Any condition that may result in a hazard shall cause the sling to be removed from service. Written inspection records are not required for frequent inspections.

PERIODIC INSPECTION

All slings must be inspected "periodically" by designated personnel at regular intervals. In order to validate the Frequent Level of Inspection, the Periodic Inspection should be done by someone other than the individual(s) who performs the Frequent Inspection. The interval is based upon: the frequency of use, severity of the service conditions, the nature of the work being performed and experience gained during the inspection of slings used in similar circumstances. Recommendations to prevent damage must be evaluated to improve the service life of the replacement slings. Periodic Inspection intervals shall not exceed one year intervals.

ASME stipulates the following time interval guidelines for Periodic Inspections:

Normal Service - Yearly

Severe Service - Monthly to Quarterly

Special Service - As recommended by a Qualified Person

Written records of the most recent periodic inspection shall be maintained. Reference to a unique, sling identification number is not required. If your employer or industry requires recording the condition of individual slings, continue the practice. The important point to realize is the ASME recordkeeping requirement mandates that the event be documented not the condition of individual slings.

Irrespective of the recordkeeping requirements that govern your actions, it is important that slings inspected "periodically" be identified or tracked to validate that the Periodic Inspection occurred. Lift-It® Slings can be equipped with an Inspection Loop™, Inspection Tag or RFID Chipped for easy, visual verification of Periodic Inspections (See pages 54 and 55).

Designated Person: Selected or assigned by the employer or employer's representative as being competent to perform specific duties.

Qualified Person: A person, who by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

Twin-Path® Inspection

Twin-Path® slings must be inspected thoroughly for damage. Visual, Tactile and patented inspection systems such as ✔CHECK-FAST®, Fiber Optics and Tattle Tails will assist inspectors in determining sling condition. Twin-Path® slings shall be removed from service for an evaluation by the manufacturer if any of the following conditions are detected:

1. ✔CHECK-FAST® External Warning Indicator (EWI) and Tattle Tail indicators shall extend past the sling tag area. If slings are equipped with ✔CHECK-FAST® and the EWI is not visible or both Tattle Tails are not visible, remove the sling from service and return to the manufacturer for repair evaluation.
2. If slings are equipped with the Fiber-Optic Inspection option, inspect by allowing light to enter the fiber optics. If the fiber optic cable does not transmit light from end to end, remove the sling from service and return for repair evaluation.
3. If sling tags are missing or illegible, slings shall not be used and be returned to manufacturer for repair evaluation.
4. Inspect slings for evidence of heat damage, i.e., melting, charring or weld spatter. Sparkeater® Slings shall not be exposed to temperatures over 300°F/149°C or below -40°F/-40°C. Twin-Path slings with K-Spec® and polyester core yarn shall not be exposed to temperatures above 180°F/82°C or below -40°F/-40°C.
5. If any part of the sling is stiff or brittle, indicating heat or chemical damage, remove the sling from service. Return the sling to the manufacturer for repair evaluation.
6. Slings shall be examined throughout their length for damage such as: holes, tears, cuts, embedded materials, abrasive wear or snags that expose the core yarn. If damage is detected, slings shall be removed from service for repair evaluation.
7. Damage to the cover may indicate a loss of core yarn strength. Slings with serious cover damage shall not be used until evaluated by the manufacturer.
8. If core yarns are broken, cut or damaged, slings must be removed from service. If broken stitching in the cover exposes core yarn, slings must be removed from service and returned to the manufacturer for repair evaluation.
9. Twin-Path® slings and attached fittings shall be regularly inspected. In addition to the initial inspection and periodic inspections done by designated, competent inspectors, slings shall be visually inspected before each use.
10. Fittings determined to be elongated, damaged, corroded or not AMSE B30.10 and/or ASME B30.26 compliant shall be removed from service and returned to the manufacturer for repair evaluation.
11. Slings that are tied in knots or joined by knotting.
12. Inspections shall be performed as required by competent persons and inspection documentation shall be maintained. Inspections may be done more often based on: frequency of use, severity of conditions or experience gained on the service life of slings used in similar circumstances. Periodic inspection intervals must not exceed 1 Year.
13. Slings removed from service that are not repairable shall be destroyed and rendered completely unfit for any future use.

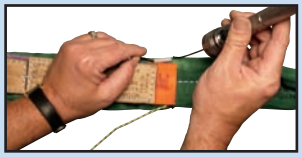
✔CHECK-FAST® EWI PRESENT
(Sling passes inspection)



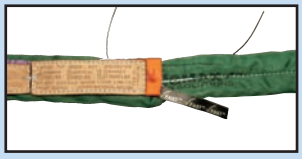
TATTLE TAILS PRESENT
(Sling passes inspection)



FIBER OPTIC-Transfers Light
(Sling passes inspection)



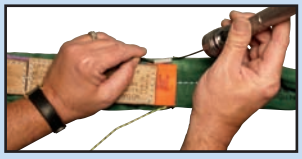
✔CHECK-FAST® EWI MISSING
(Sling fails inspection)



TATTLE TAIL MISSING
(Sling fails inspection)



FIBER OPTIC-No Light Transfer
(Sling fails inspection)



Refer to pages 38-42 for additional information on environmental and mechanical considerations applicable to Twin-Path® slings.

Refer to pages 43-52 for information on sling protection. Be proactive and employ protection that is adequate to prevent sling damage and ensure your safety.

TWIN-PATH® BRIDLES

Twin-Path® Bridles are the lightest and strongest synthetic bridles available.

Twin-Path® Bridles with K-Spec® core yarn are less than half the weight of an equivalent, steel bridle assembly. With no heavy masterlink, the top eye fits effortlessly over the lifting mechanism.

Please specify top eye length and information for interfacing hardware. For additional versatility, hooks can attached or removed with G-Links™, see pages 207-210.

Work Load Limits of 200,000 Lbs. are readily available.

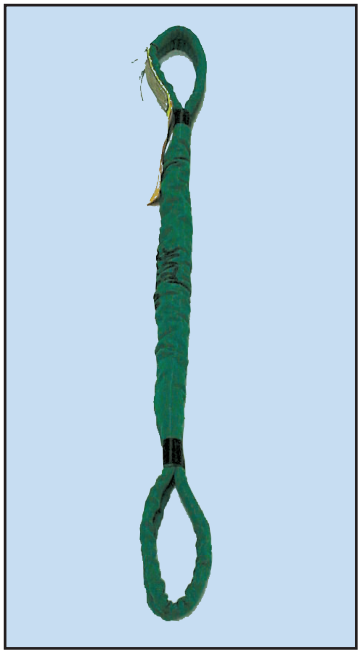
If four leg bridles are required, use two Twin-Path® Bridles.



TWIN PATH® BRIDLE SPECIFICATIONS (Capacities in Lbs.)					
Stock Number	Vertical	60 Deg. Horizontal	45 Deg. Horizontal	Eye Width	Weight Lbs./Ft.
TUFXKSB 1000	10,000	8,500	7,000	3 In.	.34
TUFXKSB 1500	15,000	12,750	10,500	3 In.	.44
TUFXKSB 2000	20,000	17,000	14,000	3 In.	.61
TUFXKSB 3000	30,000	25,500	21,000	4 In.	.88
TUFXKSB 4000	40,000	34,000	28,000	4 In.	1.23
TUFXKSB 5000	50,000	42,500	35,000	5 In.	1.65

TWIN-PATH® EYE & EYE SLINGS

Twin-Path® Eye and Eye Slings are a perfect Slingmax® solution for applications requiring an eye and eye configuration. All the benefits of Twin-Path® are included in the Twin-Path® Eye & Eye Sling, which features a single body and integrated eyes.



TWIN PATH® EYE & EYE SLING SPECIFICATIONS (Capacities in Lbs.)					
Stock Number	Choker	Vertical	90° Basket	Weight (Lbs./Ft.)	Width (Inches)
TUFXKS 1000EE	8,000	10,000	20,000	.28	3
TUFXKS 1500EE	12,000	15,000	30,000	.36	3
TUFXKS 2000EE	16,000	20,000	40,000	.50	3
TUFXKS 2500EE	20,000	25,000	50,000	.60	4
TUFXKS 3000EE	24,000	30,000	60,000	.75	4
TUFXKS 4000EE	32,000	40,000	80,000	1.00	4
TUFXKS 5000EE	40,000	50,000	100,000	1.40	5

Please Note: Work Load Limits include both paths and are for one complete sling. Work Load Limits are based upon connection points that have equal or greater strength. Twin-Path® Extra Slings conform to the specifications and standards of: ASME B30-9, Chapter 6, Web Sling and Tie Down Association, WSTDA-RS-1, US Navy, NAVFAC P307, Section 14.6.4.3 and the Cordage Institute Roundsling Standard, CI-1905.

⚠ WARNING Slings can fail if damaged, misused, or overloaded. Inspect before use. Damaged slings shall not be used. Do Not Exceed Rated Capacity. Protect sling from being cut by load edges, protrusions, corners and abrasive surfaces. Avoid exposure to damaging chemicals and temperatures over 180 degrees (F). DEATH or INJURY can occur from improper use or maintenance.

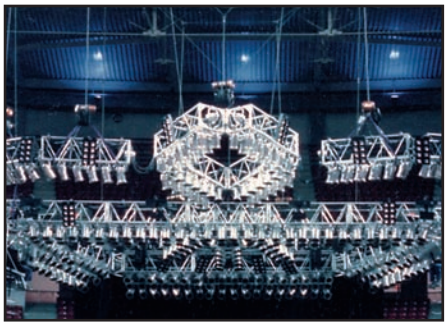
Twin-Path® Sparkeater® Slings

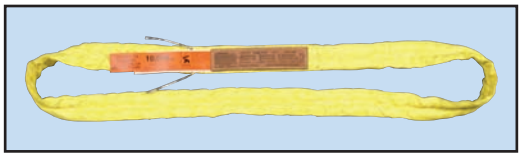
Twin-Path® Sparkeater® Slings provide exceptional thermal stability and withstand temperatures up to 300˚F/149˚C. Fire exposure testing was conducted by London Scientific, in conjunction with the Offshore Certification Bureau. Sparkeater® Slings were identified as being, as good as wire rope or chain slings in off-shore applications for the petroleum industry. Twin-Path® Sparkeater® Slings are available in 10,000 to 100,000 Lbs. vertical capacities.

Aramid, load bearing core yarns used in Twin-Path® Sparkeater® Slings have high tenacity, low stretch and desirable, thermal properties. A Nomex®, protective, outer cover encapsulates the inner, red cover, providing an early warning alert.

Sparkeater® Slings feature all the benefits of the Twin-Path® sling design: two paths for back up, redundant, protection, double, contrasting covers and tattle tails.

Twin-Path® Stage Rigging Sparkeater® slings are a perfect Slingmax® solution for the inherent dangers posed by pyrotechnical displays. Stage Rigging Sparkeater® Slings are furnished with a black, outer, Nomex® cover.









TWIN-PATH® SPARKEATER® SPECIFICATIONS

Twin Path® Stock Number	WORK LOAD LIMITS (Lbs.) Choker	Vertical	Basket Hitches 90°	60°	45°	Approximate Weight (Lbs. per Ft.) (Bearing-Bearing)	Nominal Body Width (Inches) Tube/Tapered
TPSE 1000	8,000	10,000	20,000	17,320	14,140	.40	1.5 - 3"
TPSE 1500	12,000	15,000	30,000	25,980	21,210	.45	1.5 - 3"
TPSE 2000	16,000	20,000	40,000	34,640	28,280	.51	1.5 - 3"
TPSE 2500	20,000	25,000	50,000	43,300	35,350	.57	1.5 - 3"
TPSE 3000	24,000	30,000	60,000	51,960	42,420	.71	2.0 - 4"
TPSE 4000	32,000	40,000	80,000	69,280	56,560	.83	2.0 - 4"
TPSE 5000	40,000	50,000	100,000	86,600	70,700	1.14	2.0 - 4"
TPSE 6000	48,000	60,000	120,000	103,920	84,840	1.27	2.0 - 4"
TPSE 7000	56,000	70,000	140,000	121,240	98,980	1.39	3.5 - 7"
TPSE 8500	68,000	85,000	170,000	147,220	120,190	1.65	3.5 - 7"
TPSE 10000	80,000	100,000	200,000	173,200	141,400	1.84	3.5 - 7"

✔Check-Fast® High Performance Roundslings

✔Check-Fast® High Performance Roundslings are the only single path HP Roundsling to feature the ✔Check-Fast®, Overload Inspection System. Resilient K-Spec® Load Bearing Core Yarns are encapsulated by Covermax®, one of the most durable sling covers available.



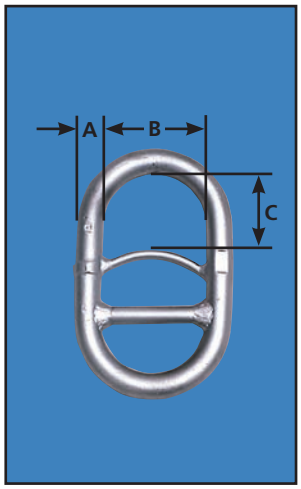
✔CHECK-FAST® HIGH PERFORMANCE ROUNDSLING SPECIFICATIONS

✔Check-Fast® HP Roundsling Stock Number	WORK LOAD LIMITS (Lbs.) Choker	Vertical	Basket Hitches 90°	60°	45°	Approximate Weight (Lbs. per Ft.) (Bearing-Bearing)	Nominal Body Width (Inches)
SP 500CF	4,000	5,000	10,000	8,660	7,070	0.34	2.5"
SP 1000CF	8,000	10,000	20,000	17,320	14,140	0.38	2.5"
SP 1500CF	12,000	15,000	30,000	25,980	21,210	0.44	2.5"
SP 2000CF	16,000	20,000	40,000	34,640	28,280	0.52	2.5"
SP 2500CF	20,000	25,000	50,000	43,300	35,350	0.59	3"
SP 3000CF	24,000	30,000	60,000	51,960	42,420	0.65	3"
SP 4000CF	32,000	40,000	80,000	69,280	56,560	0.85	3"
SP 5000CF	40,000	50,000	100,000	86,600	70,700	0.98	4"
SP 6000CF	48,000	60,000	120,000	103,920	84,840	1.11	4"
SP 7000CF	56,000	70,000	140,000	121,240	98,980	1.24	4"
SP 8500CF	68,000	85,000	170,000	147,220	120,190	1.63	5"
SP 10000CF	80,000	100,000	200,000	173,200	141,400	1.81	5"

Twin-Path® Adjustable Bridles

Twin-Path® Adjustable Bridles are the ultimate rigging tool. They replace standard two or four leg bridles, with the additional value of self-adjustment to awkward loads. One leg has twice the capacity of the other leg. As tension is applied, Twin-Path® Adjustable Bridles self-adjust over the center of gravity to find the lifting point for level, load handling.







TWIN-PATH® ADJUSTABLE BRIDLE SPECIFICATIONS										
Bridle Stock Number	Bridle Capacity (Lbs.)	Nominal Sling Width	Adjustable Ring Specifications				Shackle Specifications		Sling Weight (Lbs.) (Approximate)	
			Ring Diameter "A"	Hook Area Width "B"	Hook Area Length "C"	Unit Weight (Lbs.)	Nominal Shackle Size	Work Load Limit (Tons)	Base 3 Ft.	Adder Per/Ft.
TUFA 6	6,000	2"	13/16"	3-1/2"	2-5/8"	3	5/8"	3-1/4T	5	1.35
TUFXKSA 12	12,000	3"	1-1/8"	4-1/8"	3-5/8"	5.5	7/8"	6-1/2T	7	1.95
TUFXKSA 20	20,000	4"	1-1/8"	4-1/8"	3-5/8"	5.5	1-1/4"	12T	14	2.70
TUFXKSA 40	40,000	5"	1-5/8"	5-1/4"	4-3/4"	18.7	1-3/4"	25T	31	4.20
TUFXKSA 60	60,000	5"	2"	7"	6-1/4"	47.3	2"	35T	60	5.70
TUFXKSA 90	90,000	6"	2-1/4"	8"	7-1/4"	67.5	2-1/4"	55T	86	8.10

TUFA 6 TPA Bridle Sling features polyester Load Bearing Core Yarn.
TUFXKSA TPA Bridle Slings feature K-Spec® High Performance, Load Bearing Core Yarn.
Please Note: Capacities shown are for the entire bridle assembly with the double leg at 90 ° to 45° horizontal angle.

Twin-Path® Military Adjustable Bridles

Twin-Path® Military Adjustable Bridles were designed to give a level lift to military aircraft (nose to tail), regardless of whether the aircraft is "slick", has attached armaments, fuel or is missing parts. Twin-Path® Military Adjustable Bridles include all necessary fittings to attach to the original equipment, airframe lifting adaptors. Ideal for aircraft recovery crews when the option of removing attachments or fuel does not exist and light enough in most cases for one person to carry.



TPXA-F18-44

TWIN-PATH® MILITARY ADJUSTABLE BRIDLE SPECIFICATIONS			
Bridle Stock Number	Bridle Capacity (Lbs.)	Assembly Weight (Lbs.)	Aircraft Model Number
TPXA-F15-41	41,000	74	F-15
TPXA-F16-41	41,000	74	F-16
TPXA-F18-44	44,000	71	F-18
TPXA-A10-40	40,000	175	A-10

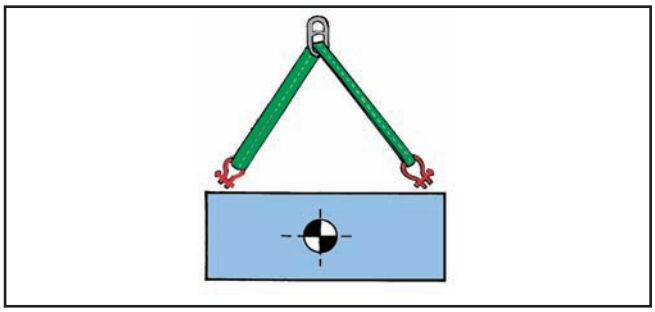


TPXA-A10-40

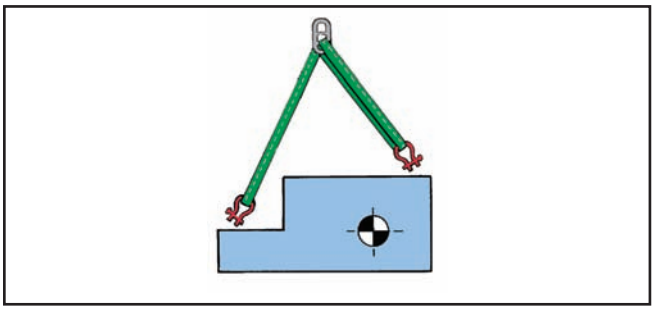
Twin-Path® Adjustable Bridles

Twin-Path® Adjustable Bridle Slings are a multiple-purpose rigging tool and proper use is extremely important. The adjustment ring has a double leg for the heavy side of the load and a single sling for the lighter side. Only competent, trained personnel shall use any rigging device.

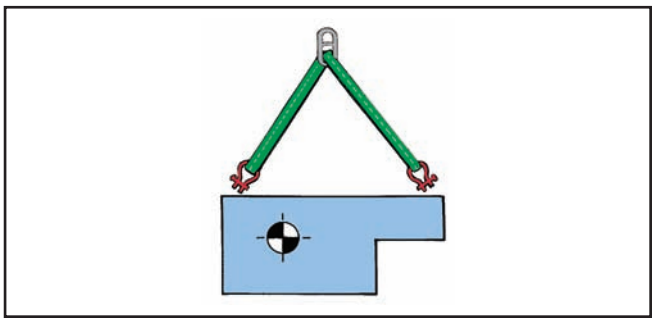
⚠ WARNING Improper use or lack of training may result in severe INJURY or DEATH.



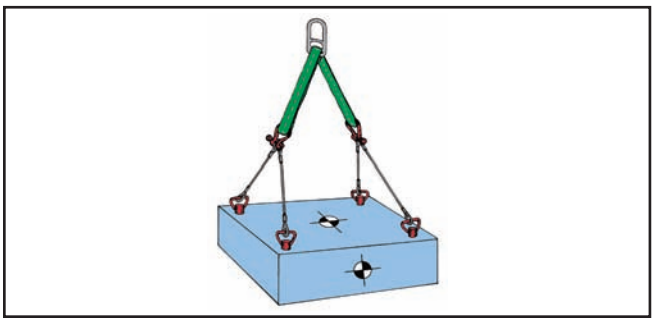
If the lifting points are equal in distance from the center of gravity, the Twin-Path® Adjustable Bridle can be attached with the double or single leg on either lifting point.



If the lifting points are an equal distance on either side of the center of gravity, but one lift point is higher; the double leg should be attached to the higher lifting point.



If one of the lifting points is closer to the center of gravity, attach the double leg to this lifting point. .If the Twin-Path® Adjustable Bridle is attached with the single leg nearest the center of gravity, the lift cannot be made.



⚠ WARNING Never use Twin-Path® Adjustable Bridles when the horizontal angle is less than 45˚ for the double leg. Always connect above the center of gravity. If connections are made below the center of gravity, the load may turn when lifted.

Twin-Path® Polyester Slings

TWIN-PATH® POLYESTER SLING SPECIFICATIONS

Polyester Cover Stock Number	Covermax® Cover Stock Number	WORK LOAD LIMITS (Lbs.) Choker	Vertical	Basket Hitches 90˚	Basket Hitches 60˚	Basket Hitches 45˚	Approximate Weight Lbs./Ft. (Bearing)	Approximate Body Width (Inches)
TP 600	TUF 600	4,800	6,000	12,000	10,392	8,484	.48	3″
TP 750	TUF 750	6,000	7,500	15,000	12,990	10,605	.65	3″
TP 900	TUF 900	7,200	9,000	18,000	15,588	12,726	.70	3″
TP 1200	TUF 1200	9,600	12,000	24,000	20,784	16,968	.90	4″
TP 1400	TUF 1400	11,200	14,000	28,000	24,248	19,796	.95	4″
TP 1700	TUF 1700	13,600	17,000	34,000	29,440	24,038	1.2	4″
TP 2200	TUF 2200	17,600	22,000	44,000	38,104	31,108	1.4	5″
TP 2600	TUF 2600	20,800	26,000	52,000	45,032	36,764	1.7	5″
TP 3200	TUF 3200	25,600	32,000	64,000	55,424	45,248	1.9	6″
N/A	TUF 5000	40,000	50,000	100,000	86,600	70,700	2.7	6″
N/A	TUF 6000	48,000	60,000	120,000	103,920	84,840	3.0	6″

⚠ WARNING Slings can fail if damaged, misused, or overloaded. Inspect before use. Damaged slings shall not be used. Do Not Exceed Rated Capacity. Protect sling from being cut by load edges, protrusions, corners and abrasive surfaces. Avoid exposure to damaging chemicals and temperatures over 180° (F). DEATH or INJURY can occur from improper use or maintenance.

⚠ WARNING TO THE USERS OF ADJUSTABLE ROPE SLINGS



The ⚠WARNING Icon, used in our product information is done to alert sling users to potentially hazardous conditions and situations.

⚠WARNING It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this bulletin, in our catalog, on our website www.lift-it.com and follow OSHA and ASME guidelines. Use by untrained persons is hazardous.

The American Society of Mechanical Engineers, in the ASME B30.9 Sling Safety Standard, clearly establishes the requirement for training. Section 9-4.1-Training states, "Synthetic rope sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter."

⚠WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations.

Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and rigging products will fail if damaged, abused, misused, overused or improperly maintained.

Any hazardous condition disclosed by an inspection shall require sling replacement. Temporary repairs are not permitted. Damage and wear seriously reduce sling Work Load Limits.

Always know the load weight and select the appropriate sling for the load, configuration of lift necessary to ensure load control and any chemical exposure.

Always take into account sling angles to calculate changes in the sling Work Load Limits, when used in choker and non-perpendicular vertical, basket or bridle configurations.

Ensure that the load will not cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces with suitable materials of sufficient strength, thickness and construction.

The strength of synthetic rope slings can be affected by chemically active environments. Sling materials may be susceptible to damage from caustic or acid substances or fumes. Strong oxidizing environments attack all common sling materials and components. Consult the manufacturer prior to selection and use.

Absorbed moisture or impurities will dramatically increase the conductivity of the rope.

Dynamic loading affects ropes with less stretch, to a greater degree, than ropes that have greater elongation properties. Likewise, a shorter length rope is more profoundly affected by dynamic loading, than a longer length rope.

Lifts can be made with any two or three legs of the four leg, Adjustable Rope Sling, if it has a Masterlink or Masterlink with subassembly. If three of the four legs are used, the assembly Work Load Limit must be reduced by 33% and is effectively the same work load as a two leg (double) sling.



⚠ WARNING

Slings can fail if damaged, misused, or overloaded. Inspect before use. Use only if trained. Observe rated load. Use adequate sling protection to avoid damage to sling. DEATH or INJURY can occur from improper use or care. Avoid exposure to acid, alkali, sunlight and temperatures over 180° F. ALWAYS protect the sling from damage with materials of sufficient strength, thickness and construction.

RATED LOAD = RATED CAPACITY = WORK LOAD LIMIT



SYNTHETIC ROPE SLINGS



INSTRUCTIONS FOR CARE ♦ USE ♦ INSPECTION ♦ REPAIR.

CARE ♦ Store away from possible mechanical damage, corrosion, dust, grit, extreme temperatures, sun and any ultraviolet light source. Exposure to sunlight will reduce the strength of synthetic slings. Polyester rope slings lose 30% of sling strength after 12 months of constant exposure; nylon rope slings lose 40% to 60% of sling strength after a 12 to 36 month constant exposure period.

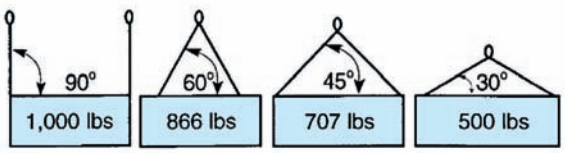
USE ♦ Know the weight of load. ♦ Check tag to confirm that sling is rated adequately for the load (see load angle chart). ♦ Sling shall not be twisted, tied into knots or joined by knotting. ♦ Shackles and other hardware must be inspected and padded if there are edges that could damage the sling. ♦ Be sure that the load can't cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces; **use materials of sufficient strength, thickness and construction.** ♦ Center sling in the base (bowl) of hook unless hook is designed for point loading. ♦ Balance the load. ♦ Maintain load control. ♦ Avoid jerking the load. ♦ Be alert for snagging of load ♦ Do not pull on stuck objects. ♦ Avoid dragging sling over rough surfaces and from under the load. ♦ Choker hitch must choke on rope, never on a splice or end fitting. ♦ Stand clear of load at all times. ♦ Persons are not to ride on sling or load. ♦ For use in abnormal conditions of heat, cold, chemical activity, consult the manufacturer. ♦ Rope slings must be used with compatible fittings, hooks and shackles. ♦ Bunching of rope reduces capacity. ♦ Avoid exposure to acid, alkali or sunlight. ♦ Do not use synthetic rope slings at temperatures above 180° F or below -40° F. ♦ Pad edges of load to avoid damage to the synthetic rope sling.

INSPECTION ♦ Before each use: Check tag to confirm that sling is rated adequately for the load. Inspect rope for cuts, areas of extensive fiber breakage or abrasion along the length of rope. Check for a reduction of no more than 10% of the rope diameter or if covered by fuzz or whiskers. Inspect the inside of the rope for broken or melted fibers for no more than 10% of the fiber in any strand. Inspect hardware for distorted, cracked, worn fittings. **If this wear or damage is present or if the rated load tag is missing or illegible, remove from service and repair or replace sling.** Frequent inspection is done by the person handling the sling before each use and must include all of the before use items. Periodic Inspections are required at least annually for normal service, quarterly or more frequently if in severe service or nearly constant use. Periodic inspections are performed by designated person(s) who are trained and a written record of the most periodic inspection shall be maintained. The inspector shall determine when further use would be hazardous.

REPAIR ♦ If any hazardous condition is disclosed during an inspection, the sling shall be removed from service for repair or replacement. ♦ Field repair is not permitted. Only manufacturers or qualified persons may make repairs. All repaired slings must be proof tested and certified.

LOAD ANGLE CHART

Angle factor *must* be applied to calculate the reduced sling capacity when lifting force is not at 90° to the plane of the load!



Multiply angle factor x sling's vertical rated load to calculate the reduced capacity at the angle.

Angle	Factor
90°	1.0000
80°	0.9848
75°	0.9659
70°	0.9397
65°	0.9063
60°	0.8660
55°	0.8192
50°	0.7660
45°	0.7071
40°	0.6248
35°	0.5736
30°	0.5000

When D/d ratios (see Figure 14) smaller than those cited in Figure 11 of ASME B-30.9 are necessary, the rated load of the sling is decreased. Consult with the manufacturer or a qualified person.

GENERAL NOTE: When D is 8 Times the component rope diameter (d) the D/d is expressed as 8/1.

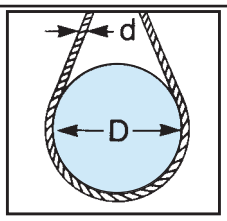
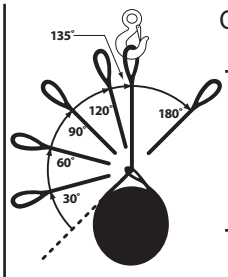


Figure 14 D/d Ratio



Choke Angle Effect

Choker Angle (Degrees)	Rated Capacity, % [Note (1)]
Over 120	100
90 - 120	87
60 - 89	74
30 - 59	62
0 - 29	49

NOTE: (1) Percent of sling rated capacity in a choker hitch.

Because of the reduced lifting capacity, use extra care when the **horizontal** lift angle is less than 45° and do not make lifts of less than 30° load angle. *Example:* A sling with adequate capacity could be broken because of increased tension resulting from angles of less than 30 degrees. When possible, use longer slings to minimize angular tension by increasing the angle.

CONSIDERATIONS

ABRASION:

Avoid all abrasive conditions. Synthetic Rope Slings may be severely damaged if subjected to rough surfaces or damaging edges. Lifting hardware and attachment points must be maintained in good condition and kept free of burrs and rust. Do not drag Synthetic Rope Slings over the floor, ground or over rough surfaces. Dirt and grit can work into the strands, damaging the internal fibers. Look closely at both the inner and outer fibers. When either is worn the rope is weakened. Open the strands and inspect for powdered fiber, indicating internal wear. Examine the internal wear to estimate total fiber loss. Protect slings from cutting and abrasion with sling protection that is the correct size and type. See pages 43-52.

CHEMICALS:

Avoid exposing Synthetic Rope Slings to damaging chemicals. Take into consideration: chemical exposure, such as solvents, acids, alkalis or where fumes, vapors or mists are present. Consult us prior to purchase or use.

DISCOLORATION:

With use, all rope slings become dirty. Areas of discoloration may also indicate chemical damage. Determine the cause of the discoloration and if chemical degradation has occurred, remove the sling from service.

TEMPERATURE:

Synthetic Rope Slings have lower tensile strengths and Work Load Limits at elevated temperatures. Continued exposure at elevated levels may melt, part or cause permanent damage. Do not use at temperatures above 180°(F)/82°(C) or below -40°(F)/-40°(C). Glossy or glazed areas are evidence of heat damage and experience more strength loss than is visibly evident. Fibers adjacent to the heat damaged areas may appear normal, but are not.

CARE AND STORAGE:

Synthetic Rope Slings should be stored in a clean, dry area out of direct sunlight and away from sources of extreme heat. The storage location should also be free of environmental and mechanical damage.

INCONSISTENT DIAMETER:

Inspect for flat areas, bumps or lumps, as they can indicate core or internal damage from overloading or shock loading. If these forms of damage are evident replace the sling and do not use damaged slings for any application.

⚠ WARNING TO THE USERS OF ADJUSTABLE ROPE SLINGS

Absorbed moisture or impurities will dramatically increase the conductivity of the rope.

It is dangerous if personnel are in line with a rope under tension. Rope failure can result in a deadly recoil force. Personnel should never be under a rope sling or suspended load.

Work Load Limits are based on a moderately dynamic lifting or pulling operation. Instantaneous changes (rapid acceleration or sudden stops) constitute hazardous shock loading and WORK LOAD LIMITS AS STATED DO NOT APPLY.

Dynamic loading affects ropes with less stretch, to a greater degree, when compared to ropes that have greater elongation properties. Likewise, a shorter rope is more profoundly affected by dynamic loading than a longer rope.

Lift-It® Adjustable Rope Sling capacities are lower than our competitors. The Work Load Limit of four Leg slings is based upon three legs carrying the load. Our conservative approach is respected by conscientious users and appreciated by sophisticated purchasers.

Lifts can be made with any two or three legs of the four leg, Adjustable Rope Sling, if it has a Masterlink or Masterlink with subassembly. If three of the four legs are used, the assembly Work Load Limit must be reduced by 33% and is effectively the same work load as a two leg (double) sling.

⚠WARNING Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. Observe and do not exceed Work Load Limits. DEATH and INJURY can occur from improper use or maintenance. See pages 123-126 for Important Safety, Use and Inspection Information.

SLING INSPECTION

Synthetic Rope Sling users shall be trained in the selection, inspection, cautions to personnel, environmental considerations and rigging practices. Be sure to read and understand information that accompanies the sling and is contained in this publication. See pages 38-40 for information on mechanical and environmental considerations. Use by untrained persons may result in INJURY or DEATH.

Synthetic Rope Slings must be protected from damage by materials of sufficient strength, thickness and construction. See pages 43-52 for sling protection information.

Inspect prior to use for frayed strands and broken yarns. A pulled strand can snag during use. Do not use Synthetic Rope Slings that appear to be damaged. If there is any doubt, do not use the sling; remove it from service for evaluation. See page 33 for information on Sling Inspection Systems. Be sure to employ all three levels of inspection: Initial, Frequent and Periodic. No visual inspection can accurately determine the residual strength of the sling.

Both outer and inner rope fibers contribute to the strength of Synthetic Rope Slings. When either is worn, Synthetic Rope Slings are weakened. Heavy use will cause the rope to be compacted or hard. This is an indication that rope tensile strength has been reduced.

UV degradation is indicated by discoloration and the presence of splinters and slivers on the rope surface.

SLING DAMAGE

⚠WARNING IF ANY DAMAGE SUCH AS THE FOLLOWING IS VISIBLE, THE SLING SHALL BE REMOVED FROM SERVICE IMMEDIATELY. PHOTOS DEPICT EXAMPLES OF SLING DAMAGE, BUT NOTE THEY ARE EXTREME EXAMPLES PROVIDED FOR ILLUSTRATION PURPOSES ONLY.



Rope Displaying Original Diameter



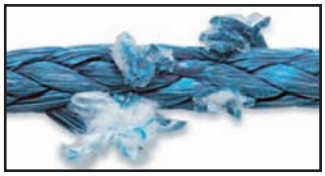
Rope Diameter Reduced 25%* from Abrasion



Rope Strands Displaying Full Volume



Rope Strands Reduced 25%* from Abrasion



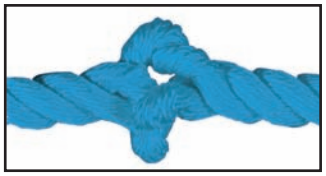
Cut Strands



Compression Slight Sheen Is Visible**



Melting or Glazing Area will be Stiff



Hockles

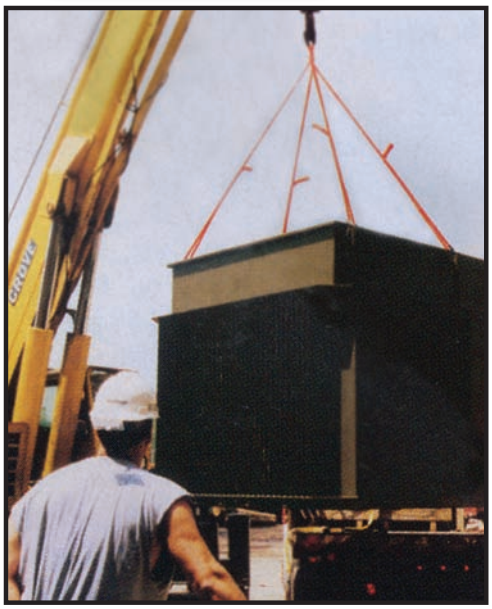
* 10% is cause for removal from service **Don't confuse compression with heat damage.

ASME B30.9-4.9.4 REMOVAL FROM SERVICE CRITERIA

Synthetic rope slings shall be removed from service if conditions such as the following are present:

- Missing or illegible sling identification (See page 34).
  Identification content for rope sling tags is identical to web sling tag requirements.
- Cuts, gouges, areas of extensive fiber breakage along the length and abraded areas on the rope.
- Damage that is estimated to have reduced the effective diameter of the rope by more than 10%.
- Uniform fiber breakage along the major part of the length of the rope in the sling such that the entire rope appears covered with fuzz or whiskers.
- Inside the rope, fiber breakage, fused or melted fiber (observed by prying or twisting to open the strands) involving damage estimated at 10% of the fiber in any strand or the rope as a whole.
- Discoloration, brittle fibers and hard of stiff areas that may indicate chemical damage, ultraviolet light damage or heat damage.
- Dirt and grime in the interior of the rope structure that is deemed excessive.
- Foreign matter that has permeated the rope and makes it difficult to handle and may attract and hold grit.
- Kinks and distortion in the rope structure, particularly if caused by forcibly pulling on loops (known as hockles).
- Melted, hard or charred areas that affect more than 10% of the diameter of the rope or affect several adjacent strands along the length that affect more than 10% of strand diameters.
- Poor condition of thimbles or other components manifested by corrosion, cracks, distortion, sharp edges or localized wear.
- For hooks, removal criteria as stated in ASME B30.10.
- For rigging hardware, removal criteria as stated in ASME B30.26.
- Other visible damage that causes doubt as to the strength of the sling.

Adjustable Rope Slings



Adjustable Rope Slings replace multiple, "non-adjustable" slings by accommodating a range of dimensional requirements with infinite adjustability.

Available in single, double and four leg configurations, standard Adjustable Rope Slings are made from single braid, twelve strand, polyester rope. The polyester rope is treated with a coating to optimize Adjustable Rope Sling service life.

Adjustable Rope Slings fabricated from Vectrus rope provide higher Work Load Limits than standard, polyester rope slings. Vectrus is a single braid, high performance fiber rope, made of Liquid Crystal Polymer (LCP). Super strong and ultra light, Vectrus Adjustable Rope Slings are treated with a coating to enhance abrasion and UV degradation resistance.

Lift-It Adjustable Rope Slings feature wear protection sleeves in the lift and connection eyes. Hooks, thimbles and other hardware can also be attached, by special request.

Adjustable Rope Slings are labeled with the information currently required by the various regulatory agencies. Custom lengths are available.

ADJUSTABLE ROPE SLING SPECIFICATIONS

SINGLE LEG - ADJUSTABLE ROPE SLINGS

ROPE DIAMETER	STOCK NUMBER	POLYESTER WLL (Lbs.)			ADJ. RANGE	STOCK NUMBER	VECTRUS WLL (Lbs.)			ADJUSTMENT RANGE
		CHOKER	VERTICAL	90° BASKET			CHOKER	VERTICAL	BASKET	
3/8 In.	Y-S-382048	800	1,000	2,000	20-48"	V-S-383460	1,600	2,000	4,000	34" - 60"
1/2 In.	Y-S-122860	1,600	2,000	4,000	28-60"	V-S-124372	2,400	3,000	6,000	43" - 72"
5/8 In.	Y-S-583260	2,400	3,000	6,000	32-60"	V-S-5865108	4,800	6,000	12,000	65" - 108"
3/4 In.	Y-S-343872	3,200	4,000	8,000	38-72"	V-S-3475108	6,000	7,500	15,000	75" - 108"
7/8 In.	Y-S-784696	4,800	6,000	12,000	46-96"	V-S-7887120	8,000	10,000	20,000	87" - 120"
1 In.	Y-S-10054120	6,000	7,500	15,000	54"-120"					

DOUBLE LEG - ADJUSTABLE ROPE SLINGS

ROPE DIAMETER	STOCK NUMBER	POLYESTER WLL (Lbs.)		ADJ. RANGE	STOCK NUMBER	VECTRUS WLL (Lbs.)		ADJUSTMENT RANGE
		60 DEG.	45 DEG.			60 DEG.	45 DEG.	
3/8 In.	Y-D-382460	1,700	1,400	24-60"	V-D-383060	3,400	2,800	30" - 60"
1/2 In.	Y-D-123260	3,400	2,800	32-60"	V-D-1243672	5,100	4,200	36" - 72"
5/8 In.	Y-D-583860	5,100	4,200	38-60"	V-D-5857108	10,000	8,400	57" - 108"
3/4 In.	Y-D-344672	6,900	5,600	46-72"	V-D-3467108	12,900	10,600	67" - 108"
7/8 In.	Y-D-785296	10,300	8,400	52-96"	V-D-7876120	17,000	14,100	76" - 120"
1 in	Y-D-10060120	12,100	9,800	60"-120"				

Adjustable Rope Slings

Lift-It® Four Leg Adjustable Rope Slings feature a Top Lifting Link. Depending upon your selection, based on Work Load, you must determine whether a Masterlink or Masterlink with Subassemblies makes the most sense from a fitting weight perspective. With either option, heavy duty thimbles are attached at the connection points to the Top Lifting Link.

Lift-It® Adjustable Rope Slings with Top Lifting Links feature hardware that is substantially larger than other manufacturers. We take into account not only the strength requirements, but the spatial relationship between sling attachment points and interfacing hardware.

Lift-It® Bridle Assembly capacities are lower than our competitors. Four Leg Bridle Assembly capacities are based on three legs carrying the assigned capacity.

Lower capacities and more expensive, larger hardware will never allow us to be the successful, low bidder. Our conservative approach is respected by conscientious users and appreciated by sophisticated purchasers. In this instance, spending more for less provides for increased safety and longer sling service.

Lifts can be made with any two or three legs of the four leg, Adjustable Rope Sling, if it has a Masterlink or Masterlink with subassembly. If three of the four legs are used, the assembly Work Load Limit must be reduced by 33% and is effectively the same as the work load for a two leg (double) sling.

ADJUSTABLE ROPE SLING SPECIFICATIONS

POLYESTER FOUR LEG - ADJUSTABLE ROPE SLINGS WITH TOP LINK

ROPE DIAMETER	STOCK NUMBER	WORK LOAD LIMIT (Lbs.)		ADJ. RANGE	MASTERLINK		MASTERLINK W/SUBS ASSYS.	
		60 DEG.	45 DEG.		DIAMETER	WEIGHT	DIAMETER	WEIGHT
3/8 In.	Y-Q-382460TL	2,500	2,100	24"- 60"	1-1/4"	9.6 Lbs.	5/8"	2.9 Lbs.
1/2 In.	Y-Q-123260TL	5,000	4,200	32"- 60"	1-1/2"	16 Lbs.	1"	9.9 Lbs.
5/8 In.	Y-Q-583884TL	7,700	6,300	38"- 84"	1-3/4"	25 Lbs.	1"	9.9 Lbs.
3/4 In.	Y-Q-344684TL	10,300	8,400	46"- 84"	2-1/4"	55 Lbs.	1-1/4"	20 Lbs.
7/8 In.	Y-Q-785296TL	15,500	12,700	52"- 96"	2-1/2"	75 Lbs.	1-3/4"	44 Lbs.
1 In.	Y-Q-10060120TL	18,100	14,800	60"-120"	2-3/4"	100 Lbs.	2"	71 Lbs.

VECTRUS FOUR LEG - ADJUSTABLE ROPE SLINGS WITH TOP LINK

ROPE DIAMETER	STOCK NUMBER	WORK LOAD LIMIT (Lbs.)		ADJ. RANGE	MASTERLINK		MASTERLINK W/SUBS ASSYS.	
		60 DEG.	45 DEG.		DIAMETER	WEIGHT	DIAMETER	WEIGHT
3/8 In.	V-Q-383060TL	5,100	4,200	30"- 60"	1-1/4"	9.6 Lbs.	1"	9.9 Lbs.
1/2 In.	V-Q-123672TL	7,700	6,300	36"- 72"	1-1/2"	16 Lbs.	1"	9.9 Lbs.
5/8 In.	V-Q-5857108TL	15,500	12,700	57"- 108"	1-3/4"	25 Lbs.	1-1/2"	26.5 Lbs.
3/4 In.	V-Q-3467108TL	19,400	15,900	67"- 108"	2-1/4"	55 Lbs.	1-3/4"	44 Lbs.
7/8 In.	V-Q-7876120TL	25,980	21,200	76"- 120"	2-1/2"	75 Lbs.	2"	71 Lbs.

⚠ WARNING

Work Load Limits for Multi-Leg Bridle Assemblies are based on the following conditions:

1. Even load weight distribution on all legs.
2. Bridle legs being same length. If the legs are not sharing the load equally, the assembly design factor is reduced.
3. All bridle legs used at the same horizontal angle.

If the conditions of the lift vary from those above, Work Load Limits must be recalculated.

⚠ WARNING

DO NOT EXCEED WORK LOAD LIMITS
See pages 123-126 for Important Safety, Use and Inspection Information.

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



THE "INSIDE" STORY





LOUPS Rope Slings are the most efficient synthetic rope sling available. LOUPS Rope Slings feature Ultra High Molecular Polyethylene (UHMPE) core elements, providing strength, but weigh only a fraction of wire rope and conventional polyester roundslings.

The internal load carrying core element is one, continuous looped piece of rope that has been spliced (end to end). The number of wraps dictates Work Load Limit and finished body diameter; additional wraps increase capacity and finished body diameter. LOUPS Rope Slings bend gracefully due to the small diameter of the core element. Since the core element in LOUPS Rope Slings is small, the D/d Ratio or Bending Radius is superior to larger diameter ropes of comparable strength. Loups Rope Slings can be made in minimum lengths of 3 Ft. (Pull to Pull) and Vertical Work Load Limits of 1,000,000 Lbs. Larger capacities are available.

LOUPS Rope Slings feature distinctive tracer strands that reveal UV degradation. The UV Tracer Strands are not load bearing. They are specifically designed to be more susceptible to UV degradation than the LOUPS Rope Sling. When the UV Tracer Yarns start to break it is time to replace the LOUPS Rope Sling.

⚠ WARNING

See Pages 123-126 for Important Safety, Use and Inspection Information.

LOUPS Synthetic Rope Sling Specifications

Stock Number	Diameters (inches)	Work Load Limit (Lbs.)			Weight (Lbs.)	
		Choker	Vertical	90° Basket	Base 6 Ft.	Adder/Ft.
LRS-16	.16	9,600	12,000	24,000	1.1	.18
LRS-19	.19	12,000	15,000	30,000	1.3	.22
LRS-20	.20	16,000	20,000	40,000	1.5	.25
LRS-22	.22	19,200	24,000	48,000	1.8	.30
LRS-28	.28	22,400	28,000	56,000	2.7	.45
LRS-34	.34	24,000	30,000	60,000	3.2	.53
LRS-38	.38	36,000	45,000	90,000	4.4	.73
LRS-42	.42	48,000	60,000	120,000	5.5	.92
LRS-53	.53	60,000	75,000	150,000	11.1	1.85
LRS-58	.58	80,000	100,000	200,000	13.6	2.26
LRS-68	.68	100,000	125,000	250,000	17.5	2.91
LRS-75	.75	128,000	160,000	320,000	21.5	3.58
LRS-82	.82	160,000	200,000	400,000	26.3	4.38

Don't Make Me Get Ugly!

If you are not buying your rigging from my Uncle Mike, you really need to talk to me.

Uncle Mike and his friends at Lift-It® have been making slings and providing training for thirty-three years.

When you're between a rock and a hard spot, call our 24/7/365 Emergency Order Number 909-524-9287. We'll make you famous.

Sincerely

Bailey J. Bernard

Bailey J. Bernard
Marketing Director
Lift-It® Manufacturing, Co. Inc.





You have a boat to move in Guam and think you're sunk? Not the Case!



Our Specialty: Wind Equipment. Bars, Blocks, Slings and Blade Socks, NOW!



Solid Rocket Boosters handled safely and efficiently with custom designed, Lift-It® slings.



- Adjustable Chain Slings
- Adjustable Rope Slings
- Blocks & Swivels
- Boat Slings
- Chain Hoists
- Chaffing Gear
- Confined Space Entry
- Container Lifting Slings
- Cordage
- Cornermax® Pads and Sleeves
- Dirt Slings
- Drum Slings
- Dynamometers
- Fall Prevention Devices
- Gas Cylinder Cradles
- Lanyards
- Magnetic Corner Protectors
- Material Handling Devices
- Nets:
  - Cargo
  - Deck
  - Gangway
  - Fall Prevention
  - Rope
  - Wheel
- Plate Clamps
- Radio Frequency Identification (RFID)
- Radome Slings
- Rigger Cards
- Roundslings
- Shackles
- Spreader Beams
- Swivel Hoist Rings
- Tie Down Assemblies
- Tool Bags
- Tow Straps
- Training
- Twin-Path® Slings
- Web Slings
- Wire Mesh Slings
- Wire Rope Slings

Certified System AS9100 ISO9001 ISO REGISTERED

LIFT-IT® MANUFACTURING COMPANY, INC.

1603 W. SECOND STREET • POMONA, CA 91766
909.469-2251 • E-mail: info@lift-it.com • www.lift-it.com

1979 33 2012 LIFT MANUFACTURING CO. INC. LOS ANGELES, CA

QUALITY • SERVICE • INNOVATION

⚠WARNING TO THE USERS OF WIRE ROPE SLINGS



The **⚠WARNING** Icon, used in our product information is done to alert sling users to potentially hazardous conditions and situations.

⚠WARNING It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this bulletin, in our catalog, on our website www.lift-it.com and follow OSHA and ASME guidelines. Use by untrained persons is hazardous.

The American Society of Mechanical Engineers, in the ASME B30.9 Sling Safety Standard clearly establishes the requirement for training. Section 9-2.1-Training states, "Wire rope sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter."

⚠WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations. Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and rigging products will fail if damaged, abused, misused, overused or improperly maintained.

Do not inspect a sling by passing bare hands over the wire rope body. Broken wires if present, may puncture hands.

Any hazardous condition disclosed by an inspection shall require sling replacement. Temporary repairs are not permitted. Damage and wear seriously reduce sling Work Load Limits.

Always know the load weight and select the appropriate sling for the load, configuration of lift necessary to ensure load control and any chemical exposure.

Always take into account sling angles to calculate changes in the sling Work Load Limits, when used in choker and non-perpendicular vertical, basket or bridle configurations.

Ensure that the load will not cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces with suitable materials of sufficient strength, thickness and construction.

The strength of Wire Rope Slings can be affected by chemically active environments. Sling materials may be susceptible to damage from caustic or acid substances or fumes. Strong oxidizing environments attack all common sling materials and components. Consult the manufacturer prior to selection and use. Fiber Core Wire Rope Slings should not be subjected to degreasing or solvents because of possible damage to the core.

Fiber Core wire rope slings of all grades shall not be exposed to temperatures in excess of 180°F/82°C or below -40°F/-40°C. Fiber core slings are less crush resistant and not as strong as IWRC wire rope slings. IWRC Wire Rope Slings shall not be exposed to temperatures in excess of 400°F/204°C or below -40°F/-40°C.

The sling and load shall not be allowed to rotate when hand tucked spices are used in a single leg vertical lift application. Care should be taken to minimize sling rotation. A single leg sling with hand tucked splice can unlay and drop the load if allowed to rotate during a lift. Always use a tag line. Rotation resistant wire rope will not be used in the construction of the slings and assemblies featured in our catalog.

Slings made with wire rope clips shall not be used in a choker hitch.



⚠ WARNING

Slings can fail if damaged, misused, or overloaded. Inspect before use. Use only if trained. Observe rated load. ALWAYS protect the sling from damage with materials of sufficient strength, thickness and construction. DEATH or INJURY can occur from improper use or care.

RATED LOAD = RATED CAPACITY = WORK LOAD LIMIT



WIRE ROPE SLINGS



INSTRUCTIONS FOR CARE ♦ USE ♦ INSPECTION ♦ REPAIR.

CARE ♦ Store wire rope slings on a rack away from possible mechanical damage, corrosion, moisture, dust, grit and extreme temperatures or kinking.

USE ♦ Know the weight of load. ♦ Check tag to confirm that sling is rated adequately for the load (see load angle chart). ♦ Sling shall not be twisted, tied into knots or joined by knotting. ♦ Be sure that the load can't cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces; ***use materials of sufficient strength, thickness and construction.*** ♦Center sling eye in the base (bowl) of sling hook unless sling hook is designed for point loading. ♦ Balance the load. ♦ Maintain load control. ♦ Avoid jerking the load. ♦ Be alert for snagging of load. ♦ Do not pull on stuck objects. ♦ Avoid dragging sling over rough surfaces and from under the load. ♦ Choker hitch must choke on sling body, never on a splice or end fitting. ♦Stand clear of load at all times. ♦ Persons are not to ride on sling or load. ♦ For use in abnormal conditions of heat, cold, chemical activity, consult the manufacturer. ♦ Do not use fiber core wire rope slings at temperatures above 180°F or below -40°F. Do not use steel core wire rope slings at temperatures above 400°F or below -40°F.

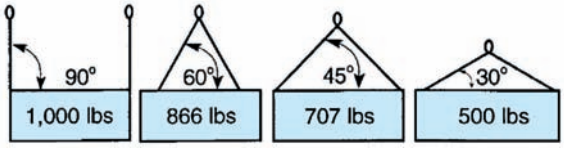
♦***Important:*** A single leg sling with hand tucked splice can unlay and drop the load if allowed to rotate during a lift. Always use a tag line. If any load is allowed to rotate during lifting, moving, lowering or placement, DO NOT use a hand tucked sling.

INSPECTION ♦Before each use: Inspect for broken wires, severe localized abrasion or scraping, kinking, crushing, bird caging or other damage to rope structure, heat damage or severe corrosion. Inspect the end attachments and fittings for cracks, wear or deformation; hooks with twists or a throat opening increase or severe corrosion. ♦ For strand laid and single part slings, no more than ten randomly distributed broken wires in a one rope lay, or five broken wires in one strand in one rope lay. For cable laid and braided broken wire inspection criteria, consult the manufacturer. **If this wear or damage is present or if rated load tag is missing or illegible, remove from service and replace.** Frequent inspection is done by the person handling the sling before each use and must include all of the before use items. Periodic Inspections are required at least annually for normal service, quarterly or more frequently if in severe service or nearly constant use. Periodic inspections are performed by designated person(s) who are trained and a written record of the most periodic inspection shall be maintained. The inspector shall determine when further use would be hazardous.

REPAIR ♦ If any hazardous condition is disclosed during an inspection, the sling shall be removed from service. Repair is not option.

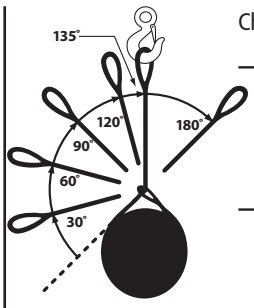
LOAD ANGLE CHART

Angle factor must be applied to calculate the reduced sling capacity when lifting force is not at 90° to the plane of the load!



Multiply angle factor x sling's vertical rated load to calculate the reduced capacity at the angle.

Angle	Factor
90°	1.0000
80°	0.9848
75°	0.9659
70°	0.9397
65°	0.9063
60°	0.8660
55°	0.8192
50°	0.7660
45°	0.7071
40°	0.6248
35°	0.5736
30°	0.5000



Choker Angle (Degrees)	Rated Capacity, % [Note (1)]
Over 120	100
90 - 120	87
60 - 89	74
30 - 59	62
0 - 29	49

NOTE: (1) Percent of sling rated capacity in a choker hitch.

Because of the reduced lifting capacity, use extra care when the sling to load angle, also known as the horizontal angle, is less than 45° and do not make lifts of less than 30° load angle. Example: A sling with adequate capacity could be broken because of increased tension resulting from angles of less than 30 degrees. When possible, use longer slings to minimize angular tension by increasing the angle.

Rated capacity of slings are decreased when D/d ratio (see Fig. 6) will be smaller than that cited in ASME B30.9 chapter 2. Consult the sling manufacturer for specific data or refer to the WRTB Wire Rope Sling Users Manual.

GENERAL NOTE:
When D is 25 Times the component rope diameter (d) the D/d is expressed as 25/1.

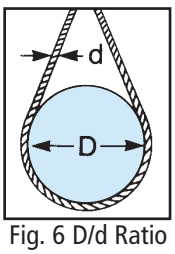


Fig. 6 D/d Ratio

WIRE ROPE SLING INSPECTION

A specific procedure for sling inspection is the best safeguard against injury, death and property damage. It is important that you employ a three stage level of inspection to ensure that slings are inspected with appropriate frequency. It is also important that all inspections must be done by trained and qualified personnel. Please refer to page 134 for more information.

To detect possible damage, you should perform a visual inspection of the entire sling by making all parts of the sling readily visible. If necessary, remove dirt and grime so wires and components are visible. Look for any of the conditions listed in the Removal from Service Criteria. The examples on page 134 depict some of the types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

If you identify ANY of these types of damage, remove slings from service immediately, even if the damage you see is not as extensive as shown. Slings that are removed from service must be destroyed and rendered completely unusable. Never ignore sling damage or attempt to perform temporary field repairs of damaged slings. It is very important that slings are regularly and properly inspected. If you are not sure whether or not a sling is damaged, DO NOT USE IT.

SLING TAG REQUIREMENTS

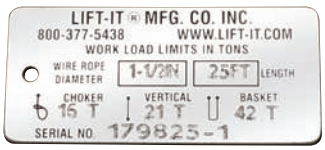
Identification Requirements- ASME B30-9, Section 9-2.7.1 states: Each sling shall be marked to show:

1) Name or trademark of manufacturer.

2) Rated load for at least one hitch and the angle upon which it is based.

3) Diameter or size.

4) Number of legs, if more than one.



Sling identification should be maintained during the life of the sling by the sling user.

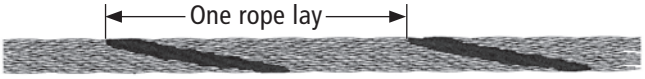
WIRE ROPE SLING REMOVAL FROM SERVICE CRITERIA

⚠WARNING Do not inspect Wire Rope slings by passing bare hands over the wire rope body. Broken wires, if present, may puncture hands.

Slings shall be inspected throughout their entire length for evidence of damage. Wire Rope Slings shall be removed from service if any of the following is visible:

A) Missing or Illegible Sling Tag.

B) Broken Wires
For strand laid and single part slings, 10 randomly distributed broken wires in one rope lay or 5 broken wires in one strand in one rope lay.

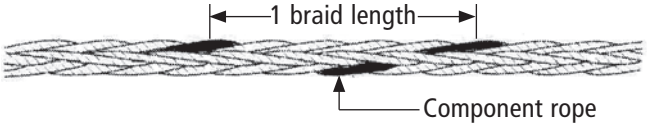


For cable-laid slings: 20 broken wires per lay.

For 6 part braided slings: 20 broken wires per braid.

For eight part braided slings: 40 broken wires per braid.

Either the broken wire or broken strand count shall apply separately to the one braid length or one lay length in cable-laid slings.



C) Severe localized abrasion and scraping.

D) Kinking, crushing, birdcaging or any other damage resulting in damage to the rope structure.

E) Evidence of heat damage, usually manifested by metallic discoloration or the presence of internal lubricant.

F) End attachments that are cracked, deformed or worn to the extent that the strength of the sling is substantially affected.

G) Severe corrosion of the rope, end attachments or fittings.

H) For hooks, removal criteria, as stated in ASME B30.10.

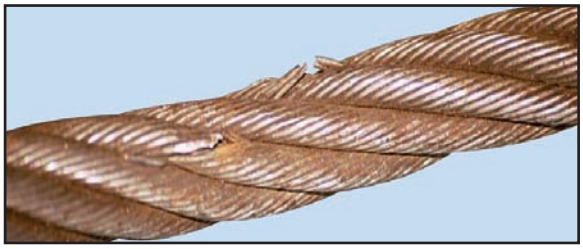
I) For other applicable hardware, removal criteria as stated in ASME B20.36.

J) Other conditions, including visible damage that cause doubt as to the continued use of the sling.

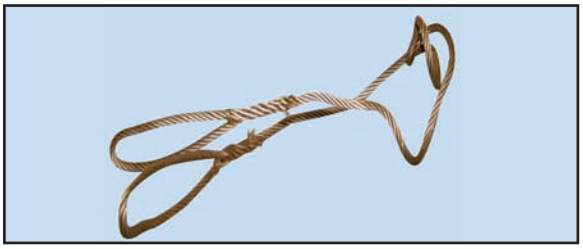
SLING DAMAGE EXAMPLES

If you identify ANY of these types of damage in a sling, remove it from service immediately, even if the damage is not as extensive as shown. Slings that are removed from service must be destroyed and rendered completely unusable. Never ignore sling damage or attempt to perform temporary field repairs of damaged slings. It is very important that slings are regularly and properly inspected. If you are not sure whether or not a sling is damaged, DO NOT USE IT.

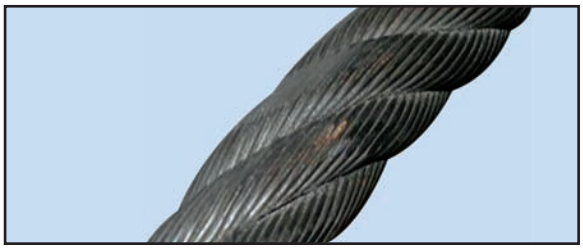
Broken Wires



Kinked Wire



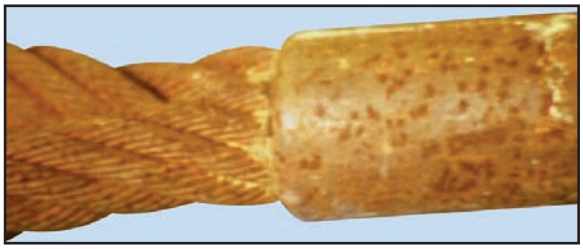
Abraded/Worn Wire



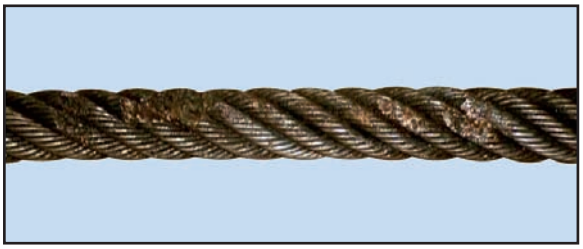
Popped Core



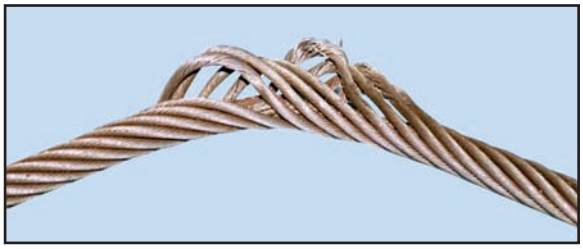
Corrosion



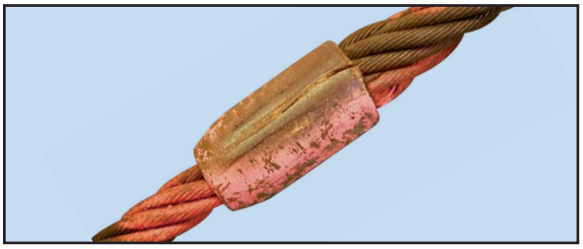
Heat Damage



Bird Caging



Damaged Fittings



WIRE ROPE SLING CONSIDERATIONS

⚠ WARNING Follow OSHA, ASME, Association, Industry and Manufacturer Guidelines. Be sure to read and understand the following information relative to proper sling usage:

Lift-Planning & Evaluation- Page 16
Repair and Testing- Pages 36-37
Sling Care and Storage- Page 37
Sling Protection- Pages 43-52 and 140
Mechanical Considerations Pages 39-40
Purchase & Use Considerations- Pages 17-18
Hitches, Angles and Tension- Pages 19-22
Sling Training- Pages 5-10
Rigging & Hitch Information- Pages 23, 24 and 135-140
Sling Inspection Systems- Page 33

What follows are some useful tips to help riggers do their jobs more efficiently and safely. Prevailing work rules and government regulations place full responsibility for proper performance upon the rigger, so it is his/her duty to be familiar with the condition and capability of all tools and equipment used, as well as techniques employed. One basic rule always applies: Always know, never guess.

Each lift may be divided into three parts, providing a convenient plan for successful rigging:

1. **The Lifting Device:** Know its capability, limitations and condition. When was the lifting device last inspected? If in doubt about capacity, check the placard or other appropriate records.

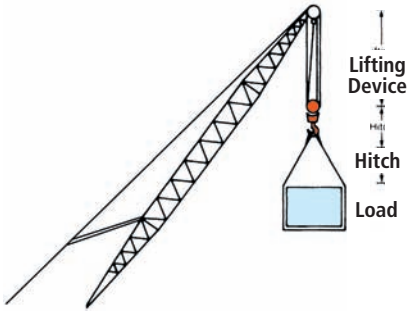
2. **The Hitch:** Here is where the rigger can exercise ingenuity, but it is also the easiest place to make a mistake.

3. **The Load:** The weight must be known. You must also protect the load from possible damage by the slings and protect the slings from damage by the load.

IS THE LIFTING DEVICE ADEQUATE?

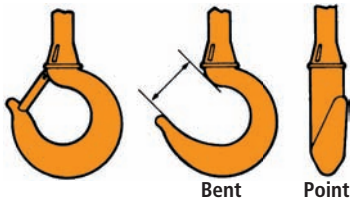
Check the placard on the crane or hoist, and then answer three questions:

1. Is capacity adequate for this lift?
2. Will it lift high enough?
3. Is the horizontal reach adequate?



CHECK HOOKS AND REEVING

1. Are sheaves properly rigged? If multi-part reeving, will it support the load?
2. Is the hook the right size so sling eyes won't be distorted when placed over the hook?
3. Check for cracks in bowl of the hook and for evidence of point loading or bending.



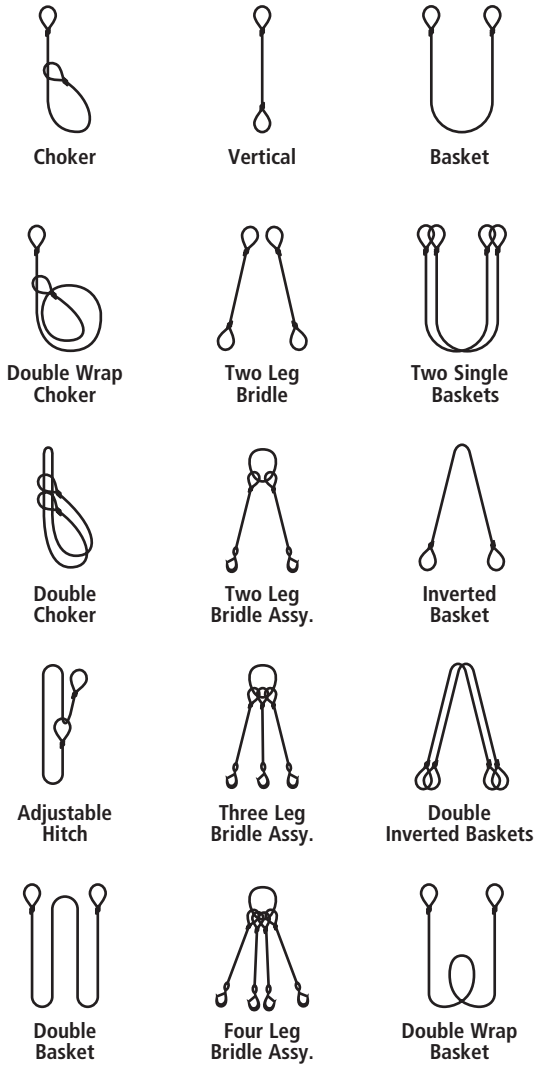
TYPE OF HITCH DETERMINES CHOICE OF SLING

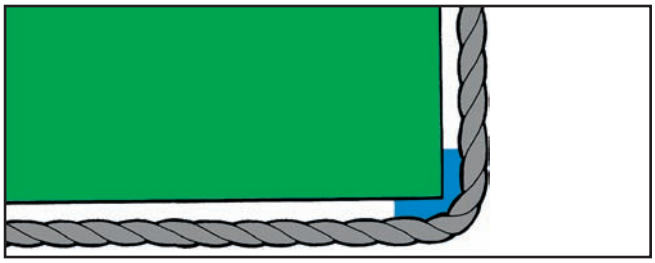
Before you select a sling for a specific lift, determine the most effective hitch to do the job, protect the load and protect the sling.

The type of hitch you select may determine the type of sling that will best do the job, as well as the length of sling that will be needed. Lifting height, overhead clearance and hook travel will affect the hitch selection and sling length.

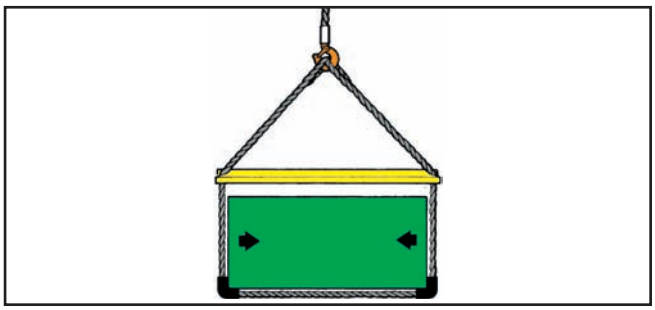
Select slings that will best support the load while providing adequate rated capacity. The proper choice will provide:

1. Lifting capacity needed.
2. Proper D/d Ratio.
3. Handling characteristics needed for rigging.
4. Minimal damage to the sling.
5. Minimal damage to the load.

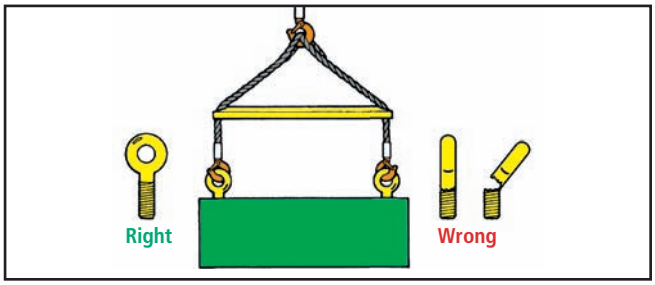




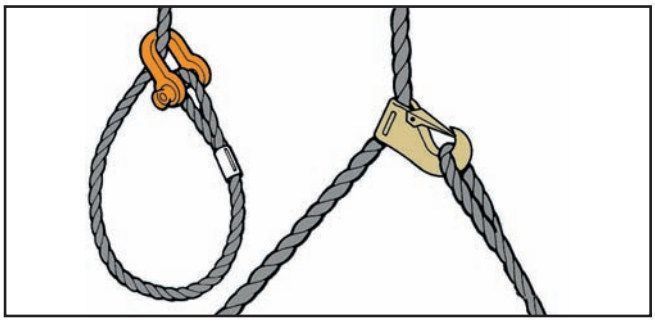
Protect slings during the lift with blocking or padding that is adequate to prevent sling or load damage.



Use a spreader bar between sling legs to prevent excessive side pressure on the load from sling contact during the lift. One sling in is depicted for illustration purposes only.

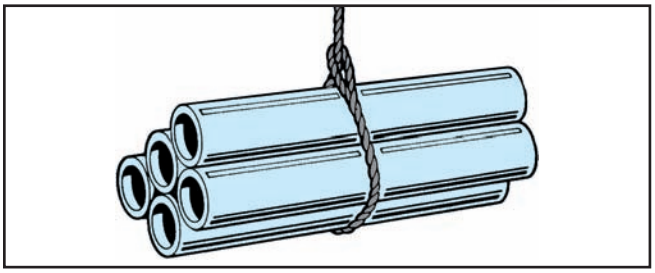


When attaching slings to eye bolts, always pull in line with the bolt axis. A side pull may break the eye bolts. Eye bolts without shoulders cannot be used for angular lifting.

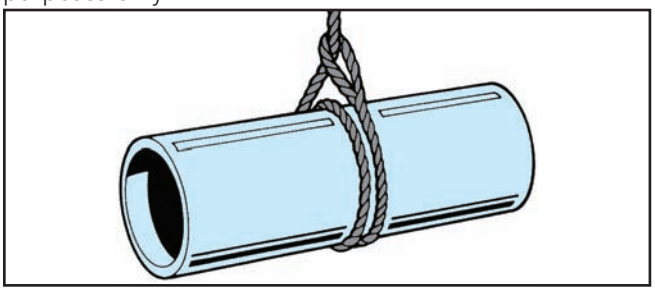


Use a shackle in sling eyes during a choke to protect sling body against excessive distortion. Always put shackle pin through sling eye, rather than against the sling body. If the shackle is installed incorrectly the sliding movement of the sling body could rotate and disengage the shackle pin.

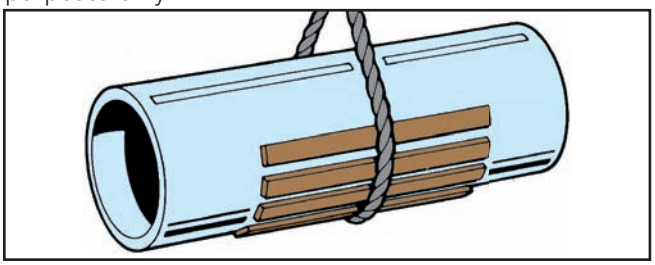
A sliding hook choker is superior to a shackle or unprotected eye, since it provides a greater bending radius for the sling body.



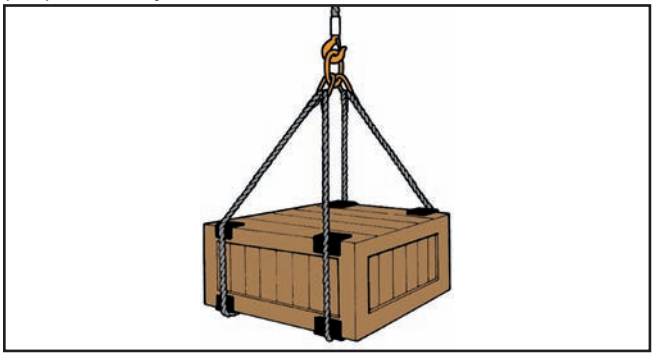
When lifting a bundled load, a choke is more effective than a basket hitch to provide control and prevent slipping of the load in the sling. Odd numbers of rounded objects will nestle as even numbers tend to slide out. If practical use more than one sling and employ a double wrap choke hitch. Please Note: One sling is depicted for illustration purposes only.



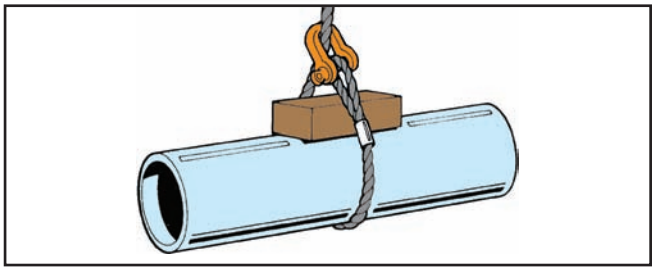
Use a double wrap choke hitch around the load for 360° load contact, to prevent load slippage. Please Note: One sling is depicted for illustration purposes only.



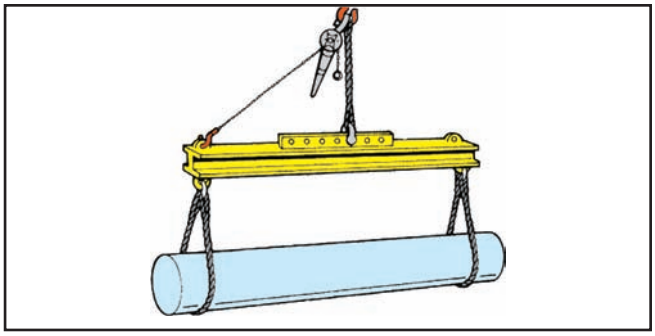
Use blocking or padding to protect hollow vessels, loose bundles and fragile items from scuffing and bending. Remember, blocking becomes part of the load and must be added to the total load weight. Please Note: One sling is depicted for illustration purposes only.



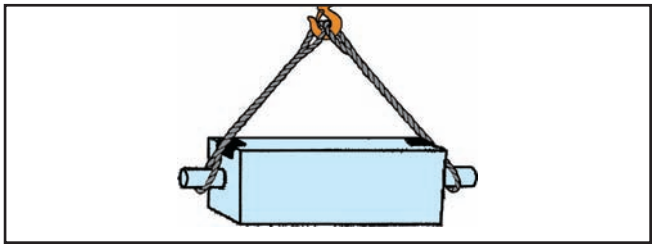
When lifting crates or wooden boxes in a basket hitch, be sure the load can withstand side pressure as sling tension is applied. Use spreader bars and sling protection to prevent damage.



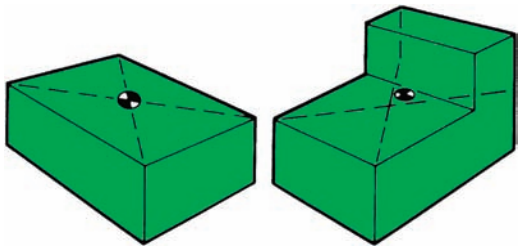
You can improve the angle of a choke with blocking between the hitch and the load. The angle of choke increases, improving sling efficiency. Please Note: One sling is depicted for illustration purposes only.



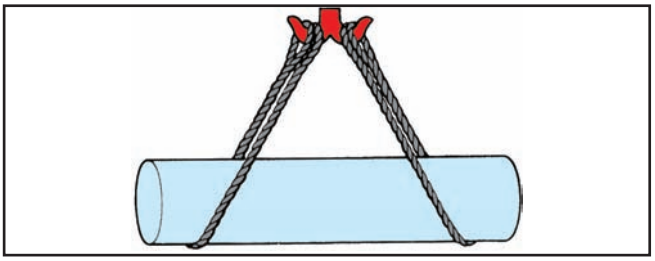
An equalizing bar with two slings rigged in a basket hitch reduces the tendency of slings to slide and keeps the load level. By adjusting the lifting point and using a Lever Hoist to support the heavy end, the load can be kept level during the lift.



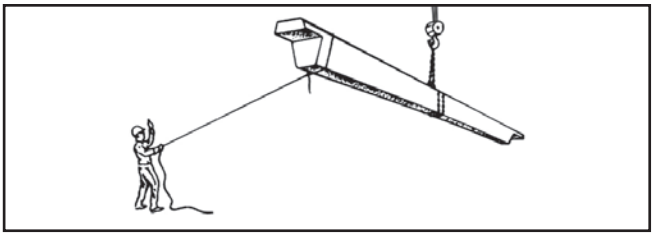
When rigging two or more slings as a bridle, select identical sling constructions and lengths with identical previous loading experience. Sling stretch must be the same for paired slings to avoid overloading individual legs and to provide load control.



The Center of Gravity for rectangular objects with homogeneous characteristics will usually be below the junction of lines drawn diagonally from opposite corners. When a rectangular object has weight concentrated at one end, the Center of Gravity will be situated toward that end – away from the intersection of diagonal lines. To avoid an unbalanced lift, the lifting hook must be rigged directly above the Center of Gravity.



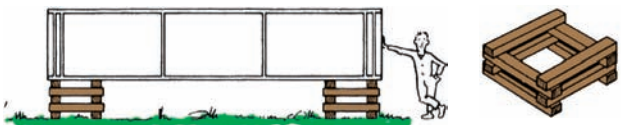
Two slings rigged in a basket hitch provide better balance for loads. Be sure that slings cannot slide along the load when the lift is made and use extreme caution.



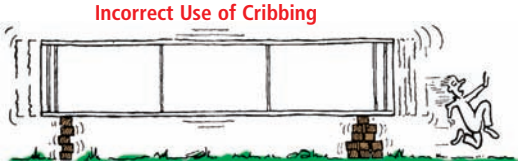
⚠ WARNING Hand-spliced slings should not be used in lifts where slings may rotate and cause the wire rope to unlay.

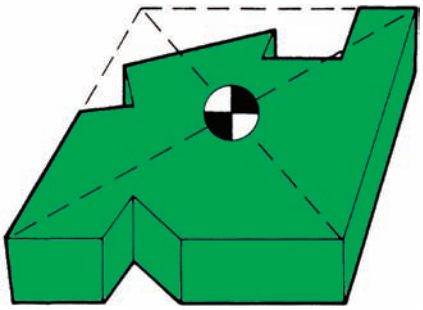
Use taglines to prevent load rotation. The further from the load's center of gravity the tag line is placed, the greater degree of control with less effort is realized.

Proper Use of Cribbing

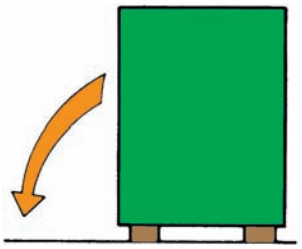


Incorrect Use of Cribbing



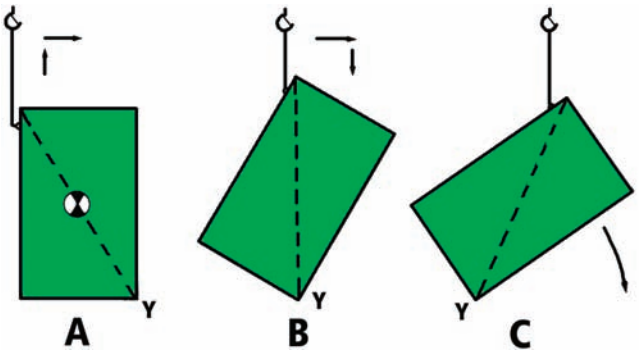


To locate the approximate Center of Gravity of an irregularly shaped article, visualize it enclosed by a rectangle. Where diagonals from opposite corners intersect will usually indicate a location for a lift point near the Center of Gravity.

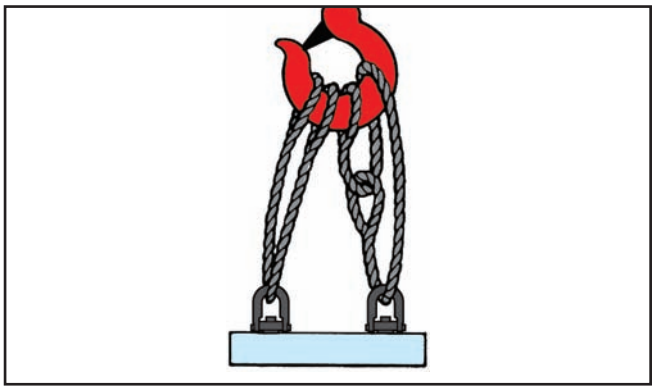


To turn or reposition a load, either one or two lifting devices may be employed. Always use a choker hitch. Never attempt to turn a load with a basket, since the load will slide against the sling body, resulting in damage to both the sling and load.

ONE HOOK TURNING



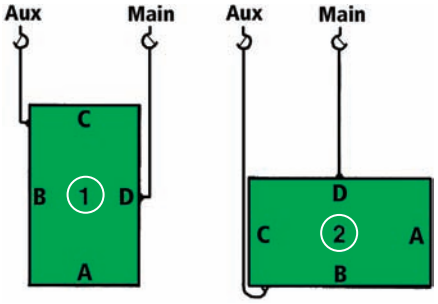
To turn a load with one hook, attach the sling directly to the load ABOVE the Center of Gravity. The lifting hook must be able to move, or travel, in the direction of the turn to prevent sliding of the load's pivot edge as the load leaves the ground. It may be necessary to lift the load again to reposition it after the turn is completed. Irregular shapes sometimes will require blocking for support during and after the turn.



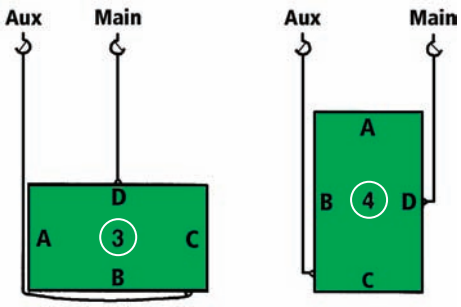
Lifting unbalanced loads when exact length slings are not available can be accomplished by rigging an adjustable hitch on the heavy end. Sling length can be adjusted before weight is applied, but once sling loading occurs, the hitch is locked in position for the lift.

TWO HOOK TURNING

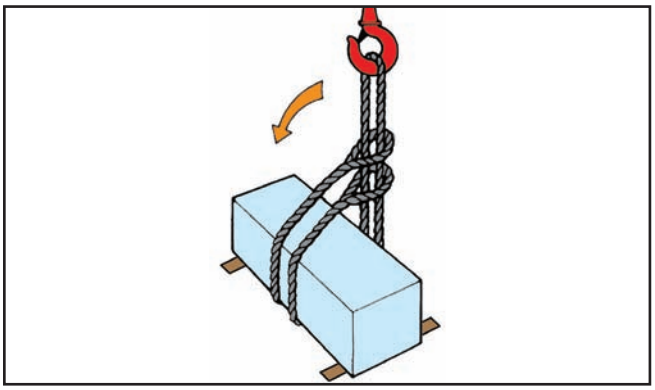
Two-hook turning is employed when it is desired to turn the load in the air. Main and auxiliary hoists of a crane can be used, if permitted or two cranes can be used.



To turn from side (A) to (B) in 1 & 2 above, attach to side (B) above the Center of Gravity and to side (D) at the Center of Gravity, then lift both hoists equally until load is suspended. Lower until turn is completed.



To turn from side (B) to (C) in 3 & 4 above, lift balanced load at (D) directly above the Center of Gravity; then auxiliary at (B) to desired position. Lower both hooks simultaneously until side (C) is in desired position.



Turning with a double choker gives good control. To rig, place both eyes on top of load, pointing opposite the direction of turn. Body of sling is then passed under load, through both eyes and over lifting hook. Blocking should be used under the load to protect sling and facilitate removal.

RIGGER'S CHECK LIST

1. Analyze and Measure — Determine the total weight to be moved, as well as exactly how far it is to move and how high it must be lifted.

2. Determine the Hitch — Decide how the load will be rigged and how the sling will grip or be attached to the load.

3. Select the Sling — In addition to adequate Work Load for the angles and hitch involved, slings should be the most suitable for handling the specific load. Select slings with proper end fittings, eye protection, as well as attachment hardware.

4. Inspect the Sling — Thoroughly inspect the sling to determine if it is in acceptable condition and capable of making the lift. Refer to prevailing OSHA and ASME regulations for inspection criteria.

5. Rig Up, Not Down — Always attach the sling to the load first, then attach slings to the lifting device.

6. Check Everything — Before attempting a lift, take a light strain on the rigging to determine that blocking, sling, protection and all safety devices are in place.

7. Stand Clear and Lift — Let the lifting device and rigging do the job—don't use brute strength to prevent swinging or movement. Use a tagline to control any movement. Keep away from the load when it is suspended.

8. Don't Shock Load — Lift, move and lower slowly and with a steady application of power.

9. Put It Away! — After you've completed the job, check slings and gear for any damage. If damage is present, red tag items immediately and advise the rigging inspector. If the gear is in acceptable condition, return it to storage for safekeeping.

CARE OF SLINGS

The amount of care and proper maintenance slings receive will go a long way in determining service life. The following are guidelines which have shown helpful:

STORAGE

Proper storage requires slings be kept in an area where they will not be exposed to water, extreme heat or corrosive fumes, liquids and sprays or be kinked.

Slings should never be left beneath loads or lying around where they may be damaged or run over. All slings, when not in use, should be kept on a rack. Use of a rack minimizes accidental damage and allows easier monitoring of sling condition between regular inspections. A rack will also save time by allowing larger slings to be picked up and returned by crane, thereby reducing handling time.

EFFECTS OF TEMPERATURE

All wire rope slings should be protected from temperature extremes. The accepted rules are: Fiber Core Slings should never be exposed to temperatures in excess of 180°F or below minus 40°F. IWRC Wire Rope slings should never be exposed to temperatures above 400°F or below minus 40°F.

It is not always easy to detect when wire rope has been damaged by heat. The most common visual signs are loss of lubrication and discoloration of wires.

The best practice to follow is that if there is the slightest suspicion that slings were subjected to high temperatures, they should be taken out of service immediately.

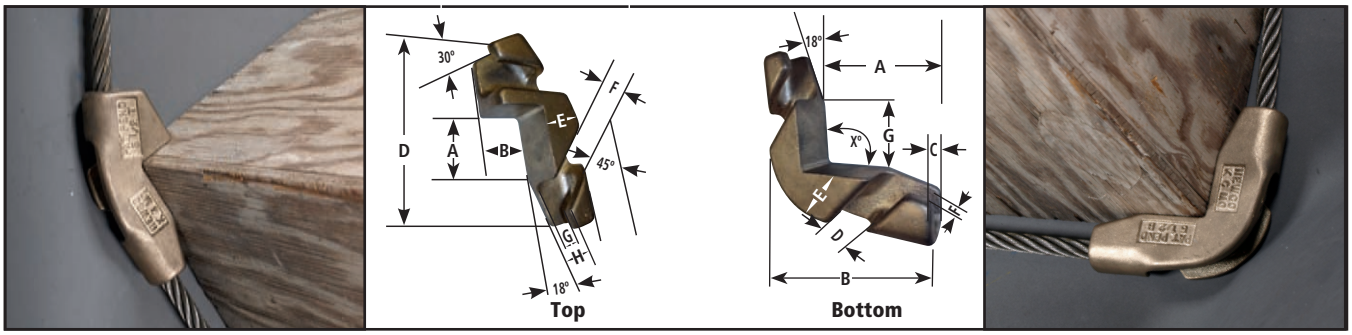
LUBRICATION

Wire rope is thoroughly lubricated at time of manufacture. Normally, for sling use under ordinary conditions, no additional lubrication is required. However, if a sling is stored outside or in an environment which would cause corrosion, lubrication should be applied during the service life to prevent rusting or corrosion.

If additional lubrication is required, consult the sling manufacturer for information on the type of lubricant to be used and best method of application.

WIRE ROPE SADDLE PROTECTORS

Wire Rope Saddle Protectors were developed to protect slings and loads. Bottom and Top Wire Rope Saddle Protectors are manufactured from lightweight manganese bronze and are easily positioned.



TOP SADDLE - DIMENSIONAL DATA (Inches)									
STOCK NUMBER	ROPE DIAMETER	A	B	C	D	E	F	G	Weight (Lbs.)
5T	3/8	1-5/32	23/32	1-11/16	3-5/8	4-5/8	7/16	7/16	.50
5-1/2T	1/2	1-7/8	1-3/16	2-9/16	5-5/16	5-3/4	5/8	5/8	1.25
6T	5/8	2	1-3/8	2-15/16	5-7/8	8	3/4	3/4	1.50
7T	3/4	2-1/2	1-23/32	3-19/32	7-1/2	10	15/16	15/16	2.5
9T	7/8 & 1	3	2-3/16	4-7/16	8-3/4	12	1-1/8	1-1/8	4.25
10T	1-1/8 & 1-1/4	3-1/2	2-3/8	5	10-3/8	14	1-3/8	1-3/8	7.50
12T	1-3/8 & 1-1/2	4-1/4	2-13/16	5-15/16	11-7/8	17	1-11/16	1-11/16	9

BOTTOM SADDLE - DIMENSIONAL DATA (Inches)										
STOCK NUMBER	ROPE DIAMETER	A	B	C	D	E	F	G	X°	Weight (Lbs.)
5B	3/8	2-1/8	3	7/8	7/16	1-3/16	7/16	1-1/4	90°	.50
5-1/2B	1/2	3-1/16	4-1/2	1-3/16	5/8	1-5/8	5/8	1-7/8	90°	1.50
6B	5/8	3-7/16	5	1-5/16	3/4	1-3/4	3/4	2	90°	1.75
7B	3/4	4-9/32	6-1/4	1-1/2	15/16	2-3/16	15/16	2-5/8	90°	3
9B	7/8 & 1	5-1/8	7-3/8	1-3/4	1-1/8	2-5/8	1-1/8	3-1/8	90°	5
10B	1-1/8 & 1-1/4	6-1/8	9	2-1/8	1-3/8	3-1/8	1-5/16	3-3/4	90°	10
12B	1-3/8 & 1-1/2	6-7/8	10-1/4	2-3/8	1-11/16	3-1/2	1-5/8	4-1/8	90°	11

HOW TO ORDER: ALWAYS SPECIFY

Single Body Slings:
Specify Type: (1 thru 15)
Domestic or Import Wire Rope
Diameter
Length: Bearing to Bearing
Sling Protection: Type, Length, etc.

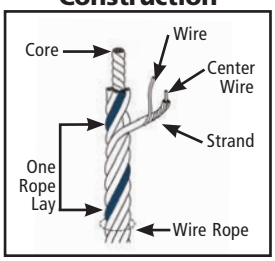
Bridle Assemblies
Specify Type:
Double, Triple or Quad Leg
Domestic or Import Wire Rope
Diameter
Length:
Brg. Top Thimble-Brg. Bottom Fitting
Bottom Fittings: Masterlinks, Hooks
Sling Protection: Type, Length, etc.

Strand Laid Grommets
Specify Stock Number
Domestic or Import Wire Rope
Diameter
Length: Bearing to Bearing
Sling Protection: Type, Length, etc.

Slingmax® Wire Rope Slings
Type: Triflex®, Gator-Laid® or
Gator-Max®
Gator-Flex: Sling or Grommet
Stock Number
Domestic or Import Wire Rope
Finished Diameter
Length: Bearing to Bearing
Sling Protection: Type, Length, etc.

Swaged Socket Assemblies
Specify Stock Number
Domestic or Import Wire Rope
Diameter
Length: Bearing to Bearing
Pin Orientation:
Parallel or 90 degrees
Sling Protection: Type, Length, etc.

Wire Rope Construction



Single Body Wire Rope Slings feature 6 x 19 or 6 x 37 Construction, Extra Improved Plow Steel (EIPS) wire rope with an Independent Wire Rope Core (IWRC). Single Body, Flemish Eye/Mechanical Splice, Wire Rope Slings provide additional security, superior to return loop slings should the swage sleeve become damaged during use. Thimbles greatly improve sling longevity by protecting the rope at connection points.

Stainless Steel Slings, Fiber Core Slings with reduced Work Load Limits, Cable Laid Slings with galvanized finish and larger diameter slings are also available.

⚠ WARNING See Pages 131-140 for Important Safety, Use and Inspection Information.

SINGLE BODY SLING TYPES


Type 1- Eye & Eye


Type 2- Eye & Hook


Type 3- Eye & Thimble


Type 4- Eye & Slip-Thru Thimble


Type 5- Eye & Crescent Thimble


Type 6- Crescent Thimble & Hook


Type 7- Crescent Thimbles Both Ends


Type 8- Thimble & Thimble


Type 9- Thimble & Hook


Type 10- Thimble & Slip-Thru Thimble


Type 11- Thimble & Crescent Thimble


Type 12- Slip-Thru Thimble & Hook


Type 13- Slip-Thru Thimble - Both Ends

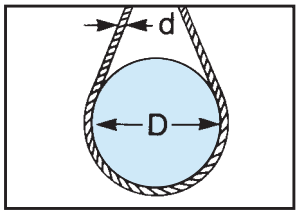
Please Note:
Heavy duty, galvanized thimbles are standard. Eye Hooks and Sliding Choker Hooks will be supplied with latches.

Sliding Chokers


Type 14
Eye & Thimble
With Sliding
Choker Hook


Type 15
Eye & Eye
With Sliding
Choker Hook

(D/d) Considerations



When wire rope is bent around a load, or diameter, the rope strength is decreased. The D/d ratio is diameter of the object around which the rope is bent (D), divided by the diameter (d) of the rope. D/d affects slings used in basket hitches and must be taken into consideration. When the diameter of the load is 4 times the diameter of the wire rope sling the D/d ratio is 4/1 and the sling efficiency is 75% of the Basket WLL.

D/d RATIO	Wire Rope Sling Strength Efficiencies
25/1	100%
20/1	92%
15/1	88%
10/1	86%
8/1	84%
6/1	80%
4/1	75%
2/1	65%
1/1	50%

SINGLE BODY WIRE ROPE SPECIFICATIONS

ROPE DIA. (In.)	WORK LOAD LIMITS (TONS) D/d = 25/1 TON = 2000 LBS.			MIN. SLING LENGTH (TYPE I)	STANDARD EYE SIZE (Inches) W X L	THIMBLED EYE SIZE (Inches) W X L	EYE HOOK WLL (TONS)	CRESCENT THIMBLE EYE SIZE (Inches) W X L	SLIP-THRU THIMBLE EYE SIZE (Inches) W X L	SLIDING CHOKER HOOK (Inches)
	CHOKER	VERTICAL	90° BASKET							
1/4	.48	.65	1.3	18″	2 X 4	7/8 X 1-5/8	1	2 X 4	2-1/8 X 4-1/8	3/8
5/16	.74	1.0	2.0	21″	2-1/2 X 5	1-1/16 X 1-7/8	1	2 X 4	2-1/8 X 4-1/8	3/8
3/8	1.1	1.4	2.9	24″	3 X 6	1-1/8 X 2-1/8	1-1/2	2 X 4	2-1/8 X 4-1/8	3/8
7/16	1.4	1.9	3.9	27″	3-1/2 X 7	1-1/4 X 2-1/4	2	2 X 5	2-3/8 X 4-3/8	1/2
1/2	1.9	2.5	5.1	30″	4 X 8	1-1/2 X 2-1/4	3	2-1/4 X 6	2-3/8 X 4-3/8	1/2
9/16	2.4	3.2	6.4	33″	4-1/2 X 9	1-1/2 X 2-3/4	5	2-1/4 X 7	2-3/8 X 4-3/8	5/8
5/8	2.9	3.9	7.8	3ft	5 X 10	1-3/4 X 3-1/4	5	2-3/4 X 7	3-3/8 X 6-5/8	5/8
3/4	4.1	5.6	11	3ft-6in	6 X 12	2 X 3-3/4	7	3-1/4 X 8-1/2	3-3/8 X 6-5/8	3/4
7/8	5.6	7.6	15	4ft	7 X 14	2-1/4 X 4-1/4	11	4-1/2 X 10	3-3/4 X 7-1/8	7/8
1	7.2	9.8	20	4ft-6in	8 X 16	2-1/2 X 4-1/2	11	4-1/2 X 11-1/2	3-3/4 X 7-1/8	1
1-1/8	9.1	12	24	5ft	9 X 18	2-7/8 X 5-1/8	15	4-7/8 X 13	4-3/8 X 8-3/8	1-1/8
1-1/4	11	15	30	5ft-6in	10 X 20	3-1/2 X 6-1/2	15	5-1/2 X 14-1/2	4-3/8 X 8-3/8	1-1/4
1-3/8	13	18	36	6ft	11 X 22	3-1/2 X 6-1/4	22	6 X 16	5 X 9-1/2	1-3/8
1-1/2	16	21	42	7ft	12 X 24	3-1/2 X 6-1/4	22	6 X 17-1/2	5 X 9-1/2	1-1/2
1-3/4	21	28	57	8ft	14 X 28	4-1/2 X 9	37	7 X 20	6-3/4 X 11-3/4	-
2	28	37	73	9ft	16 X 32	6 X 12	45	7 X 23-1/2	8 X 14-1/2	-
2-1/4	35	44	89	10ft	18 X 36	7 X 14	45	8-1/2 X 26	8 X 15-1/2	-
2-1/2	42	54	109	11ft	20 X 40	-	60	8-1/2 X 29-1/2	-	-

MULTIPLE LEG BRIDLE ASSEMBLIES

- SINGLE PART BODY
- THIMBLES PROTECT SLING
- 6 X 19 OR 6 X 37 ROPE CONSTRUCTION
- IWRC RESISTS CRUSHING
- OTHER FITTINGS AVAILABLE

DO NOT EXCEED WORK LOAD LIMITS

DOUBLE-LEG BRIDLE



TRIPLE-LEG BRIDLE



QUAD-LEG BRIDLE



ROPE DIAMETER (INCHES)	MIN. SLING LENGTH	EYE HOOK CAP. (TONS)	WORK LOAD LIMITS Tons = 2,000 Lbs. 60°	45°	MASTER LINK STOCK DIA.	WORK LOAD LIMITS Tons = 2,000 Lbs. 60°	45°	MASTER LINK STOCK DIA.	WORK LOAD LIMITS Tons = 2,000 Lbs. 60°	45°	MASTER LINK STOCK DIA.
1/4	15″	1	1.1	.91	1/2	1.7	1.4	1/2	2.2	1.8	5/8
5/16	18″	1	1.7	1.4	1/2	2.6	2.1	1/2	3.5	2.8	3/4
3/8	20″	1-1/2	2.5	2.0	1/2	3.7	3.0	3/4	5.0	4.1	3/4
7/16	22″	2	3.4	2.7	3/4	5.0	4.1	3/4	6.7	5.5	1
1/2	24″	3	4.4	3.6	3/4	6.6	5.4	1	8.8	7.1	1
9/16	26″	5	5.5	4.5	3/4	8.3	6.8	1	11	9	1-1/4
5/8	28″	5	6.8	5.5	1	10	8.3	1-1/4	14	11	1-1/2
3/4	33″	7	9.7	7.9	1-1/4	15	12	1-1/2	19	16	1-3/4
7/8	39″	11	13	11	1-1/4	20	16	1-1/2	26	21	2
1	42″	11	17	14	1-1/2	26	21	1-3/4	34	28	2-1/4
1-1/8	4′	15	21	17	1-1/2	31	26	1-3/4	42	34	2-3/4
1-1/4	4′- 6″	15	26	21	1-3/4	38	31	2	51	42	2-3/4
1-3/8	5′	22	31	25	1-3/4	46	38	2-1/4	-	-	-
1-1/2	5′- 6″	22	37	30	2	55	45	2-1/4	-	-	-
1-3/4	6′- 6″	30	49	40	2-1/4	74	60	3-1/4	-	-	-
2	8′	37	63	52	2-3/4	-	-	-	-	-	-

Length tolerance for single body slings is +/- two rope diameters or +/- .5% of the sling length, whichever is greater. Bridle or matched slings are +/- one rope diameter.

WARNING See Pages 131-140 for Important Safety, Use and Inspection Information.

WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.

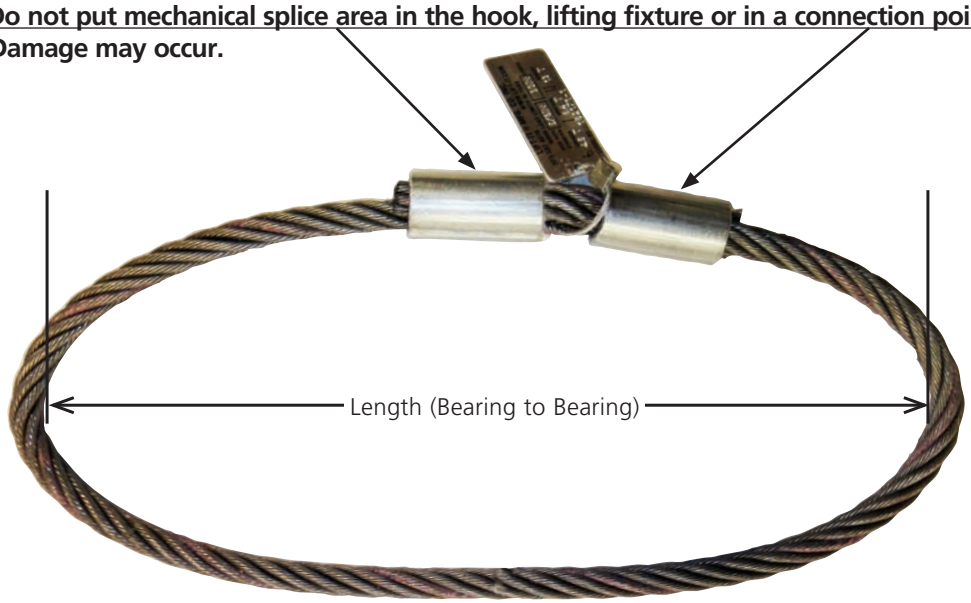


STRAND LAID GROMMET

Strand Laid Grommets feature a wire rope body with a mechanical splice to form an endless body. The minimum sling circumference is 96 times the grommet body diameter. Sling capacities are based upon a minimum D/d of 5/1. You must specify: Sling Stock Number, Body Diameter and Sling Length.

NOTE: SLING LENGTH IS EXPRESSED AS BEARING TO BEARING LENGTH.

⚠ WARNING **Do not put mechanical splice area in the hook, lifting fixture or in a connection point to the load. Damage may occur.**



FINISHED SLING BODY DIAMETER (Inches)	SLING STOCK NUMBER	WORK LOAD LIMITS (Tons = 2000 Lbs.) CHOKER	VERTICAL	BASKET 90 Deg.	BASKET 60 Deg.	BASKET 45 Deg.	MINIMUM SLING LENGTH (Ft.)
1/4	SLG-0140	.74	1.1	2.1	1.8	1.5	1.5
5/16	SLG-0516	1.2	1.6	3.3	2.8	2.3	1.5
3/8	SLG-0380	1.6	2.4	4.7	4.1	3.3	2
7/16	SLG-0716	2.2	3.2	6.4	5.5	4.5	3
1/2	SLG-0120	2.9	4.1	8.3	7.2	5.9	3
9/16	SLG-0916	3.7	5.2	10	9.1	7.4	3
5/8	SLG-0580	4.5	6.4	13	11	9.1	3
3/4	SLG-0340	6.4	9.2	18	16	13	4
7/8	SLG-0780	8.7	12	25	22	18	4
1	SLG-1000	11	16	32	28	23	4
1-1/8	SLG-1180	14	20	41	35	29	5
1-1/4	SLG-1140	17	25	50	43	35	5
1-3/8	SLG-1380	21	30	60	52	42	6
1-1/2	SLG-1120	25	36	71	62	50	6
1-5/8	SLG-1158	29	41	82	71	58	7
1-3/4	SLG-1134	33	48	95	83	68	7
1-7/8	SLG-1178	38	54	109	94	77	8
2	SLG-2000	43	62	124	107	87	8
2-1/4	SLG-2140	54	77	154	133	109	9
2-1/2	SLG-2150	66	94	188	163	133	10
2-3/4	SLG-2340	79	113	225	195	159	11
3	SLG-3000	93	133	265	230	188	12

⚠ WARNING See Pages 131-140 for Important Safety, Use and Inspection Information.

Vertical and Basket WLL are based upon a MINIMUM D/d of 5/1. Where "d" = Finished Body Diameter.
Work Load Limits (WLL) are based upon pin diameter no smaller than 5 times the Body diameter.
Sling Angles less than 30 degrees shall not be used.
Please Note: Strand Laid Grommets are made from 6 X 19 or 6 X 37 Classification, EIPS-IWRC Wire Rope.

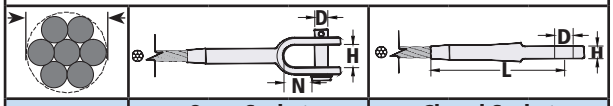
SWAGED SOCKET ASSEMBLIES

Swaged Socket Assemblies feature forged, steel fittings and develop the full, nominal wire rope breaking strength. All assemblies are proof tested and certified. Custom assemblies are available. Please note that stated Work Load Limits apply to 6 X 19 or 6 X 37 IWRC, EIP wire rope for sling and lifting applications. If Swaged Socket Assemblies are to be used for crane boom pendants or other applications, please contact us as the stated Work Load Limits do not apply.

When ordering you must specify:

1) Diameter 2) Stock Number 3) Pin Orientation [Pins Parallel or Pins at 90 Degrees].

SWAGED SOCKET DIMENSIONAL INFORMATION

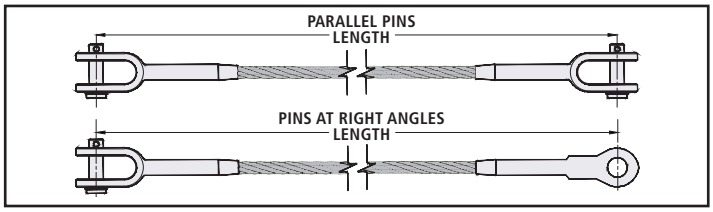


Rope Diameter (Inches)	Open Socket (Dimensions in Inches)			Closed Socket (Dimensions in Inches)		
	N	H	D	D	H	L
1/4″	1.47	.69	.69	.76	.50	3.50
5/16″	1.67	.80	.81	.88	.68	4.50
3/8″	1.67	.80	.81	.88	.68	4.50
7/16″	1.96	1.00	1.00	1.07	.87	5.75
1/2″	1.96	1.00	1.00	1.07	.87	5.75
9/16″	2.21	1.25	1.19	1.28	1.14	7.25
5/8″	2.21	1.25	1.19	1.28	1.14	7.25
3/4″	2.69	1.50	1.38	1.49	1.33	8.63
7/8″	3.20	1.75	1.63	1.73	1.53	10.09
1″	3.68	2.00	2.00	2.11	1.78	11.50
1-1/8″	4.18	2.25	2.25	2.37	2.03	12.75
1-1/4″	4.64	2.50	2.50	2.62	2.25	14.38
1-3/8″	5.25	2.41	2.50	2.62	2.29	15.75
1-1/2″	5.70	3.00	2.75	2.87	2.56	17
1-3/4″	6.67	3.50	3.50	3.63	3.08	20
2″	8.19	4.00	3.75	3.88	3.31	23

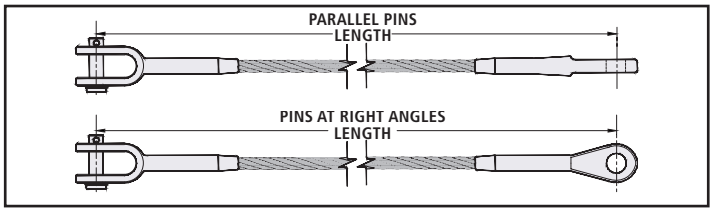
⚠ WARNING See Pages 131-140 for Important Safety, Use and Inspection Information.

Larger sizes available. Stainless Steel assemblies available.

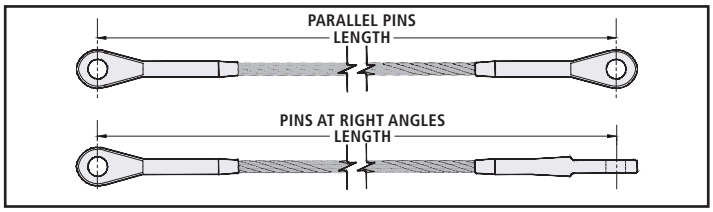
OPEN SWAGED SOCKETS



OPEN and CLOSED SWAGED SOCKETS



CLOSED SWAGED SOCKETS



SWAGED SOCKET ASSEMBLY SPECIFICATIONS

Rope Diameter (Inches)	Minimum Assembly Length	Vertical Work Load (Tons)	Stock Numbers		
			Open Open	Open Closed	Closed Closed
1/4″	11″	.68	OOSA-140	OCSA-140	CCSA-140
5/16″	15″	1.1	OOSA-516	OCSA-516	CCSA-516
3/8″	15″	1.5	OOSA-380	OCSA-380	CCSA-380
7/16″	20″	2	OOSA-716	OCSA-716	CCSA-716
1/2″	20″	2.7	OOSA-120	OCSA-120	CCSA-120
9/16″	24″	3.4	OOSA-916	OCSA-916	CCSA-916
5/8″	24″	4.1	OOSA-580	OCSA-580	CCSA-580
3/4″	29″	5.9	OOSA-340	OCSA-340	CCSA-340
7/8″	34″	8	OOSA-780	OCSA-780	CCSA-780
1″	38″	10	OOSA-100	OCSA-100	CCSA-100
1-1/8″	42″	13	OOSA-180	OCSA-180	CCSA-180
1-1/4″	48″	16	OOSA-140	OCSA-140	CCSA-140
1-3/8″	77″	19	OOSA-138	OCSA-138	CCSA-138
1-1/2″	81″	23	OOSA-120	OCSA-120	CCSA-120
1-3/4″	85″	31	OOSA-134	OCSA-134	CCSA-134
2″	98″	40	OOSA-200	OCSA-200	CCSA-200

Rated capacity is based on 5:1 Design Factor.

Ton = 2000 Lbs.

Work Load Limits apply when Swage Assemblies are used for slings.

Work Load Limits do not apply when Swaged Assemblies are used for crane boom pendants.


WILLIAMS

REFERENCE CHART

Sling Type	Parts of Wire Rope in Body	D/d Body*	D/d Eye*	Termination of Each Eye	Minimum Length	Features
Tri-Flex® Sling	3	5/1	1.5/1	1 Ferrule	6′ for 7/8″ component wire**	Replacement for single-strand wire rope slings
Gator-Laid® Sling	9	5/1	1/1	3 Ferrules	6′ for 3/4″ component wire**	80% efficiency: Parallel-laid eyes
Gator-Max® Sling	9	5/1	1/1	Hand tuck	15′ for 1/2″ component wire**	80% efficiency: Parallel-laid eyes
Gator-Flex® Sling	9	5/1	1/1	Hand tuck	15′ for 1/2″ component wire**	Unwrapped eyes Easy to inspect
Gator-Flex® Grommet	9	5/1	N/A	Hand tuck	4′ for 1/4″ component wire**	Endless

*Ratio based on finished body diameter.
**Minimum length increases as component wire size increases.

INSPECTION OF SLINGMAX® WIRE ROPE SLINGS

Follow the criteria in ASME/ANSI B30.9 Chapter 9-2.9 "Wire Rope Slings — Inspection, Removal and Repair"

Retirement Criteria:

For Gator®-family and Tri-Flex® slings of less than 9 parts:

If there are 20 broken wires per lay length, the sling should be removed from service.

For Gator®-family and Tri-Flex® slings of more than 9 parts:

If there are 40 broken wires per lay length, the sling should be removed from service.

For more inspection information, see pages 133 and 134.

Advantages: Flexibility, Low D/d Ratios, Manufactured to Tight Tolerances. Meets the specifications of the Wire Rope Technical Board Sling Manual.


Tri-Flex®


Gator-Laid®


Gator-Max®


Gator-Flex® Sling


Gator-Flex® Grommet

Gator-Laid® Wire Rope Slings with Parallel Eyes

Gator-Laid® products were developed in conjunction with the offshore oil industry to provide the world's best, heavy lift wire rope slings. Gator-Laid® Wire Rope Slings are the most efficient wire rope slings for heavy lifting and meet all industrial and regulatory standards. Gator-Laid® Wire Rope Slings feature twelve parts of wire rope in the eye and provide flexibility, strength and the additional advantage of shorter minimum lengths, when necessary. Gator-Laid® Slings and Gator-Max® Slings are identical except the Gator-Laid® sling has metal sleeves for the splice connection.

US Patent #5,561,973



GATOR-LAID® WIRE ROPE SLING SPECIFICATIONS

Finished Body Diameter	Component Wire Rope Diameter	Standard Eye Length	WORK LOAD LIMITS (Tons)			Weight Per Foot (Lbs.)
			Choker	Vertical	90° Basket	
1/2"	1/8"	8"	1.0	1.4	2.8	.26
5/8"	5/32"	10"	1.5	2.0	4.0	.40
3/4"	3/16"	12"	2.2	3.0	6.0	.59
7/8"	7/32"	14"	3.0	4.0	8.0	.77
1"	1/4"	16"	3.6	4.8	9.6	.99
1-1/4"	5/16"	18"	5.6	7.5	15.0	1.56
1-1/2"	3/8"	20"	7.8	10.5	21.0	2.19
1-3/4"	7/16"	22"	10.9	14.6	29.2	3.15
2"	1/2"	24"	14.3	19.1	38.2	4.14
2-1/4"	9/16"	26"	18.0	24.1	48.2	5.31
2-1/2"	5/8"	28"	22.2	29.6	59.2	6.48
3"	3/4"	30"	31.7	42.3	84.6	9.36
3-1/2"	7/8"	35"	42.9	57.3	114.6	12.78
4"	1"	40"	55.8	74.4	148.4	16.65
4-1/2"	1-1/8"	45"	60.2	93.6	187.2	21.06
5"	1-1/4"	50"	86.2	115.0	230.0	26.01
5-1/2"	1-3/8"	55"	103.6	138.2	276.4	31.50
6"	1-1/2"	60"	123.0	164.1	328.2	37.44
7"	1-3/4"	70"	165.2	220.3	440.6	51.03
8"	2"	80"	213.8	285.1	570.2	66.51
9"	2-1/4"	90"	266.7	355.6	711.2	84.24
10"	2-1/2"	100"	326.1	434.8	869.6	104.00

NOTE: Rated capacity is based on 5:1 Design Factor.
Ton = 2000 Lbs.

⚠ WARNING Inspect before use. Follow OSHA, ASME B30.9 and Manufacturer's Guidelines. Use by untrained persons is hazardous. Improper use will result in serious injury or death. Do not exceed rated capacity. This product will fail if damaged, abused, misused, overused or improperly maintained.

See Pages 131-140 for Important Safety, Use and Inspection Information.

Gator-Max® Wire Rope Slings with Parallel Eyes

Gator-Max® Wire Rope Slings were developed to meet requirements specified by the US Navy and Wire Rope Technical Board Sling Manual. Testing has proven Gator-Max® Wire Rope Slings to be the strongest multi-part wire rope sling when attached to small diameter pins. Sling eyes feature parallel wires (6 Ropes =12 Parts) and are terminated in a patented, hand-tuck fabrication procedure. Sling eyes are wrapped with heavy duty material to keep them in position. Gator-Max® Wire Rope Slings are extremely flexible.

US Patent #5,561,973



GATOR-MAX® WIRE ROPE SLING SPECIFICATIONS

Finished Body Diameter	Component Wire Rope Diameter	Standard Eye Length	WORK LOAD LIMITS (Tons)			Weight Per Foot (Lbs.)
			Choker	Vertical	90° Basket	
1/2″	1/8″	8″	1.0	1.4	2.8	.26
5/8″	5/32″	10″	1.5	2.0	4.0	.40
3/4″	3/16″	12″	2.2	3.0	6.0	.59
7/8″	7/32″	14″	3.0	4.0	8.0	.77
1″	1/4″	16″	3.6	4.8	9.6	.99
1-1/4″	5/16″	18″	5.6	7.5	15.0	1.56
1-1/2″	3/8″	20″	7.8	10.5	21.0	2.19
1-3/4″	7/16″	22″	10.9	14.6	29.2	3.15
2″	1/2″	24″	14.3	19.1	38.2	4.14
2-1/4″	9/16″	26″	18.0	24.1	48.2	5.31
2-1/2″	5/8″	28″	22.2	29.6	59.2	6.48
3″	3/4″	30″	31.7	42.3	84.6	9.36
3-1/2″	7/8″	35″	42.9	57.3	114.6	12.78
4″	1″	40″	55.8	74.4	148.4	16.65
4-1/2″	1-1/8″	45″	60.2	93.6	187.2	21.06
5″	1-1/4″	50″	86.2	115.0	230.0	26.01
5-1/2″	1-3/8″	55″	103.6	138.2	276.4	31.50
6″	1-1/2″	60″	123.0	164.1	328.2	37.44
7″	1-3/4″	70″	165.2	220.3	440.6	51.03
8″	2″	80″	213.8	285.1	570.2	66.51
9″	2-1/4″	90″	266.7	355.6	711.2	84.24
10″	2-1/2″	100″	326.1	434.8	869.6	104.00

NOTE: Rated capacity is based on 5:1 Design Factor.
Ton = 2000 Lbs.

⚠ WARNING Inspect before use. Follow OSHA, ASME B30.9 and Manufacturer's Guidelines. Use by untrained persons is hazardous. Improper use will result in serious injury or death. Do not exceed rated capacity. Slings will fail if damaged, abused, misused, overused or improperly maintained.

See Pages 131-140 for Important Safety, Use and Inspection Information.

Gator-Flex® Wire Rope Slings

Gator-Flex® Wire Rope Slings were developed in conjunction with offshore oil company riggers who desired a heavy lift, multi-part sling that could be visually inspected and possess flexibility. Gator-Flex® Slings have a nine-part body. The wires in the eyes are crossed or interwoven, so no wrapping is necessary and are "hand tuck" terminated. Gator-Flex® Wire Rope Slings offer the highest flexibility available for a multi-part wire rope sling.

US Patent #5,561,973



GATOR-FLEX® WIRE ROPE SLING SPECIFICATIONS

Finished Body Diameter	Component Wire Rope Diameter	Standard Eye Length	WORK LOAD LIMITS (Tons)			Weight Per Foot (Lbs.)	Minimum Length
			Choker	Vertical	90° Basket		
1 3/4"	7/16"	22"	10.3	13.8	27.6	3.15	15'
2"	1/2"	24"	13.5	18.0	36.0	4.14	15'
2-1/4"	9/16"	26"	18.1	22.7	45.4	5.31	20'
2-1/2"	5/8"	28"	20.8	27.8	55.6	6.48	20'
3"	3/4"	30"	29.8	39.7	79.4	9.36	20'
3-1/2"	7/8"	35"	40.3	53.7	107.4	12.78	25'
4"	1"	40"	52.3	69.8	139.6	16.65	28'
4-1/2"	1-1/8"	45"	65.8	87.7	175.4	21.06	33'
5"	1-1/4"	50"	81.0	108.8	216	26.01	38'
5-1/2"	1-3/8"	55"	97.5	130	260	31.50	40'
6"	1-1/2"	60"	115.5	154	308	37.44	45'
7"	1-3/4"	70"	154.5	206	412	51.03	51'
8"	2"	80"	200.2	267	534	66.51	58'
9"	2-1/4"	90"	249.7	333	666	84.24	65'
10"	2-1/2"	100"	306	408	816	104.00	72'

NOTE: Vertical Work Load Limit is based on 5:1 Design Factor, EIP, IWRC or GAC.
D/d for the sling body is 5:1 where D is the Pin or Load and d is the sling body diameter.
D/d for sling eyes: 1:1 where D is the pin and d is the sling eye diameter.
Ton = 2000 Lbs.

⚠ WARNING Inspect before use. Follow OSHA, ASME B30.9 and Manufacturer's Guidelines. Use by untrained persons is hazardous. Improper use will result in serious injury or death. Do not exceed rated capacity. This product will fail if damaged, abused, misused, overused or improperly maintained.

See Pages 131-140 for Important Safety, Use and Inspection Information.

Gator-Flex® Wire Rope Grommets

Gator-Flex® Grommets are endless in configuration and are a perfect Slingmax® solution for heavy lift applications that require minimum sling lengths.

Gator-Flex® Grommets can be made shorter than standard multi-part slings and are the most flexible grommets in the world.

US Patent #5,561,973



GATOR-FLEX® GROMMET SPECIFICATIONS

Finished Body Diameter	Component Wire Rope Diameter	WORK LOAD LIMITS (Tons)			Weight Per Foot (Lbs.)
		Choker	Vertical	90° Basket	
1"	1/4"	7	10	20	2
1-1/4"	5/16"	11	15	30	3
1-1/2"	3/8"	15	22	44	5
1-3/4"	7/16"	21	29	58	6
2"	1/2"	27	38	76	8
2 1/4"	9/16"	34	48	96	11
2-1/2"	5/8"	42	59	118	13
3"	3/4"	59	85	170	19
3-1/2"	7/8"	81	115	230	25
4"	1"	104	148	296	33
4-1/2"	1-1/8"	131	187	374	42
5"	1-1/4"	161	230	460	52
5-1/2"	1-3/8"	194	276	552	63
6"	1-1/2"	230	328	656	75
7"	1-3/4"	308	441	882	102
8"	2"	399	570	1140	133
9"	2-1/4"	498	711	1422	168
10"	2-1/2"	609	870	1740	209
11"	2-3/4"	728	1040	2080	250
12"	3"	857	1224	2448	300

NOTE: Vertical Work Load Limit is based on 5:1 Design Factor, EIP, IWRC or GAC.
D/d for the sling body is 5:1 where D is the Pin or Load and d is the sling body diameter.
D/d for sling bearing connection points is 5:1 where D is the pin and d is the sling body diameter.
A Gator-Flex® Grommet (4 inch finished body diameter) would need to be attached to a 20 inch diameter connection point to attain a 5/1 Design Factor.
Ton = 2000 Lbs.

⚠ WARNING Inspect before use. Follow OSHA, ASME B30.9 and Manufacturer's Guidelines. Use by untrained persons is hazardous. Improper use will result in serious injury or death. Do not exceed rated capacity. Slings will fail if damaged, abused, misused, overused or improperly maintained.

See Pages 131-140 for Important Safety, Use and Inspection Information.

Tri-Flex® Wire Rope Slings



Tri-Flex® Wire Rope Slings provide the optimum combination of strength and flexibility. Patented Tri-Flex® sling construction provides substantial savings in material and labor for larger sling sizes. Economy combined with ease of use make Tri-Flex® Slings, the slings of choice for educated buyers.

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.





TRI-FLEX® WIRE ROPE SLING SPECIFICATIONS

Finished Diameter	Component Wire Rope Diameter	WORK LOAD LIMITS (Tons)			Weight Per Foot Lbs.
		Choker	Vertical	90° Basket	
1/2″	1/4″	1.3	1.7	3.4	.44
5/8″	5/16″	1.9	2.6	5.2	.68
3/4″	3/8″	2.7	3.6	7.2	.99
7/8″	7/16″	3.7	4.9	9.8	1.33
1″	1/2″	4.8	6.4	12.8	1.75
1-1/8″	9/16″	6	8	16	2.24
1-1/4″	5/8″	7.4	9.9	19.8	2.73
1-1/2″	3/4″	10.5	14	28	3.9
1-3/4″	7/8″	14.3	19	38	5.4
2″	1″	18.6	24.8	49.6	7
2-1/4″	1-1/8″	23.4	31.2	62.4	8.9
2-1/2″	1-1/4″	28.8	38.4	76.8	10
2-3/4″	1-3/8″	34.5	46	92	13.3
3″	1-1/2″	41.2	55	110	15.8
3-1/2″	1-3/4″	54.8	73	146	21.5
4″	2″	71.2	95	190	28
4-1/2″	2-1/4″	88.5	118	236	35.6
5″	2-1/2″	109	145	290	44

NOTE: Vertical Work Load Limit is based on 5:1 Design Factor
D/d for the sling body is 5:1 where D is the Pin or Load and d is the sling body diameter.
D/d for sling eyes: 1.5/1 where D is the pin and d is the sling eye diameter.
Ton = 2000 Lbs.

⚠ WARNING Inspect before use. Follow OSHA, ASME B30.9 and Manufacturer's Guidelines. Use by untrained persons is hazardous. Improper use will result in serious injury or death. Do not exceed rated capacity. This product will fail if damaged, abused, misused, overused or improperly maintained.

See Pages 131-140 for Important Safety, Use and Inspection Information.

T&D Ultra-Flex™ Wire Rope Slings

T&D Ultra-Flex™ Wire Rope Slings are extremely flexible, with great applications for general rigging and use in the power, transmission and distribution industries. The development of T&D Ultra-Flex™ Wire Rope Slings was done through a committee composed of utility company workers and members of the SLINGMAX® design team. Actual field testing determined that T&D Ultra-Flex™ Wire Rope Slings perform especially well when setting or removing utility poles.

US Patent #5,561,973



T&D ULTRA-FLEX™ WIRE ROPE SLING SPECIFICATIONS

Finished Body Diameter (Inches)	Component Wire Rope Diameter (Inches)	Standard Eye Length (Inches)	WORK LOAD LIMITS (Tons)			Weight Per Foot (Lbs.)
			Choker	Vertical	90° Basket	
5/8"	5/32"	10"	1.3	1.7	3.4	.40
3/4"	3/16"	12"	1.9	2.6	5.2	.59
7/8"	7/32"	14"	2.6	3.5	7	.77
1"	1/4"	16"	3.4	4.6	9.2	.99
1-1/4"	5/16"	18"	5.2	7	14	1.56
1-1/2"	3/8"	20"	7.5	10	20	2.19

NOTE: Vertical Work Load Limit is based on 5:1 Design Factor
D/d for the sling body is 5:1 where D is the Pin or Load and d is the sling body diameter.
D/d for sling eyes 1:1 where D is the pin and d is the sling eye diameter.
Ton = 2000 Lbs.

⚠ WARNING Inspect before use. Follow OSHA, ASME B30.9 and Manufacturer's Guidelines. Use by untrained persons is hazardous. Improper use will result in serious injury or death. Do not exceed rated capacity. Slings will fail if damaged, abused, misused, overused or improperly maintained.

See Pages 131-140 for Important Safety, Use and Inspection Information.

Container Lifting Assemblies

Lift-It® Container Lifting Assemblies provide efficiency in handling containers featuring a bottom lifting slot.

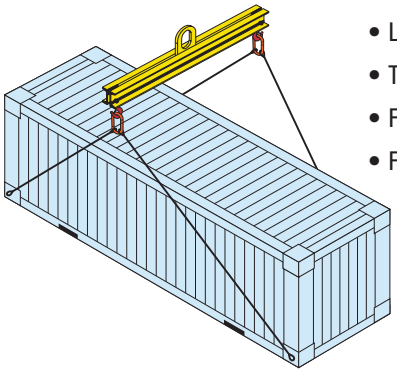
Available in two models, Fixed and Adjustable, Container Lifting Assemblies are rated to handle 20 ft. and 40 ft. containers.

Please provide container length, width, height, weight and location of center of gravity and we will determine the system that will be best suited for your application.

⚠ WARNING See Pages 131-140 and 269-270 for Important Safety, Use and Inspection Information.

FIXED ASSEMBLIES

Fixed Container Lifting Assemblies are used when the center of gravity is located at the center of the container.



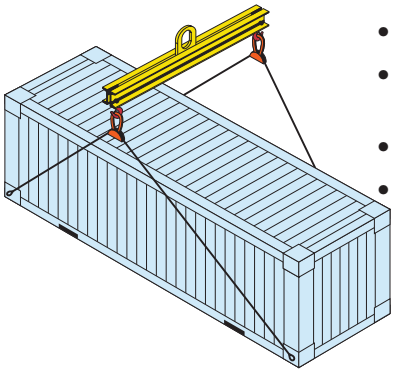
Includes:

- Lifting beam
- Two wire rope slings
- Four anchor shackles
- Four container lifting lugs

Stock Number	Container Size
CLS-45-20	20 Ft.
CLS-45-40	40 Ft.

ADJUSTABLE ASSEMBLIES

Adjustable Container Lifting Assemblies are used when the center of gravity is offset and not located at the center of the container.



Includes:

- Lifting beam
- Two adjuster mechanisms with wire rope slings
- Four anchor shackles
- Four container lifting lugs

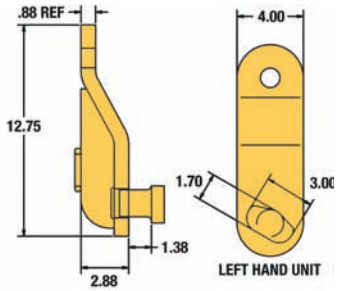
Stock Number	Container Size
CLSA-48-20	20 Ft.
CLSA-48-40	40 Ft.

COMPONENT INFORMATION

CONTAINER LIFTING LUGS

- An efficient way to lift containers from bottom lifting slot.
- Handle indicator shows Lug is engaged for lifting.

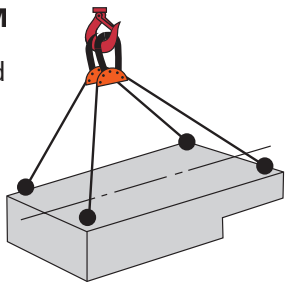


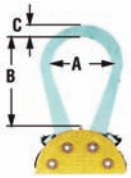


Stock Number	WLL (Lbs.)
CLL	17,000

TOP ADJUSTER MECHANISM

- Allows the crane hook to be placed directly over the Center of Gravity.
- Quickly adjusts to the CG.
- Can be locked into place for repetitive lifts.
- See page 294 for additional information.





Stock Number	WLL (Lbs.)	CTAM DIMENSIONS (Inches)			WEIGHT (LBS.)
		A	B	C	
CTAM24	60,000	5-5/8	8-3/4	2-3/8	220

LIFTING LUG OPERATION

Align Lug with Container Fitting



Insert Lug into Container Fitting



Apply Tension and Indicator Shows Lug in Locked Position.



⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.

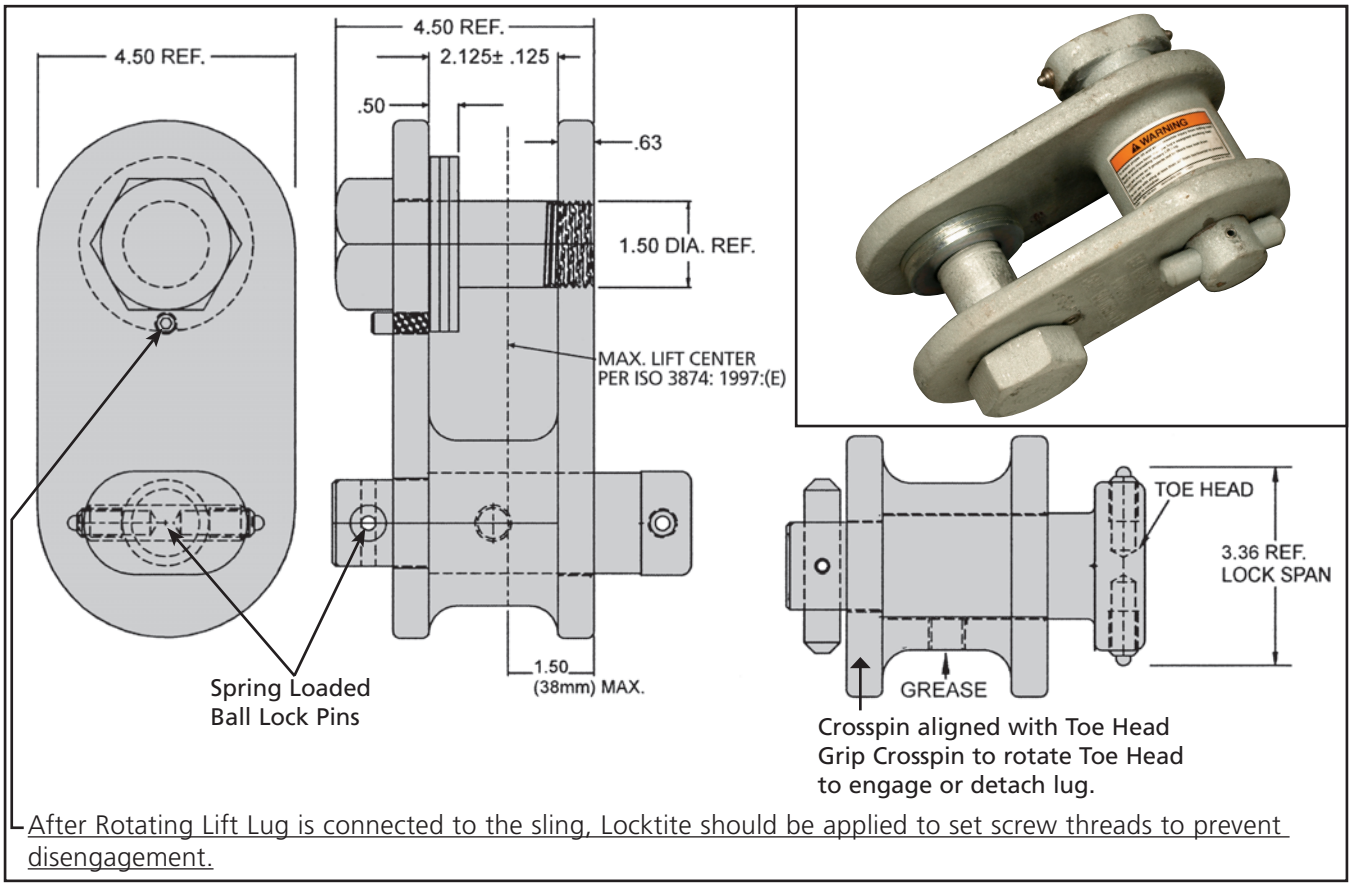
Rotating Lift Lugs

Rotating Lift Lugs are used to connect slings to the bottom, side apertures of ISO 668 Container Corner Fittings (ISO 1161).

Rotating Lift Lugs with the Pre-Lift Safety Lock feature prevents unwanted fallout while Lugs are NOT under load. The roof wall of the corner fitting captures the toe to prevent accidental dislodgement, while the Lift Lug body rotates around the toe.

Rotating Lift Lugs fit left or right hand corner fittings and do not require shackles for sling connection. They rotate to any angle; however ISO 1496 does not permit containers to be lifted from the bottom corners at angles less than 30 degrees horizontal. DOL-OSHA does not permit rigging to contact containers. Spreader bars or other means must be utilized to ensure compliance.

Rotating Lift Lugs are Thermal Zinc Coated (similar to hot dip galvanizing) and are proof tested to twice WLL.



Rotating Lift Lug Stock No. RLL-416000C-LSTZ
WLL- 33,600 Lbs.
Lift Lug Weight-22.3 Lbs.
Temperature Range: 120°/-40°(F)

Safety Lock Replacement Kit Stock No. SLRK-416005B-1TZK
Safety Lock Kit Weight-6.3 Lbs.

Rotating Lift Lugs are simple to use:
Insert the "Toe". Twist the Cross Pin 90 degrees to lock and prepare to Lift.

Recommended for applications where it is not practical for personnel to ensure that the 90 degree toe interlock in the corner fitting is maintained, **prior to lifting.**

⚠WARNING Lift Lug Users must be trained and knowledgeable in ISO 668, ISO 3874 Bottom Lift Standards and all other, applicable, federal, state, provincial, and maritime standards and regulations. Use by untrained personnel is hazardous and may result in INJURY, DEATH and/or property destruction. DO NOT EXCEED WORK LOAD LIMIT.

⚠ WARNING TO THE USERS OF CHAIN SLINGS



The ⚠WARNING Icon, used in our product information is done to alert sling users to potentially hazardous conditions and situations.

⚠WARNING It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this bulletin, in our catalog, on our website www.lift-it.com and follow OSHA and ASME guidelines. Use by untrained persons is hazardous.

The American Society of Mechanical Engineers, in the ASME B30.9 Sling Safety Standard clearly establishes the requirement for training. Section 9-1.1-Training states, "Chain sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter."

⚠WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations.

Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and rigging products will fail if damaged, abused, misused, overused, or improperly maintained.

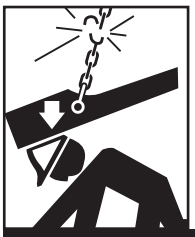
Any hazardous condition disclosed by an inspection shall require sling replacement. Temporary repairs are not permitted. Damage and wear seriously reduce sling Work Load Limits.

Always know the load weight and select the appropriate sling for the load, configuration of lift necessary to ensure load control and any chemical exposure.

Always take into account sling angles to calculate changes in the sling Work Load Limits, when used in choker and non-perpendicular vertical, basket or bridle configurations.

Ensure that the load will not cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces with suitable materials of sufficient strength, thickness and construction.

The strength of Chain Slings can be affected by chemically active environments. Sling materials may be susceptible to damage from caustic or acid substances or fumes. Strong oxidizing environments attack all common sling materials and components. Consult the manufacturer prior to selection and use.



⚠ WARNING

Slings can fail if damaged, misused, or overloaded. Inspect before use. Use only if trained. Observe rated load. Use adequate sling protection to avoid damage to sling. DEATH or INJURY can occur from improper use or care. Always protect the sling from damage with materials of sufficient strength, thickness and construction.

RATED LOAD = RATED CAPACITY = WORK LOAD LIMIT

ALLOY CHAIN SLINGS

INSTRUCTIONS FOR CARE ♦ USE ♦ INSPECTION ♦ REPAIR.

CARE ♦ Store chain slings on a rack away from possible mechanical damage, corrosion, moisture, dust, grit and extreme temperatures. ♦ Oil prior to prolonged storage. ♦ Do not anneal (temper) alloy chain, connecting links or hooks. For hot galvanized chain products consult the manufacturer.

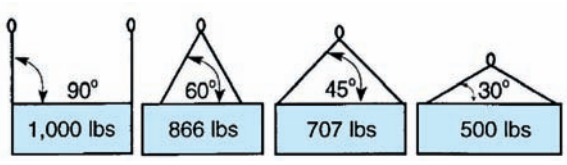
USE ♦ Know the weight of load. ♦ Check tag to confirm that sling is rated adequately for the load (see load angle chart). ♦ Avoid twists, knots or kinks ♦ Be sure that the load can't cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces; ***use materials of sufficient strength, thickness and construction.*** ♦ Center the sling in the base (bowl) of sling hook unless sling hook is designed for point loading. ♦ Balance the load. ♦ Maintain load control. ♦ Avoid jerking the load. ♦ Be alert for snagging of load. ♦ Do not pull on stuck objects. ♦ Avoid dragging sling over rough surfaces and from under the load. ♦ Choker hitch must choke on sling body, never on a fitting. ♦ Stand clear of load at all times. ♦ Persons are not to ride on sling or load. ♦ If sling is to be used in a chemical environment, contact manufacturer for specific recommendations. ♦ Do not use chain slings at temperatures above 400° F or below -40° F. ♦ When shortening chain, use only the manufacturer's recommended alloy components.

INSPECTION ♦ Before each use: Check for nicks, gouges or excessive wear. Inspect for bent, twisted, deformed chain or components. Inspect for heat damage, weld spatter, pitting or corrosion, increase in hook throat opening, missing latch (if so equipped). **If this wear or damage is present, if rated load tag is missing or illegible; remove from service and repair or replace sling.** Periodic Inspections are required at least annually for normal service, quarterly or more frequently if in severe service or nearly constant use. Periodic inspections are performed by designated person(s) who are trained and a written record of the most periodic inspection shall be maintained and shall include the condition of the sling. The inspector shall determine when further use would be hazardous.

REPAIR ♦ If any hazardous condition is disclosed during an inspection, the sling shall be removed from service and shall require repair by chain sling manufacturer or a qualified person. All repaired slings shall be proof tested and certified.

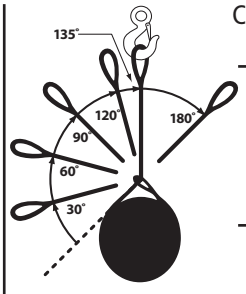
LOAD ANGLE CHART

Angle factor *must* be applied to calculate the reduced sling capacity when lifting force is not at 90° to the plane of the load!



Multiply angle factor x sling's vertical rated load to calculate the reduced capacity at the angle.

Angle	Factor
90°	1.0000
80°	0.9848
75°	0.9659
70°	0.9397
65°	0.9063
60°	0.8660
55°	0.8192
50°	0.7660
45°	0.7071
40°	0.6248
35°	0.5736
30°	0.5000



Choke Angle Effect

Choker Angle (Degrees)	Rated Capacity, % [Note (1)]
Over 120	100
90 - 120	87
60 - 89	74
30 - 59	62
0 - 29	49

NOTE: (1) Percent of sling rated capacity in a choker hitch.

Because of the reduced lifting capacity, use extra care when the **horizontal** lift angle is less than 45° and do not make lifts of less than 30° load angle. *Example:* A sling with adequate capacity could be broken because of increased tension resulting from angles of less than 30 degrees. When possible, use longer slings to minimize angular tension by increasing the angle.

Chain Sling Safety Information

The following information contains warnings and use information applicable to Gunnebo Lifting Grade 80 and Grade 100 Alloy Steel Chain Slings and components and is furnished with all shipments.

Never use a sling without training, OSHA regulation requires responsible work practice.

"The employer shall permit only those employees qualified by training or experience to operate equipment and machinery." OSHA 1926.20 (b) (4).

Employee training should include information given in OSHA training literature, ASME B30.9 "Slings" and ASME B30.10 "Hooks" safety standards and this document.

Always inform yourself and ask your employer for chain sling, safe use instruction.

"The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury." OSHA 1926.21 (b) (2).

Always comply with applicable Federal and local regulations, which govern worksite activity.

Understand all governing laws and safety standards before using chain slings. OSHA 1910.184 regulates chain sling safe operating practices, product identification, inspection requirements, and use limitations. ASME B30.9 "Sling" safety standard provides additional recommendations for chain sling use.

"If a particular standard is specifically applicable to a condition, practice, means, method, operation or process, it shall prevail over any different general standard." OSHA 1910.5 (c) (1).

Contact OSHA at (800) 321-6742 or www.OSHA.gov and ASME at (800) 843-2763 or www.ASME.org for reference assistance.

Always know load weight to avoid sling failure.

ASME B30.9-1.10.1 (c) stipulates, "The rated load of the sling shall not be exceeded."

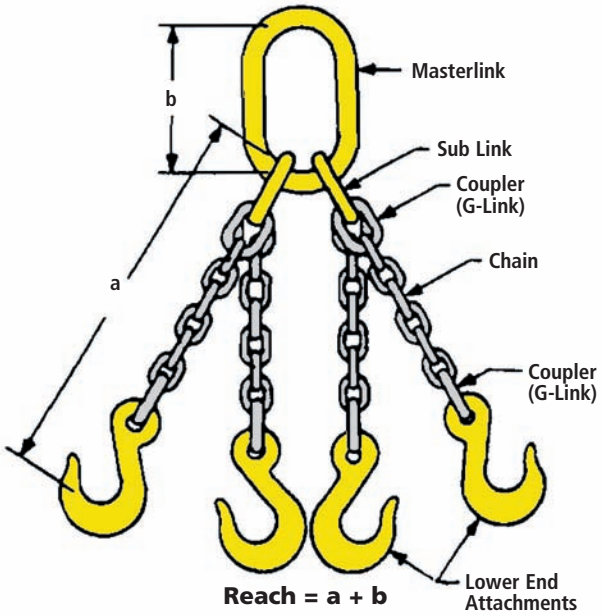
The weight of the load to be lifted must be known for determination of proper sling configuration and Work Load Limit.



PROTECT YOURSELF AND OTHERS:

- **Never** use a sling without training.
- **Always** inform yourself. Ask your employer for the manufacturer's sling use limitations.
- **Always** comply with applicable Federal and local regulations.
- **Always** know load weight.
- **Never** use a sling without a legible capacity tag.
- **Never** overload a sling. Never ride on sling or load.
- **Never** use an improper sling configuration.
- **Never** use a worn-out or damaged sling.
- **Never** use a sling in extreme temperatures.
- **Never** use a sling in acidic conditions.

Quadruple Leg Sling



Never use a sling without a legible identification tag. Sling identification is required to ensure proper sling usage.

OSHA 1910.184 (e) (1) states, "Alloy steel chain slings shall have permanently affixed, durable identification stating size, grade, rated capacity and reach."

OSHA 1910.184 (e) (2) (i) states, "Hooks, rings or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used or the sling shall not be used in excess of the rated capacity of the weakest component."

OSHA 1910.184 (e) (2) (ii) states, "Makeshift links or fasteners shall not be used."

Lift-It® provides an identification tag, attached by a coupler stamped with: sling WLL, sling angle, serial number, chain size, grade, reach, type and manufacturer.

Grade of the component with the lowest breaking strength shall be specified on the identification tag. Non-standard grades shall be designated by "NS".

Work Load Limit (WLL) is the maximum Work Load for a specified working range. Sling working range includes sling angles from 90° to a specified minimum.

Work Load is to be applied vertically to a sling assembly having symmetrical leg angles. WLL applies to loads lifted vertically and does not include torsional, binding, shock or non-symmetrical load effects.

Gunnebo Lifting Grade 80 & Grade 100 Alloy Steel Chain Vertical and Basket Sling Work Load Limits for selected working ranges of symmetrical sling leg angles are listed in pounds and given in TABLES 1A and 1B. No chain sling shall be rigged with a leg angle less than 30° from the horizontal.

ASTM A906/A 906M – 02-9.2 states: "Slings containing any Grade 80 components shall be rated at Grade 80 Work Load Limits."

Double Leg and Single Basket Sling WLL for an alternate working range of symmetric sling leg angles equals (=) 2x TABLE 1A or 1B single leg WLL x sine of the minimum working range angle.

Triple and Quadruple leg and Double Basket Sling WLL for an alternate working range of symmetrical sling leg angles equals (=) 3 x TABLE 1A or 1B single leg WLL x sine of the minimum working range angle.

TABLE 2 lists for convenience sine values for selected sling leg angles.

TABLE 2

Angle	Sine	Angle	Sine	Angle	Sine
85	.996	70	.940	50	.766
80	.985	65	.906	40	.643
75	.966	55	.819	35	.574

Multi Leg and Basket Sling WLL for non-symmetrical loading can only be determined by an engineering analysis of the specific rigging condition. In the absence of an engineering analysis, WLL shall be equal to single leg sling WLL given in TABLE 1A or 1B.

TABLE 1A- GR 80 ALLOY STEEL CHAIN SLING WORK LOAD LIMITS* (Lbs.)
DESIGN FACTOR 4/1

GUNNEBO LIFTING GR 80 CHAIN SIZE		SINGLE LEG	DOUBLE LEG			TRIPLE & QUAD LEG		
MM	IN	90°	90° - 60°	90° - 45°	90° - 30°	90° - 60°	90° - 45°	90° - 30°
6	7/32	2,100	3,600	3,000	2,100	5,450	4,450	3,150
7	9/32	3,500	6,100	4,900	3,500	9,100	7,400	5,200
8	5/16	4,500	7,800	6,400	4,500	11,700	9,500	6,800
10	3/8	7,100	12,300	10,000	7,100	18,400	15,100	10,600
13	1/2	12,000	20,800	17,000	12,000	31,200	25,500	18,000
16	5/8	18,100	31,300	25,600	18,100	47,000	38,400	27,100
19	3/4	25,500	44,100	36,000	25,500	66,200	54,000	38,200
20	3/4	28,300	49,000	40,000	28,300	73,500	60,000	42,400
22	7/8	34,200	59,200	48,400	34,200	88,900	72,500	51,300
26	1	47,700	82,600	67,400	47,700	123,900	101,200	71,500
32	1-1/4	72,300	125,200	102,200	72,300	187,800	153,400	108,400

*Work Load Limits are valid between temperatures of -40°F and 400°F.

TABLE 1B - GR 100 ALLOY STEEL CHAIN SLING WORK LOAD LIMITS*(Lbs.) DESIGN FACTOR OF 4/1								
GUNNEBO GR 100 CHAIN SIZE		SINGLE LEG	DOUBLE LEG			TRIPLE & QUAD LEG		
MM	IN	90°	90° - 60°	90° - 45°	90° - 30°	90° - 60°	90° - 45°	90° - 30°
5.5	7/32	2,700	4,700	3,800	2,700	7,000	5,700	4,000
7	9/32	4,300	7,400	6,100	4,300	11,200	9,100	6,400
8	5/16	5,700	9,900	8,100	5,700	14,800	12,100	8,500
10	3/8	8,800	15,200	12,400	8,800	22,900	18,700	13,200
13	1/2	15,000	26,000	21,200	15,000	39,000	31,800	22,500
16	5/8	22,600	39,100	32,000	22,600	58,700	47,900	33,900
20	3/4	35,300	61,100	49,900	35,300	91,700	74,900	53,000
22	7/8	42,700	74,000	60,400	42,700	110,900	90,600	64,000

*Work Load Limits are valid between temperatures of -40°F and 400°F.

Choked chain sling WLL is affected by choke angle. TABLE 3A and 3B illustrates choke angle and gives Sling Choker WLL's as a percentage of the WLL shown in TABLES 1A and 1B for full range of choke angles.

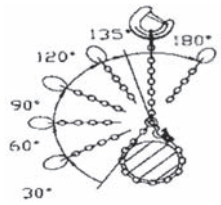
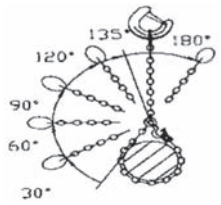
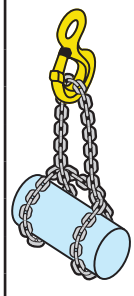
TABLE 3A		GR 80
	Choke Angle	Percentage Of TABLE 1A WLL
	120 - 180	100%
	90 - 119	87%
	60 - 89	74%
	30 - 59	62%
	0 - 29	49%

TABLE 3B		GR 100
	Choke Angle	Percentage Of TABLE 1B WLL
	120 - 180	80%
	90 - 119	70%
	60 - 89	60%
	30 - 59	50%
	0 - 29	40%

Choked Endless Chain Sling WLL's for selected Gunnebo Lifting Grade 80 and Grade 100 chain leg angles are listed in TABLES 4A and 4B.

Table 4A GR 80 - CHOKED ENDLESS CHAIN SLING WORK LOAD LIMITS (Lbs.) Design Factor 4/1				
	GUNNEBO GRADE 80	CHOKER WLL (Lbs.)		
	CHAIN SIZE	ENDLESS		
MM	IN	90°	90° - 60°	90° - 45°
6	7/32	3,150	2,700	2,250
7	9/32	5,250	4,575	3,675
8	5/16	6,750	5,850	4,800
10	3/8	10,600	9,200	7,500
13	1/2	18,000	15,600	12,700
16	5/8	27,100	23,400	19,200
19	3/4	38,200	33,000	27,000
20	3/4	42,400	36,700	30,000
22	7/8	51,300	44,400	36,300
26	1	71,500	61,900	50,500
32	1-1/4	108,400	93,900	76,600

*Work Load Limits are valid between temperatures of -40°F and 400°F.

Table 4B GR 100 - CHOKED ENDLESS CHAIN SLING WORK LOAD LIMITS (Lbs.) Design Factor 4/1				
	GUNNEBO GRADE 100	CHOKER WLL (Lbs.)		
	CHAIN SIZE	ENDLESS		
MM	IN	90°	90° - 60°	90° - 45°
5	7/32	4,000	3,500	2,800
7	9/32	6,400	5,500	4,600
8	5/16	8,500	7,400	6,100
10	3/8	13,200	11,400	9,300
13	1/2	22,500	19,500	15,900
16	5/8	33,900	29,300	24,000
20	3/4	52,900	45,800	37,400
22	7/8	64,000	55,500	45,300

*Work Load Limits are valid between temperatures of -40°F and 400°F.

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.



Never overload a sling by understanding Work Load Limits.

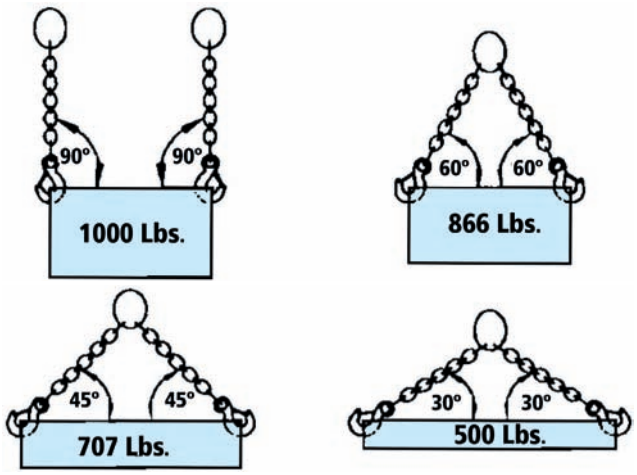
OSHA 1910.184 (c) (4) stipulates, "Slings shall not be loaded in excess of their rated capacities."

ASME 830.9-1.4 states, "The design factor for alloy steel chain slings shall be a minimum of 4."

Standard Gunnebo Lifting Work Load Limits (WLL) are based on a 4/1 design factor. Lift dynamics, duty cycle and hitch type may require an increased design factor, hence a reduced WLL. Inattention to required design factor can result in sling overload.

Sling WLL depends on the sling leg angle. The WLL for a sling is reduced as the horizontal sling leg angle gets smaller. This fact applies to all multi-leg and basket slings and must not be ignored.

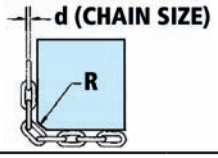
The following diagram illustrates the effect of sling leg angle on the WLL for a single basket and two-leg sling.



The WLL of a sling with a 30° leg angle is 50% of the WLL for the same sling with a 90° leg angle. Inattention to the effect of sling leg angle can result in sling overload.

Chain sling WLL is to be reduced in accordance with TABLE 5 when chain is rigged over an edge radius (R) less than two (2) x the chain rod diameter (d).

Reduced WLL equals chain sling WLL from identification tag x reduction factor.

TABLE 5	GR 80 AND GR 100 CHAIN
	

Edge Radius	R>2 x Chain d	R> Chain d	R< Chain d
Reduction Factor	1.0	0.7	0.5

Never ride on sling or load and avoid death and injury.

OSHA 1910 184 (c) (9) Sling Use regulations require that: "All employees shall be kept clear of loads about to be lifted and of suspended loads."

OSHA 1910.180 (h) (3) (v) General Worksite regulations require that: "No hoisting, lowering, swinging or traveling shall be done while anyone is on the load or hook assembly."

OSHA 1926.550 (g) (2) Construction Worksite Regulation stipulates: "The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold would be more hazardous or is not possible because of structural design or worksite conditions."

Alloy steel chain slings shall not be used to rig personnel platforms.

Never rig a sling to load improperly and avoid dropped loads and sling damage.
Safe operating practices per OSHA 1910.184 (c) and operating practices per ASME B30.9-1.10 state:

- Sling leg shall not be less than 30° from the horizontal.
- Slings shall be shortened with a shortening hook only and not with knots or bolts or other makeshift devices.
- Sling legs shall not be kinked or twisted.
- Sling hooks shall not be point loaded.
- Sling hook latch may be mandatory by regulation, safety codes or insurance.
- Slings used in a basket hitch shall have the loads balanced to prevent slipping.
- Slings shall be securely attached to their loads.
- Slings shall be padded or protected from the edges of their loads when the edge radius is less than .5 of the chain rod diameter (d). See TABLE 5.
- Sling shall be rigged to prevent chain from sliding over a load edge radius while lifting.

Never use a worn-out or damaged sling.

"Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use where service conditions warrant. Damaged or defective slings shall be immediately removed from service" OSHA 1910.184 (d).

"In addition to the inspection required by paragraph 1910.184(d), a thorough periodic inspection shall be made on a regular basis, to be determined on the basis of:

(A) frequency of sling use;
(B) severity of service conditions;
(C) nature of lifts being made;
(D) experience gained on the service life of slings used in similar circumstances.

Such inspections shall in no event be at intervals greater than once every 12 months."
OSHA 1910.184 (e) (3) (i).

"The thorough inspection of alloy steel chain slings shall be performed by a competent person designated by the employer, and shall include a thorough inspection for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service." OSHA 1910.184 (e) (3) (iii)

"Worn or damaged alloy steel chain slings or attachments shall not be used until repaired." OSHA 1910.184 (e) (7) (i).

A chain sling with reach longer than given on identification tag shall be immediately removed from service and evaluated for wear and material stretch.

Chain link wear is limited by minimum cross-sectional dimensions given in TABLE 6. Chain worn below the given limits shall be removed from service.

A chain sling connector or attachment with wear greater than 10 percent of the original dimension for any cross section shall be removed from service.

TABLE 6		GR80 AND GR100	
Nominal Chain or Coupling Link Size		Minimum Cross-Sectional "C" Dimensional Limit	
mm.	in.	mm.	in.
6	7/32	5.2	.205
7	9/32	5.9	.239
8	5/16	6.9	.273
10	3/8	8.7	.342
13	1/2	11.3	.443
16	5/8	13.9	.546
19	3/4	16.3	.643
20	3/4	16.9	.665
22	7/8	19.0	.750
26	1	22.5	.887
32	1-1/4	27.7	1.091

A chain sling coupler, chain, G-Link, masterlink, sub-link, hook or attachment that is broken, cracked, bent, stretched or twisted shall be removed from service and shall not be repaired.

Chain slings with a coupler, chain, G-link, masterlink, sub-link, hook or attachment that is nicked or gouged or lapped shall be removed from service and shall not be returned to service unless properly repaired.

Hook latch, when required, shall be fully functional and properly seated.

Never use a sling in alkaline or acidic conditions.

Gunnebo Lifting Grade 80 and Grade 100 alloy steel chain and components shall not be used in alkaline or acidic conditions. Resulting metal embrittlement and accelerated corrosion can cause sudden sling failure. Hot dip galvanizing and electro-zinc plating of alloy steel chain and components shall be done only by Gunnebo.

Never use a sling in extreme temperatures.

"Alloy steel chain slings shall be permanently removed from service if they are heated above 1000°F". OSHA 1910.184 (e) (6).

Alloy steel chain slings shall not be used while heated above 1000°F or cooled below -40°F.

Alloy steel chain sling Work Load Limits (WLL) given in TABLE 1A or 1B are valid between temperatures of -40°F and 400°F.

Alloy steel chain sling WLL shall be reduced in accordance with TABLES 7A or 7B when heated between 400°F and 1000°F.

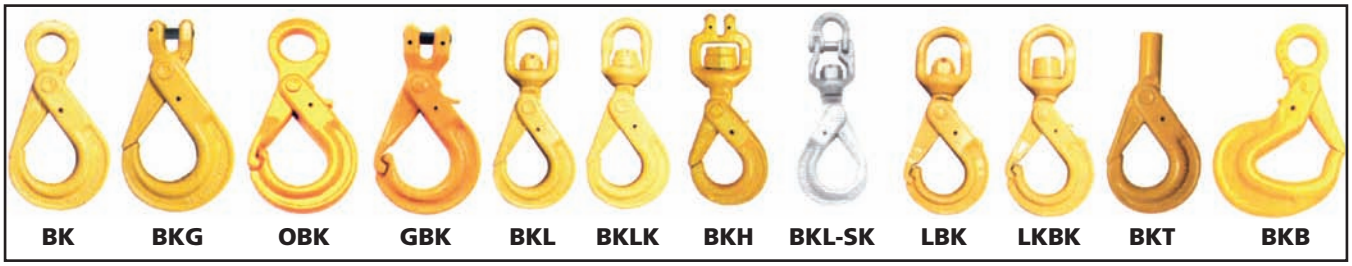
Permanent WLL reduction shall be made in accordance with TABLE 7A or 7B for chain slings heated over temperatures indicated. Identification tag shall be replaced and the new tag shall have the reduced WLL.

TABLE 7A	GR 80 CHAIN AND COMPONENTS	
Sling Component Temperature	Percentage of TABLE 1A AND 4A WLL	
	During Exposure	After Exposure
-40°F to 400°F	None	None
>400°F to 500°F	95%	None
>500°F to 600°F	90%	None
>600°F to 700°F	82%	None
>700°F to 800°F	75%	90%
>800°F TO 900°F	65%	75%
>900°F TO 1000°F	60%	70%

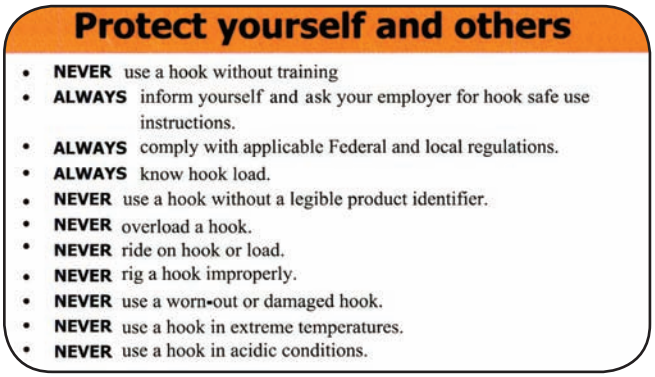
TABLE 7B	GR 100 CHAIN AND COMPONENTS	
Sling Component Temperature	Percentage of TABLE 1B AND 4B WLL	
	During Exposure	After Exposure
-40°F to 400°F	None	None
>400°F to 500°F	95%	95%
>500°F to 600°F	90%	90%
>600°F to 700°F	82%	85%
>700°F to 800°F	75%	80%
>800°F TO 900°F	65%	75%
>900°F TO 1000°F	60%	70%

BK Self-Locking Hook Safety Information

The following information contains warnings and use information applicable to Gunnebo Lifting Alloy Steel BK Self-locking Hooks.







Never use a hook without training.

OSHA regulation requires responsible work practices. "The employer shall permit only those employees qualified by training or experience to operate equipment and machinery." OSHA 1926.20 (b) (4)

Employee training should include information given in OSHA training literature, ASME B30.9 "Slings" and ASME B30.10 "Hooks" safety standards and this document.

Always inform yourself and ask your employer for hook safe use instruction.

"The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury." OSHA 1926.21 (b) (2)."

Always comply with applicable Federal and local regulations, which govern worksite activity. Understand all governing laws and safety standards before using BK self-locking hooks. OSHA 1910.184 regulates sling safe operating practices, product identification, inspection requirements and use limitations. ASME B 30.9 "Sling" safety standard and B30.10 "Hooks" provides additional recommendations for chain sling and hook usage.

"If a particular standard is specifically applicable to a condition, practice, means, method, operation or process, it shall prevail over any different general standard." OSHA 1910.5 (c) (1)

Contact OSHA at (800) 321-6742 or www.OSHA.gov and ASME at (800) 843-2763 or www.ASME.org for reference assistance.

Always know hook load to avoid hook failure. OSHA 1910.184 (i)(3)(i) stipulates, "Fittings shall be of a minimum break strength equal to that of the sling."

ASME B30.10-1.3 states, "It shall be determined that the weight of the load to be lifted does not exceed the lesser of the load rating of the hook or the load rating of the equipment of which the hook is a part."

The maximum load applied to self-locking hooks must be known for proper self-locking hook selection.

Never use a hook without a legible product identifier.
Product Identification is required to ensure proper application.

OSHA 1910.184 (e)(2)(i) stipulates, "Hooks, rings or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used or the sling shall not be used in excess of the rated capacity of the weakest component."

Gunnebo Lifting product identifiers are forged into self-locking hooks and designate trade size followed by the grade, Example: 13-8

Gunnebo Lifting Grade 80 and Grade 100 Alloy Steel BK self-locking hook Work Load Limits for selected design factors are listed in pounds and given in TABLE 1A and TABLE 1B.

Never overload a hook.
Understand Work Load Limits.

OSHA 1910.184 (c)(4) states, "Slings shall not be loaded in excess of their rated capacities."

TABLE 1A

GR 80 ALLOY STEEL BK SELF-LOCKING HOOK WORK LOAD LIMITS (Lbs.)*

TRADE SIZE		DESIGN FACTOR			
MM	IN	4:1	5:1	6:1	9:1
5/6	7/32	2100	1680	1400	930
7/8	9/32	3500	2800	2330	1560
10	3/8	7100	5680	4730	3160
13	1/2	12000	9600	8000	5330
16	5/8	18100	14480	12070	8040
18/20	3/4	28300	22640	18860	12570
22	7/8	34200	27360	22800	15200
26	1	47700	38160	31800	21200
28	1-1/8	55100	44080	36700	24480

*Work Load Limits are valid between temperatures of -40°F and 400°F.

Work Load Limit (WLL) is the maximum Working Load to be applied to BK self-locking hooks for the specific application. WLL applies to in-line loading and does not include torsional, binding, shock or side load effects.

"The design factor for alloy steel chain slings shall be a minimum of 4." ASME B30.9-1.4

"The design factor for wire rope slings shall be a minimum of 5" ASME B30.9-2.4

"The design factor for synthetic rope slings shall be a minimum of 5." ASME B30.9-4.4

"The design factor for synthetic webbing slings shall be a minimum of 5." ASME B30.9-5.4

"The design factor for roundslings shall be a minimum of 5." ASME B30.9-6.4

Standard Gunnebo Lifting Work Load Limits are based on a 4/1 design factor. Lift dynamics, duty cycle and lift system type may require an increased design factor, hence a reduced WLL. Inattention to required design factor can result in hook overload. Contact Gunnebo Johnson Corp. Service Department for assistance at (800) 331-5460.

Never ride on hook or load. Avoid death or injury.

OSHA 1910.184(c)(9)-Sling use regulation stipulates: "All employees shall be kept clear of loads about to be lifted and of suspended loads."

TABLE 1B

GR 100 ALLOY STEEL BK SELF-LOCKING HOOK WORK LOAD LIMITS (Lbs.)*

TRADE SIZE		DESIGN FACTOR			
MM	IN	4:1	5:1	6:1	9:1
5/6	7/32	2700	2160	1800	1200
7/8	9/32	5700	4560	3800	2530
10	3/8	8800	7040	5860	3900
13	1/2	15000	12000	10000	6660
16	5/8	22600	18080	15060	10040
18/20	3/4	35300	28240	23530	15680
22	7/8	42700	34160	28460	18970

*Work Load Limits are valid between temperatures of -40°F and 400°F.

OSHA 1910.180 (h) (3) (v) states, "No hoisting, lowering, swinging or traveling shall be done while anyone is on the load or hook."

OSHA 1926.550(g)(2) stipulates: "The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use and dismantling of a conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions."

"Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work and shall not be used for any other purpose when not hoisting personnel." OSHA 1926.550 (g) (4) (iv) (E)

Alloy steel BK self-locking hooks may be used to rig personnel platforms when lift system is in full compliance with OSHA 1926.550 (g).

Never rig a hook to a load improperly and avoid dropped loads and hook damage.
See: OSHA 1910.184 (c), ASME B30.5-3.2,
ASME B30.9-1.10, 2.10, 3.10, 4.10, 5.10 and 6.10.

Loads shall be centered in the base (bowl/saddle) of hook to prevent point loading of the hook. (See Figures 1a, 1b and 1c).

Hooks shall not be used in such a manner as to place a side load or back load on the hook. (See Figures 2a and 2b).

When using a device to close the throat opening of the hook, care shall be taken that the load is not carried by the closing device. (See Figures 3a and 3b).

Hands, fingers and body shall be kept from between hook and load.

The use of a hook with a latch does not preclude the inadvertent detachment of a slack sling or a load from the hook. Visual verification of proper hook engagement is required in all cases.

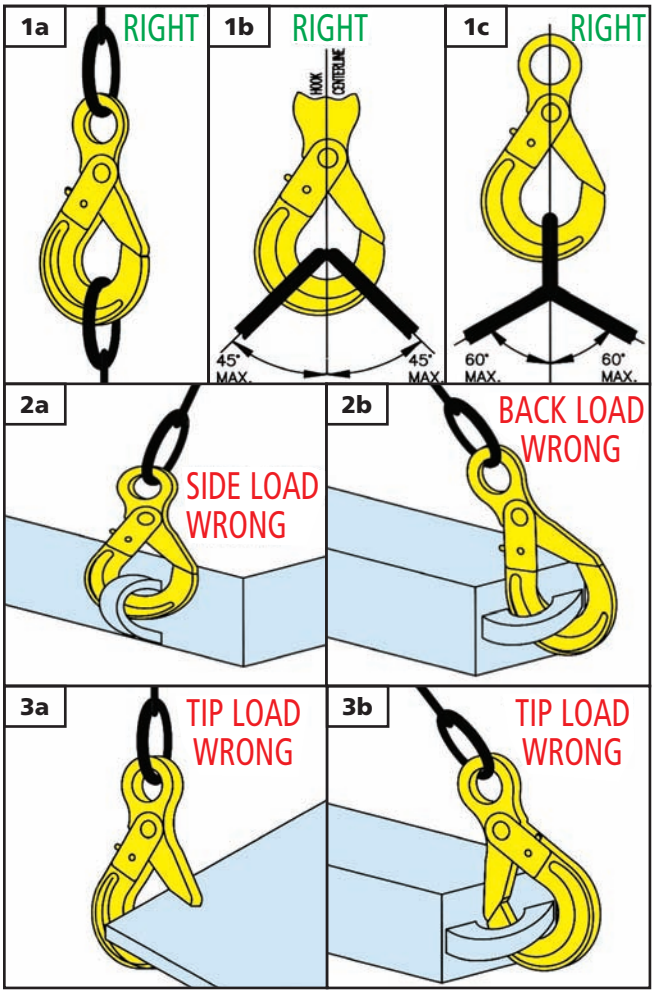
Self-locking hooks shall be locked during use.

ASME B30.10-1.3 states, "When a hook is equipped with a latch, the latch should not be restrained from closing during use."

Self-locking hooks shall not be rigged with more than two (2) sling legs in the hook saddle and sling leg angles shall not be greater than 45° from hook centerline. (See Figure 1b).

Self-locking hooks shall be rigged with a masterlink or shackle when three (3) or more sling legs are used or sling leg angles exceed 45° from hook centerline. (See Figure 1c).

Synthetic slings may require a Work Load Limit (WLL) reduction when used in self-locking hook eye or saddle. Contact the synthetic sling manufacturer for recommendations.



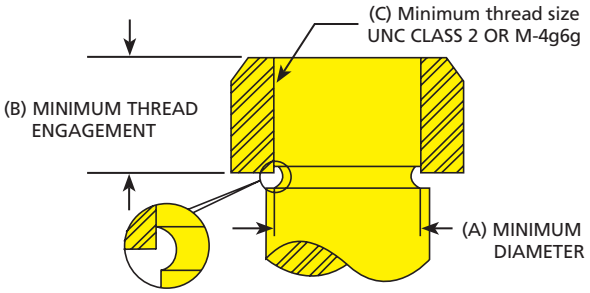
Chain sling WLL when choked with BK self-locking hooks equals 80% of sling identification tag WLL.

BKT self-locking hook shank machining limits are defined and are given in TABLE 2 and these limits are required for Work Load Limits given in TABLES 1A and 1B. Failure to comply can result in stripped threads and loss of load.

Hook shank threads shall end with a thread relief. Hook shank shall not be swaged to wire rope or rod. Hook shank shall not be drilled and internally threaded.

TABLE 2

BKT Machining Limits



English				
Trade Size		(A)	(B)	(C) Min. Thread
MM	IN	Dia.	Length	Class 2
5/6	7/32	.430	.563	9/16-12 UNC
7/8	9/32	.485	.625	5/8-11 UNC
10	3/8	.600	.750	3/4-10 UNC
13	1/2	.820	1.00	1-8 UNC
16	5/8	1.048	1.25	1-1/4-7 UNC

Metric				
Trade Size		(A)	(B)	(C) Min. Thread
MM	IN	Dia.	Length	Class 4g6g
5/6	7/32	11	14	M14x2
7/8	9/32	13	16	M16x2
10	3/8	16	20	M20x2.5
13	1/2	20	24	M24x3
16	5/8	25	30	M30x3.5

Never use a worn-out or damaged hook.

OSHA 1910.184(d) states, "Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use where service conditions warrant. Damaged or defective slings shall be immediately removed from service."

OSHA 1910-184 (e) (3) (i) stipulates, "In addition to the inspection required by paragraph (d) of this section, a thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of: (A) frequency of sling use; (B) severity of service conditions; (C) nature of lifts being made and (D) experience gained on the service life of slings used in similar circumstances. Such inspections shall in no event be at intervals greater than once every 12 months."

OSHA 1910.184 (e) (3) (iii) states, "The thorough inspection of alloy steel chain slings shall be performed by a competent person designated by the employer, and shall include a thorough inspection for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service."

OSHA 1910.184 (e) (7) (i) states, "Worn or damaged alloy steel chain slings or attachments shall not be used until repaired."

Self-locking hooks with wear greater than 10 percent of the original dimension for any cross-section shall be removed from service.

Inspect self-locking hooks and threads with magnetic particle and/or dye penetrant at intervals no greater than once annually. Some disassembly may be required.

Self-locking hooks with corroded threads shall be removed from service and shall not be returned to service unless approved by a competent person.

Self-locking hooks that are broken, cracked, bent, stretched, twisted or welded on shall be removed from service and shall not be repaired.

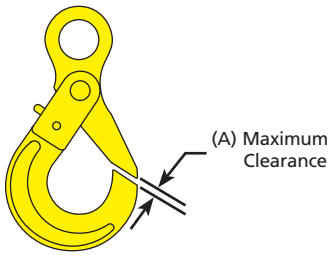
Self-locking hooks that are nicked, gouged or lapped shall be removed from service and shall not be returned to service unless properly repaired.

Gunnebo Johnson Corp. and/or Lift-It® Manufacturing Co., Inc. cannot assume responsibility for: (1) Machining quality, (2) Application or (3) Attachment to power source or load.

Hook latch shall properly close and lock.

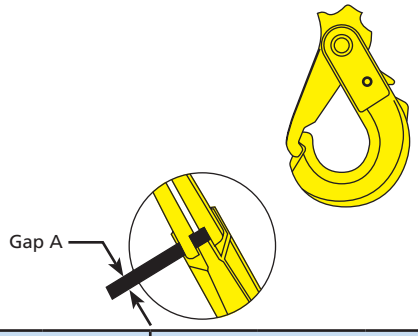
Self-locking hooks with latch tip opening greater than the amount given in TABLE 3A and TABLE 3B shall be removed from service and shall not be returned to service unless properly repaired.

TABLE 3A



Trade Size		(A) Maximum Clearance			
		Material Handling		Personnel Handling	
MM	IN	MM	IN	MM	IN
5/6	7/32	2.2	.09	1.5	.06
7/8	9/32	2.7	.11	1.9	.07
7	9/32	2.7	.11	1.9	.07
8	5/16	2.7	.11	1.9	.07
10	3/8	3.2	.13	2.2	.09
13	1/2	3.7	.15	2.6	.10
16	5/8	4.7	.19	3.2	.13
18/20	3/4	5.3	.21	3.6	.14
22	7/8	6.3	.25	4.2	.17
26	1	6.8	.27	4.6	.18
28	1-1/8	7.7	.30	5.1	.20

TABLE 3B



Trade Size		(A) Maximum Clearance			
		Material Handling		Personnel Handling	
MM	IN	MM	IN	MM	IN
5/6	7/32	3.2	.13	2.2	.09
7/8	9/32	3.7	.15	2.7	.11
7	9/32	3.7	.15	2.7	.11
8	5/16	3.7	.15	2.7	.11
10	3/8	4.2	.17	3.2	.13
13	1/2	4.7	.19	3.7	.15
16	5/8	5.7	.23	4.7	.19
18/20	3/4	6.3	.25	5.3	.21
22	7/8	7.3	.29	6.3	.25

Never use a hook in extreme temperatures.

Alloy steel BK self-locking hooks shall not be used in temperatures above 1000°F or cooled below -40°F.

Alloy steel self-locking hooks shall be permanently removed from service if heated above 1000°F.

Work Load Limits (WLL) given in TABLES 1A and 1B are valid between temperatures of -40° and 400°F.

WLL shall be reduced in accordance with TABLES 4A and 4B when heated between 400°F and 1000°F.

Permanent WLL reduction shall be made in accordance with TABLES 4A and 4B for self-locking hooks heated over temperatures indicated. Lifting equipment identification tag shall be replaced and the new tag shall have the reduced WLL.

Never use a hook in alkaline or acidic conditions.

Gunnebo alloy steel BK self-locking hooks shall not be used in alkaline or acidic conditions. Resulting metal embrittlement and accelerated corrosion can cause sudden failure. Hot dipped galvanizing and electro-zinc plating shall be done only by Gunnebo.

TABLE 4A Grade 80		
Sling Component Temperature	Percentage of TABLE 1A WLL	
	During Exposure	After Exposure
-40°F to 400°F	None	None
>400°F to 500°F	95%	None
>500°F to 600°F	90%	None
>600°F to 700°F	82%	None
>700°F to 800°F	75%	90%
>800°F TO 900°F	65%	75%
>900°F TO 1000°F	60%	70%

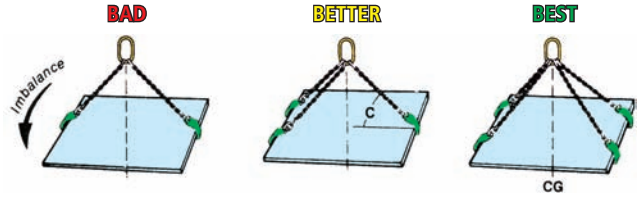
TABLE 4B Grade 100		
Sling Component Temperature	Percentage of TABLE 1B WLL	
	During Exposure	After Exposure
-40°F to 400°F	None	None
>400°F to 500°F	95%	95%
>500°F to 600°F	90%	90%
>600°F to 700°F	82%	85%
>700°F to 800°F	75%	80%
>800°F TO 900°F	65%	75%
>900°F TO 1000°F	60%	70%

Guidelines for Chain Sling Use

1. Visually examine the sling before each use. Look for stretched, gouged, bent or damaged links and components, including hooks with opened throats, cracks or distortion. If damaged, remove from service.



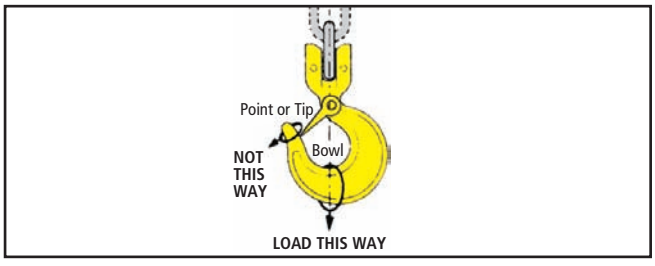
2. Know the load. Determine the weight, center of gravity, angle of lift and select the proper size and type of sling.



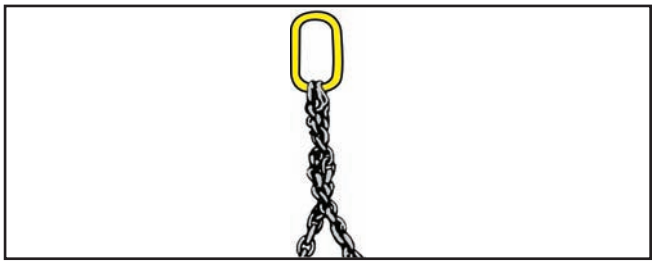
3. Never overload the sling. Check the Work Load Limit on the identification tag. Always consider the Sling-to-load Angle "C". The tension on each leg of the sling increases as the Sling-to-Load Angle decreases. Use the charts in this catalog to select the sling with adequate capacity, taking into account the effects of angle and tension. Sling tension is indicated by the rigging.



4. Do not point load hooks. The load should bear on the bowl or base of the hook.



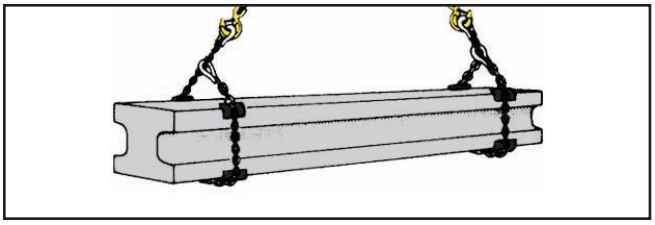
5. Ensure that chain is not twisted, knotted or kinked before lifting the load.



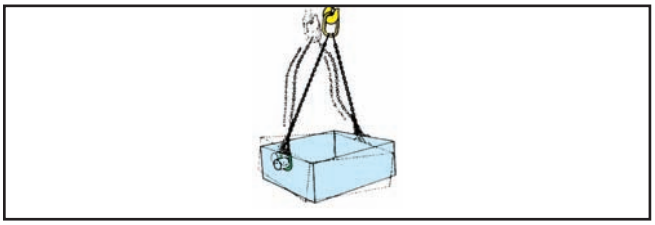
6. Slings shall not be shortened with knots, bolts or other makeshift devices.



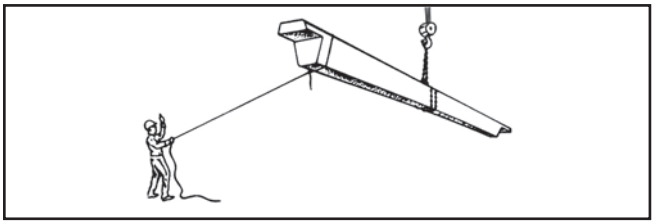
7. Protect chain with padding of sufficient strength, thickness and construction when lifting on loads that could damage the sling. Also protect the load from damage resulting from sling contact, if necessary.



8. Lift and lower loads smoothly, do not shock load.



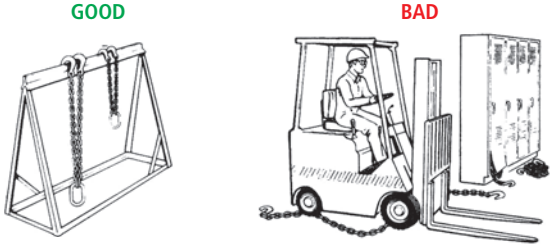
9. Hands and fingers should not be placed between the sling and load while sling tightens around the load. When lifted, the load should not be pushed or guided by employee's hands. Use a tagline. One Sling is depicted for illustration purposes only.



10. Do not expose alloy chain slings to excessive temperatures. See Page 161.

11. Protect chain slings from corrosion during storage.

12. Store slings properly on an A-Frame.



Recommendation: Daily or before each shift, Inspections shall be conducted by a competent person designated by the employer.

Periodic Inspection – OSHA specifies that all alloy steel chain slings shall have a thorough periodic inspection, by a competent person, at least once every 12 months. These inspections must be recorded and maintained for each individual sling.

The inspection schedule should be based on:

- frequency of sling use.
- severity of service conditions.
- nature of lifts being made.
- experience gained on service life of slings used in similar circumstances.

INSPECTION

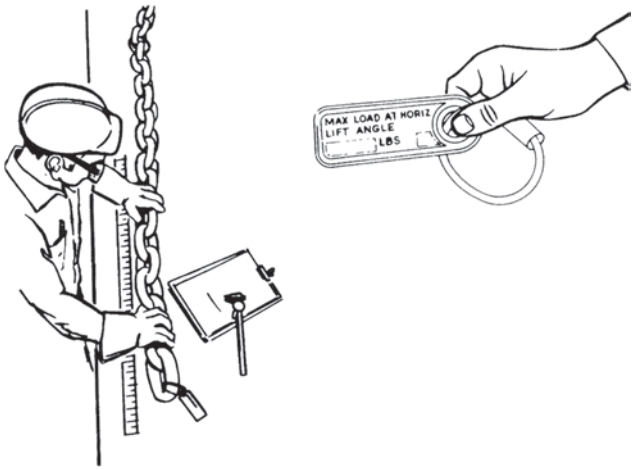
1. Clean chain prior to inspection, to more easily see damage or defects.



(Model is not Dequoy Weaver)

2. Hang chain vertically if practical, for preliminary inspection.

Measure reach accurately (bearing point of masterlink to bearing point of hook). Check this length against reach shown on tag. If the "inspected" length is greater than that shown on tag, there is a possibility that the sling has been subjected to overloading or excessive wear.



3. Make a link-by-link inspection of the chain slings for:

A. Excessive wear – If the wear on any portion of any link exceeds the allowable wear shown in Table 6, (see page 161) remove the sling from service.

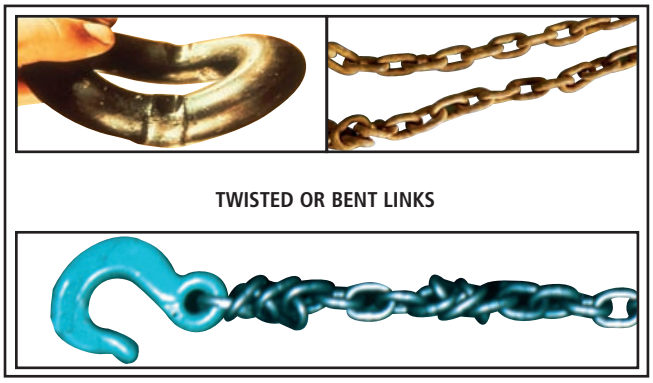
B. Twisted, bent, gouged, nicked, worn or elongated links.

C. Cracks in the weld area of any portion of the link. Transverse markings are the most dangerous.

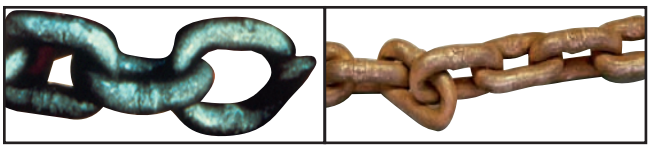
D. Severe corrosion.



WORN LINKS

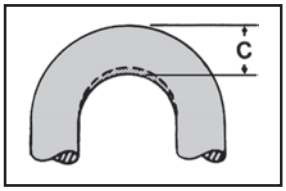


TWISTED OR BENT LINKS

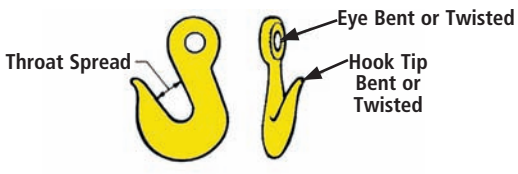


GOUGED, NICKED OR CRACKED LINKS

STRETCHED LINKS



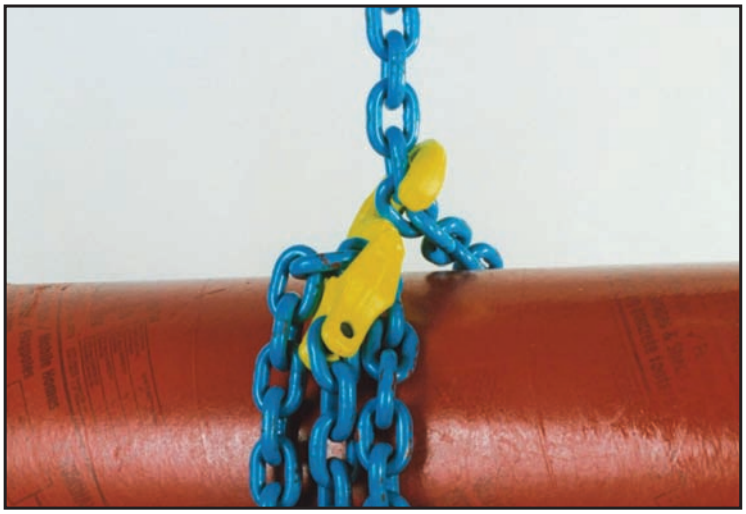
E. Check masterlinks and hooks for all of the above mentioned faults; hooks especially for excessive throat opening. Slings showing any of the damage described above should immediately be removed from service and returned to the manufacturer for repair.





More Flexibility in Chain Sling Uses

When GrabiQ legs are furnished with chain pockets, chain slings can be used for a much wider variety of loads, often reducing the amount of on-site rigging. Chain pockets can be used to either shorten a leg or create a leg loop. Some GrabiQ fittings are equally well suited for use at the top or bottom of a chain sling. GrabiQ C-Grab fittings can be used as a top-of-the-sling connector or at the bottom of the sling as an adjustable sliding choker.



Quality Standards

Gunnebo Grade 100 GrabiQ alloy steel chain and chain sling components are manufactured and tested in accordance with ASTM A973, A952 and A907 material standards.

GrabiQ chain and components meet or exceed the safety standards as prescribed by ASME B30.9, B30.10 and OSHA 1910.184-Alloy Steel Chain Sling regulations.

All chain and components are proof tested to 62% of the minimum ultimate strength for the GrabiQ system.

The Swedish plants manufacturing GrabiQ products are certified to ISO 9001/ISO 9002 Quality Standards. Gunnebo's quality management covers all aspects of production from raw materials to delivered product.

A NEW WAY TO FABRICATE CHAIN SLINGS

GrabiQ is an exciting new family of alloy chain sling components. Instead of the old "one component does one job" fitting approach, GrabiQ combines in a single component up to three separate functions. The GrabiQ Master Grab combines a masterlink, connecting links for two legs of chain and shortening hooks for each leg, **in one fitting.** Using traditional fittings to construct the same sling would require seven components, instead of just one. Some new GrabiQ fittings are equally well suited for use as top assembly connectors or as hooks at the bottom of a sling, adding even more versatility. Each leg of a GrabiQ sling is typically furnished with a chain pocket, which can be used for shortening or creating leg loops.

Increased Strength to Weight Ratio with GrabiQ-Grade 100

While the specific Work Load Limits vary, depending on size, slings fabricated from Grade 100 chain and fittings are about 25% stronger than Grade 80 counterparts. Converting from Grade 80 to GrabiQ (Grade 100) will benefit users who can make use of the additional WLL without the expense of purchasing larger chain and fittings. The percentage of strength increase varies depending on the size. Work Load Limit (WLL) gain for 3/8" is about 24 percent, while the WLL for 7/32" is more than 30 percent. All other sizes fall somewhere between.

Fewer Components Means:	**Less Weight**	**Easier Rigging**
	Less Clutter	**Easier Inspections**

Most of the time, GrabiQ slings will be lighter than Grade 80 counterparts. Fewer components mean less weight and clutter and much easier rigging. Inspecting chain slings is easier and faster because fewer components must be examined for wear or damage.

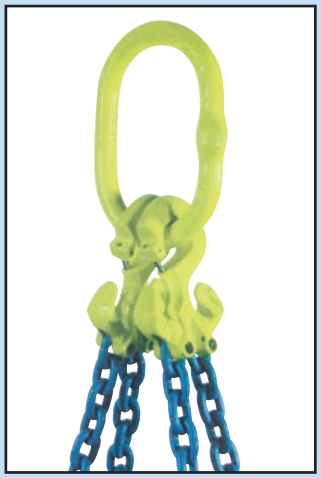


The GrabiQ Master Grab combines a masterlink, masterlink connectors for two legs of chain and two shortening hooks into a single fitting.



Traditional two leg, fully adjustable slings require 7 components.

ONE VS. SEVEN



Only 3 GrabiQ components are needed to make a four leg, adjustable sling.



Traditional four leg, fully adjustable slings require 13 components.

THREE VS. THIRTEEN

GrabiQ® Warning and Use Limitations



Masterlink (MF) (MFX) | Masterlink (MTX) | Master Grab (MG) | Master Grab Dual (MGD) | C-Grab (CG) | C-Grab Dual (CGD) | C- Lok (CL) | C-Lok Dual (CLD) | Sling Hook (EGKN) | Chain (KL) | Self Locking (GBK) | Self Locking (LBK) | Self Locking (LKBK) | MIG

See pages 151-168 for additional, important information for proper sling use and user safety.
If you are not trained and knowledgeable, do not use any rigging product.
Never use a sling without training. See page 157.
Always inform yourself. See page 157.
Always comply with applicable regulations. See page 157.
Always know load weight. See page 157.
Never use a sling without a legible sling identification tag. See page 158.

GrabiQ components shall be used only with Gunnebo Grade 100 Alloy Steel Chain.
Product identifier is forged into GrabiQ sling components and is designated as:
GrabiQ-(Model Designator) – (Trade Size) – (Grade) Example: GrabiQ-MG-13-10.

Never overload a sling. See page 160. Also read and understand the following:

Gunnebo GrabiQ Grade 100 Alloy Steel Chain Sling Work Load Limits (WLL) for selected working ranges of symmetrical sling leg angles are listed in pounds and given in TABLE 1B, page 159. No chain sling shall be rigged with a leg angle less than 30° from the horizontal.

Double Leg Sling WLL for an alternate working range of symmetrical sling leg angles equals:
2 X TABLE 1B single leg WLL X sine of the minimum working range angle.

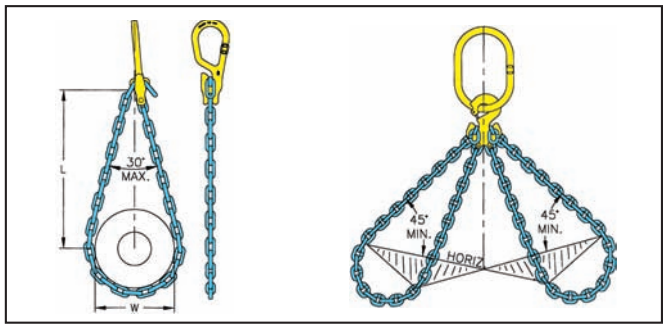
Triple and Quadruple Leg Sling WLL for an alternate working range of symmetrical sling leg angles equals:
3 X TABLE 1B single leg WLL X sine of the minimum working range angle.

TABLE 2, page 158 lists the sine values for selected sling leg angles.

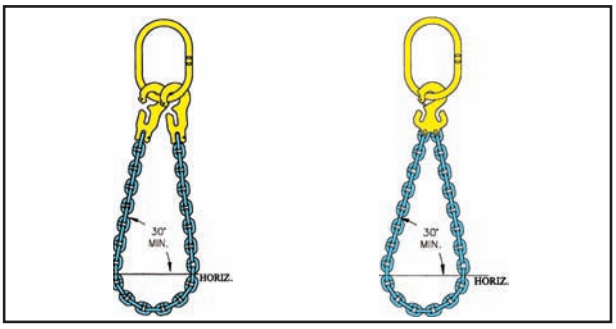
Multi Leg Sling WLL for non-symmetrical loading can only be determined by engineering analysis of the specific rigging condition. In the absence of an engineering analysis, WLL shall be equal to single leg sling WLL given in TABLE 1B, page 159.

Choked endless chain sling WLL for selected working ranges of symmetric leg angles are listed in pounds and given in TABLE 4B, page 159.

Choked chain sling WLL is affected by choke and choke angle. Table 3B, page 159 illustrates choke angle and reduced Choker Work Load Limits as a percentage of the Table 1B Single Leg (Vertical) WLL.



Gunnebo GrabiQ Grade 100 "Loop Leg" Sling Work Load Limits for selected working ranges of symmetrical sling leg angles are listed in pounds and given in Table 1B. A "Loop Leg" hitch is a type of basket hitch made with a single GrabiQ fitting having an integral chain pocket. The Loop Leg Hitch included angle is limited to a maximum of 30° and shall not be rigged with a leg angle less than 45° from horizontal as illustrated. Sling leg angle is defined by the leg of the "Loop" with the smallest angle.



A basket hitch made with both chain ends terminated by a GrabiQ Clevis connection on the same fitting or to a separate fitting is a conventional basket hitch and is illustrated.

Gunnebo GrabiQ Grade 100 Conventional Basket Sling Work Load Limits for selected working ranges of symmetrical sling leg angles are listed in pounds and given in Table 1B. Conventional basket hitches are limited to single and double leg slings and shall not be rigged with a leg angle less than 30° from the horizontal.

Never ride a sling or a load. See page 160. Read and understand the following:

GrabiQ alloy steel chain slings shall not be used to rig personnel platforms.

Self-Locking hooks shall not be used in personnel lift systems unless complying with applicable federal or local lift system and fall arrest regulations. See Table 3A, page 166.

Never rig a sling to a load improperly. Avoid dropped loads and sling damage.

Refer to Safe Operating Practices per: OSHA 1910-184 (C), ASME B30.5-3.2 and ASME B30.9-1.9:

Load shall be centered in the base (bowl/saddle) to prevent point loading of the hook.
See Figures 1a, 1b and 1c, page 164.

Hooks shall not be used in such a manner as to place a side load or back load on the hook.
See Figures 2a and 2b, page 164.

When using a device to close the hook throat opening, care shall be taken so that the load is not carried by the closing device. See Figures 3a and 3b, page 164.

Hands, fingers and body parts shall not be placed between the sling and the hook and/or load.

The use of a hook with a latch does not preclude the inadvertent detachment of a slack sling or a load from the hook. Visual verification of proper hook engagement is required in all cases.

Self-locking hooks shall be locked during use.

ASME B30.10-1.3 states, "When a hook is equipped with a latch, the latch should not be restrained from closing during use."

Hooks shall not be rigged with more than two (2) sling legs in the hook saddle and sling leg angles shall not be greater than 45° from hook centerline. (Figure 1b, page 164)

Hooks shall be rigged with a masterlink or shackle when three (3) or more sling legs are used or sling leg angles exceed 45° from hook centerline (Figure 1c, page 164)

Sling leg angle shall not be less than 30° from the horizontal.

Slings shall only be shortened with a shortening fitting and not shortened with knots, bolts or other makeshift devices.

Sling legs shall not be kinked or twisted.

Sling hooks shall not be point loaded.

Sling hook latch may be mandatory by regulation, safety codes or insurance requirements.

Slings used in a basket hitch shall have the loads balanced to prevent slipping.

Slings shall be securely attached to their loads.

Slings shall be rigged to prevent chain from sliding over a load edge while lifting.

The maximum number of GrabiQ fittings to be connected to a masterlink is three as illustrated in Figure 1.

Figure 1

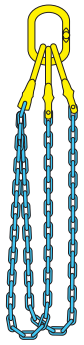


Figure 2

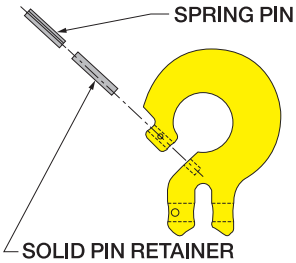
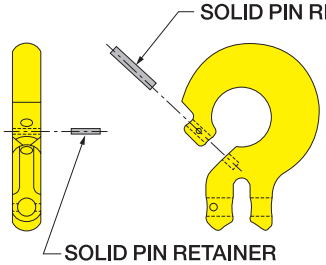


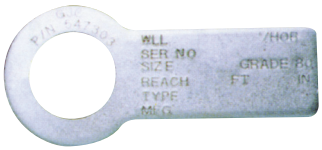
Figure 3



Sling shall not be used unless the GrabiQ coupler of at least one end of each chain leg is secured to the masterlink by one of the retainer and keeper methods illustrated in Figures 2 and 3.

Free end of sling leg when connected to a masterlink with a GrabiQ coupler does not require a retainer. However, either method illustrated in Figure 2 or 3 may be used when desired.

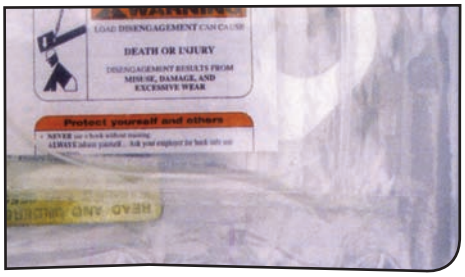
GrabiQ® Sling Assembly Guidelines



Warning Tag

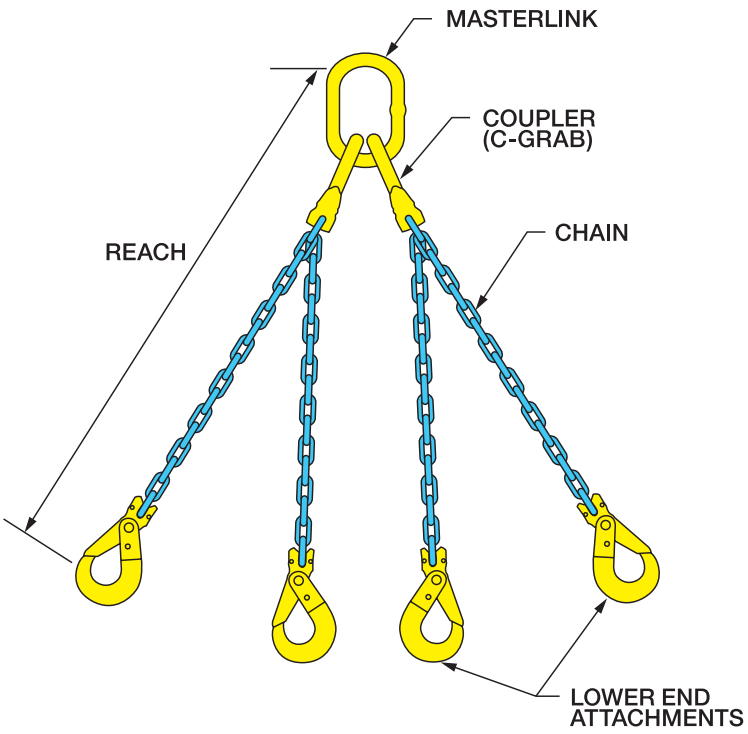


Sling Identification Tag



Safety Warning Kit

QUADRUPLE LEG SLING



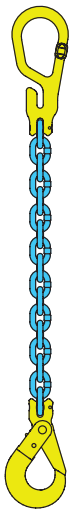
1. It is a common practice, when possible, to keep all hooks in the same plane as the masterlink. This is easily accomplished on 1, 2, and 4 leg slings. It is not possible with 3-leg GrabiQ slings when single and dual fittings are mixed.
2. It is a common practice, when possible, to attach hooks so that latches point away from the masterlink.
3. Mixing GrabiQ fittings: Adding two additional chain links to CL and CLD components gives the same effective reach as CG and CGD. MG and MGD components have the same effective reach.
4. Metal ID tags must always be attached to a chain sling, showing serial number, size, reach, Work Load Limit at angle of lift and manufacturer. Sling Warning Tags must also be attached. If these are missing, do not use the sling and contact us for replacements. Hook latches must be present and operational. If these are not functioning properly contact us for replacements.
5. The reach of the sling is the length measured from the load-bearing surface of the masterlink or top fitting to the load-bearing surface of the hook or lower terminal (as shown in illustration).
6. Normally, the masterlink will have a maximum of two connecting links: CG, CGD, CL or CLD. The maximum number of connecting links that can ever be mounted on a single masterlink is three, when constructing a double leg basket.
7. A GrabiQ sling can never have more than four independent legs or two basket legs.
8. Attaching CG, CGD, CL and CLD connectors to MF, MFX and MTX Masterlinks: Insert the connector onto the masterlink at the engineered flat. C-Connecting links are normally attached to the masterlink using the Dismountable Connecting Set type CS or the Permanent Connecting Set type CP. Each C-Connector includes: one solid retainer pin, one larger rolled spring keeper pin and one smaller rolled spring keeper pin. When the dismountable connecting set is used, the sling can be disassembled for repair. The permanent connecting set cannot be disassembled for repair.

   (a) CS: First install the solid retainer pin and then drive the smaller rolled spring keeper pin through the hole provided, at a right angle to the solid retainer pin. The fit should be very snug.

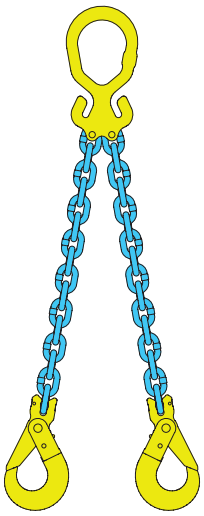
   (b) CP: First install the solid retainer pin and drive the larger rolled spring keeper pin into the same hole, directly behind solid retainer pin. The fit should be very snug.

GrabiQ® Popular Sling Models

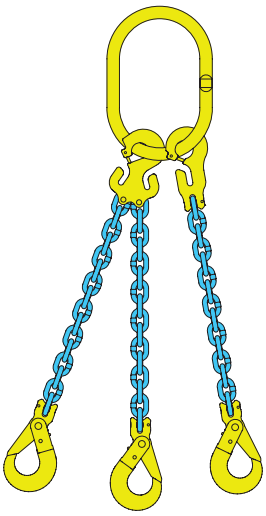
MG-BKG



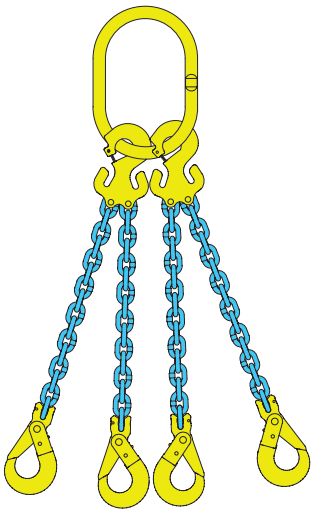
MDG-BKG



TG3-BKG



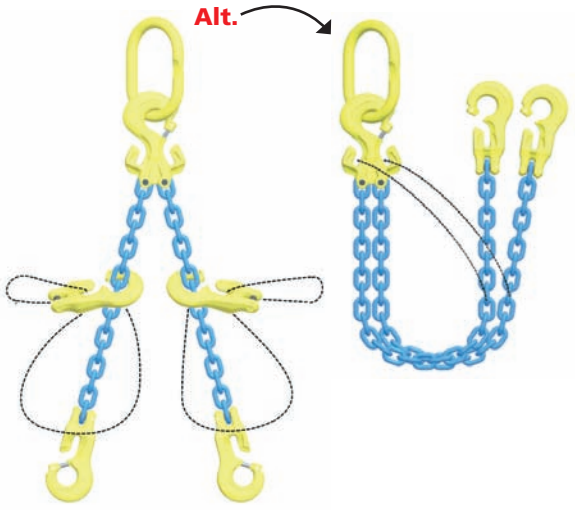
TG4-BKG



TG1-CL



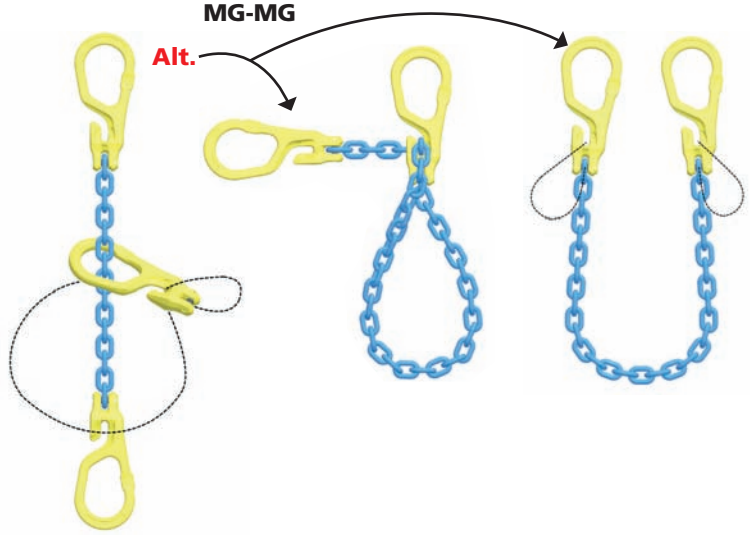
TG2-CG



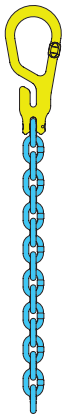
TG3-GBK



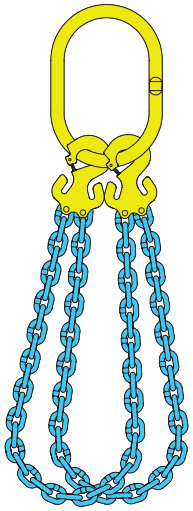
MG-MG



MG-P



BDGG



⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Every Link is calibrated and pull tested to 62% of the minimum breaking force.



Minimum 20% elongation. Fully hardened and tempered alloy steel.

Alloy Chain



Heat Number identification for product traceability.

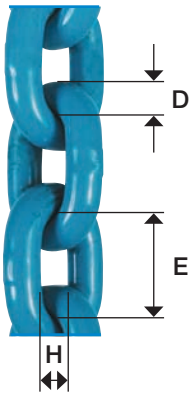
Integral Chain Pockets permit shortening or creating leg loops for each leg.



Master Grab MG **Master Grab Dual MGD**

ALLOY CHAIN - GRADE 100						
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.)	DIMENSIONS (Inches)			WEIGHT 100 Ft. (Lbs.)
			D	E	H	
KLA-8-10	5/16	5,700	.32	.95	.45	97
KLA-10-10	3/8	8,800	.40	1.20	.58	151
KLA-13-10	1/2	15,000	.52	1.50	.72	253
KLA-16-10	5/8	22,600	.63	1.90	.87	450

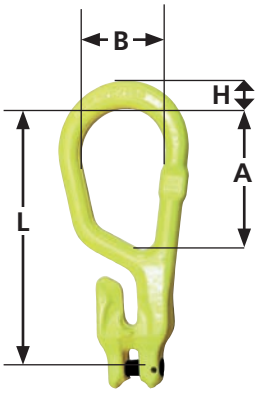
*Design Factor 4:1



All in one fitting, combining masterlink, connector and shortening function for single leg slings.

MASTER GRAB TYPE - MG							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.)	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	A	B	H	
MG-8-10	5/16	5,700	6.7	3.7	2.4	.71	2.2
MG-10-10	3/8	8,800	8.3	4.6	3	.87	4.0
MG-13-10	1/2	15,000	10.3	5.6	3.5	1	7.7
MG-16-10	5/8	22,600	12.2	6.4	4.1	1.2	12.8

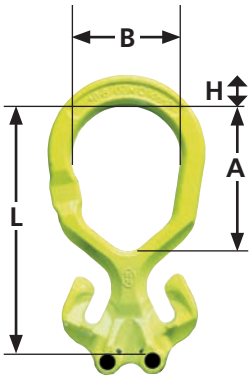
*Design Factor 4:1



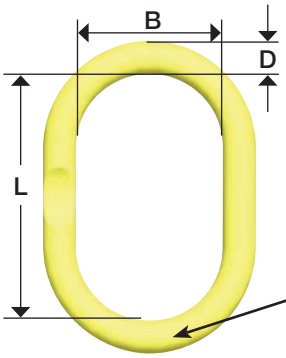
All in one fitting, combining masterlink, connector and shortening function for two leg slings.

MASTER GRAB DUAL TYPE - MGD							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.)	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	A	B	H	
MGD-8-10	5/16	9,900	6.7	3.9	3	.83	3.1
MGD-10-10	3/8	15,200	8.3	4.9	3.5	.95	5.5
MGD-13-10	1/2	26,000	10.3	5.8	4.1	1.1	11.0
MGD-16-10	5/8	39,100	12.2	6.9	4.7	1.4	19.6

*Design Factor 4:1



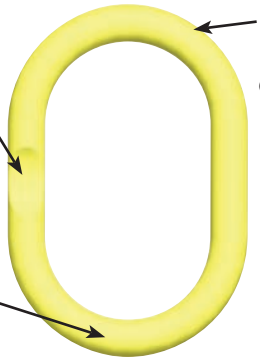
⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.



Oblong Masterlink MF

Engineered Flat helps match masterlink with correct GrabiQ connecting links.

Heat number identification for product traceability.



Oversize Masterlink MFX

Oversized masterlinks designed for use on large crane hooks.

Single Sublink holds all required GrabiQ connecting links.



Masterlink w/Sublink MTX

For 1, 2, 3 or 4 leg chain slings when used with C-Grab and C-Lok Connectors.

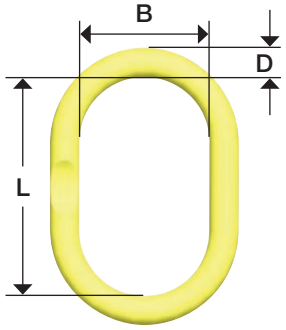
OBLONG MASTERLINK - MF											
STOCK NUMBER	TRADE SIZE (Inches)	1 LEG 90°	WORK LOAD LIMIT (Lbs.)	2 LEGS 60°	WORK LOAD LIMIT (Lbs.)	3 or 4 LEGS 60°	WORK LOAD LIMIT (Lbs.)	DIMENSIONS (Inches)			WEIGHT EACH (Lbs.)
								L	B	D	
MF-86-10	1/2	5/16	5,700	-	-	-	-	4.7	2.8	.55	.9
MF-108-10	5/8	3/8	8,800	5/16"	9,900	-	-	5.5	3.2	.67	1.5
MF-1310-10	7/8	1/2	15,000	3/8"	15,200	5/16"	14,800	6.3	3.7	.87	3.3
MF-1613-10	1	5/8	22,600	1/2"	26,000	3/8"	22,900	7.5	4.3	1.10	5.5
MF-2016-10	1-3/8	-	-	5/8"	39,100	1/2"	39,000	9.4	5.5	1.30	11.2
MF-2220-10	1-1/2	-	-	-	-	5/8"	58,700	9.8	5.9	1.60	16.1

*Design Factor 4:1

For 1 or 2 leg chain slings when used with C-Grab and C-Lok connectors.

OBLONG MASTERLINK - MFX OVERSIZED FOR LARGE CRANE HOOKS									
STOCK NUMBER	TRADE SIZE (Inches)	1 LEG 90°	WORK LOAD LIMIT (Lbs.)	2 LEGS 60°	WORK LOAD LIMIT (Lbs.)	DIMENSIONS (Inches)			WEIGHT EACH (Lbs.)
						L	B	D	
MFX-108-10	1	5/16"	5,700	-	-	13.4	7.1	.99	8.2
MFX-108-10	1	3/8"	8,800	5/16"	9,900	13.4	7.1	.99	8.2
MFX-1310-10	1-1/8	1/2"	15,000	3/8"	15,200	13.4	7.1	1.1	10.4
MFX-1613-10	1-3/8	5/8"	22,600	1/2"	26,000	13.4	7.1	1.3	15.4
MFX-1916-10	1-1/2	-	-	5/8"	39,100	13.4	7.1	1.6	18.7

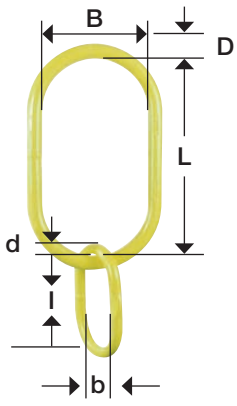
*Design Factor 4:1



For 3 or 4 leg chain slings when used with C-Grab and C-Lok Connectors.

OBLONG MASTERLINK WITH SUBLINK - MTX OVERSIZED FOR LARGE CRANE HOOKS											
STOCK NUMBER	TRADE SIZE (Inches)	3 or 4 LEGS 60°	WORK LOAD LIMIT (Lbs.)	DIMENSIONS (Inches)						WEIGHT EACH (Lbs.)
				L	B	D	l	b	d	
MTX-8-10	1-1/8	5/16"	14,800	13.4	7.1	1.1	6.3	3.7	.87	13.7
MTX-10-10	1-3/8	3/8"	22,900	13.4	7.1	1.3	7.9	4.7	1.20	23.1
MTX-13-10	1-1/2	1/2"	39,000	13.4	7.1	1.6	7.9	4.7	1.30	28.4
MTX-16-10**	1-3/4	5/8"	58,700	13.4	7.1	1.8	-	-	-	30.2

*Design Factor 4:1
** Does not require Subassembly



WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.



Integral Cradle Chain Pockets permit shortening or creating leg loops for each leg with no reduction of Work Load Limits.

C-Grab Type CG



Heat Number identification for product traceability.

C-Grab Dual Type CGD



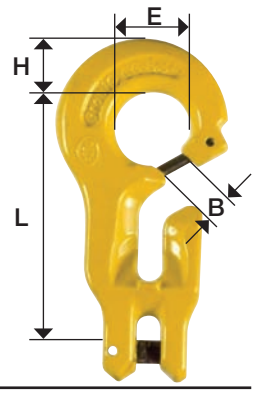
Use as a connecting link or sliding choker hook.

C-Lok Type CL



C-Lok Dual Type CLD

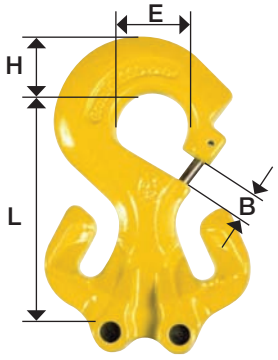
A connecting link used with MF, MFX or MTX masterlinks to attach one leg of chain.
Can also be used as an adjustable sliding choker.
Fitting includes built-in chain pocket for shortening or creating leg loops with no WLL reduction.



C-GRAB TYPE - CG							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	B	E	H	
CG-8-10	5/16	5,700	4.2	.47	1.3	.95	1.8
CG-10-10	3/8	8,800	5.3	.59	1.6	1.1	3.3
CG-13-10	1/2	15,000	6.8	.71	2.0	1.5	7.1
CG-16-10	5/8	22,600	8.5	.87	2.5	1.9	13.4

*Design Factor 4:1

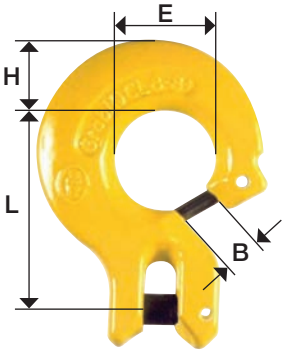
A connecting link used with MF, MFX or MTX masterlinks to attach two legs of chain.
Fitting includes built-in chain pocket for shortening or creating leg loops.



C-GRAB DUAL TYPE - CGD							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	B	E	H	
CGD-8-10	5/16	9,900	4.2	.47	1.3	1.1	2.9
CGD-10-10	3/8	15,200	5.2	.59	1.6	1.5	5.5
CGD-13-10	1/2	26,000	6.8	.71	2	1.8	12.1
CGD-16-10	5/8	39,100	8.5	.87	2.5	2.2	22.5

*Design Factor 4:1

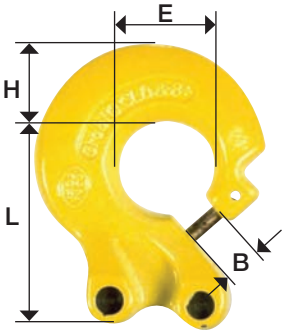
A connecting link used with MF, MFX or MTX masterlinks to attach one leg of chain.
The C-Lok can also be used as a connecting link or at the bottom of a sling as a sliding choker.



C-LOK TYPE - CL							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	B	E	H	
CL-8-10	5/16	5,700	2.2	.47	1.3	.95	1.1
CL-10-10	3/8	8,800	2.8	.59	1.6	1.1	2.0
CL-13-10	1/2	15,000	3.7	.71	2.0	1.5	4.4
CL-16-10	5/8	22,600	4.7	.87	2.5	1.9	8.4

*Design Factor 4:1

A connecting link used with MF, MFX or MTX masterlinks to attach two legs.



C-LOK DUAL TYPE - CLD							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	B	E	H	
CLD-8-10	5/16	9,900	2.2	.47	1.3	1.1	1.8
CLD-10-10	3/8	15,200	2.8	.59	1.6	1.5	3.3
CLD-13-10	1/2	26,000	3.7	.71	2.0	1.8	7.3
CLD-16-10	5/8	39,100	4.5	.99	2.5	2.2	13.2

*Design Factor 4:1

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.



EGKN Sling Hook



GBK Self Locking Hook



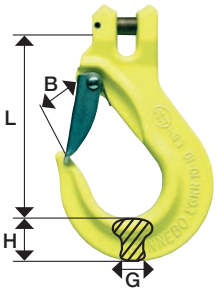
LBK Swivel Eye Grip Latch



LKBK Swivel Eye Grip Latch

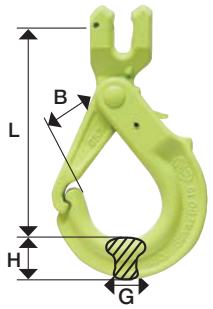
EGKN SLING HOOK							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	B	G	H	
EGKN-8-10	5/16	5,700	3.7	1.1	.67	.87	1.1
EGKN-10-10	3/8	8,800	4.8	1.4	.90	1.2	2.2
EGKN-13-10	1/2	15,000	5.7	1.7	1.1	1.5	5.1
EGKN-16-10	5/8	22,600	6.7	2.0	1.4	1.8	8.4

*Design Factor 4:1



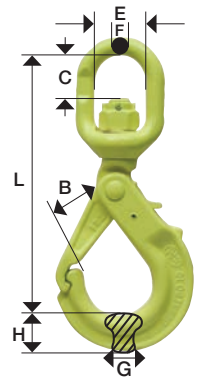
GBK SELF LOCKING HOOK							
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
			L	B	G	H	
GBK-8-10	5/16	5,700	4.7	1.5	.79	.87	1.8
GBK-10-10	3/8	8,800	5.9	1.9	.94	1.1	2.9
GBK-13-10	1/2	15,000	6.8	2.1	1.1	1.4	5.3
GBK-16-10	5/8	22,600	8.5	2.4	1.5	2.0	12.3

*Design Factor 4:1



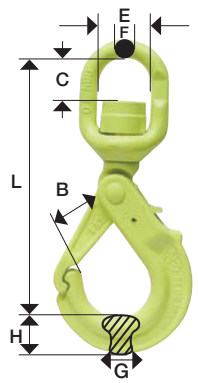
LBK SWIVEL EYE GRIP LATCH SELF LOCKING HOOK with Bronze Bushing										
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSIONS (Inches)							WEIGHT EACH (Lbs.)
			L	B	C	E	F	G	H	
LBK-7/8-10	5/16	5,700	6.9	1.5	1.1	1.5	.47	.79	.87	1.8
LBK-10-10	3/8	8,800	8.4	1.9	1.4	1.7	.59	.87	1.1	4.0
LBK-13-10	1/2	15,000	9.3	2.1	1.9	1.9	.75	1.10	1.4	8.4

*Design Factor 4:1



LKBK SWIVEL EYE GRIP LATCH SELF LOCKING HOOK with Ball Bearings										
STOCK NUMBER	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSIONS (Inches)							WEIGHT EACH (Lbs.)
			L	B	C	E	F	G	H	
LKBK-7/8-10	5/16	5,700	6.9	1.5	1.1	1.5	.47	.79	.87	1.8
LKBK-10-10	3/8	8,800	8.4	1.9	1.4	1.7	.59	.87	1.1	4.0
LKBK-13-10	1/2	15,000	9.3	2.1	1.9	1.9	.75	1.10	1.4	8.4

*Design Factor 4:1

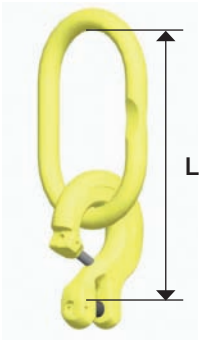


⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Assembly required for Single Leg, non-adjustable sling.

TOP LOK TYPE - TL1					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TL1-8-10	MF-86-10 & CL-8-10	5/16	5,700	7.1	2.0
TL1-10-10	MF-108-10 & CL-10-10	3/8	8,800	8.4	3.5
TL1-13-10	MF-1310-10 & CL-13-10	1/2	15,000	10.1	7.7
TL1-16-10	MF-1613-10 & CL-16-10	5/8	22,600	12.1	13.2

*Design Factor 4:1



Assembly required for Double Leg, non-adjustable sling.

TOP LOK TYPE - TL2					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TL2-8-10	MF-108-10 & CLD-8-10	5/16	9,900	7.8	3.3
TL2-10-10	MF-1310-10 & CLD-10-10	3/8	15,200	9.2	6.6
TL2-13-10	MF-1613-10 & CLD-13-10	1/2	26,000	11.2	11.9
TL2-16-10	MF-2016-10 & CLD-16-10	5/8	39,100	14.0	24.5

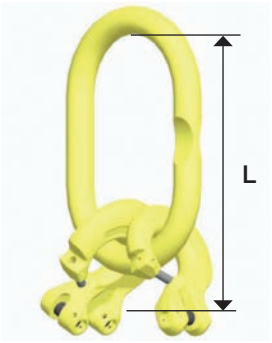
*Design Factor 4:1



Assembly required for Triple Leg, non-adjustable sling.

TOP LOK TYPE - TL3					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TL3-8-10	MF-1310-10 & CLD-8-10 & CL-8-10	5/16	14,800	8.5	6.2
TL3-10-10	MF-1613-10 & CLD-10-10 & CL-10-10	3/8	22,900	10.3	10.1
TL3-13-10	MF-2016-10 & CLD-13-10 & CL-13-10	1/2	39,000	13.2	22.7
TL3-16-10	MF-2220-10 & CLD-16-10 & CL-16-10	5/8	58,700	14.4	37.5

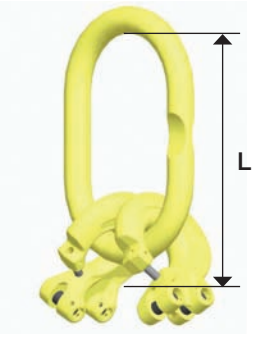
*Design Factor 4:1



Assembly required for Quad Leg, non-adjustable sling.

TOP LOK TYPE - TL4					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TL4-8-10	MF-1310-10 & 2ea. CLD-8-10	5/16	14,800	8.5	6.8
TL4-10-10	MF-1613-10 & 2 ea. CLD-10-10	3/8	22,900	10.3	11.5
TL4-13-10	MF-2016-10 & 2 ea. CLD-13-10	1/2	39,000	13.2	25.3
TL4-16-10	MF-2220-10 & 2 ea. CLD-16-10	5/8	58,700	14.4	42.3

*Design Factor 4:1



⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Assembly required for Single Leg fully adjustable sling.

TOP GRAB TYPE - TG1					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 90°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TGI-8-10	MF-86-10 & CG-8-10	5/16	5,700	8.9	2.6
TGI-10-10	MF-108-10 & CG-10-10	3/8	8,800	10.8	4.8
TGI-13-10	MF-1310-10 & CG-13-10	1/2	15,000	13.1	10.4
TGI-16-10	MF-1613-10 & CG-16-10	5/8	22,600	16	18.3

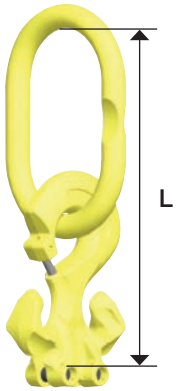
*Design Factor 4:1



Assembly required for Double Leg fully adjustable sling.

TOP GRAB TYPE - TG2					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TG2-8-10	MF-108-10 & CGD-8-10	5/16	9,900	9.7	4.4
TG2-10-10	MF-1310-10 & CGD-10-10	3/8	15,200	11.5	8.8
TG2-13-10	MF-1613-10 & CGD-13-10	1/2	26,000	14.3	17.0
TG2-16-10	MF-2016-10 & CGD-16-10	5/8	39,100	17.9	33.7

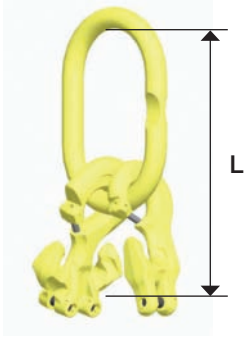
*Design Factor 4:1



Assembly required for Triple Leg fully adjustable sling.

TOP GRAB TYPE - TG3					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
TG3-8-10	MF-1310-10 & CGD-8-10 & CG-8-10	5/16	14,800	10.5	7.9
TG3-10-10	MF-1613-10 & CGD-10-10 & CG-10-10	3/8	22,900	12.7	13.7
TG3-13-10	MF-2016-10 & CGD-13-10 & CG-13-10	1/2	39,000	16.3	30.4
TG3-16-10	MF-2220-10 & CGD-16-10 & CG-16-10	5/8	58,700	18.3	51.8

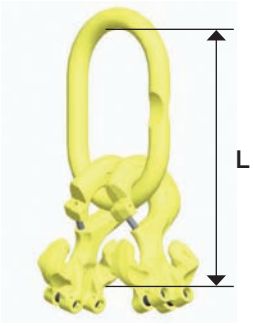
*Design Factor 4:1



Assembly required for Quad Leg fully adjustable sling.

TOP GRAB TYPE - TG4					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (In)	WEIGHT EACH (Lbs.)
TG4-8-10	MF-1310-10 & 2 ea. CGD-8-10	5/16	14,800	10.5	9.0
TG4-10-10	MF-1613-10 & 2 ea. CGD-10-10	3/8	22,900	12.7	15.9
TG4-13-10	MF-2016-10 & 2 ea. CGD-13-10	1/2	39,000	16.3	35.5
TG4-16-10	MF-2220-10 & 2 ea. CGD-16-10	5/8	58,700	18.3	60.8

*Design Factor 4:1



⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.



BS



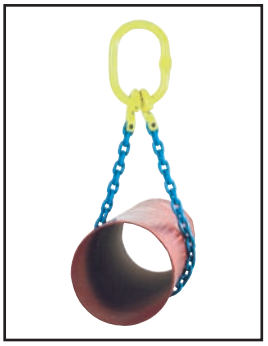
BSG



BSGG

Single leg basket sling with fixed length leg. Not adjustable.

SINGLE BASKET TYPE - BS					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
BS-8-10	MF-108-10 & 2 ea. CL-8-10	5/16	9,900	7.8	3.7
BS-10-10	MF-1310-10 & 2 ea. CL-10-10	3/8	15,200	9.2	7.3
BS-13-10	MF-1613-10 & 2 ea. CL-13-10	1/2	26,000	11.3	13.7
BS-16-10	MF-2016-10 & 2 ea. CL-16-10	5/8	39,100	14.1	28



*Design Factor 4:1
L = Effective length of components

Single leg basket sling, adjustable from one side only.

SINGLE BASKET TYPE - BSG						
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSIONS (Inches)		WEIGHT EACH (Lbs.)
				L	L1	
BSG-8-10	MF-108-10 & CG-8-10 & CL-8-10	5/16	9,900	9.7	7.8	4
BSG-10-10	MF-1310-10 & CG-10-10 & CL-10-10	3/8	15,200	11.6	9.2	8.6
BSG-13-10	MF-1613-10 & CG-13-10 & CL-13-10	1/2	26,000	14.3	11.3	16.3
BSG-16-10	MF-2016-10 & CG-16-10 & CL-16-10	5/8	39,100	17.9	14.1	33.1



*Design Factor 4:1
L = Effective length of MF + CG
L1 = Effective length of MF + CL

Single leg basket sling, adjustable from either side.

SINGLE BASKET TYPE - BSGG					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
BSGG-8-10	MF-108-10w & 2 ea. CG-8-10	5/16	9,900	9.7	5.1
BSGG-10-10	MF-1310-10 & 2 ea. CG-10-10	3/8	15,200	11.6	9.9
BSGG-13-10	MF-1613-10 & 2 ea. CG-13-10	1/2	26,000	14.3	19.4
BSGG-16-10	MF-2016-10 & 2 ea. CG-16-10	5/8	39,100	17.9	42.8



*Design Factor 4:1
L = Effective length of components

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

GrabiQ® Components – Double Baskets



BD



BDG



BDGG

Double leg basket sling, with fixed length for each leg. Not adjustable.

DOUBLE BASKET TYPE - BD					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
BD-8-10	MF-1310-10 & 2 ea. CLD- 8-10	5/16	14,800	8.5	6.8
BD-10-10	MF-1613-10 & 2 ea. CLD-10-10	3/8	22,900	10.3	11.5
BD-13-10	MF-2016-10 & 2 ea. CLD-13-10	1/2	39,000	13.1	25.3
BD-16-10	MF-2220-10 & 2 ea. CLD-16-10	5/8	58,700	14.4	42.3



*Design Factor 4:1
L = Effective length of components

Double leg basket sling, with either leg adjustable from one side only.

DOUBLE BASKET TYPE - BDG						
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSIONS (Inches)		WEIGHT EACH (Lbs.)
				L	L1	
BDG-8-10	MF-1310-10 & CGD-8-10 & CLD-8-10	5/16	14,800	10.5	8.5	7.9
BDG-10-10	MF-1613-10 & CGD-10-10 & CLD-10-10	3/8	22,900	12.8	10.3	13.7
BDG-13-10	MF-2016-10 & CGD-13-10 & CLD-13-10	1/2	39,000	16.3	13.1	30.4
BDG-16-10	MF-2220-10 & CGD-16-10 & CLD-16-10	5/8	58,700	18.3	14.4	51.6



*Design Factor 4:1
L = Effective length of MF + CGD
L1 = Effective length of MF + CLD

Double leg basket sling, with either leg adjustable from both sides.

DOUBLE BASKET TYPE - BDGG					
STOCK NUMBER	COMPONENTS REQUIRED	CHAIN SIZE (Inches)	WORK LOAD LIMIT (Lbs.) AT 60°	DIMENSION L (Inches)	WEIGHT EACH (Lbs.)
BDGG-8-10	MF-1310-10 & 2 ea. CGD-8-10	5/16	14,800	10.5	9
BDGG-10-10	MF-1613-10 & 2 ea. CGD-10-10	3/8	22,900	12.7	15.9
BDGG-13-10	MF-2016-10 & 2 ea. CGD-13-10	1/2	39,000	16.3	35.5
BDGG-16-10	MF-2220-10 & 2 ea. CGD-16-10	5/8	58,700	18.3	60.8



*Design Factor 4:1
L = Effective length of components

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

MIG MIDGRAB SHORTENER



Instant mounting and positioning on any part of the chain.

Capacity of shortened legs is not reduced.



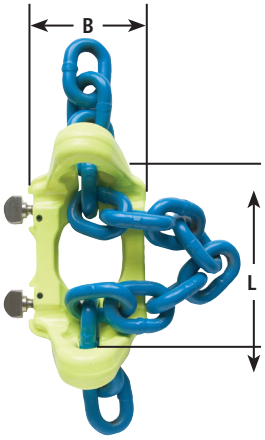
Can be set idle on the leg when not in use.



With Close/Open Device on One End and Locking Device on Opposite End

MIG MIDGRAB SHORTENER (NON-REMOVABLE)						
STOCK NUMBER	CHAIN SIZE (Inches)**	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)			WEIGHT EACH (Lbs.)
			L	A	B	
MIG CL-8-10	5/16	5,700	3.7	2.0	2.4	1.4
MIG CL-10-10	3/8	8,800	4.9	2.8	3.0	2.4
MIG CL-13-10	1/2	15,000	5.9	3.5	3.1	5.7

*Design Factor 4:1
** For use with GrabiQ Chain Only.



With Close/Open Device on Both Ends

MIG MIDGRAB SHORTENER (REMOVABLE)						
STOCK NUMBER	CHAIN SIZE (Inches)**	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)			WEIGHT EACH (Lbs.)
			L	A	B	
MIG CC-8-10	5/16	5,700	3.7	2.0	2.4	1.4
MIG CC-10-10	3/8	8,800	4.9	2.8	3.0	2.4
MIG CC-13-10	1/2	15,000	5.9	3.5	3.1	5.7

*Design Factor 4:1
** For use with GrabiQ Chain Only.



WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

WOULD YOU PUT YOUR TRIPLE BYPASS OUT FOR BID AND HAVE IT DONE BY THE "LOW" BIDDER?





It's easy to laugh at this scenario and come to the conclusion that when your life is on the line, there is absolutely no way that the "low bid" rule makes sense. Likewise a medical school graduate, who has completed their surgical training and internship, has to start somewhere. Given a choice, however, one would probably opt for the "seasoned" veteran and let the "beginner" practice on someone else.

If you purchase slings, you may be far removed from the location and consequences of your purchase decisions. All rigging gear is serious equipment. The consequences of inferior materials or manufacturing procedures may have profound effects upon the lives and loved ones of unsuspecting users or innocent third parties.

We are a self regulated industry. It doesn't take much to get into the sling business. Start up costs are relatively low, sewing machines are readily available, webbing, yarn and thread suppliers, abundant. With any supplier, including the successful, low bidder, it comes down to one important element, TRUST. Trust me with your life, your limbs and your family's financial and emotional well being.

It wasn't easy spending 10% of our startup cost, over thirty years ago to set up a single department that produces our heavy duty, sling tags. It would have been much easier on the pocket book to supply plastic tags, completed with magic marker. It wasn't easy to spend thousands of dollars for destruction tests conducted at an independent test facility for many of our popular items, before we opened our doors for business. It hasn't gotten any easier over the past thirty-three years to fabricate and independently verify every lot of yarn and thread, or to spend thousands of dollars to build and break a sling with a tensile strength of 840,000 pounds and many others. There is nothing that mandates these actions except a sense of responsibility and a desire to be the best at what we do.

Machinery, production techniques and input materials appear to be similar, but they are not. The people that assemble your slings are another important consideration. We attract and keep the best and most talented sling fabricators in the country. We pay a living wage, provide a retirement plan, funded solely from contributions made by the company and consider our people, family.

Consider our approach from the "family" perspective. We build every sling with integrity, just as if our loved ones were destined to use it. When you purchase slings and rigging, from others, ask yourself if you would want your loved ones to use the least expensive option or the best. It's an easy decision to make, once you look at the situation from the "family" perspective.

The idea is to go home from the jobsite to our loved ones and not leave it in a paramedic or coroner van. The proper use of products made with pride and responsibility, purchased at a reasonable price are key ingredients in a commitment to excellence, longevity and the "family" perspective.

The following information must be specified on orders and should be used for chain sling inquiries:

1. **CHAIN SLING TYPE:** Single Leg, Bridle Assembly, Adjustable, Endless or Choker.
2. **CHAIN SLING STOCK NUMBER:** SOG, DOS, TOF, QOG
3. **CHAIN GRADE:** GR 80 OR GR 100
4. **TOP AND BOTTOM FITTINGS:** Masterlink, Grab Hook, Foundry Hook, etc.
5. **SIZE:** The size of the material from which the chain is made.
6. **REACH:** Length, including attachments, measured from bearing point to bearing point.

CHAIN SLING ORDER CODES



SOG

Single Leg Chain Slings

Type	One End	Opposite End
SG	Plain	Grab Hook
SOO	Oblong Link	Oblong Link
SOS	Oblong Link	Sling Hook
SOSKN	Oblong Link	Sling Hook w/ Half Link
SOG	Oblong Link	Grab Hook
SOF	Oblong Link	Foundry Hook
SOBK	Oblong Link	Self Locking Hook
SOBKL	Oblong Link	Self Locking Hook-Swivel
SGG	Grab Hook	Grab Hook
SSS	Sling Hook	Sling Hook
SSG	Grab Hook	Sling Hook
ASOS	Oblong Link	Adjustable W/Sling Hook
Type A	Adjuster	No Chain
Type B	Adjuster	12 Inches of Chain
SOLK	Oblong Link	Choker Hook



SOO



DOBK

Double Leg Chain Slings

Type	Top Fitting	Connectors
DOS	Oblong Link	Sling Hooks
DOSKN	Oblong Link	Sling Hooks w/ Half Link
DOG	Oblong Link	Grab Hooks
DOF	Oblong Link	Foundry Hooks
DOBK	Oblong Link	Self Locking Hooks
DOBKL	Oblong Link	Self Locking Hooks-Swivel
DOO	Oblong Link	Oblong Links
BS	Oblong Link	N/A
ENDLESS	N/A	N/A
ADOS	Oblong Link	Adjustable W/Sling Hooks
DOLK	Oblong Link	Choker Hooks



ADOS



TOF

Triple Leg Chain Slings

Type	Top Fitting	Connectors
TOS	Masterlink Subassembly	Sling Hooks
TOG	Masterlink Subassembly	Grab Hooks
TOF	Masterlink Subassembly	Foundry Hooks
TOBK	Masterlink Subassembly	Self Locking Hooks
ATOS	Masterlink Subassembly	Adjustable W/Sling Hooks

Quadruple Leg Chain Slings

Type	Top Fitting	Connectors
QOS	Masterlink Subassembly	Single Hooks
QOG	Masterlink Subassembly	Grab Hooks
QOF	Masterlink Subassembly	Foundry Hooks
QOBK	Masterlink Subassembly	Self Locking Hooks
AQOS	Masterlink Subassembly	Adjustable W/Sling Hooks
BD	Masterlink Subassembly	N/A



QOBK


SG


SOO


SOS


SOSKN


SOG


SOF


SOBK


SOBKL


SGG


SSS


SSG


ASOS


TYPE A ADJUSTER


TYPE B ADJUSTER


SOLK

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Please Note:
Type "A" Adjuster has the cradle grab hook attached to masterlink with a coupling link.
Type "B" Adjusters are furnished with approximately 12 inches of chain in adjuster legs.
Cradle Grab Hooks are standard.
If so equipped, all Hooks will be furnished with latches.



DOS



DOSKN



DOG



DOF



DOBK



DOBKL



DOO



BS



ENDLESS



ADOS



DOLK

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Please Note:
Type "A" Adjuster has the cradle grab hook attached to masterlink with a coupling link.
Type "B" Adjusters are furnished with approximately 12 inches of chain in adjuster legs.
Cradle Grab Hooks are standard.
If so equipped, all Hooks will be furnished with latches.

TRIPLE LEG CHAIN SLINGS



TOS



TOG



TOF



TOBK



ATOS

QUAD LEG CHAIN SLINGS



QOS



QOG



QOF



QOBK



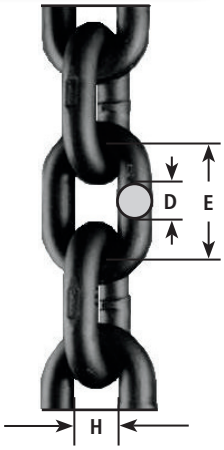
AQOS



BD

WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Please Note:
Type "A" Adjuster has the cradle grab hook attached to masterlink with a coupling link.
Type "B" Adjusters are furnished with approximately 12 inches of chain in adjuster legs.
Cradle Grab Hooks are standard.
If so equipped, all Hooks will be furnished with latches.

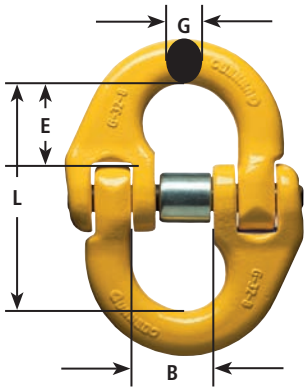


- Chain grade embossed each foot.
- Each link calibrated and pull tested to 2.5 times WLL.
- Minimum 20% elongation.
- Fully hardened and tempered alloy.

ALLOY CHAIN GRADE 80 & 100 - KLB

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)			WEIGHT 100 Ft. (Lbs.)
				D	E	H	
KLB-7-10	9/32	100	4,300	.28	.83	.41	77
KLB-8-10	5/16	100	5,700	.32	.94	.45	97
KLB-10-10	3/8	100	8,800	.40	1.18	.57	151
KLB-13-10	1/2	100	15,000	.52	1.54	.72	253
KLB-16-10	5/8	100	22,600	.65	1.89	.91	394
KLB-20-10	3/4	100	35,300	.81	2.36	1.12	630
KLB-22-8	7/8	80	34,200	.87	2.60	1.20	715
KLB-26-8	1	80	47,700	1.02	3.07	1.38	961
KLB-32-8	1-1/4	80	72,300	1.26	3.78	1.69	1545

*Design Factor 4:1

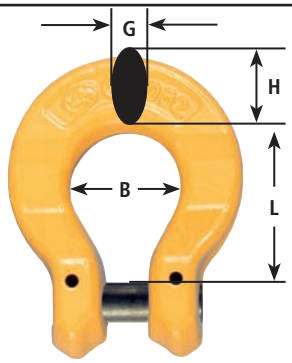


- Proof tested and certified.
- Forged extra wide, inside.
- Heat Number I.D. for traceability.
- Heavy duty retaining collar, with stainless steel locking spring.
- Unlimited number of assemblies and disassemblies.

ALLOY COUPLING LINKS - G

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
				L	B	G	E	
G-7-10	9/32	100	4,300	2.2	.71	.35	.87	.44
G-8-10	5/16	100	5,700	2.2	.71	.35	.87	.44
G-10-10	3/8	100	8,800	2.7	.98	.47	1.0	.66
G-13-10	1/2	100	15,000	3.5	1.1	.59	1.3	1.5
G-16-10	5/8	100	22,600	4.1	1.4	.75	1.6	2.6
G-20-10	3/4	100	35,300	4.9	1.7	1.0	2.8	5.7
G-22-8	7/8	80	34,200	6.0	2.0	.95	2.3	6.6
G-26-8	1	80	47,700	6.3	2.3	1.1	2.4	10.1
G-32-8	1-1/4	80	72,300	7.9	2.8	1.5	3.1	19

*Design Factor 4:1



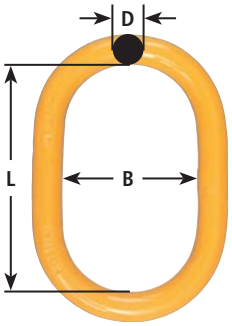
- Proof tested and certified.
- Uniquely designed to prevent size mix and match problems.
- Heat Number I.D. for traceability.
- For use with hooks and masterlinks.

COUPLER - BL

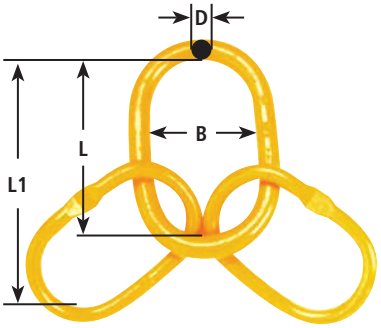
STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
				L	B	G	H	
BL-7/8-8	9/32	80	3,500	1.4	1.0	.43	.71	.44
BL-7/8-8	5/16	80	4,500	1.4	1.0	.43	.71	.44
BL-10-8	3/8	80	7,100	1.8	1.3	.55	.87	.88
BL-13-8	1/2	80	12,000	2.2	1.6	.67	1.10	2.20

*Design Factor 4:1

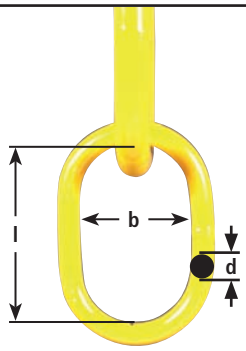
WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.



- Proof tested to 2X WLL
- Heat number ID for traceability.
- Extra width allows a better fit over hooks.



- Proof tested to 2X WLL.
- Extra width allows a better fit over hooks.



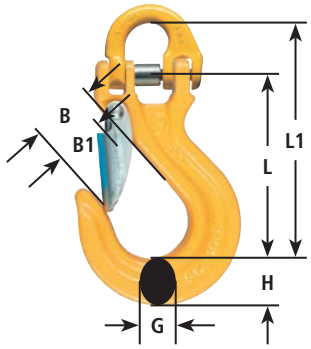
- Heat number ID for traceability.
- Engineered flat sublinks will eliminate mix or match problems.

MASTERLINKS (M) and MASTERLINKS WITH SUBASSEMBLIES (MT) GRADE 100

	TRADE SIZE		STOCK NUMBER	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)							WEIGHT (Lbs.)
	IN	MM				L	B	D	L1	l	b	d	
MASTERLINKS	3/8	11	M-6-10	100	3,300	3.9	2.4	.43	-	-	-	-	.44
	1/2	14	M-86-10	100	7,000	4.7	2.8	.55	-	-	-	-	.88
	5/8	17	M-108-10	100	11,400	5.5	3.1	.67	-	-	-	-	1.8
	3/4	19	M-13-10	100	12,300	5.9	3.5	.75	-	-	-	-	2.2
	7/8	22	M-1310-10	100	17,200	6.3	3.7	.87	-	-	-	-	3.3
	1	25	M-1613-10	100	29,900	7.5	4.3	1	-	-	-	-	5.1
	1-1/4	30	M-19-10	100	35,200	7.9	4.7	1.2	-	-	-	-	7.7
	1-3/8	34	M-2016-10	100	45,300	9.4	5.5	1.3	-	-	-	-	11.7
	1-1/2	38	M-2220-10	100	68,000	9.8	5.9	1.5	-	-	-	-	15.4
	1-5/8	40	M-2622-10	100	70,400	9.8	5.9	1.6	-	-	-	-	17.6
	1-3/4	45	M-32-10	100	84,900	11.8	7.1	1.8	-	-	-	-	26.4
	2	50	M-3226-10	100	102,600	11.8	7.9	2	-	-	-	-	33.1
	2-1/4	55	M-3632-10	100	143,100	13.8	7.9	2.2	-	-	-	-	46.3
	2-1/2	60	M-4536-10	100	160,000	14.8	8.3	2.4	-	-	-	-	57.3
	2-3/4	70	M-90T-10	100	220,200	17.7	9.8	2.8	-	-	-	-	94.8
	3-1/4	80	M-125T-10	100	275,300	17.7	10.2	3.1	-	-	-	-	125.6
MASTERLINKS W/SUB ASSEMBLIES	3/4	19	MT-6-10**	100	11,000	5.9	3.5	.75	10.6	4.7	2.8	.55	4
	7/8	22	MT-8-10**	100	17,600	6.3	3.7	.87	11.8	5.5	3.1	.67	6.6
	1	25	MT-9-10	100	21,300	7.5	4.3	1	13.4	5.9	3.5	.75	9.5
	1-1/4	30	MT-10-10**	100	35,200	7.9	4.7	1.2	14.2	6.3	3.7	.87	14.3
	1-5/8	40	MT-13-10**	100	57,200	9.8	5.9	1.6	17.7	7.9	4.7	1.2	33.1
	2	50	MT-16-10**	100	77,000	11.8	7.9	2	19.7	7.9	4.7	1.3	50.7
	2-1/4	55	MT-20-10**	100	110,100	11.8	7.9	2.2	21.7	9.8	5.9	1.5	72.7
	2-1/2	60	MT-22-10	100	165,100	13.8	7.9	2.4	24	10.2	5.5	1.8	101.4
	2-3/4	70	MT-26-10	100	220,200	17.7	9.8	2.8	28.7	11	6.3	2	156.5
	3-1/4	80	MT-32-10	100	275,300	17.7	10.2	3.1	29.5	11	6.3	2.2	200.6

*Design Factor 5:1 Work Load Limit is Vertical for a Single Leg Sling
**Subassemblies Contain Engineered Flats

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

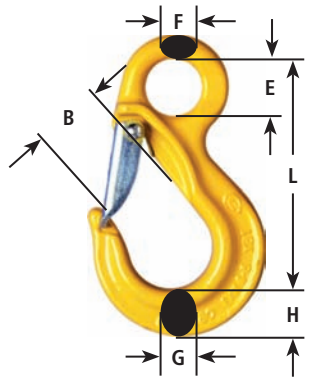


- Proof tested and certified.
- Heat ID number for traceability.
- Quick and simple assembly.
- Heavy Duty Latch.

SLING HOOKS - SKN WITH HALF LINKS AND LATCH

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)						WEIGHT EACH (Lbs.)
				L	L1	B	B1	G	H	
SKN-7/8-8	9/32	80	3,500	3.5	4.6	1.3	1.1	.71	.83	1.1
SKN-7/8-8	5/16	80	4,500	3.5	4.6	1.3	1.1	.71	.83	1.1
SKN-10-8	3/8	80	7,100	4.5	5.9	1.6	1.3	.91	1.1	2.4
ESKN-13-8	1/2	80	12,000	5.6	7.4	2	1.7	1.1	1.4	5.1
ESKN-16-8	5/8	80	18,100	7.1	9.2	2.4	2.1	1.3	1.7	9
ESKN-18/20-8	3/4	80	28,300	7.8	10.2	2.6	2.3	1.6	2.0	13.4

*Design Factor 4:1

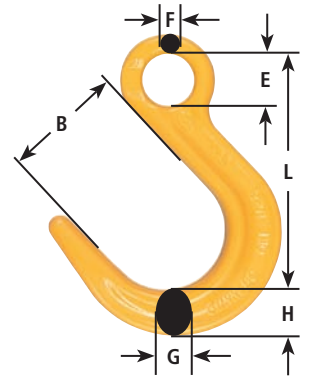


- Proof tested and certified.
- Heat ID number for traceability.
- Std. heavy duty latch with slotted tip to resist side loading.
- Forged cover on hook body protects latch from snagging.

SLING HOOK - EKN WITH RECESSED LATCH (EYE TYPE)

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)						WEIGHT EACH (Lbs.)
				L	B	G	H	E	F	
EKN-7/8-10	9/32	100	4,300	4.3	1.1	.67	.91	1.1	.51	1.1
EKN-7/8-10	5/16	100	5,700	4.3	1.1	.67	.91	1.1	.51	1.1
EKN-10-10	3/8	100	8,800	5.3	1.5	.90	1.2	1.3	.59	2.2
EKN-13-10	1/2	100	15,000	6.5	1.7	1.1	1.5	1.7	.75	4.4
EKN-16-10	5/8	100	22,600	8.0	2	1.4	1.8	2.2	.94	8.2
EKN-18/20-8	3/4	80	28,300	9.0	2.4	1.6	2	2.4	1	11.5
EKN-22-8	7/8	80	34,200	10.5	3	1.7	2.6	2.5	1.2	20.7
EKN-26-8	1	80	47,700	11.9	3.2	2	3	2.6	1.3	27.8
EKN-32-8	1-1/4	80	72,300	13.1	3.7	2.4	3.1	3	1.5	39.5

*Design Factor 4:1



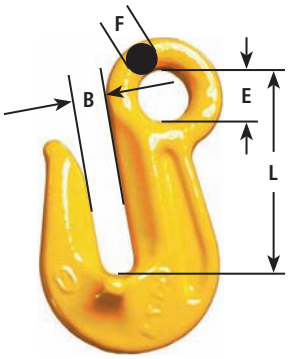
- Proof tested and certified.
- Large throat opening for attachment to large objects.

FOUNDRY HOOKS - OKE (EYE TYPE)

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)						WEIGHT EACH (Lbs.)
				L	B	E	F	G	H	
OKE-7/ 8-10	9/32	100	4,300	4.8	2.5	1.1	.45	.79	1	1.5
OKE-7/ 8-10	5/16	100	5,700	4.8	2.5	1.1	.45	.79	1	1.5
OKE-10-10	3/8	100	8,800	5.9	3	1.3	.59	1	1.1	2.9
OKE-13-10	1/2	100	15,000	7.2	3.5	1.7	.75	1.3	1.5	6.2
OKE-16-10	5/8	100	22,600	8.5	4	2.2	.91	1.6	1.8	10.8
OKE-18/20-8	3/4	80	28,300	9.7	4.5	2.4	1	1.8	2.2	13.4
OKE-26-8	1	80	47,700	11.8	4.4	2.8	1.4	2.5	2.9	33.1
OKE-32-8	1-1/4	80	72,300	15.1	5.7	3.5	1.7	3	3.7	67.0

*Design Factor 4:1

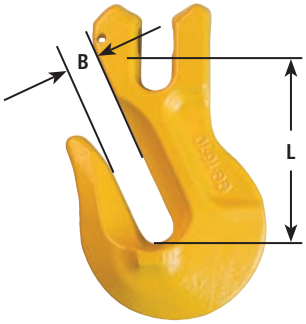
WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.



- Proof tested and certified.
- Heat ID Number for Traceability.
- No reduction of Work Load Limit due to supporting saddle in the bowl of the hook.
- Not for use with BL Coupler

EYE GRAB HOOKS (CRADLE TYPE) - OG								
STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)				WEIGHT EACH (Lbs.)
				L	B	E	F	
OG-7/8-8	9/32	80	3,500	2.6	.39	.63	.39	.66
OG-7/8-8	5/16	80	4,500	2.6	.39	.63	.39	.66
OG-10-8	3/8	80	7,100	3.3	.47	.79	.47	1.3
OG-13-8	1/2	80	12,000	4.1	.59	.99	.63	2.6
OG-16-8	5/8	80	18,100	5.1	.75	1.1	.75	5.3
OG-19/20-8	3/4	80	28,300	6.1	.89	1.4	.91	10.1
OG-22-8	7/8	80	34,200	7.1	1	1.7	1	13.7

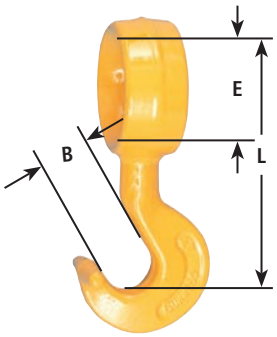
*Design Factor 4:1



- Proof tested and certified.
- No reduction of Work Load Limit due to supporting saddle in the saddle of the hook.
- Clevis prevents hook to chain size mismatch.
- Deep chain pocket.

CLEVIS GRAB HOOKS (CRADLE TYPE) - GG						
STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)		WEIGHT EACH (Lbs.)
				L	B	
GG-7-10	9/32	100	4,300	2.2	.39	.66
GG-8-10	5/16	100	5,700	2.2	.41	.88
GG-10-10	3/8	100	8,800	3.3	.47	2
GG-13-10	1/2	100	15,000	3.8	.63	4
GG-16-10	5/8	100	22,600	4.9	.79	6.8
GG-20-10	3/4	100	35,300	5.8	1	15.4

*Design Factor 4:1

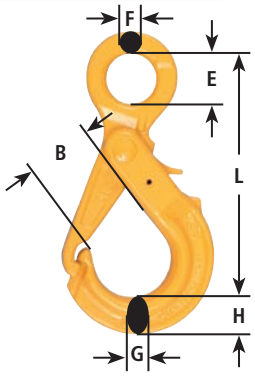


- Proof tested and certified.
- Used with BL coupler to form sliding choker.
- Allows for easy removal of chain sling from load.

CHOKER HOOKS - LK							
STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)			WEIGHT EACH (Lbs.)
				L	B	E	
LK-7/8-8	9/32	80	3,500	3.8	.75	1.3	.7
LK-7/8-8	5/16	80	4,500	3.8	.75	1.3	.7
LK-10-8	3/8	80	7,100	4.7	.83	1.7	1.8
LK-13-8	1/2	80	12,000	5.9	1	2	4

*Design Factor 4:1

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

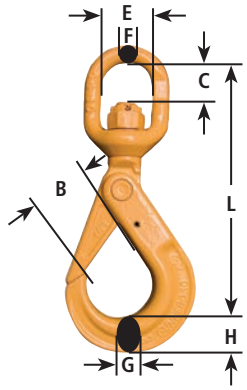


- Proof tested and certified.
- Heat ID number for traceability.
- Latch is protected and will act as a gauge to signal bent hook or latch.
- Grip latch locks into point of hook.

SELF-LOCKING HOOKS - OBK WITH GRIP LATCH (EYE TYPE)

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)						WEIGHT EACH (Lbs.)
				L	B	E	F	G	H	
OBK-6-10	7/32	100	2,700	4.1	1	.87	.35	.55	.67	.88
OBK-7/8-10	9/32	100	4,300	5.5	1.5	1.1	.39	.79	.87	1.8
OBK-7/8-10	5/16	100	5,700	5.5	1.5	1.1	.39	.79	.87	1.8
OBK-10-10	3/8	100	8,800	6.7	1.9	1.3	.51	.87	1.1	2.9
OBK-13-10	1/2	100	15,000	8.1	2.1	1.7	.59	1.1	1.4	5.3
OBK-16-10	5/8	100	22,600	9.8	2.7	2.2	.75	1.1	1.7	9.3
OBK-18/20-8	3/4	80	28,300	11.5	2.9	2.4	.87	1.5	1.9	18.1
OBK-22-8	7/8	80	34,200	13.2	3.4	2.8	.94	1.6	2.2	24.2

*Design Factor 4:1

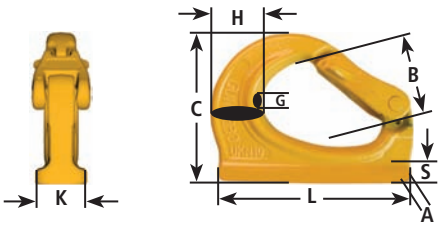


- Proof tested and certified.
- Heat ID number for traceability.
- Bushing allows hook to swivel before lifting, NOT when under load.
- Release trigger will only operate when hook is unloaded.

SELF-LOCKING HOOKS - BKL WITH BRONZE BUSHINGS (SWIVEL EYE TYPE)

STOCK NUMBER	CHAIN SIZE (Inches)	GRADE	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)							WEIGHT EACH (Lbs.)
				L	B	C	E	F	G	H	
BKL-6-10	7/32	100	2,700	5.9	1.1	0.9	1.3	.43	.59	.83	1.5
BKL-7/8-10	9/32	100	4,300	7.2	1.5	1.1	1.5	.47	.67	1	2.6
BKL-7/8-10	5/16	100	5,700	7.2	1.5	1.1	1.5	.47	.67	1	2.6
BKL-10-10	3/8	100	8,800	8.6	1.7	1.4	1.7	.59	.83	1.2	4.4
BKL-13-10	1/2	100	15,000	11	2.1	1.9	1.9	.75	1.2	1.5	8.4
BKL-16-10	5/8	100	22,600	13.5	2.4	2.6	2.4	.87	1.5	1.9	15.6
BKL-18/20-10	3/4	100	35,300	14.4	2.7	2.8	2.9	1.0	1.7	2.5	24.5

*Design Factor 4:1



- Proof tested and certified.
- Heat ID number for traceability.
- Durable spring loaded latch.
- Welding instructions with each hook.

ALLOY WELD ON HOOKS - UKN

STOCK NUMBER	WORK LOAD LIMIT (Lbs.)*	DIMENSIONS (Inches)								WEIGHT EACH (Lbs.)
		B	C	G	H	K	L	S	A	
UKN-0.75**	.75	.79	2.2	.51	.79	.75	3.2	.20	.12	.66
UKN-1**	1	.79	2.8	.67	.99	.99	3.7	.24	.16	1.3
UKN-2**	2	1	3.4	.79	1.2	1.2	4.5	.31	.20	2.2
UKN-3	3	1.2	4.1	.91	1.3	1.4	5.2	.39	.24	2.9
UKN-4	4	1.1	4.5	1.1	1.5	1.7	5.5	.43	.28	4.2
UKN-5	5	1.3	5.2	1.2	1.9	1.8	6.5	.47	.32	6.4
UKN-8	8	1.3	5.2	1.6	2	2	6.8	.51	.35	7.7
UKN-10	10	1.9	6.7	1.7	2.3	2.2	8.7	.55	.35	14.1
UKN-15	15	2.1	7.4	2	2.6	2.4	9.4	.59	.47	19.4

*Design Factor 5:1
**Welding Plate on UKN-0.75, UKN-1 AND UKN-2 is slightly curved. For welding use electrode AWS A 5.1 E 7018.

WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Slingmax® Chain Saddle Rings

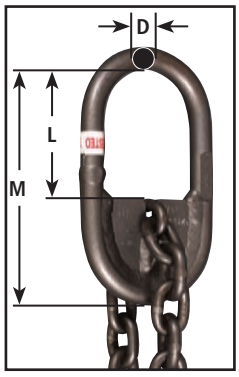
Slingmax® Chain Saddle Rings provide quick adjustment for unbalanced loads and are lighter, more economical and versatile than conventional chain slings with couplers. If a complete assembly is desired, you must specify sling length (reach) and fittings.

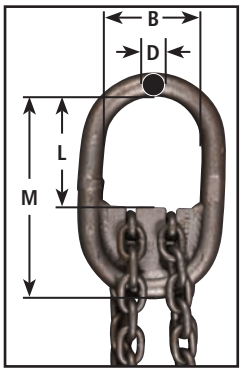




Canadian Patent No. 1,086,510
British Patent No. 2,029,370

CHAIN SIZE (Inches)	GRADE	CSR STOCK NUMBER	WORK LOAD LIMITS (Lbs.) SINGLE LEG 90 DEG.	SINGLE/DOUBLE LEG 60°	SINGLE/DOUBLE LEG 45°	CSR STOCK NUMBER	TRIPLE/QUAD LEG 60°	TRIPLE/QUAD LEG 45°
9/32	100	CSR-D-932	4,300	7,400	6,100	CSR-Q-932	11,200	9,100
3/8	100	CSR-D-380	8,800	15,200	12,400	CSR-Q-380	22,900	18,700
1/2	100	CSR-D-120	15,000	26,000	21,200	CSR-Q-120	39,000	31,800
5/8	100	CSR-D-580	22,600	39,100	32,000	CSR-Q-580	58,700	47,900
3/4	100	CSR-D-340	35,300	61,100	49,900	CSR-Q-340	91,700	74,900
7/8	100	CSR-D-780	42,700	74,000	60,400	CSR-Q-780	110,900	90,600
1	80	CSR-D-100	47,700	82,600	67,400	CSR-Q-100	123,900	101,200
1-1/4	80	CSR-D-125	72,300	125,200	102,200	CSR-Q-125	187,800	153,400
1-1/2	80	CSR-D-150	80,000	138,600	113,100	-	-	-





CHAIN SADDLE RING SPECIFICATIONS

CHAIN SIZE (Inches)	CSR STOCK NUMBER	SINGLE/DOUBLE (INCHES) D	B	L	M	CSR STOCK NUMBER	TRIPLE/QUAD (INCHES) D	B	L	M
9/32	CSR-D-932	37/64	2-1/2	3	5-3/8	CSR-Q-932	13/16	3	3-3/4	6-3/4
3/8	CSR-D-380	13/16	3	3-1/2	6-3/4	CSR-Q-380	1-1/8	4	5-1/4	9-1/8
1/2	CSR-D-120	1-1/8	4	4-1/2	9-1/8	CSR-Q-120	1-1/4	4	4-1/3	9-1/4
5/8	CSR-D-580	1-1/4	4	4-3/8	9-1/4	CSR-Q-580	1-5/8	5-1/4	5-3/4	12-1/8
3/4	CSR-D-340	1-5/8	5-1/4	5-3/4	12-1/8	CSR-Q-340	1-7/8	6	6-5/8	13-7/8
7/8	CSR-D-780	UPON REQUEST				CSR-Q-780	UPON REQUEST			
1	CSR-D-100	UPON REQUEST				CSR-Q-100	UPON REQUEST			
1-1/4	CSR-D-125	UPON REQUEST				CSR-Q-125	UPON REQUEST			
1-1/2	CSR-D-150	UPON REQUEST				-	-	-	-	-

⚠ WARNING See Pages 155-173 for Important Safety, Use and Inspection Information.

Wire Mesh Sling Safety Information

⚠ WARNING TO THE USERS OF WIRE MESH SLINGS



The **⚠ WARNING** Icon, used in our product information is done to alert sling users to potentially hazardous conditions and situations.

⚠ WARNING It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this bulletin, in our catalog, on our website www.lift-it.com and follow OSHA and ASME guidelines. Use by untrained persons is hazardous.

The American Society of Mechanical Engineers, in Sling Safety Standard, ASME B30.9 clearly establishes the requirement for training. Section 9-3.1-Training states, "Wire mesh sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter".

⚠ WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations.

Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠ WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and rigging products will fail if damaged, abused, misused, overused or improperly maintained.

Any hazardous condition disclosed by an inspection shall require sling replacement. Temporary repairs are not permitted. Damage and wear seriously reduce sling Work Load Limits.

Always know the load weight and select the appropriate sling for the load, configuration of lift necessary to ensure load control and any chemical exposure.

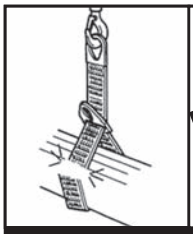
Always take into account sling angles and calculate changes in the sling Work Load Limits, when used in choker and non-perpendicular vertical, basket or bridle configurations.

Ensure that the load will not cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces with suitable materials of sufficient strength, thickness and construction.

The strength of Wire Mesh Slings can be affected by chemically active environments. Sling materials may be susceptible to damage from caustic or acid substances or fumes. Strong oxidizing environments attack all common sling materials and components. Consult the manufacturer prior to selection and use.

⚠ WARNING Do not use Wire Mesh Slings in pairs, unless used vertically and attached to a spreader bar.

⚠ WARNING Maximum Operating temperature for coated wire mesh slings is 150°(F)/65°C.





⚠ WARNING

Slings can fail if damaged, misused or overloaded. Inspect before use. Use only if trained. Observe rated load. ALWAYS protect the sling from damage with materials of sufficient strength, thickness and construction. Do not use in pairs, unless used vertically and attached to a spreader bar. DEATH or INJURY can occur from improper use or care.

RATED LOAD = RATED CAPACITY = WORK LOAD LIMIT

WIRE MESH SLINGS

INSTRUCTIONS FOR CARE USE ♦ INSPECTION ♦ REPAIR.

CARE Store on a rack away from possible mechanical damage, corrosion, moisture, dust, grit and extreme temperatures Do not hammer sling to straighten or force a spiral or cross rod into position.

USE Know the weight of load. Check tag to confirm that sling is rated adequately for the load (see load angle chart). Avoid twists, knots or kinks. Be sure that the load cannot cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces; use materials of sufficient strength, thickness and construction. Distribute load evenly across width of mesh. Balance the load. Maintain load control. Avoid jerking the load. Be alert for snagging of load. Do not pull on stuck objects. Avoid dragging sling over rough surfaces and from under the load. Use between -20° & 550°F (uncoated), 0° & 150°F (elastomer coated). Use only in a vertical, vertical basket or choker hitch (if fitted with a choker triangle). Choker hitch must choke on mesh, never on end fitting. Stand clear of load at all times. Persons are not to ride on sling or load.

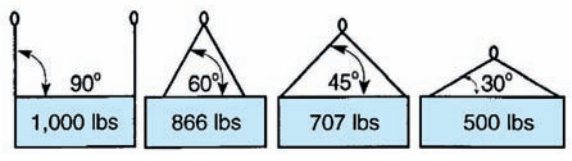
INSPECTION Before each use: Check that rated loads are marked on end fitting. Inspect for broken edge welds/ brazed joints, broken wires, lack of flexibility, wire diameter reduced 25% from wear or 15% by corrosion. Check end fittings for reduction in eye opening more than 10%. Check triangle choker fitting slot for more than 10% increase in depth. Check fittings for cracks, twisting, and elongation. **If this wear or damage is present, or rated load is missing or Illegible, remove from service and repair or replace sling.**

Frequent inspection is done by the person handling the sling before each use and must include all of the before use items. Periodic Inspections are required at least annually for normal service, quarterly or more frequently if in severe service or nearly constant use. Periodic inspections are performed by designated person(s) who are trained and a written record of the most periodic inspection shall be maintained. The inspector shall determine when further use would be hazardous.

REPAIR Any hazardous condition disclosed by an inspection shall require repair or replacement. Field repair is not permitted. Only manufacturers or authorized centers may make repairs. All repaired slings must be proof tested and certified.

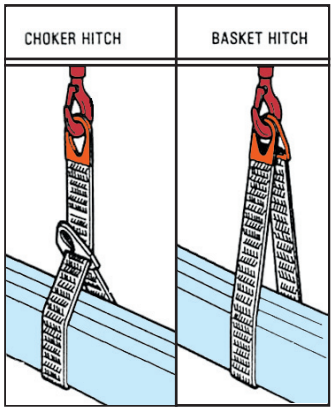
LOAD ANGLE CHART

Angle factor *must* be applied to calculate the reduced sling capacity when lifting force is not at 90° to the plane of the load!



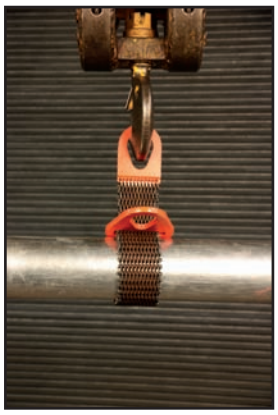
Multiply angle factor x sling's vertical rated load to calculate the reduced capacity at the angle.

Angle	Factor
90°	1.0000
80°	0.9848
75°	0.9659
70°	0.9397
65°	0.9063
60°	0.8660
55°	0.8192
50°	0.7660
45°	0.7071
40°	0.6248
35°	0.5736
30°	0.5000



Because of the reduced lifting capacity, use extra care when the sling to load, also known as the horizontal angle, is less than 45° and do not make lifts of less than 30° load angle. Example: A sling with adequate capacity could be broken because of increased tension resulting from angles of less than 30 degrees. When possible, use longer slings to minimize angular tension by increasing the angle.

Wire Mesh Slings



Lift-It® is the Western Regional Service Center for Cambridge International. Lift-It® Wire Mesh Sling Welded Edge construction will outlast and outperform brazed edges, offered by others. Our Wire Mesh slings are fabricated in a timely manner and you will receive the same service level that you have come to know and expect.

The unique woven wire construction of Lift-It® Wire Mesh Slings consists of a series of smooth, spiral wires joined together across the sling body. This construction gives mesh slings flexibility and long life. Standard mesh materials are high strength, Carbon Steel (10 or 12 gauge), 4130 Heat Treated Alloy Steel and Stainless Steel (Type 304).

Lift-It® Wire Mesh Slings are widely used in metal working applications and are ideal for positioning coiled strip for slitting and for handling sheet steel, hot rolled flat bar stock and cold drawn flats. Other applications include the efficient handling of pre-stressed concrete, pre-fabricated wall panels and pre-cast hollow core concrete beams.

Lift-It® Wire Mesh Slings are recommended for use where loads are hot, abrasive or tend to damage synthetic slings. Wire Mesh Slings grip the load with little stretch and withstand temperatures to 550˚(F)/287˚(C).

⚠ WARNING Do not use Wire Mesh Slings in pairs, unless used vertically and attached to a spreader bar.

SLING AND HARDWARE SPECIFICATIONS

	MESH WIDTH	WORK LOAD LIMITS				Sling Wt. (Lbs.)		Terminal Dimensions (Inches)		
		Choker	Basket Hitches							
			90°	60°	45°	3 Ft. Sling	Adder Per Ft.	"A"	"B"	"C"
10 GAUGE CARBON	2	1,600	3,200	2,700	2,200	5	1.25	1-3/4	4	6
	3	3,000	6,000	5,100	4,200	8	1.88	2-1/2	5-1/4	7-1/2
	4	4,400	8,800	7,600	6,220	10	2.50	2-1/2	5-1/2	7-3/4
	6	6,600	13,200	11,430	9,300	15	3.88	2-3/4	6-1/2	9
	8	8,800	17,600	15,000	12,400	20	5.13	4	8-3/4	12
	10	11,000	22,000	19,050	15,550	26	6.38	3-1/2	7-3/4	10-3/4
	12	13,200	26,400	22,860	18,660	33	7.63	3-1/2	8	11-1/4
	14	15,400	30,800	26,670	21,775	47	8.78	4-1/2	10-5/8	14-11/16
	16	17,600	35,200	30,480	24,886	55	10.12	4-1/2	11-1/4	15-9/16
	18	19,800	39,600	34,290	27,990	64	11.38	4-1/2	11-7/8	16-9/16
	20	22,000	44,000	38,100	31,100	73	12.75	4-1/2	12-1/2	17-9/16

CHEMICAL AND ENVIRONMENTAL INFORMATION

Metal Mesh Composition	Weak Sulfuric Acid	Weak Hydrochloric Acid	Alkaline Caustic Solutions	Salt Solutions	Organic Solvents	Water
Carbon Steel	No	No	No	No	Yes	No
T-304 Stainless Steel	No	No	Yes	No	Yes	Yes
AISI 4130 Alloy Steel*	No	No	No	No	Yes	No
Urethane-Coated	No	Yes	No	Yes	No	Yes

*Heat Treated

The above chart provides general guidelines and all data listed is based upon a 70 degree (f) exposure. For specific time, temperature and concentration factors, consult us prior to purchase or use.

REPAIR AND CERTIFICATION

All newly manufactured Lift-It® Wire Mesh Slings are proof tested to twice vertical Work Load Limit. Each sling is assigned a unique serial number and supplied with proof test certification.

Lift-It® Manufacturing will repair and certify all types and brands of Wire Mesh Slings. Repairs are charged on a material and labor basis, after a thorough sling inspection. All repaired slings are tested to twice vertical Work Load Limit and certified.

SPECIAL COVERINGS

For maximum load protection, consider Coated Wire Mesh Slings. Soft, smooth, elastic coverings enhance the gentleness and service life of slings and improve ease of handling. Coverings increase sling thickness approximately 5/16" and flexes to a radius as small as 2 inches.

⚠ WARNING Maximum operating temperatures for Coated Wire Mesh Slings is 150˚(F)/65˚(C).

URETHANE COVERING

Urethane Covering is well known for its flexibility, without checking, toughness and its long service. Urethane is resistant to attack by lower concentrations of: nitric, sulfuric, hydrochloric acids, hydrofluoric acids and sodium hydroxide.



NEOPRENE COVERING

Neoprene is resistant to attack by oils, greases, stronger concentrations of sodium hydroxide, sulfuric acid, hydrochloric acid and hydrofluoric acid.

REMOVAL FROM SERVICE CRITERIA

Slings must be inspected before each use and shall be removed from service if any of the following defects are present:

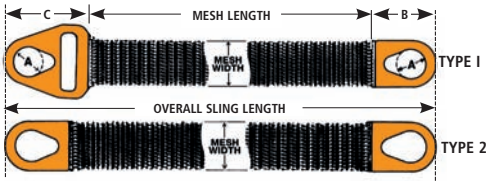
- Missing or illegible sling identification.
- Broken weld along the sling edge.
- Broken wire in any part of the mesh.
- A reduction in wire diameter of 25% due to abrasion or 15% from corrosion.
- Lack of flexibility due to mesh distortion.
- Distortion of the choker fitting so the depth of the slot is increased by more than 10%.
- Distortion of either fitting so the width of the eye opening is decreased by more than 10%.
- 15% reduction of the original cross sectional area of any point around the hook opening.
- Visible distortion of either fitting out of its plane.
- Cracked end fittings.
- Slings with locked spirals or without free articulation or movement.
- Fittings that are pitted, corroded, cracked, bent, twisted, gouged or broken.
- Other conditions, including visible damage, that cause doubt as to the continued use of the sling.

HOW TO ORDER

DETERMINE SLING STOCK NUMBER

WM - 1 - 10 - 4 - X 10 Ft.

- WM — WIRE MESH
- 1 — SLING TYPE (Type 1: Choker, Type 2: Basket)
- 10 — MESH GAUGE (10: 10 Gauge, 12: 12 Gauge)
- 4 — MESH WIDTH (INCHES)
- X 10 Ft. — OVERALL SLING LENGTH (FEET)



1) Select the Sling Material: Carbon Steel , Alloy or Stainless.
2) Select sling type: Type 1-Choker or Type 2-Basket.
3) Specify gauge for carbon steel.
4) Specify mesh width: Inches.
5) Specify sling length: Feet (Overall).

MAXIMIZER BRAIDED CHAIN SLING

The Maximizer is composed of 7 parts of 3/8" (grade 100) alloy chain, interlaced with 1/4" galvanized wire rope. The sling body is attached to T-1 end fittings with grade 100 alloy connecting links. Maximizer Braided Chain Slings are rated at 110,000 Lbs. Basket WLL.

Stock No. MBCS-110
You must specify sling length (Bearing Hardware).



INSPECTION CRITERIA FOR MAXIMIZER BRAIDED CHAIN SLINGS

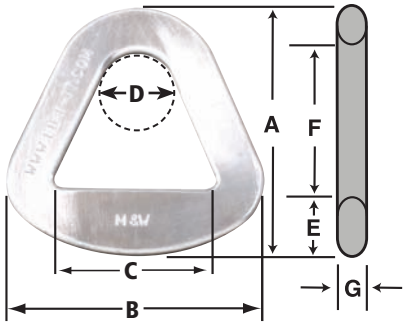
- Wear, nicks, cracks, breaks, gouges, stretch, bends or weld spatter on chain or attachments.
- Chain and attachments will not hinge freely.
- Visible distortion of end fittings out of their plane.
- Discoloration from excessive heat exposure.
- Cracked end fitting.
- Distortion or any eye collapse of fittings.

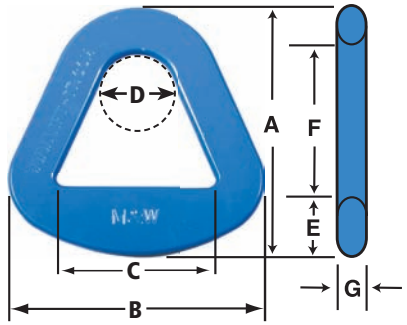
See page 168 for additional use and inspection information.

ALUMINUM AND STEEL TRIANGLES

ALUMINUM TRIANGLES- DIMENSIONS (Inches) and DATA									
Size	Stock No.	A	B	C	D	E	F	Weight	Thickness
2″	AT2	3.94	3.75	2.31	2.25	1.62	1.00	.35	.50
3″	AT3	5.31	5.00	3.31	3.06	2.00	1.25	.60	.50
4″	AT4	6.75	6.75	3.75	4.25	2.00	1.75	1.11	.50
6″	AT6	9.25	9.38	5.50	6.13	3.25	2.38	1.97	.50

STEEL TRIANGLES- DIMENSIONS (Inches) and DATA									
Size	Stock No.	A	B	C	D	E	F	Weight	Thickness
2″	ST2	3.94	3.75	2.31	2.25	1.63	1.00	1.00	.50
3″	ST3	5.31	5.00	3.31	3.06	2.00	1.25	1.73	.50
4″	ST4	6.75	6.75	3.75	4.25	2.00	1.75	3.12	.50
5″	ST5	7.70	7.81	4.60	5.13	2.72	1.99	3.79	.50
6″	ST6	9.25	9.37	5.50	6.13	3.25	2.38	5.70	.50
8″	ST8	11.88	12.25	7.50	8.44	3.25	2.75	12.06	.75
10″	ST10	13.25	13.88	8.63	10.88	4.50	3.18	14.41	.75
12″	ST12	15.75	16.69	10.31	13.00	5.36	3.69	20.24	.75

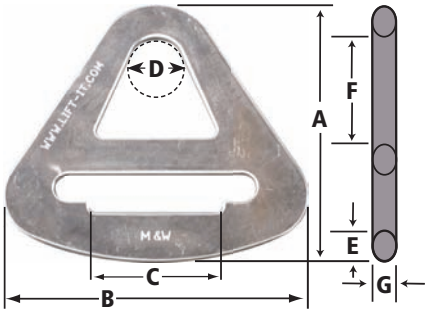


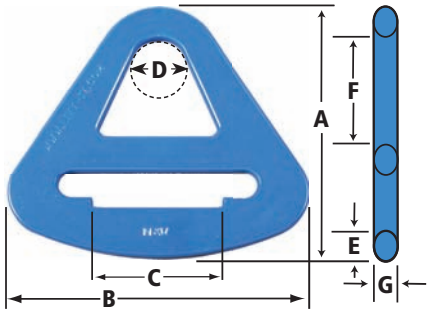


ALUMINUM AND STEEL CHOKERS

ALUMINUM CHOKERS- DIMENSIONS (Inches) and DATA										
Size	Stock No.	A	B	C	D	E	F	G	Weight	Thickness
2″	ST2	6.16	6.30	2.31	2.25	4.12	1.62	.89	.75	.50
3″	ST3	8.00	8.17	3.31	3.06	5.40	2.00	1.32	1.20	.50
4″	ST4	9.40	10.67	3.75	4.25	7.10	2.00	1.73	1.80	.50
6″	ST6	13.24	14.48	5.50	6.13	9.75	3.25	2.37	5.10	.50

STEEL CHOKERS- DIMENSIONS (Inches) and DATA										
Size	Stock No.	A	B	C	D	E	F	G	Weight	Thickness
2″	SC2	6.16	6.30	2.31	2.25	4.12	1.62	.89	1.8	.50
3″	SC3	8.00	8.17	3.31	3.06	5.40	2.00	1.32	2.9	.50
4″	SC4	9.40	10.67	3.75	4.25	7.10	2.00	1.73	4.4	.50
5″	SC5	11.18	12.16	4.62	5.15	8.19	2.72	2.04	6	.50
6″	SC6	13.24	14.48	5.50	6.13	9.75	3.25	2.37	7.6	.50
8″	SC8	14.31	16.19	7.13	5.14	12.00	5.13	2.56	15	.75
10″	SC10	16.88	17.88	8.44	5.26	13.38	5.25	3.50	27.8	.75
12″	SC12	20.25	21.44	10.13	6.30	16.00	6.30	4.20	39	.75

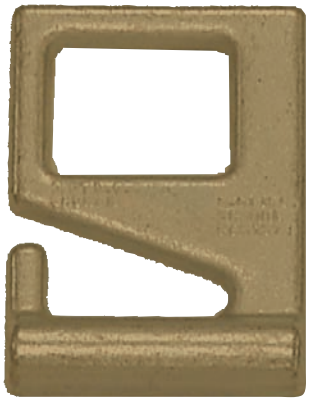
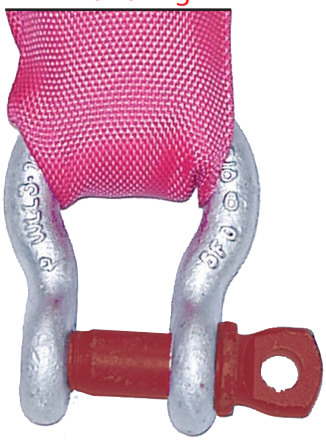




PLEASE NOTE: All dimensions are nominal and subject to change without notice.
If dimensions are critical for your application, please specify.
4-ply steel hardware dimensional data available on request.
All Fitting Weights are expressed in pounds.

⚠WARNING Fittings should never be used where exposure to sprays, mists, vapors, fumes or liquids of harmful acids, alkalis, chlorine or other corrosive agents are present. While aluminum fittings are non-sparking and do not rust, they are not as durable and cost more than steel hardware. Aluminum fittings are degraded by salt water and should not be cleaned with chlorine based solutions.

Synthetic slings were developed decades after rigging hardware for chain and wire rope slings. "Heavy metal" sling fittings were not designed with synthetic slings in mind. Slingmax®, Crosby® and other progressive manufacturers are now providing alternatives which make "geometric", good sense for synthetic slings.

FLAT - STRAIGHT	FLAT - STRAIGHT	FLAT - STRAIGHT
G-Link™ 	Web Sling Hook  Synthetic Sling Saver Shackle 	High Performance Sling Connector 
Rounded - Curved 	"Corner" Loading - Wrong 	Round - Curved 
Bunching 	Wrong 	Non-Optimal Relationship 

Work Load Limits can only be fully obtained when there is a proper spatial and geometric relationship between synthetic slings and hardware connection points. When slings are bunched or edge loaded, strength loss occurs. Increased strength realized from alloy shackles is great, but please consider using oversized alloy shackles or larger, carbon shackles with synthetic slings.

Loss of strength due to distortion can be overcome when slings are properly supported over a fitting design that is flat and straight. Other desirable characteristics would be proper thickness, diameter and finish. Sling Saver Fittings®, Synthetic Sling Saver Shackles®, High Performance Sling Connectors and G-Links™ support slings efficiently.

"Synthetic Sling Saver" Shackles

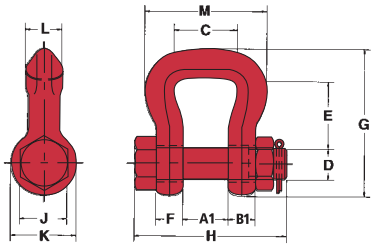


Bolt Type
S-252

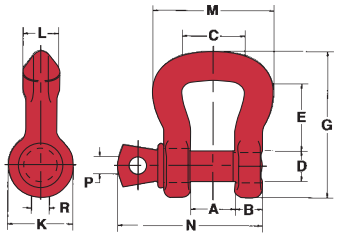
- Fatigue rated to 20,000 cycles at 1-1/2 times Work Load Limit
- Eliminates "bunching" effect caused by traditional shackles
- Increased bow radius allows better load distribution on internal fibers
- Meets or exceeds all ASME B30.26 Requirements
- All alloy construction
- Design Factor- 5 /1



Screw Pin
S-253



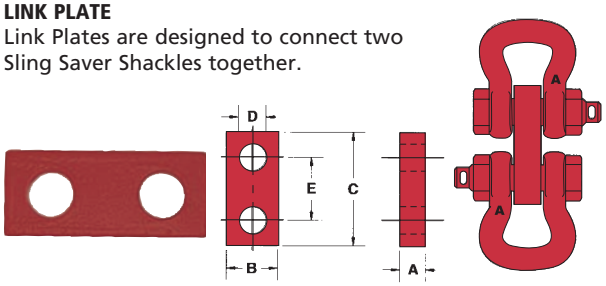
BOLT TYPE		SHACKLE SIZE (Inches)	SCREW PIN	
WEIGHT (Lbs.)	ORDER CODE		WEIGHT (Lbs.)	ORDER CODE
1.4	1020485	1	1.4	1020575
2.4	1020496	1.5	2.2	1020584
4.1	1020507	2	3.8	1020593
8.0	1020518	3	7.3	1020602
16.9	1020529	4	15.2	1020611
35.0	1020540	5	30.8	1020620
57.5	1020551	6	52.0	1020629



Shackle Size (Inches)	Work Load Limit (Lbs.)	DIMENSIONAL DATA (Inches)																
		A S-253	B S-253	A1 S-252	B1 S-252	C	D	E	F	G	H	J	K	L	M	N	P	R
1	6,500	.88	.62	1.00	.58	1.38	.75	1.50	.44	3.38	3.68	1.12	1.50	.75	2.69	3.22	.44	1.00
1.5	13,000	1.25	.75	1.25	.75	1.75	.88	1.88	.50	4.15	4.25	1.31	1.81	1.00	3.38	4.03	.50	1.19
2	17,500	1.38	.88	1.38	.88	2.25	1.00	2.81	.56	5.50	4.72	1.50	2.09	1.12	4.19	4.50	.50	1.44
3	25,000	1.62	1.12	1.62	1.12	3.25	1.25	3.06	.75	6.34	5.88	1.88	2.62	1.38	5.62	5.59	.62	1.81
4	41,000	2.12	1.38	2.12	1.38	4.50	1.50	5.75	.88	9.45	7.19	2.25	3.12	1.75	7.50	6.88	.75	2.13
5	70,000	2.50	1.75	2.50	1.75	5.50	2.00	6.34	1.12	11.50	9.31	3.00	4.19	2.25	9.19	8.66	1.00	2.88
6	100,000	3.00	2.12	3.00	2.12	6.50	2.25	7.70	1.25	13.75	10.38	3.38	4.75	2.75	11.00	10.22	1.22	3.19

ACCESSORIES

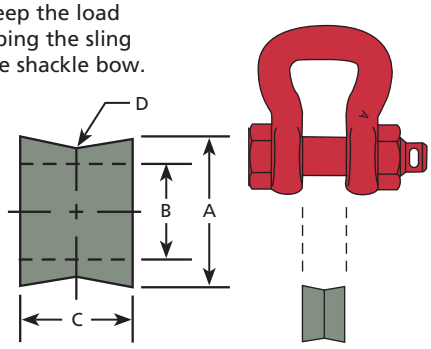
LINK PLATE
Link Plates are designed to connect two Sling Saver Shackles together.



Shackle Size (Inches)	Work Load Limit (Lbs.)	Order Code	DIMENSIONS (Inches)					Weight (Lbs.)
			A	B	C	D	E	
1	6,500	1020785	.75	1.50	3.38	.81	1.88	.83
1.5	13,000	1020796	1.00	1.75	4.12	.94	2.25	1.62
2	17,500	1020807	1.25	2.00	4.75	1.06	2.62	2.71
3	25,000	1020818	1.50	2.50	6.00	1.31	3.37	5.18
4	41,000	1020829	1.75	3.00	7.00	1.62	3.75	8.19
5	70,000	1020840	2.00	4.00	9.25	2.12	5.00	17.19
6	100,000	1020851	3.00	5.00	10.50	2.38	5.75	37.40

SPOOL
Spools are designed to keep the load centered on the pin, keeping the sling positioned correctly in the shackle bow.



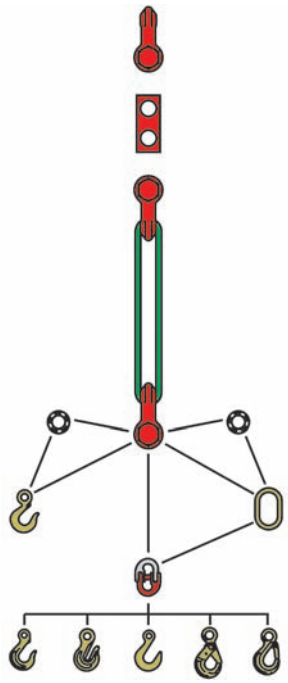


Shackle Size (Inches)	Work Load Limit (Lbs.)	Order Code	DIMENSIONS (Inches)				Weight (Lbs.)
			A	B	C	D	
1	6,500	1020903	1.25	.81	.75	.19	.33
1.5	13,000	1020912	1.50	.94	1.00	.25	.57
2	17,500	1020921	1.75	1.05	1.19	.31	.89
3	25,000	1020930	2.00	1.31	1.50	.38	1.45
4	41,000	1020939	2.50	1.63	1.88	.44	2.79
5	70,000	1020948	3.25	2.13	2.25	.50	2.40
6	100,000	1020957	3.75	2.38	2.75	.62	4.06

Sling Saver Shackle - "Sling System"

Synthetic Sling Saver Shackles were designed to easily adapt Crosby® sling fittings into the construction of complete rigging assemblies for synthetic slings.

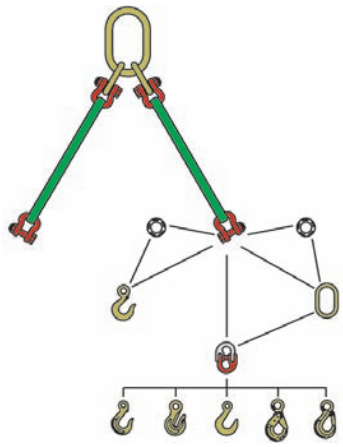
SINGLE LEG SYSTEM



Order Code							**Lok-A-Loy Link A-1337				
S-252 Bolt Type	S-253 Screw Pin	Work Load Limit 5/1 Design Factor (Lbs.)	S-255 Spool (Inches)	S-256 Link Plate (Inches)	S-320A Eye Hook (Tons)	A-342 Alloy Master Link (Inches)	A-327 Sling Hook (Inches)	A-328 Eye Grab Hook (Inches)	A-329 Eye Foundry Hook (Inches)	S-1316 Eye Hook SHUR-LOC (Inches)	S-315A Eye Latching (Inches)
1020485	1020575	6,500	1	1	5*	3/4	3/8	3/8	3/8	3/8	3/8
1020496	1020584	13,000	1.5	1.5	7*	1	5/8	5/8	5/8	5/8	5/8
1020507	1020593	17,500	2	2	11*	1	5/8	5/8	5/8	5/8	5/8
1020518	1020602	25,000	3	3	15*	1-1/4	3/4	3/4	3/4	-	3/4
1020529	1020611	41,000	4	4	22*	1-3/4	-	3/4	-	3/4	-
1020540	1020620	70,000	5	5	37	2	-	3/4	-	-	-
1020551	1020629	100,000	6	6	60	2-1/4	-	3/4	-	-	-

*New 320N Eye Hook
** LOK-A-LOY same size as hook size

DOUBLE LEG SYSTEM



Order Code								**Lok-A-Loy Link A-1337				
S-252 Bolt Type	S-253 Screw Pin	Work Load Limit 5/1 Design Factor (Lbs.)	S-255 Spool (Inches)	S-256 Link Plate (Inches)	S-320A Eye Hook (Tons)	A-342 Alloy Master Link (Inches)	A-345 Master Sub-Assy (Inches)	A-327 Sling Hook (Inches)	A-328 Eye Grab Hook (Inches)	A-329 Eye Foundry Hook (Inches)	S-1316 Eye Hook SHUR-LOC (Inches)	S-315A Eye Latching (Inches)
1020485	1020575	6,500	1	1	5*	3/4	1	3/8	3/8	3/8	3/8	3/8
1020496	1020584	13,000	1.5	1.5	7*	1	1-1/4	5/8	5/8	5/8	5/8	5/8
1020507	1020593	17,500	2	2	11*	1	1-1/4	5/8	5/8	5/8	5/8	5/8
1020518	1020602	25,000	3	3	15*	1-1/4	1-1/2	3/4	3/4	3/4	-	3/4
1020529	1020611	41,000	4	4	22*	1-3/4	1-3/4	-	3/4	-	-	-
1020540	1020620	70,000	5	5	37	2	-	3/4	-	-	-	-
1020551	1020629	100,000	6	6	60	2-1/4	-	3/4	-	-	-	-

*New 320N Eye Hook
** LOK-A-LOY same size as hook size

HIGH PERFORMANCE SLING CONNECTORS

"QT" QUENCHED & TEMPERED®

Load Rated®

S-237



S-238

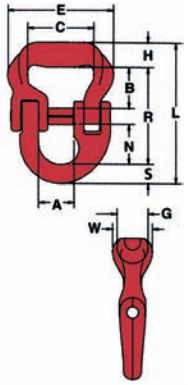


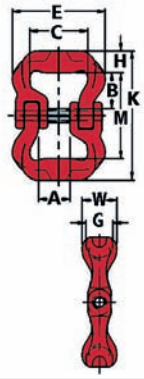
S237 High Performance Sling Connectors are designed to easily connect HP slings to masterlinks or eye hooks for the creation of bridle assemblies. The Metal-on-Metal "hinge point" enables increased sling longevity and efficiency.

S238 High Performance Sling Connectors allow slings to be joined together.

High Performance Sling Connectors feature all alloy construction, a 5/1 design factor and are individually proof tested to 2 times WLL.

Increased radius of bow gives wider sling bearing surface resulting in an increased area for better fiber load distribution.





S-237 HIGH PERFORMANCE SLING CONNECTOR - DIMENSIONAL DATA (INCHES)

Stock Number	Work Load Limit (Lbs.)	Nominal Sling Body Width (Inches)	Lok-A-Loy Size (Inches)	A	B	C	E	G	H	L	N	R	S	W	Weight (Lbs.)
1020695	5,000	2	3/8	.88	1.42	2.00	3.18	1.00	.80	4.20	1.04	2.92	.48	1.38	1.14
1020704	10,000	3	5/8	1.42	1.52	2.75	4.13	1.25	.98	5.68	1.71	3.94	.75	1.75	2.96
1020713	15,000	3	3/4	1.63	1.58	2.75	4.37	1.38	1.10	6.49	2.04	4.46	.93	1.88	4.75
1020722	25,000	4	7/8	2.00	2.33	3.75	6.00	1.75	1.41	7.97	2.27	5.51	1.06	2.25	8.59
1020731	30,000	4	7/8	2.00	2.20	3.75	6.19	1.75	1.41	7.84	2.27	5.38	1.06	2.38	9.24
1020740	40,000	5	1	2.25	2.91	4.75	7.25	2.25	1.78	9.45	2.44	6.45	1.22	3.09	15.70
1020759	60,000	6	1-1/4	2.56	3.36	5.75	9.13	2.31	1.86	11.08	3.07	7.72	1.50	3.16	26.00

S-238 HIGH PERFORMANCE SLING CONNECTOR - DIMENSIONAL DATA (INCHES)

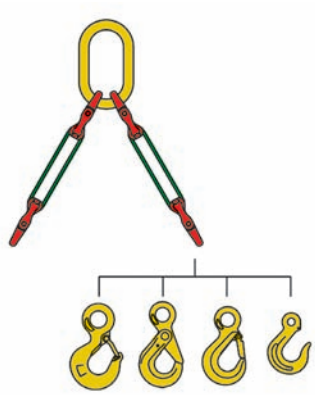
Stock Number	Work Load Limit (Lbs.)	Nominal Sling Body Width (Inches)	Lok-A-Loy Size (Inches)	A	B	C	E	G	H	K	M	W	Weight (Lbs.)
1020415	5,000	2	3/8	.88	1.42	2.00	3.18	1.00	.80	4.90	3.30	1.38	1.60
1020423	10,000	3	5/8	1.42	1.52	2.75	4.13	1.25	.98	5.72	3.76	1.75	3.3
1020432	15,000	3	3/4	1.63	1.58	2.75	4.37	1.38	1.10	6.16	3.96	1.88	4.90
1020441	25,000	4	7/8	2.00	2.33	3.75	6.00	1.75	1.41	8.40	5.58	2.25	10.1
1020450	30,000	4	7/8	2.00	2.20	3.75	6.19	1.75	1.41	8.14	5.32	2.38	11.4
1020469	40,000	5	1	2.25	2.91	4.75	7.25	2.25	1.78	10.48	6.92	3.09	20.7
1020478	60,000	6	1-1/4	2.56	3.36	5.75	9.13	2.31	1.86	11.72	8	3.16	32

Crosby Sling Saver hardware meets the requirements for minimum stock diameter or thickness and effective contact width shown in the Recommended Standard Specification for Synthetic Roundslings by the Web Sling & Tie Down Association. WSDTA-RS1 (2010).

HIGH PERFORMANCE SLING CONNECTORS

S237 and S238 High Performance Sling Connectors are designed to easily adapt to other Crosby fittings to develop complete systems for High Performance Slings.

The easy to use charts are furnished to allow you to determine the Crosby® fitting required for your High Performance Sling application.

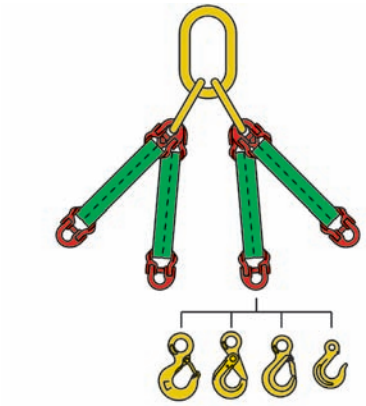




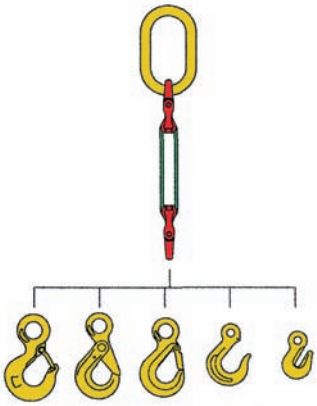
JOIN TWO SLINGS



CONNECT TO OTHER HARDWARE



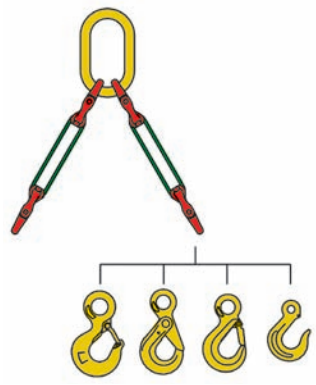
SINGLE LEG SLING



S-237 Frame	Work Load Limit (Lbs.)	A-1337	A-342	A-344	S-320/S-320AN*		S-1316	S-315A	A-327
									
		Lok-A-Loy (Inches)	Alloy Master Link (Inches)	Welded Master Link (Inches)	Eye Hook		SHUR-LOC Hook (Inches)	Eye Hook Latching (Inches)	Sling Hook (Inches)
					Tons	Frame			
5	5,000	3/8	1	7/8	7*	JA	5/8	5/8	5/8
10	10,000	5/8	1	7/8	7*	JA	5/8	5/8	5/8
15	15,000	3/4	1-1/4	1	11*	KA	3/4	n/a	3/4
25	25,000	7/8	1-1/2	1-1/4	15*	LA	7/8	n/a	7/8
30	30,000	7/8	1-1/2	1-1/4	15*	LA	7/8	n/a	7/8
40	40,000	1	1-3/4	n/a	22*	NA	1	n/a	n/a
60	60,000	1-1/4	2	n/a	30	OA	n/a	n/a	n/a

*S-320AN Style Hook / n/a-not available

DOUBLE LEG SLING



S-237 Frame	Work Load Limit (Lbs.)	A-1337	A-342	A-344	S-320/S-320AN*		S-1316A	S-315A	A-327
									
		Lok-A-Loy (Inches)	Alloy Master Link (Inches)	Welded Master Link (Inches)	Eye Hook		SHUR-LOC Hook (Inches)	Eye Hook Latching (Inches)	Sling Hook (Inches)
					Tons	Frame			
5	5,000	3/8	1-1/4	1-1/4	7*	JA	5/8	5/8	5/8
10	10,000	5/8	1-1/4	1-1/4	7*	JA	5/8	5/8	5/8
15	15,000	3/4	1-1/2	n/a	11*	KA	3/4	n/a	3/4
25	25,000	7/8	1-3/4	n/a	15*	LA	7/8	n/a	7/8
30	30,000	7/8	1-3/4	n/a	15*	LA	7/8	n/a	7/8
40	40,000	1	2	n/a	22*	NA	1	n/a	n/a
60	60,000	1-1/4	2-1/4	n/a	30	OA	n/a	n/a	n/a

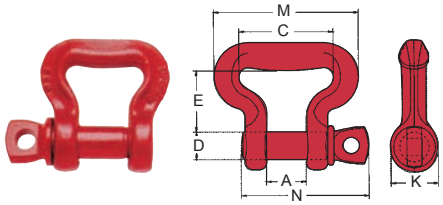
*S-320AN Style Hook / n/a-not available

Crosby® Sling Saver Fittings

A variety of sling components for synthetic round or web slings. The "bunching" effect is eliminated and sling efficiencies are increased. Sling Saver Fittings are alloy construction with a 5/1 design factor.

S-281 WEB SLING SHACKLE

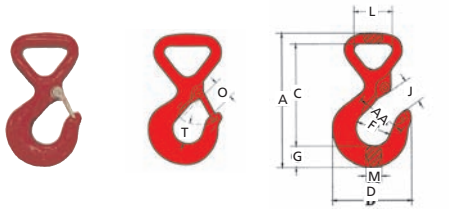
Designed to connect web and roundslings to eyebolts and lifting lugs. Web Sling Shackles feature the same ear spread "A" and pin diameters as conventional, Crosby® shackles.



SHACKLE WLL (Lbs.)	ORDER CODE	FOR WEBBING WIDTH (Inches)	FOR EYE WIDTH (Inches)	FOR ROUNDSLING STOCK NUMBER(S)	DIMENSIONAL DATA (Inches)							
					A	C	D	E	K	M	N	WEIGHT (Lbs.)
6,500	1021048	2	2	RS 30/60	1.06	2.50	.75	1.62	1.22	3.84	3.34	1.2
9,000	1021057	3	1.5	RS 90	1.25	2.00	.88	1.50	1.41	3.38	3.97	1.5
12,500	1021066	4	2	RS 120	1.44	2.50	1.00	2.00	1.62	4.22	4.50	2.5
17,000	1021075	6	3	RS 150/180	1.69	3.62	1.13	2.75	1.84	5.64	5.13	4.3

WS-320 WEB SLING HOOK

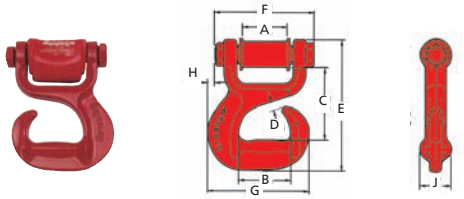
The hook eye is designed with a wide beam surface to eliminate bunching effects. Web Sling Hooks are supplied with latches.



HOOK WLL (Lbs.)	ORDER CODE	FOR EYE WIDTH (Inches)	FOR ROUNDSLING STOCK NUMBER(S)	DIMENSIONAL DATA (Inches)											
				A	C	D	F	G	J	L	M	O	T	AA	WEIGHT (Lbs.)
3,000	1022701	1		5.25	3.98	3.11	1.38	.84	.93	1.50	.63	.91	.98	2.00	1.10
6,000	1022712	2	RS 60	7.11	5.31	3.97	1.63	1.13	1.13	2.50	.85	1.09	1.16	2.00	2.86
10,000	1022723	3	RS 90	9.33	7.06	4.81	2.00	1.44	1.47	3.75	1.13	1.36	1.53	2.50	6.60

S-287 SLIDING CHOKER HOOK

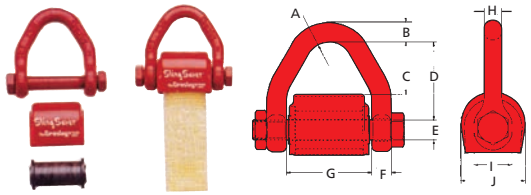
Designed to reduce friction, abrasion and fraying in the area of choke. Replacement spools and covers are available.



HOOK WLL (Lbs.)	ORDER CODE	FOR WEBBING WIDTH (Inches)	FOR EYE WIDTH (Inches)	FOR ROUNDSLING STOCK NUMBER(S)	DIMENSIONAL DATA (Inches)									
					A	B	C	D	E	F	G	H	J	WEIGHT (Lbs.)
6,500	1021909	2	2	RS 30/60	2.13	2.50	3.32	.38	6.03	4.77	4.88	.34	1.50	3.7
9,000	1021918	3	1.5		1.63	3.50	3.67	.38	7.06	4.53	6.51	1.36	1.88	6.1

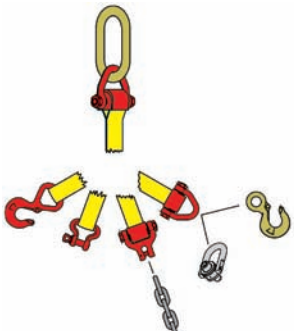
S-280 WEB SLING CONNECTOR

Designed to connect synthetic web slings to conventional Crosby® hardware: 320N Eye Hooks, Masterlinks, Rings and Shackles.

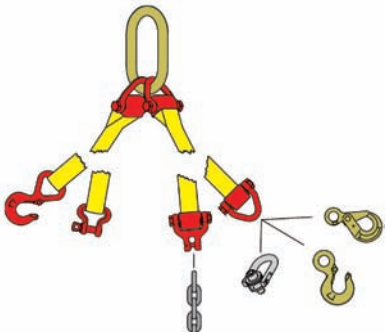


SHACKLE WLL (Lbs.)	ORDER CODE	FOR WEBBING WIDTH (Inches)	FOR EYE WIDTH (Inches)	FOR ROUNDSLING STOCK NUMBER(S)	DIMENSIONAL DATA (Inches)										
					A	B	C	D	E	F	G	H	I	J	WEIGHT (Lbs.)
6,500	1021681	2	2	RS 30/60	.75	.62	1.63	2.44	.63	.62	2.69	.56	1.19	2.02	1.5
9,000	1021690	3	1.5		.75	.69	1.10	2.01	.75	.69	2.19	.60	1.38	2.34	1.9
12,500	1021700	4	2		.75	.81	1.66	2.56	.88	.75	2.69	.69	1.62	2.46	2.9
17,000	1021709	6	3	RS 150/180	1.00	.94	2.47	3.50	1.00	.88	3.69	.88	1.88	2.84	5.1

⚠ WARNING Before use, tighten bolt, then tighten nut.
Read, understand and follow all instructions and chart information before using web connectors.



CROSBY® SYNTHETIC SLING SAVER FITTINGS CAN BE USED TO CREATE WEB AND ROUNDSLING BRIDLES.



SINGLE LEG AND DOUBLE LEG ASSEMBLIES

S-280 S-281 S-282 WLL	S-280 Web Connector** / S-281 Web Sling Shackle / S-282 Chain Connector: FOR WEBBING WIDTH (Inches)	SLING PLY	FOR EYE WIDTH (Inches)	FOR ROUNDSLING STOCK NUMBERS	WS-320 WEB SLING HOOK (Tons)	S-282 WEB/CHAIN* CONNECTOR (In.)	(mm)	S-320AN EYE HOOK (Tons)	S 280 Web Sling Connector: S-1316 SHUR-LOC HOOK (Inches)	HR-125 HOIST RING (Lbs.)	Top Fitting: A-342 MASTER LINK Single Leg (Inches)	A-342 MASTER LINK Double Leg (Inches)
6,500	2	2	2	RS 30/60	3	3/8	10	3	1/2	7,000	5/8	3/4
9,000	3	2	1.5	RS 90**	5	1/2	13	5	5/8	10,000	3/4	1
12,500	4	2	2	RS 120**		5/8	16	7	5/8	15,000	1	1
17,000	6	2	3	RS 150/180				11		24,000	1	1-1/4

* For use with Grade 8 Alloy Chain
**S-280 Web Connector will not accept slings listed

TRIPLE AND QUAD LEG ASSEMBLIES

S-280 S-281 S-282 WLL	S-280 Web Connector ** / S-281 Web Sling Shackle / S-282 Chain Connector: FOR WEBBING WIDTH (Inches)	SLING PLY	FOR EYE WIDTH (Inches)	FOR ROUNDSLING STOCK NUMBERS	WS-320 WEB SLING HOOK (Tons)	S-282 WEB/CHAIN* CONNECTOR (In.)	(mm)	S-320AN EYE HOOK (Tons)	S 280 Web Sling Connector: S-1316 SHUR-LOC HOOK (Inches)	HR-125 HOIST RING (Lbs.)	Top Fitting: A-342 MASTER LINK Single Leg (Inches)	A-342 MASTER LINK Double Leg (Inches)
6,500	2	2	2	RS 30/60	3	3/8	10	3	1/2	7,000	1	1
9,000	3	2	1.5	RS 90 **	5	1/2	13	5	5/8	10,000	1	1-1/4
12,500	4	2	2	RS 120 **		5/8	16	7	5/8	15,000	1-1/4	1-1/2
17,000	6	2	3	RS 150/180				11		24,000	1-1/2	1-3/4

* For use with Grade 8 Alloy Chain
**S-280 Web Connector will not accept slings listed

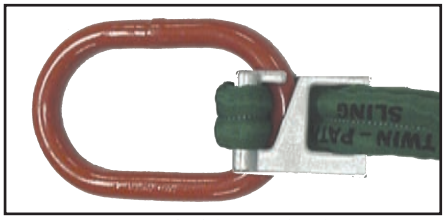
⚠ WARNING
- A falling load may cause serious injury or death.
- Read, understand and follow all instructions and chart information before using web connectors.
- Before use, tighten bolt first, then tighten nut.

Crosby® Sling Saver hardware meets the requirements for minimum stock diameter or thickness and effective contact width shown in the Recommended Standards Specification for Synthetic Polyester Roundslings by the Web Sling and Tie Down Association, WSTDA-RS1 (revised 2010).

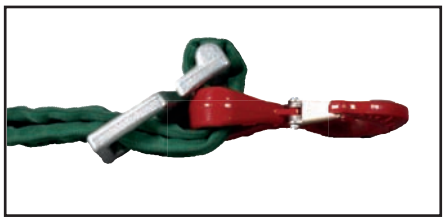
Please note: Component recommendations are based upon: Flat Eyes (Type 3), Double Ply (2 Ply), 9800 Lbs. (Class 7) Web Slings

Slingmax® G-Link™ Sling Connectors

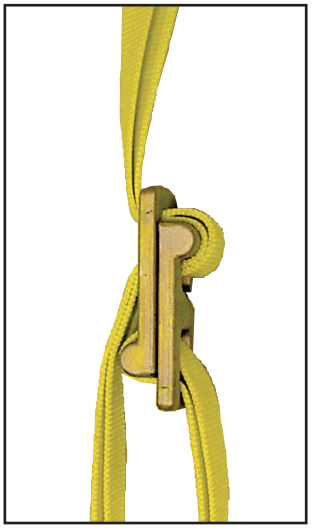
A multi-use connector specifically designed for connecting hardware to web, round or Twin-Path® slings. G-Links™ can be used to connect two slings together or be used to form a sliding choker hook. G-Links™ can also be used to construct bridles or to shorten sling reach.



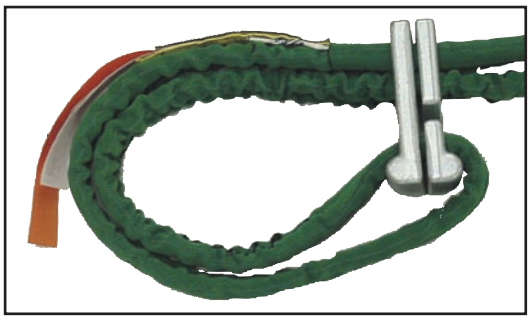
FITTING CONNECTION



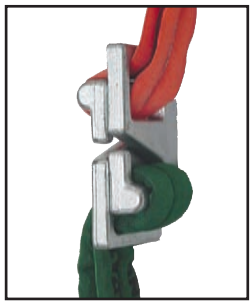
HOOK CONNECTION

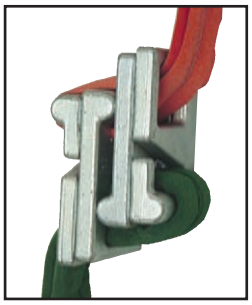


SHORTEN SLING LENGTH



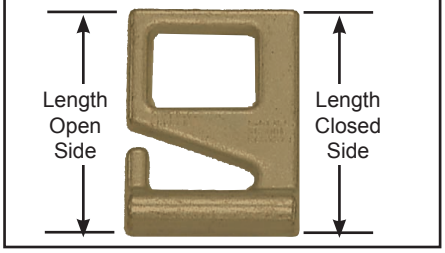
SLIDING CHOKER CONFIGURATION

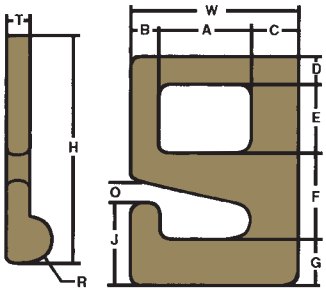




TWO SLING CONNECTION

Inspection Criteria
Open Side Length
must equal
Closed Side Length





Order Code	SINGLE G-Link™ WLL		Sling Width (Inches)	G-Link™ Weight (Lbs.)
	Vertical	Choker		
SC200L	5,000	4,000	2	2
SC300L	10,000	6,000	3	3.5
SC400L	15,000	8,000	4	7
SC500L*	30,000	16,000	5	15
SC600L*	50,000	24,000	6	29

*Flame Cut Steel

G-Link™ Dimensional Data (Inches)

ORDER CODE	A	B	C	D	E	F	G	H	J	O	R	T	W
SC200L	2	5/8	1-1/8	5/8	1-1/2	1-15/16	1	5.00	1-13/16	1/2	.50	.50	3.50
SC300L	3	11/16	1-1/4	11/16	2-1/4	2-7/16	1-1/4	6.62	2-1/2	9/16	.75	.75	5.00
SC400L	4	13/16	1-3/8	13/16	2-1/2	2-7/8	1-3/8	7.50	2-3/4	3/4	.75	1.00	6.00
SC500L	5	1-1/16	2	1-1/16	3	3-3/4	2	10.00	3-3/4	1	1.00	1.25	8.00
SC600L	6	1-1/4	2-1/4	1-1/4	4	5	2-1/4	12.50	4-3/4	1-1/4	1.00	1.50	9.38

CAUTION: Use of G-Links™ on larger stock diameters may lower the design factor.



⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.

Always use G-Links™ of correct width and strength. Two G-Links™, used together, will double the strength of one G-Link™.

INSTRUCTIONS FOR USE WITH: TWIN-PATH®, WEB AND ROUNDSLINGS

• RINGS • HOOKS • TWO SLING CONNECTION • BRIDLES • SLIDING CHOKER

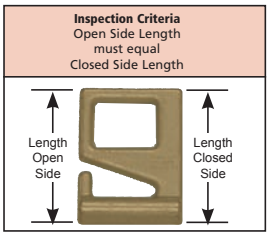
RING OR HOOK CONNECTION

Attach Ring or Hook as follows: Holding G-Link™ with half round reinforcement side facing up, put sling through closed slot and through Ring or Hook eye. Slide sling loop over open arm. Make sure that flat side of G-Link™ is down against Ring or Hook and the round side is up against sling loop.



Make sure the inside of the Hook eye is wide enough to accept the sling width and smooth enough so that the sling will not be cut or damaged.

Pull tight. Make sure flat side of G-Link™ is face down, against Ring or Hook. Make sure there is no slack in the connection before use.





Make sure the Hook is facing in the intended direction. If not, start process over and change the Hook to the proper position.

Two G-Link™ connectors on a sling makes a stronger connection. Place G-Links™ with the flat sides together. Put sling through the closed slots, around the Ring or Hook eye and connect sling loop into both open slots as shown.



Make sure the inside of the Hook eye is wide enough to accept the sling width and smooth enough so that the sling will not be cut or damaged.

Pull tight. Make sure that the flat sides of the two G-Links™ are together. Make sure there is no slack in the connection before use.

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use only if trained. Observe rated capacity. DEATH or INJURY can occur from improper use or maintenance.



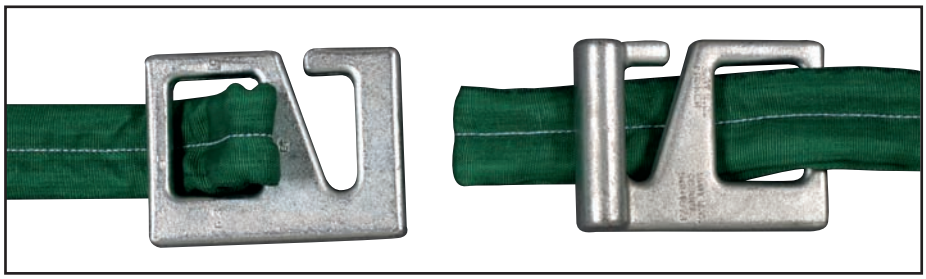
Make sure the Hook is facing in the intended direction. If not, start process over and change the Hook to the proper position.

Slingmax® G-Link™ Connectors

INSTRUCTIONS FOR USE WITH: TWIN-PATH®, WEB AND ROUNDSLINGS

• RINGS • HOOKS • TWO SLING CONNECTION • BRIDLES • SLIDING CHOKER

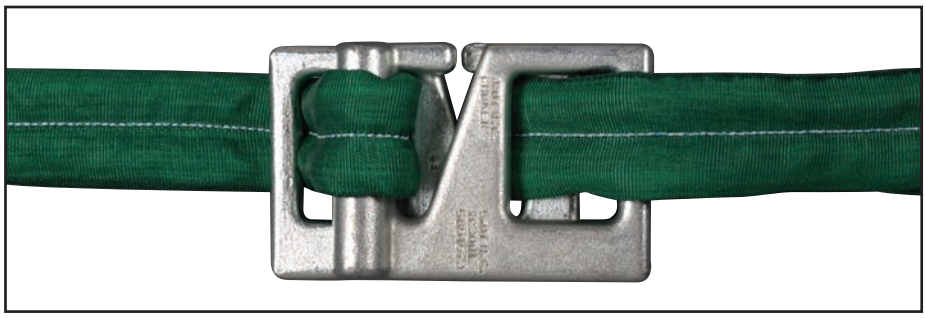
END TO END CONNECTION RATED AT SLING CHOKER CAPACITY



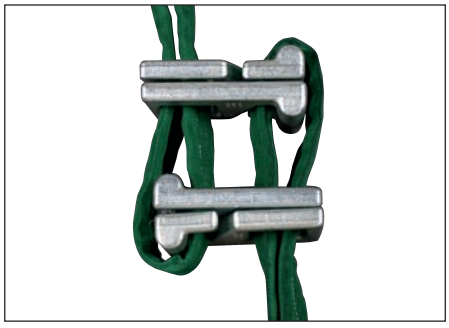
Using one G-Link™ on each sling (two total), this connection has a rated choker capacity of **one G-Link™.**

Using two G-Links™ on each sling (four total), this connection has the rated choker capacity of **two G Links™.**

Place G-Links™ with the open arms facing in the same direction and the round sides of the arms as shown. Put the slings through the closed slot of the G-Links™. Connect sling loops over the open arms.



Pull slings tight. Make sure flat sides of G-Links™ are against each other. Take slack out of the connection before use.





To make a stronger Two Sling Connection, use two G-Links™ on each sling as shown. Place flat sides of each pair of G-Links™ against each other. The half round reinforcement bars must be on opposite sides of the open arms. Attach both sling loops to the open arms of both pairs of G-Links™.

Pull slings tight. Make sure the slack is taken out of the connection before use.

SLIDING CHOKER HITCH



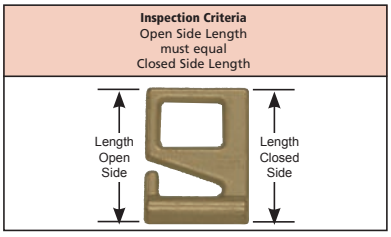
Put two G-Links™ on sling with flat sides together.

Always use two G-Links™ for this hitch.

Two G-Links™ will have the rated capacity of **one G-Link™** when used this way.



Attach sling loop to G-Links™ as shown. Always use two G-Links™ for the Sliding Choker Hitch.



⚠ WARNING

Can fail if damaged, misused or over-loaded. Inspect before use. Use only if trained. Observe rated capacity. DEATH or INJURY can occur from improper use or maintenance.

INSTRUCTIONS FOR USE WITH: TWIN-PATH®, WEB AND ROUNDSLINGS

• RINGS • HOOKS • TWO SLING CONNECTION • BRIDLES • SLIDING CHOKER

TWO LEG BRIDLE

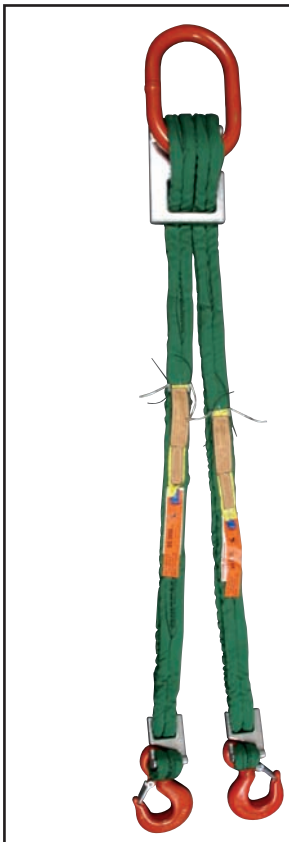
The angle of the legs affects the strength of the bridle. Determine the reduced Bridle Work Load Limit (WLL) at the angle of use. See page 19. 60° Horizontal Angle Reduces Work Load Limit 15%. 45° Horizontal Angle Reduces Work Load Limit 30%. 30° Horizontal Angle Reduces Work Load Limit 50%.



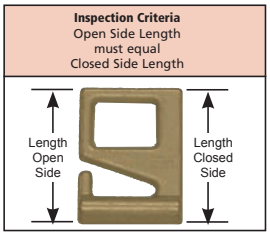
TWO SLING CONNECTION
See previous instructions for Two Sling connections. Make sure the inside of the Ring and Hooks are free from all damaging surfaces and edges. Make sure Rings and Hooks are of the proper size for the slings and the load.



G-LINKS™ TOP AND BOTTOM
See previous instructions for Rings and Hooks. The inside area of Rings and Hooks must be of the proper size and free from all damaging surfaces and edges. When connecting two G-Links™ to a Ring put them on opposite sides of the Ring, they will fit better.



WIDER G-LINK™ AT TOP
A single, wider G-Link™ at the top accommodates the width of both slings. Individual G-Links™ are placed at the bottom of each leg. See previous instructions for Ring and Hook connections. Top Link(s) must be wide enough and have proper rated capacity to accommodate both slings.





⚠ WARNING

Can fail if damaged, misused or over-loaded. Inspect before use. Use only if trained. Observe rated capacity. DEATH or INJURY can occur from improper use or maintenance.

Crosby® Shackle Warning Information



G-213



G-215

Round Pin Shackles can be used in tie down, towing, suspension or lifting applications where the load is strictly applied in-line. Round pin shackles should never be used in rigging applications to gather multiple sling legs or where side loading conditions may occur.

Screw Pin Shackles are used in Pick and Place* applications. For permanent or long-term installations, Crosby recommends the use of bolt type shackles. If you choose to disregard Crosby's recommendation, the screw pin shall be secured from rotation or loosening. See page 212.

Screw pin shackles can be used for applications involving side-loading circumstances. Reduced Work Load Limits are required for side-loading applications. While in service, do not allow the screw pin to be rotated by a live line, such as in a choker application.

* Pick and Place application: Pick (move) a load and place as required. Tighten screw pin before each pick.



G-209A



G-209



G-210



S-253



G-2130



G-2150



G-2140



G-2160

Bolt-Type Shackles can be used in any application where round pin or screw pin shackles are used. In addition, they are recommended for permanent or long term installations and where the load may slide on the shackle pin causing the pin to rotate. The bolt-type shackle's secondary securement system, utilizing a nut and cotter, eliminates the requirement to tighten pin before each lift or movement of load.

QUIC-CHECK® INFORMATION

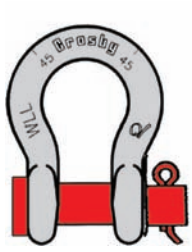
All Crosby Shackles, with the exception of 2160, 252 and 253 styles, incorporate markings forged into the product that address an easy to use **QUIC-CHECK®** feature. Angle indicators are forged into the shackle bow at 45 degree angles from vertical. These are utilized on **screw pin** and **bolt type** shackles to quickly check the approximate angle of a two-legged hitch or quickly check the angle of a single leg hitch when the shackle pin is secured and the pull of the load is off vertical (side loaded), thus requiring a reduction in the Work Load Limit of the shackle.

* **Round Pin Shackles** utilize the 45 degree **QUIC-CHECK®** indicators to ensure load is applied strictly in-line.



G-2130

SHACKLES



ROUND PIN
Do not side load, do not use as a collector ring, always use cotter pin.

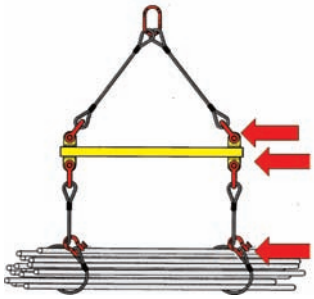


SCREW PIN
Use when picking and placing a load, tighten pin prior to each lift.



BOLT-TYPE
Use in permanent or long-term installations always use nut and cotter.

BOLT-TYPE SHACKLE





Use Bolt-Type Shackle when a permanent or long term connection is required.

Use a screw pin shackle when it will be a temporary connection.

SCREW PIN SHACKLE PIN SECURITY

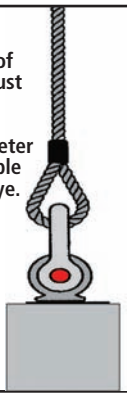
MOUSE SCREW PIN WHEN USED IN LONG TERM OR HIGH VIBRATION APPLICATIONS

A secondary securement method used to secure screw pin from rotation or loosening. Annealed iron wire is looped through the hole in collar of pin and around the adjacent leg of the shackle body with wire ends securely twisted together. Multiple wraps are required for securement where the load may slide on the shackle pin.



CONNECTION OF SLINGS TO SHACKLES

Diameter of shackle must be greater than wire rope diameter if no thimble is in the eye.





Shackle must be large enough to avoid pinching synthetic slings.

ANGLE LOADS MUST BE APPLIED IN THE PLANE OF THE BOW FOR 3/16" to 3" SHACKLE.

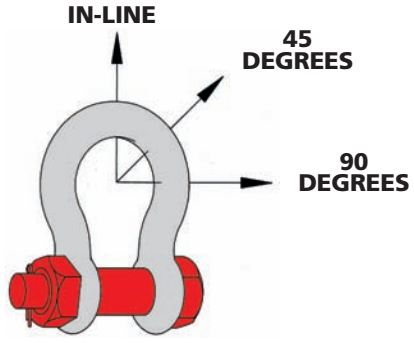
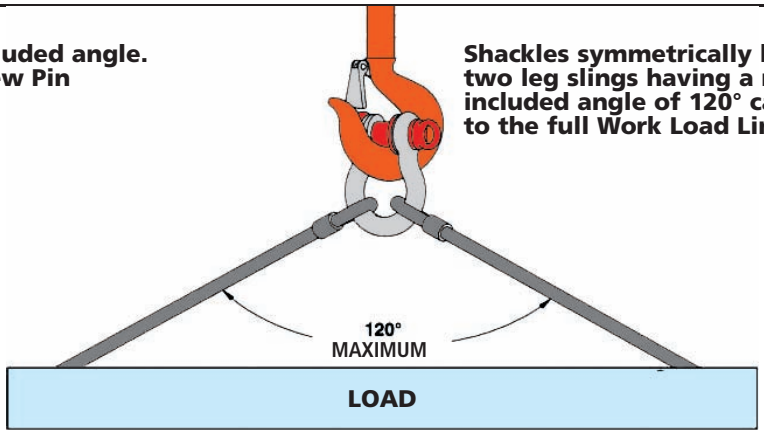


TABLE 1

Side Loading Reduction Chart For Screw Pin and Bolt-Type Shackles Only **	
Angle of Side Load from Vertical In-Line of Shackle	**Adjusted Work Load Limit**
0° In-Line*	100% of Work Load Limit
45° from In-Line*	70% of Work Load Limit
90° from In-Line*	50% of Work Load Limit

* In-Line load is applied perpendicular to pin.
** DO NOT SIDE LOAD ROUND PIN SHACKLES.

Never Exceed 120° included angle. Use Bolt-Type and Screw Pin Shackles ONLY.



Shackles symmetrically loaded with two leg slings having a maximum included angle of 120° can be utilized to the full Work Load Limit.

RIGGING PRACTICES-SHACKLES

Screw pin shall be fully engaged.

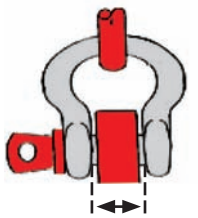
If designed for a cotter pin, it shall be used and maintained.

Applied load should be centered in the bow to prevent side loading.

Multiple sling legs should not be applied to the pin.

If side loaded, the Work Load Limit shall be reduced according to Table 1, page 212.

CROSBY® SHACKLE POINT LOADING

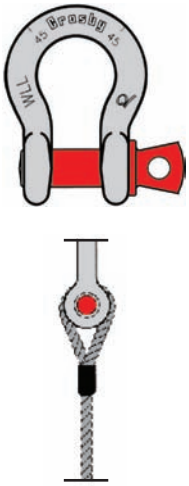


Point loading of Crosby shackle pins is acceptable, as long as the load is reasonably centered on the pin.

A pad eye width of 80% or more of the shackle spread is the best practice.

WIRE ROPE SLING AND CONNECTION TO FITTINGS

Use a thimble to protect sling and to increase D/d.

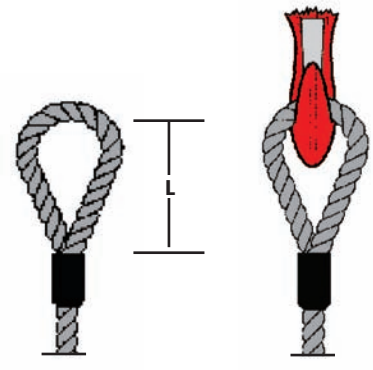




When placing two slings in a hook, the angle must be small enough so that nothing bears against the bottom of the later.

Never place eye over a fitting with a diameter or width that is smaller than the rope diameter.

Never place a sling eye over a fitting with a diameter or width greater than one half the natural length of the sling eye.



SYNTHETIC SLING WORK LOAD LIMIT

Folding, bunching or pinching of synthetic slings, which occurs when used with shackles, hooks or other applications will reduce the Work Load Limit.



BUNCHING



PINCHING

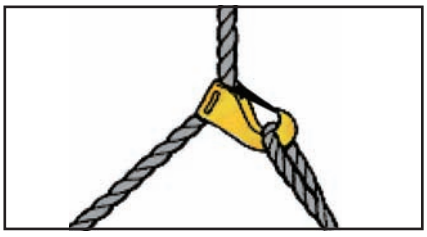
CHOKER HITCH FORMED

With Shackles, place pin in eye of sling.



CORRECT	WRONG

With Choker Hook



⚠ WARNING **IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.**

RISK MANAGEMENT

RISK MANAGEMENT DEFINITION

Comprehensive set of actions that reduces the risk of a problem, a failure, an accident.

ASME B30.9 requires that sling users shall be trained in the selection, inspection, cautions to personnel, effects of environment and rigging practices. Sling identification is required on all types of slings.

ASME B30.26 requires that rigging hardware users shall be trained in the selection, inspection, cautions to personnel, effects of environment, and rigging practices. All rigging hardware must be identified by manufacturer with name of trademark or manufacturer.

Refer to the Crosby Group catalog and other product application information.

TERMINOLOGY

WORK LOAD LIMIT (WLL)

The maximum mass or force which the product is authorized to support in a particular service.

PROOF TEST

A test applied to a product solely to determine injurious material or manufacturing defects.

ULTIMATE STRENGTH

The average load or force at which the product fails or no longer supports the load.

DESIGN FACTOR

An industrial term denoting a product's theoretical reserve capability; usually computed by dividing the catalog ultimate strength by the Work Load Limit. Generally expressed as a ratio, e.g. 5 to 1.

FOR ADDITIONAL SUPPORT

the Crosby group, inc.

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Tulsa Oklahoma 74101
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Fax: (918) 832-0940
1-800-777-1555
Web:
www.thecrosbygroup.com
E-Mail:
crosbygroup@thecrosbygroup.com

BLOCKS & FITTINGS FOR WIRE ROPE & CHAIN

CROSBY® FITTINGS
LEBUS® **McKISSICK®**
WESTERN **NATIONAL**



PLANNING AND RESPONSIBILITIES

Plan every lift, include the following questions with the questions your experience provides:

1. Who is responsible (competent) for the rigging?
2. Have communications been established?
3. Is the rigging in acceptable condition?
4. Is the rigging appropriate for lifting?
5. Does the rigging have proper identification?
6. Does all gear have known Work Load Limits?
7. What is the weight of the load?
8. Where is the load's center of gravity?
9. What is the sling angle?
10. Will there be any side or angular loading?
11. Are the slings padded against damaging corners?
12. Are the Work Load Limits adequate?
13. Is the load rigged to the center of gravity?
14. Is the hitch appropriate for the load?
15. Is a tag line required to control load?
16. Will personnel be clear of suspended loads?
17. Is there any possibility of fouling?
18. Will the load lift level and be stable?
19. Any unusual environmental concerns?
20. Any special requirements?

The rigging must be used within manufacturer's recommendations and industry standards that include: OSHA, ASME, ANSI, API and others.

USER RESPONSIBILITY

1. Utilize appropriate rigging gear suitable for lifting.
2. Utilize the rigging gear within industry standards and the manufacturer's recommendations.
3. Conduct regular inspection and maintenance of the rigging gear.
4. Provide employees with training to meet OSHA and ASME (B30.9, B30.26, etc.) requirements.

MANUFACTURER'S RESPONSIBILITY

1. Product and application information.
2. Product is clearly identified:
   - Name or logo
   - Load rating and size
   - Traceability
3. Product performance:
   - Work Load Limit
   - Ductility
   - Fatigue properties
   - Impact properties
4. Product training and training resources.

⚠ WARNING **IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.**

INSPECTION OF RIGGING HARDWARE

INSPECTION FREQUENCY PER ASME B30.26

A visual inspection shall be performed by the user or designated person before each shift or day the rigging hardware is used.

A periodic inspection shall be performed by a designated person, at least annually. The rigging hardware shall be examined and determination made as to whether damage constitutes a hazard. Written records are not required.

Semi-permanent and inaccessible locations where frequent inspections are not feasible shall have periodic inspections performed.

REJECTION CRITERIA PER ASME B30.26

1. Missing or illegible manufacturer's name or trademark and/or rated load identification (or size as required).
2. A 10% or more reduction of the original dimension.
3. Bent, twisted, distorted, stretched, elongated, cracked or broken load bearing components.
4. Excessive nicks, gouges, pitting and corrosion.
5. Indications of heat damage including weld spatter or arc strikes and/or evidence of unauthorized welding.
6. Loose or missing nuts, bolts, cotter pins, snap rings or other fasteners and retaining devices.
7. Unauthorized replacement components or other visible conditions that cause doubt as to the continued use of the fitting.

Additionally inspect wire rope clips for:

1. Insufficient number of clips
2. Incorrect spacing between clips
3. Improperly tightened clips
4. Indications of damaged wire rope or wire rope slippage
5. Improper assembly

Additionally, inspect wedge sockets for:

1. Indications of damaged wire rope or wire rope slippage
2. Improper assembly

REJECTION CRITERIA PER ASME B30.10 – HOOKS

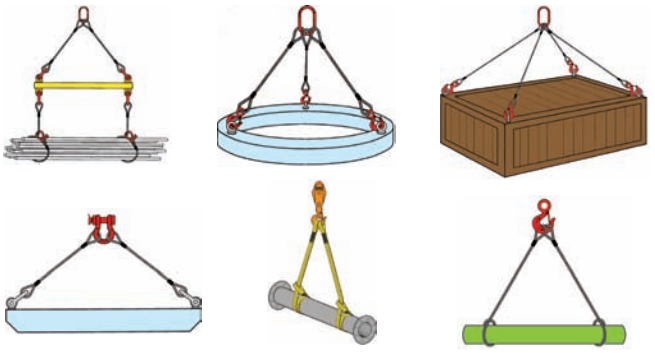
Any visibly apparent bend or twist from the plane of an identical, unbent hook. Any distortion causing an increase in throat opening of 5%, not to exceed 1/4".

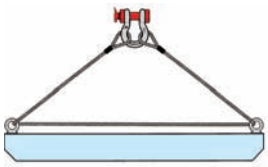
ASME B30.9 OPERATING PRACTICES

Whenever any sling is used, the following practices shall be observed.

1. Slings that are damaged or defective shall not be used.
2. Slings shall not be shortened with knots or bolts or other makeshift devices.
3. Sling legs shall not be kinked.
4. Slings shall not be loaded in excess of their rated capacities.
5. Slings used in a basket hitch shall have the loads balanced to prevent slippage.
6. Slings shall be securely attached to their load.
7. Slings shall be padded or protected by materials of sufficient strength, thickness and construction from the damaging edges of their loads.
8. Suspended loads shall be kept clear of all obstructions.
9. All employees shall be kept clear of loads about to be lifted and of suspended loads.
10. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
11. Shock loading is prohibited.
12. A sling shall not be pulled from under a load when the load is resting on the sling.

POSITIVE LOAD CONTROL





REEVING THROUGH CONNECTIONS TO LOAD INCREASES LOAD ON CONNECTION FITTINGS BY AS MUCH AS TWICE

DO NOT REEVE!

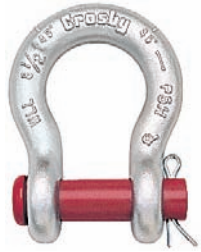
Inspection: Each day or before each shift, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

Crosby® Round Pin Shackles

Load Rated | Fatigue Rated | "QT" QUENCHED & TEMPERED | QUIC-CHECK® | MAXTOUGH®

- Capacities – 1/2 through 35 metric tons.
- Forged, Quenched and Tempered, with alloy pins.
- Work Load Limit permanently shown on every shackle.
- Hot Dip Galvanized (G) or Self Colored (S).
- Fatigue Rated.
- Shackles 25 Ton and larger are RFID EQUIPPED.
- Shackles can be furnished proof tested with certificates to designated standards, such as: ABS, DNV, Lloyds or other certification. Charges for proof testing and certification are available when requested at the time of order.
- Shackles are Quenched and Tempered and can meet DNV impact requirements of 42 joules at -20 degrees C.
- Look for the Red Pin®, it's the mark of genuine Crosby quality.

ROUND PIN ANCHOR SHACKLES



G-213 S-213

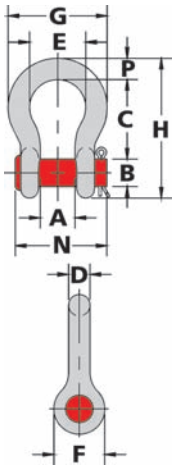
Round pin chain shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 1, except for those provisions required of the contractor.

ROUND PIN CHAIN SHACKLES



G-215 S-215

Round pin chain shackles meet the performance requirements of Federal Specification RR-C-271D Type IVB, Grade A, Class 1, except for those provisions required of the contractor.

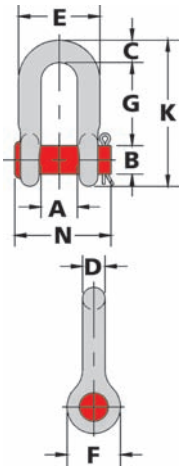


G-213 S-213

ROUND PIN ANCHOR SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)										Tolerance + / -	
		G-213	S-213		A	B	C	D	E	F	G	H	N	P	C	A
1/4	1/2	1018017	1018026	.13	.47	.31	1.13	.25	.78	.61	1.28	1.84	1.34	.25	.06	.06
5/16	3/4	1018035	1018044	.18	.53	.38	1.22	.31	.84	.75	1.47	2.09	1.59	.31	.06	.06
3/8	1	1018053	1018062	.29	.66	.44	1.44	.38	1.03	.91	1.78	2.49	1.86	.38	.13	.06
7/16	1-1/2	1018071	1018080	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	2.13	.44	.13	.06
1/2	2	1018099	1018106	.71	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	2.38	.50	.13	.06
5/8	3-1/4	1018115	1018124	1.50	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	2.91	.69	.13	.06
3/4	4-3/4	1018133	1018142	2.32	1.25	.88	2.81	.75	2	1.81	3.50	4.97	3.44	.81	.25	.06
7/8	6-1/2	1018151	1018160	3.49	1.44	1	3.31	.88	2.28	2.09	4.03	5.83	3.81	.97	.25	.06
1	8-1/2	1018179	1018188	5	1.69	1.13	3.75	1	2.69	2.38	4.69	6.56	4.53	1.06	.25	.06
1-1/8	9-1/2	1018197	1018204	6.97	1.81	1.25	4.25	1.13	2.91	2.69	5.16	7.47	5.13	1.25	.25	.06
1-1/4	12	1018213	1018222	9.75	2.03	1.38	4.69	1.29	3.25	3	5.75	8.25	5.50	1.38	.25	.06
1-3/8	13-1/2	1018231	1018240	13.25	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	6.13	1.50	.25	.13
1-1/2	17	1018259	1018268	17.25	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10	6.50	1.62	.25	.13
1-3/4	25	1018277	1018286	29.46	2.88	2	7	1.84	5	4.19	8.86	12.34	7.75	2.25	.25	.13
2	35	1018295	1018302	45.75	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.68	8.75	2.40	.25	.13

*Note: Maximum Proof Load is 2 Times Work Load Limit. Minimum Ultimate Strength is 6 times Work Load Limit.
⚠ WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.



G-215 S-215

ROUND PIN CHAIN SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)									Tolerance + / -	
		G-215	S-215		A	B	C	D	E	F	G	K	N	C	A
1/4	1/2	1018810	1018829	.10	.47	.31	.25	.25	.97	.62	.91	1.59	1.34	.06	.06
5/16	3/4	1018838	1018847	.18	.53	.38	.31	.31	1.15	.75	1.07	1.91	1.63	.06	.06
3/8	1	1018856	1018865	.25	.66	.44	.38	.38	1.42	.92	1.28	2.31	1.86	.13	.06
7/16	1-1/2	1018874	1018883	.40	.75	.50	.44	.44	1.63	1.06	1.48	2.67	2.13	.13	.06
1/2	2	1018892	1018909	.50	.81	.63	.50	.50	1.81	1.18	1.66	3.03	2.38	.13	.06
5/8	3-1/4	1018918	1018927	1.21	1.06	.75	.63	.63	2.32	1.50	2.04	3.76	2.91	.13	.06
3/4	4-3/4	1018936	1018945	2	1.25	.88	.81	.75	2.75	1.81	2.40	4.53	3.44	.25	.06
7/8	6-1/2	1018954	1018963	3.28	1.44	1	.97	.88	3.20	2.10	2.86	5.33	3.81	.25	.06
1	8-1/2	1018972	1018981	4.75	1.69	1.13	1	1	3.69	2.38	3.24	5.94	4.53	.25	.06
1-1/8	9-1/2	1018990	1019007	6.3	1.81	1.25	1.25	1.13	4.07	2.68	3.61	6.78	5.13	.25	.06
1-1/4	12	1019016	1019025	9	2.03	1.38	1.38	1.25	4.53	3	3.97	7.50	5.50	.25	.13
1-3/8	13-1/2	1019034	1019043	12	2.25	1.50	1.50	1.38	5.01	3.31	4.43	8.28	6.13	.25	.13
1-1/2	17	1019052	1019061	16.15	2.38	1.63	1.62	1.50	5.38	3.62	4.87	9.05	6.50	.25	.13
1-3/4	25	1019070	1019089	29.96	2.88	2	2.12	1.75	6.38	4.19	5.82	10.97	7.75	.25	.13
2	35	1019098	1019105	43.25	3.25	2.25	2.36	2.10	7.25	5	6.82	12.74	8.75	.25	.13

*Note: Maximum Proof Load is 2 Times Work Load Limit. Minimum Ultimate Strength is 6 times Work Load Limit.
⚠ WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.

Crosby® Screw Pin Shackles

Load Rated® Fatigue Rated® "QT" QUENCHED & TEMPERED® QUIC-CHECK® MAXTOUGH®

SCREW PIN ANCHOR SHACKLES



G-209 S-209

Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 2, except for those provisions required of the contractor.

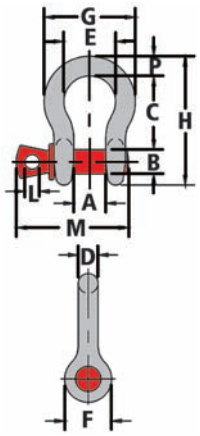
- Capacities – 1/3 through 55 metric tons.
- Forged, Quenched and Tempered, with alloy pins.
- Work Load Limit permanently shown on every shackle.
- Hot Dip Galvanized (G) or Self Colored (S).
- Fatigue Rated.
- Shackles 25 Ton and larger are RFID EQUIPPED.
- Shackles can be furnished proof tested with certificates to designated standards, such as: ABS, DNV, Lloyds or other certification. Charges for proof testing and certification are available when requested at the time of order.
- Shackles are Quenched and Tempered and can meet DNV impact requirements of 42 joules at -20 degrees C.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Look for the Red Pin®, it's the mark of genuine Crosby quality.
- Type approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7 and ABS Guide for Certification of Cranes.

SCREW PIN CHAIN SHACKLES



G-210 S-210

Screw pin chain shackles meet the performance requirements of Federal Specification RR-C-271D Type IVB, Grade A, Class 2, except for those provisions required of the contractor.

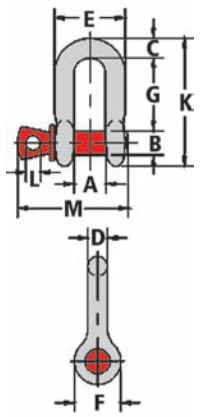


G-209 S-209

SCREW PIN ANCHOR SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)											Tolerance + / -	
		G-209	S-209		A	B	C	D	E	F	G	H	L	M	P	C	A
3/16	1/3	1018357	-	.06	.38	.25	.88	.19	.60	.56	.98	1.47	.16	1.14	.19	.06	.06
1/4	1/2	1018375	1018384	.10	.47	.31	1.13	.25	.78	.61	1.28	1.84	.19	1.43	.25	.06	.06
5/16	3/4	1018393	1018400	.19	.53	.38	1.22	.31	.84	.75	1.47	2.09	.22	1.71	.31	.06	.06
3/8	1	1018419	1018428	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.02	.38	.13	.06
7/16	1-1/2	1018437	1018446	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.37	.44	.13	.06
1/2	2	1018455	1018464	.72	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06
5/8	3-1/4	1018473	1018482	1.37	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	4-3/4	1018491	1018507	2.35	1.25	.88	2.81	.75	2	1.81	3.50	4.97	.50	3.97	.81	.25	.06
7/8	6-1/2	1018516	1018525	3.62	1.44	1	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06
1	8-1/2	1018534	1018543	5.03	1.69	1.13	3.75	1	2.69	2.38	4.69	6.56	.56	5.13	1.06	.25	.06
1-1/8	9-1/2	1018552	1018561	7.41	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.71	1.25	.25	.06
1-1/4	12	1018570	1018589	9.50	2.03	1.38	4.69	1.29	3.25	3	5.75	8.25	.69	6.25	1.38	.25	.06
1-3/8	13-1/2	1018598	1018605	13.53	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.83	1.50	.25	.13
1-1/2	17	1018614	1018623	17.20	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10	.81	7.33	1.62	.25	.13
1-3/4	25	1018632	1018641	27.78	2.88	2	7	1.84	5	4.19	8.86	12.34	1	9.06	2.25	.25	.13
2	35	1018650	1018669	45	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.68	1.22	10.35	2.40	.25	.13
2-1/2	55	1018678	1018687	85.75	4.13	2.75	10.50	2.71	7.25	5.69	12.87	17.84	1.38	13	3.13	.25	.25

*Note: Maximum Proof Load is 2 Times Work Load Limit. Minimum Ultimate Strength is 6 times Work Load Limit.
WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.



G-210 S-210

SCREW PIN CHAIN SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)										Tolerance + / -	
		G-210	S-210		A	B	C	D	E	F	G	K	L	M	G	A
1/4	1/2	1019150	1019169	.11	.47	.31	.25	.25	.97	.62	.97	1.59	.19	1.43	.06	.06
5/16	3/4	1019178	1019187	.17	.53	.38	.31	.31	1.15	.75	1.07	1.91	.22	1.71	.06	.06
3/8	1	1019196	1019203	.28	.66	.44	.38	.38	1.42	.91	1.28	2.31	.25	2.02	.13	.06
7/16	1-1/2	1019212	1019221	.43	.75	.50	.44	.44	1.63	1.06	1.48	2.67	.31	2.37	.13	.06
1/2	2	1019230	1019249	.59	.81	.63	.50	.50	1.81	1.18	1.66	3.03	.38	2.69	.13	.06
5/8	3-1/4	1019258	1019267	1.25	1.06	.75	.63	.63	2.32	1.50	2.04	3.76	.44	3.34	.13	.06
3/4	4-3/4	1019276	1019285	2.63	1.25	.88	.81	.75	2.75	1.81	2.40	4.53	.50	3.97	.25	.06
7/8	6-1/2	1019294	1019301	3.16	1.44	1	.97	.88	3.20	2.10	2.86	5.33	.50	4.50	.25	.06
1	8-1/2	1019310	1019329	4.75	1.69	1.13	1	1	3.69	2.38	3.24	5.94	.56	5.13	.25	.06
1-1/8	9-1/2	1019338	1019347	6.75	1.81	1.25	1.25	1.13	4.07	2.69	3.61	6.78	.63	5.71	.25	.06
1-1/4	12	1019356	1019365	9.06	2.03	1.38	1.38	1.25	4.53	3	3.97	7.50	.69	6.25	.25	.13
1-3/8	13-1/2	1019374	1019383	11.63	2.25	1.50	1.50	1.38	5.01	3.31	4.43	8.28	.75	6.83	.25	.13
1-1/2	17	1019392	1019409	15.95	2.38	1.63	1.62	1.50	5.38	3.63	4.84	9.05	.81	7.33	.25	.13
1-3/4	25	1019418	1019427	26.75	2.88	2	2.12	1.75	6.38	4.19	5.78	10.97	1	9.06	.25	.13
2	35	1019436	1019445	42.31	3.25	2.25	2.36	2.10	7.25	4.81	6.77	12.74	1.22	10.35	.25	.13
2-1/2	55	1019454	1019463	71.75	4.12	2.75	2.63	2.63	9.38	5.68	8.07	14.85	1.38	13	.25	.25

*Note: Maximum Proof Load is 2 Times Work Load Limit. Minimum Ultimate Strength is 6 times Work Load Limit.
WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.

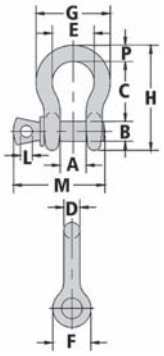
SCREW PIN



G-209 A

Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 2, except for those provisions required of the contractor.

- Capacities – 2 through 21 metric tons.
- Forged Alloy Steel, Quenched and Tempered, with alloy pins.
- Work Load Limit permanently shown on every shackle.
- Hot Dip Galvanized (G).
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Shackles can be furnished proof tested with certificates to designated standards, such as: ABS, DNV, Lloyds or other certification. Charges for proof testing and certification are available when requested at the time of order.



ALLOY SCREW PIN ANCHOR SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Metric Tons)	Stock Number	Unit Weight (Lbs.)	Dimensions (Inches)											Tolerance + / -	
		G-209 A		A	B	C	D	E	F	G	H	L	M	P	C	A
3/8	2	1017450	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.03	.38	.13	.06
7/16	2-2/3	1017472	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.38	.44	.13	.06
1/2	3-1/3	1017494	.63	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06
5/8	5	1017516	1.38	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	7	1017538	2.25	1.25	.88	2.81	.75	2	1.81	3.50	4.97	.50	3.97	.81	.25	.06
7/8	9-1/2	1017560	3.61	1.44	1	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06
1	12-1/2	1017582	5.32	1.69	1.13	3.75	1	2.69	2.38	4.69	6.56	.56	5.07	1.06	.25	.06
1-1/8	15	1017604	7.25	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.59	1.25	.25	.06
1-1/4	18	1017626	9.88	2.03	1.38	4.69	1.29	3.25	3	5.75	8.25	.69	6.16	1.38	.25	.06
1-3/8	21	1017648	13.25	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.84	1.50	.25	.13

*Note: Maximum Proof Load is 2 Times Work Load Limit (metric tons) and 2.2 Times Work Load Limit (short tons).
Minimum Ultimate Strength is 5 times Work Load Limit for short tons and/or 4.5 times the WLL for metric tons.
WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.

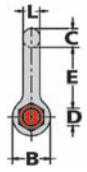
BOLT TYPE

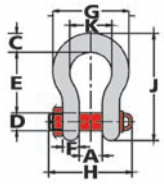


G-2140 / S-2140

G2140 bolt type shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade B, Class 3, except for those provisions required of the contractor.

- Quenched and Tempered.
- Alloy Bows and Alloy Bolts.
- Forged Alloy Steel: 30 through 175 metric tons. Cast Alloy Steel: 200 through 400 metric tons.
- Work Load Limit permanently shown on every shackle.
- All sizes are individually proof tested to 2 times Work Load Limit.
- Pins are Hot Dip Galvanized and painted red.
- All Sizes are RFID EQUIPPED.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Shackles 200 metric tons and larger are provided as follows:
  - Serialized Pin and Bow.
  - Material Certification (Chemical).
  - Magnetic Particle Inspected.
  - Certification must be requested at time of order.
- Type approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7 and ABS Guide for Certification of Cranes.





ALLOY BOLT TYPE SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Metric Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)											Tolerance + / -	
		G-2140	S-2140		A	B	C	D	E	F	G	H	J	K	L	A	E
1-1/2	30	1021110	1021129	19	2.38	3.62	1.62	1.63	5.75	1.39	6.88	7.73	10	3.88	1.53	.13	.25
1-3/4	40	1021138	1021147	34	2.88	4.19	2.25	2	7	1.75	8.81	9.33	12.34	5	1.84	.13	.25
2	55	1021156	1021165	52	3.25	4.81	2.40	2.25	7.75	2	10.16	10.41	13.68	5.75	2.08	.13	.25
2-1/2	85	1021174	1021183	96	4.12	5.81	3.12	2.75	10.50	2.62	12.75	13.58	17.90	7.25	2.71	.25	.25
3	120	1021192	-	178	5	6.50	3.63	3.25	13	3	14.62	15.13	21.50	7.88	3.12	.25	.25
3-1/2	† 150	1021218	-	265	5.25	8	4.38	3.75	14.63	3.75	17.02	17.62	24.88	9	3.62	.25	.25
4	† 175	1021236	-	338	5.50	9	4.56	4.25	14.50	4	18	20.37	25.68	10	4	.25	.25
4-3/4**	† 200	1021414	-	450	7.25	10.50	6	4.75	15.63	3.75	21	21.21	29.25	11	4.5	.25	.25
5 **	† 250	1021432	-	600	8.50	12	6.5	5	20	3.88	24.50	22.68	35	13	4.5	.25	.25
6 **	† 300	1021450	-	775	8.38	12	6.75	6	19.5	4.75	25	25.06	35.25	13	5	.25	.25
7 **	† 400	1021478	-	1102	8.25	14	7.25	7	22.5	6.50	26	28.68	40.25	13	6	.25	.25

*Note: Maximum Proof Load is 2 Times Work Load Limit. Minimum Ultimate Load is 4 times Work Load Limit on 200 through 400 metric tons.
Minimum Ultimate Load is 5.4 times Work Load Limit on 30 through 175 metric ton. † Furnished with Round Head Bolts with welded handle. ** Cast Alloy Steel.
WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.

Crosby® Bolt Type Shackles

Load Rated | Fatigue Rated | "QT" Quenched & Tempered | QUIC-CHECK® | MAXTOUGH® | "TA" Type Approved

BOLT TYPE ANCHOR SHACKLES



G-2130 S-2130

Bolt type anchor shackles with thin, hex head bolt-nut with cotter pin meets the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 3, except for those provisions required of the contractor.

- Capacities – 1/3 through 150 metric tons.
- Forged, Quenched and Tempered, with alloy pins.
- Work Load Limit permanently shown on every shackle.
- Hot Dip Galvanized (G) or Self Colored (S).
- Fatigue Rated (1/3 Ton through 55 Ton).
- Shackles 25 Ton and larger are RFID EQUIPPED.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Shackles 55 metric tons and smaller can be furnished proof tested with certificates to designated standards, such as: ABS, DNV, Lloyds or other certification. Charges for proof testing and certification are available when requested at the time of order.

  Shackles 85 metric tons and larger can be provided as follows:

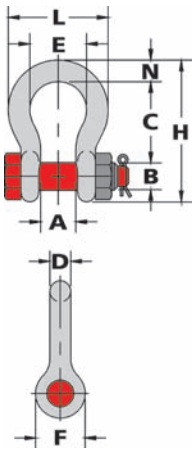
  Non Destructive Tested
  Serialized Pin and Bow
  Material Certification and or Chemical Certification must be requested at time of order.
- Look for the Red Pin®, it's the mark of genuine Crosby quality.
- Type approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7 and ABS Guide for Certification of Cranes.

BOLT TYPE CHAIN SHACKLES



G-2150 S-2150

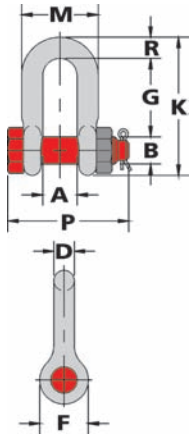
Bolt type chain shackles with thin, hex head bolt-nut with cotter pin meets the performance requirements of Federal Specification RR-C-271D Type IVB, Grade A, Class 3, except for those provisions required of the contractor.



G-2130 S-2130

BOLT TYPE ANCHOR SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)									Tolerance + / -	
		G-2130	S-2130		A	B	C	D	E	F	H	L	N	C	A
3/16	1/3‡	1019464	-	.06	.38	.25	.88	.19	.60	.56	1.47	.98	.19	.06	.06
1/4	1/2	1019466	-	.11	.47	.31	1.13	.25	.78	.61	1.84	1.28	.25	.06	.06
5/16	3/4	1019468	-	.22	.53	.38	1.22	.31	.84	.75	2.09	1.47	.31	.06	.06
3/8	1	1019470	-	.33	.66	.44	1.44	.38	1.03	.91	2.49	1.78	.38	.13	.06
7/16	1-1/2	1019471	-	.49	.75	.50	1.69	.44	1.16	1.06	2.91	2.03	.44	.13	.06
1/2	2	1019472	1019481	.79	.81	.64	1.88	.50	1.31	1.19	3.28	2.31	.50	.13	.06
5/8	3-1/4	1019490	1019506	1.68	1.06	.77	2.38	.63	1.69	1.50	4.19	2.94	.69	.13	.06
3/4	4-3/4	1019515	1019524	2.72	1.25	.89	2.81	.75	2	1.81	4.97	3.50	.81	.25	.06
7/8	6-1/2	1019533	1019542	3.95	1.44	1.02	3.31	.88	2.28	2.09	5.83	4.03	.97	.25	.06
1	8-1/2	1019551	1019560	5.66	1.69	1.15	3.75	1	2.69	2.38	6.56	4.69	1.06	.25	.06
1-1/8	9-1/2	1019579	1019588	8.27	1.81	1.25	4.25	1.13	2.91	2.69	7.47	5.16	1.25	.25	.06
1-1/4	12	1019597	1019604	11.71	2.03	1.40	4.69	1.29	3.25	3	8.25	5.75	1.38	.25	.06
1-3/8	13-1/2	1019613	1019622	15.83	2.25	1.53	5.25	1.42	3.63	3.31	9.16	6.38	1.50	.25	.13
1-1/2	17	1019631	1019640	19	2.38	1.66	5.75	1.53	3.88	3.63	10	6.88	1.62	.25	.13
1-3/4	25	1019659	1019668	33.91	2.88	2.04	7	1.84	5	4.19	12.34	8.80	2.25	.25	.13
2	35	1019677	1019686	52.25	3.25	2.30	7.75	2.08	5.75	4.81	13.68	10.15	2.40	.25	.13
2-1/2	55	1019695	1019702	98.25	4.13	2.80	10.5	2.71	7.25	5.69	17.9	12.75	3.13	.25	.25
3	† 85	1019711	-	154	5	3.30	13	3.12	7.88	6.5	21.5	14.62	3.62	.25	.25
3-1/2	† 120 ‡	1019739	-	265	5.25	3.76	14.63	3.62	9	8	24.88	17.02	4.38	.25	.25
4	† 150 ‡	1019757	-	338	5.50	4.26	14.50	4	10	9	25.68	18	4.56	.25	.25



G-2150 S-2150

BOLT TYPE CHAIN SHACKLE SPECIFICATIONS

Nominal Size (Inches)	Work Load Limit (Tons)	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)									Tolerance + / -	
		G-2150	S-2150		A	B	D	F	G	K	M	P	R	G	A
1/4	1/2	1019768	-	.13	.47	.31	.25	.62	.91	1.59	.97	1.56	.25	.06	.06
5/16	3/4	1019770	-	.23	.53	.38	.31	.75	1.07	1.91	1.15	1.82	.31	.06	.06
3/8	1	1019772	-	.33	.66	.44	.38	.92	1.28	2.31	1.42	2.17	.38	.13	.06
7/16	1-1/2	1019774	-	.49	.75	.50	.44	1.06	1.48	2.67	1.63	2.51	.44	.13	.06
1/2	2	1019775	1019784	.75	.81	.64	.50	1.18	1.66	3.03	1.81	2.80	.50	.13	.06
5/8	3-1/4	1019793	1019800	1.47	1.06	.77	.63	1.50	2.04	3.76	2.32	3.56	.63	.13	.06
3/4	4-3/4	1019819	1019828	2.52	1.25	.89	.75	1.81	2.40	4.53	2.75	4.15	.81	.25	.06
7/8	6-1/2	1019837	1019846	3.85	1.44	1.02	.88	2.10	2.86	5.33	3.20	4.82	.97	.25	.06
1	8-1/2	1019855	1019864	5.55	1.69	1.15	1	2.38	3.24	5.94	3.69	5.39	1	.25	.06
1-1/8	9-1/2	1019873	1019882	7.60	1.81	1.25	1.13	2.68	3.61	6.78	4.07	5.90	1.25	.25	.06
1-1/4	12	1019891	1019908	10.81	2.03	1.40	1.25	3	3.97	7.50	4.53	6.69	1.38	.25	.06
1-3/8	13-1/2	1019917	1019926	13.75	2.25	1.53	1.38	3.31	4.43	8.28	5.01	7.21	1.50	.25	.13
1-1/2	17	1019935	1019944	18.50	2.38	1.66	1.50	3.62	4.87	9.05	5.38	7.73	1.62	.25	.13
1-3/4	25	1019953	1019962	31.40	2.88	2.04	1.75	4.19	5.82	10.97	6.38	9.33	2.12	.25	.13
2	35	1019971	1019980	46.75	3.25	2.30	2.10	5	6.82	12.74	7.25	10.41	2.36	.25	.13
2-1/2	55	1019999	1020004	85	4.12	2.80	2.63	5.68	8.07	14.85	9.38	13.58	2.63	.25	.25
3	† 85	1020013	-	124.25	5	3.25	3	6.50	8.56	16.87	11	15.13	3.50	.25	.25

*Note: Maximum Proof Load is 2 Times Work Load Limit. Minimum Ultimate Strength is 6 times Work Load Limit.
† Individually proof tested with certification.
‡ Furnished in Anchor style only and furnished with Round Head bolts with welded handles.
⚠ WARNING For Work Load Limit reduction due to side loading, see page 212. ⚠ WARNING See Pages 212-215 for Important Safety, Use and Inspection Information.

Crosby® Wide Body Shackles

Load Rated

"QT" QUENCHED & TEMPERED®

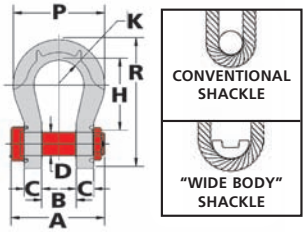
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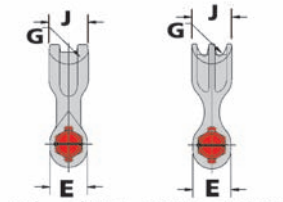
"WIDE BODY" SHACKLES



G-2160 S-2160

Patented





- All Sizes Quenched and Tempered for maximum strength.
- Forged Alloy Steel for 7 through 300 metric tons.
- 300 metric ton and smaller are proof tested to 2 times Work Load Limit.
- Cast Alloy Steel for 400 through 1550 metric tons.
- 400 metric ton and larger are proof tested to 1.33 times Work Load Limit.
- All Work Load Limits are in metric tons.
- Work Load Limit permanently shown on every shackle.
- G-2160 (7-55 Ton) are Hot Dip Galvanized and pins painted red.
- G-2160 (75 Ton and larger): Bows are furnished Dimetcoted. Pins are Dimetcoted, then painted red.
- S-2160 bows and pins are painted red.
- Shackles 30 Ton and larger are RFID EQUIPPED.
- "Wide Body" design greatly improves sling life.
- Can be used to connect HIGH STRENGTH web, round and Twin-Path® Slings or wire rope slings.
- Increase in shackle bow radius provides a minimum 58% gain in sling bearing surface and eliminates need for a thimble.
- Pin is non-rotating, with weld-on handles for easier use (75 Ton and larger).
- All G-2160 shackles are individually proof tested and magnetic particle inspected. Crosby certification is available at the time of order.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Shackles requiring ABS, Lloyds and other certifications are available upon special request and must be specified at the time of order.
- Shackles 18 Ton and larger have DNV Type approval to Rules for Certification of Lifting Appliances and are produced in accordance with DNV MSA requirements. Databook is provided that includes required documents.
  - Serialization / Identification
  - Material Testing (Physical, Chemical and Charpy)
  - Proof Testing

WIDE BODY SHACKLE SPECIFICATIONS

Work Load Limit (Tons)*	Stock Number		Dimensions (Inches)											
	G-2160	S-2160	Unit Weight (Lbs.)	A	B +/– .25	C	D +/– .02	E	G	H	J	K	P	R
7	1021256	1021548	4	4.14	1.25	.69	.88	1.82	1.25	3.56	1.60	1.25	4.10	5.87
12.5	1021265	1021557	10	5.38	1.69	.92	1.13	2.38	1.37	4.63	2.13	1.63	5.51	7.63
18	1021274	1021566	15	6.69	2.03	1.16	1.38	2.69	1.50	5.81	2.50	2	6.76	9.38
30	1021283	1021575	25	7.69	2.37	1.38	1.63	3.50	1.75	6.94	3.13	2.50	8.50	11.38
40	1021285	1021584	35	9.28	2.88	1.69	2	4	2.31	8.06	3.75	3	10.62	13.62
55	1021287	1021593	71	10.36	3.25	2	2.25	4.63	2.63	9.36	4.50	3.50	12.26	15.63
† 75	1021290	-	100	14.37	4.13	2.12	2.75	5	2.50	11.53	4.75	3.64	12.28	18.41
† 125	1021307	-	178	16.51	5.12	2.56	3.15	5.71	3.15	14.36	5.91	4.33	14.96	22.65
† 200	1021316	-	500	20.67	5.91	3.35	4.12	7.28	4.33	18.80	8.07	5.41	19.49	29.82
† 300	1021325	-	835	24.20	7.38	4	5.25	9.25	5.38	23.63	10.38	6.31	23.38	37.26
400	1021334	-	1103	30.27	8.66	5.16	6.30	11.81	6.30	22.64	12.60	7.28	27.17	38.78
500	1021343	-	1433	33.35	9.84	5.73	7.09	13.39	6.69	24.81	13.39	8.86	31.10	42.72
600	1021352	-	1897	36.02	10.83	6.23	7.87	15.50	7.28	27.56	14.57	9.74	34.06	47.24
700	1021361	-	2585	38.91	11.81	6.59	8.46	14.80	7.87	28.94	15.75	10.63	37.01	50.18
800	1021254	-	3075	41.66	12.80	7.30	9.06	16.54	8.27	29.53	16.54	10.92	38.39	52.09
900	1021389	-	3720	43.73	13.78	7.78	9.84	16.93	8.66	29.82	17.32	11.52	40.35	54.04
1000	1021370	-	4130	45.98	14.96	8.33	10.63	17.72	9.06	29.92	18.11	12.11	42.32	55.31
1250	1021272	-	6310	49.86	16.93	9.15	11.81	21	10.43	36.61	20.87	12.70	46.26	65.35
1550	1021281	-	8155	54.89	18.31	10.58	12.60	23.82	15.92	42.32	22.82	13.29	49.41	73.43

*7 Ton - 300 Ton Proof is 2 times Work Load Limit. Ultimate Load is 5 times Work Load Limit. 400 Ton - 1550 Ton Proof Load is 1.33 times the Work Load Unit. Ultimate Load is 4.55 times Work Load Limit.
† Available in Forged and Cast Alloy Steel.

⚠ WARNING For Work Load Limit reduction due to side loading, see page 212.
See Pages 212-215 for Important Safety, Use and Inspection Information.

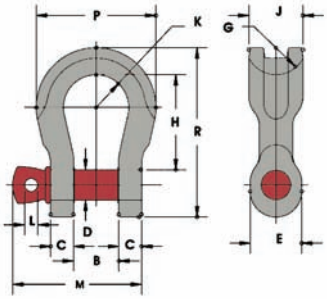
SCREW PIN "WIDE BODY"

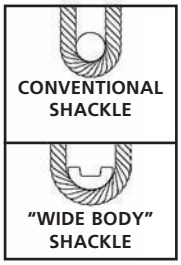


G-2169



S-2169





- Capacities of 7, 12.5 and 18 metric tons.
- Quenched and Tempered for maximum strength.
- Forged Alloy Steel.
- Available in galvanized or self-colored finish.
- Individually proof tested and magnetic particle inspected. Crosby certification is available at the time of order.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Look for the Red Pin®, the mark of genuine Crosby® quality.

SCREW PIN "WIDE BODY" SHACKLE SPECIFICATIONS

Work Load Limit (Tons)*	Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)											
	G-2169	S-2169		B	C	D	E	G	H	J	K	L	M	P	R
7	1021655	1021664	3.5	1.25	.69	.88	1.82	1.25	3.56	1.60	1.25	.50	3.97	4.10	5.87
12.5	1021673	1021682	8.8	1.69	.92	1.13	2.38	1.37	4.63	2.13	1.63	.56	5.13	5.51	7.63
18	1021691	1021699	13	2.03	1.16	1.38	2.69	1.50	5.81	2.50	2.00	.69	6.25	6.76	9.38

*Note: Maximum Proof Load is 2 Times the Work Load Limit. Minimum Ultimate Strength is 5 times the Work Load Limit.
B dimension is +/- .25 D dimension is +/- .02

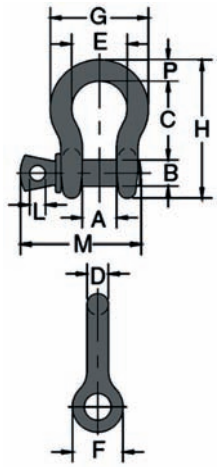
⚠WARNING For Work Load Limit reduction due to side loading, see page 212. See Pages 212-215 for Important Safety and Use Information.

THEATRICAL SHACKLE

Load Rated® Fatigue Rated® "QT" QUENCHED & TEMPERED® QUIC-CHECK® MAXTOUGH®



S-209T



- Sizes: 3/8" to 3/4".
- Capacities: 1 to 4-3/4 metric tons.
- Forged, Quenched and Tempered, with alloy pins.
- Work Load Limit permanently shown on every shackle.
- Flat black, baked on, power coat finish.
- Fatigue Rated.
- Industry leading 6 to 1 design factor.
- Screw pin anchor shackles meet the performance requirement of Federal Specification RR-C-271E Type A, Grade A, Class 2, except for those provisions required of the contractor.
- Meets the performance requirements of EN 13889:2003.
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, these shackles meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.

THEATRICAL SHACKLE SPECIFICATIONS

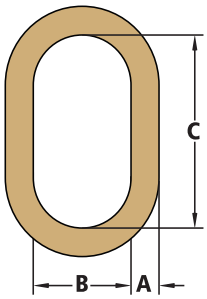
Nominal Size (inches)	Work Load Limit (Tons)	Stock Number S-209T	Unit Weight (Lbs.)	Dimensions (Inches)											Tolerance + / -	
				A	B	C	D	E	F	G	H	L	M	P	C	A
3/8	1	1018706	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.02	.38	.13	.06
7/16	1-1/2	1018724	.38	.75	.50	1.69	.4	1.16	1.06	2.03	2.9	.31	2.37	.44	.13	.06
1/2	2	1018742	.72	.81	.63	.188	.50	1.31	1.19	2.31	3.2	.38	2.69	.50	.13	.06
5/8	3-1/4	1018760	1.37	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	4-3/4	1018778	2.35	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	.81	.25	.06

*Note: Maximum Proof Load is 2 Times the Work Load Limit. Minimum Ultimate Strength is 6 times the Work Load Limit.
⚠WARNING For Work Load Limit reduction due to side loading, see page 212. See Pages 212-215 for Important Safety, Use and Inspection Information.

A-342 ALLOY MASTERLINKS



A-342 / A-342W



- Alloy Steel, Quenched and Tempered.
- Individually Proof Tested to values shown, with certification.
- Proof Tested with fixture sized to prevent localized point loading per ASTM A952. Consult Crosby for appropriate fixture size.
- Crosby A-342 products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Sizes from 1/2" to 2" are drop forged and have a Product Identification Code (PIC) for material traceability, along with the size, Crosby and USA in raised lettering.
- Selected sizes designated with "W" in the size column have enlarged inside dimensions to allow additional room for sling hardware and crane hook.
- Incorporates patented **QUIC-CHECK®** deformation indicators.

A342 ALLOY MASTERLINK SPECIFICATIONS

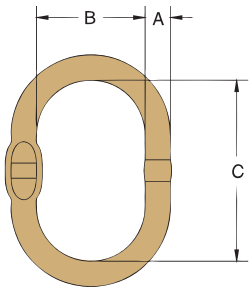
Size (Inches)	Size (MM)	Stock Number	Unit Weight (Lbs.)	Work Load Limit (Lbs.)*	Proof Load (Lbs.)**	Dimensions (Inches) A	B	D	Deformation Indicator
1/2W	13W	1014266	1.3	7400	17200	.62	2.80	5	3.50
5/8	16	1014280	1.5	9000	18000	.62	3	6	3.50
3/4W	19W	1014285	2	12300	28400	.73	3.20	6	4
7/8W	22W	1014319	3.3	15200	35200	.88	3.75	6.38	4.50
1W	26W	1014331	6.1	26000	60000	1.10	4.30	7.50	5.50
1-1/4W	32W	1014348	12	39100	90400	1.33	5.50	9.50	7
1-1/2W	38W	1014365	18.6	61100	141200	1.61	5.90	10.50	7.50
1 3/4	44	1014388	25.2	84900	169800	1.75	6	12	7.50
2	51	1014404	37	102600	205200	2	7	14	9
†† 2-1/4	†† 57	1014422	54.1	143100	289200	2.25	8	16	-
†† 2-1/2	†† 63	1014468	67.8	160000	320000	2.50	8	16	-
†† 2-3/4	†† 70	1014440	87.7	216900	433800	2.75	9.50	16	-
†† 3	†† 76	1014486	115	228000	456000	3	9	18	-
†† 3-1/4	†† 83	1014501	145	262200	524400	3.25	10	20	-
†† 3-1/2	†† 89	1014529	200	279000	558000	3.50	12	24	-
†† 3-3/4	†† 95	1015051	198	336000	672000	3.75	10	20	-
†† 4	†† 102	1015060	228	373000	746000	4	10	20	-
†† 4-1/4	†† 108	1015067	302	354000	708000	4.25	12	24	-
†† 4-1/2	†† 114	1015079	345	360000	720000	4.50	14	28	-
†† 4-3/4	†† 121	1015088	436	389000	778000	4.75	14	28	-
†† 5	†† 127	1015094	516	395000	790000	5	15	30	-

* Ultimate Load is 5 times Work Load Limit. Applications with wire rope and synthetic sling generally require a design factor of 5 to 1.
** Proof Test Load equals or exceeds the requirement of ASTM A952(8.1) and ASME B30.9
†† Welded Master Link

A-344 CROSBY WELDED MASTERLINKS WITH ENGINEERED FLAT



A-344



- Alloy Steel, Quenched and Tempered.
- Individually Proof Tested with certification.
- Proof Tested with fixture sized to prevent localized point loading per ASTM A952.
- Consult Crosby for appropriate fixture size.
- Crosby A-344 products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Each link has a Product Identification Code (PIC) for material traceability, along with the size and the name Crosby® or "CG".
- Large inside width and length to allow additional room for sling hardware and crane hook.
- Engineered Flat Masterlinks are to be used with S-1325A coupler links.

A-344 WELDED ALLOY MASTERLINK WITH ENGINEERED FLAT SPECIFICATIONS

Size (Inches)	Size (MM)	Stock Number	Unit Weight (Lbs.)	Work Load Limit (Lbs.)*	Dimensions (Inches) A	B	C
7/16	12	1256862	.66	3500	.47	2.36	4.72
1/2	13	1256932	.79	4500	.51	2.36	4.72
11/16	17	1257002	1.85	7100	.67	3.54	6.30
3/4	19	1257072	2.36	12000	.75	3.54	6.30
7/8	22	1257212	3.55	18100	.87	3.94	7.10
1-1/8	28	1257382	8.33	28300	1.10	5.71	10.83
1-1/4	31	1257422	10.30	34200	1.22	5.71	10.83
1-3/8	36	1257492	15.10	47700	1.42	6.10	11.20
2	51	1257632	38.10	72300	2	8.50	15.30

* Ultimate Load is 4 times the Work Load Limit. Based on 90 degree included angle or smaller.
Applications with wire rope and synthetic slings generally require a design factor of 5 to 1.

Crosby® Hook Warnings

⚠ WARNING IMPORTANT INFORMATION: READ AND FOLLOW.



⚠WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550(g) for personnel hoisting by cranes and derricks and OSHA Directive CPL 2-1.29 – Interim Inspection Procedures During Communication Tower Construction Activities. Crosby 319, 320 or 322 hooks with a PL latch attached and secured with a bolt, nut and cotter pin (or toggle pin) may be used for lifting personnel. Crosby 319N, 320N or 322N hooks with an S-4320 latch attached and secured with cotter pin or bolt, nut and pin; or a PL-N latch attached and secured with toggle pin may be used for lifting personnel. A hook with a Crosby SS-4055 latch attached shall NOT be used for personnel lifting.
- See OSHA Directive CPL 2-1.29 - Crosby does not recommend the placement of lanyards directly into the positive locking Crosby hook when hoisting personnel. Crosby requires that all suspension systems (vertical lifelines / lanyard) shall be gathered at the positive locked load hook by use of a masterlink or a bolt-type shackle secured with cotter pin.
- Threads may corrode and/or strip and drop the load.
- Remove securement nut to inspect or to replace S-322, S-3316 and S-3319 bearing washers (2 each).
- Hook must always support the load. The load must never be supported by the latch.
- Never apply more force than the hook's assigned Work Load Limit (WLL) rating.
- Read and understand these instructions before using hook.

QUIC-CHECK® Hoist hooks incorporate markings forged into the product which address two (2) **QUIC-CHECK®** features:

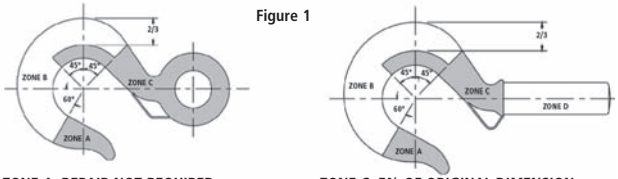
QUIC-CHECK® Q®

Deformation Indicators: Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a **QUIC-CHECK®** measurement to determine if the throat opening has changed, thus indicating abuse or overload.

To check, use a measuring device (i.e., tape measure) to measure the distance between the marks. The marks should align to either an inch or half-inch increment on the measuring device. If the measurement does not meet criteria, the hook should be inspected further for possible damage.

Angle Indicators: Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.

Figure 1



ZONE A: REPAIR NOT REQUIRED
ZONE B: 10% OF ORIGINAL DIMENSION
ZONE C: 5% OF ORIGINAL DIMENSION
ZONE D: SEE MINIMUM THREAD SIZE CHART

- A visual periodic inspection for cracks, nicks, wear, gouges and deformation as part of a comprehensive documented inspection program, should be conducted by trained personnel in compliance with the schedule in ASME B30.10.
- For hooks used in frequent load cycles or pulsating loads, the hook and threads should be periodically inspected by Magnetic Particle or Dye Penetrant. (Note: Some disassembly may be required).
- Never use a hook whose tip has been bent, resulting in throat opening of more than 5%, not to exceed 1/4 in., or is in any other way distorted or bent. **Note: A latch will not work properly on a hook with a bent or worn tip**.
- Never use a hook that is worn beyond the limits shown in Figure 1.
- Remove from service any hook with a crack, nick or gouge. Hooks with a nick or gouge shall be repaired by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1. Contact Crosby Engineering to evaluate any crack.
- Never repair, alter, rework or reshape a hook by welding, heating, burning or bending.
- Never side load, back load or tip load a hook. (Side loading, back loading and tip loading are conditions that damage and reduce the capacity of the hook, See Figure 2).
- Eye hooks, shank hooks and swivel hooks are designed to be used with wire rope or chain. Efficiency of assembly may be reduced when used with synthetic materials.
- Do not swivel S-322, S-3316 or S-3319 swivel hooks while supporting a load. These hooks are distinguishable by hex nuts and flat washers.
- The S-3322 swivel hook is designed to rotate under load. The S-3322 is distinguishable from the S-322 by use of a round nut designed to shield bearing. The frequency of bearing lubrication on the S-3322 depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgment.
- The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, ANSI/ASME B30, Insurance, etc. Note: When using latches, see instructions in "Understanding: The Crosby Group Warnings" for further information found in the Crosby Catalog or website. Also see pages 224 and 225.
- Always make sure the hook supports the load. (See Figure 3). The latch must never support the load (See Figure 4).
- When placing two (2) sling legs in hook, make sure the angle from the vertical to the outermost leg is not greater than 45 degrees, and the included angle between the legs does not exceed 90 degrees* (See Figure 5).
- See ANSI/ASME B30.10 "Hooks" for additional information.

Figure 2

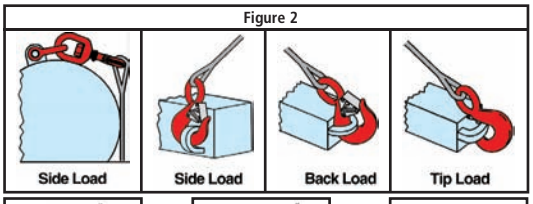


Figure 3



Figure 4



Figure 5



* For two legged slings with angles greater than 90 degrees, use an intermediate link such as a masterlink or bolt type shackle to collect the legs of the slings. The intermediate link can be placed over the hook to provide an in-line load on the hook. This approach must also be used when using assemblies with three or more legs.

Crosby® Hook Latch Kit Warnings

⚠ WARNING IMPORTANT INFORMATION: READ AND FOLLOW.

- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load. (See Figures 1 & 2).
- When placing two (2) sling legs in hook, make sure the angle between legs is small enough and the legs are not tilted so that nothing bears against the bottom of the latch. (See Figures 3 & 4).
- Latches are intended to retain loose sling or devices under slack conditions.
- Latches are not intended to be an anti-fouling device.

⚠WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550(g)(4)(iv)(B). A hook and this style latch must not be used for lifting personnel.
- Hook must always support the load. The load must never be supported by the latch.
- Read and understand these instructions before using hooks and latches.

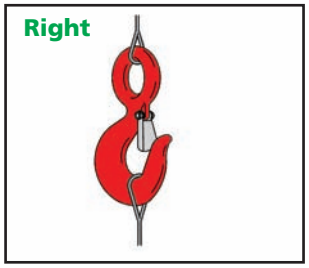


Figure 1

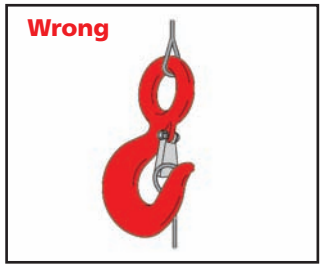


Figure 2

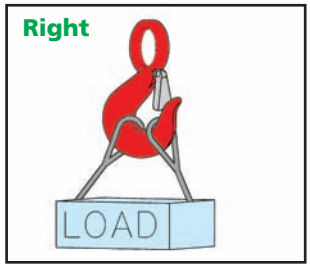


Figure 3

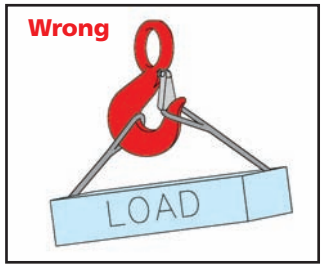
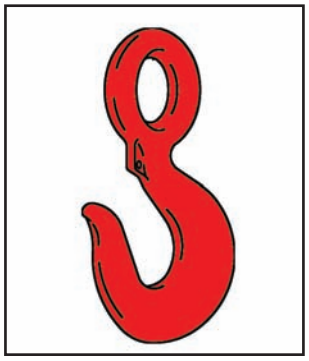


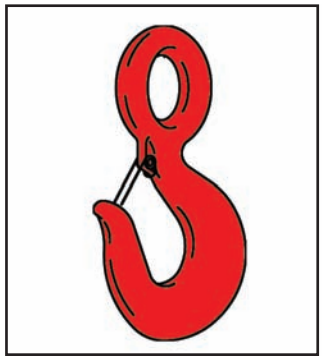
Figure 4

IMPORTANT Instructions for Assembling SS-4055 Latch On Crosby Hooks.



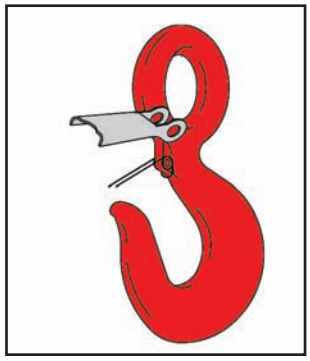
Step 1

Place hook at approximately a 45 degree angle with the cam up.



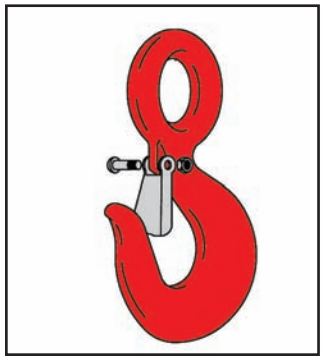
Step 2

Position coils of spring over cam with legs of spring pointing toward point of hook and loop of spring positioned down and lying against the hook.



Step 3

Position latch over tines of spring with ears partially over hook cam. Swing latch to one side of hook, point and depress latch and spring until latch clears point of hook.



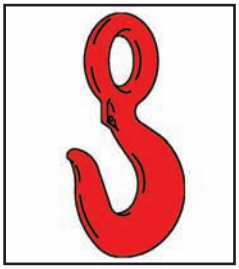
Steps 4, 5 and 6

4. Line up holes in latch with hook cam.
5. Insert bolt through latch, spring and cam.
6. Tighten self-locking nut on one end of bolt.

Crosby® Hook Latch Kit Warnings

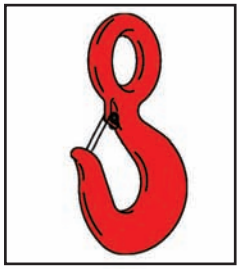
⚠ WARNING IMPORTANT INFORMATION: READ AND FOLLOW.

IMPORTANT Instructions for Assembling Model PL Latch on Crosby or McKissick Hooks.



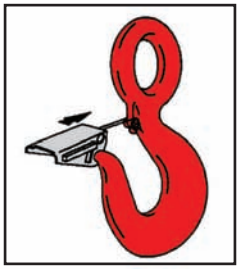
Step 1

Place hook at approximately a 45 degree angle with the cam up.



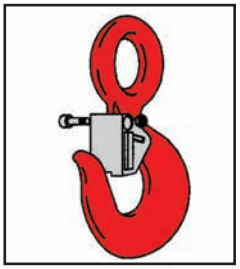
Step 2

Position coils of spring over cam with legs of spring pointing toward point of hook and loop of spring positioned down and lying against the hook.



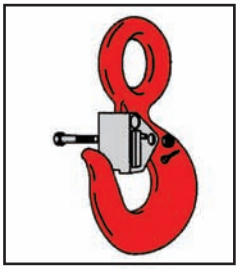
Step 3

Position latch to side of hook points. Slide latch onto spring legs between lockplate and latch body until latch is partially over hook cam. Then depress latch and spring until latch clears point of the hook.



Steps 4, 5 and 6

4. Line up holes in latch with hook cam.
5. Insert bolt through latch, spring and cam.
6. Tighten self-locking nut on one end of bolt.



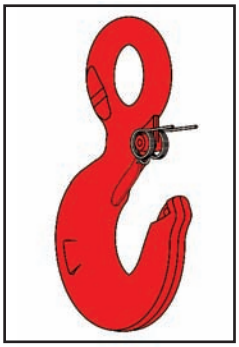
Step 7

For Personnel Lifting: With latch in closed position and rigging resting in bowl of hook, insert bolt through latch and secure with nut and cotter pin. When bolt, nut and cotter pin are not being used, store them in a designated place upon the personnel platform.

⚠ WARNING

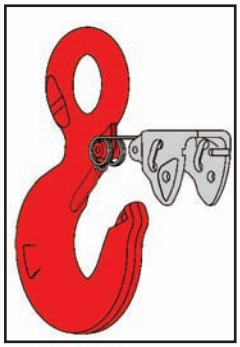
Important Information for Hook Latches, See Pages 223 and 224

IMPORTANT Instructions for Assembling Model PL-N/O Latch on Crosby or McKissick Hooks.



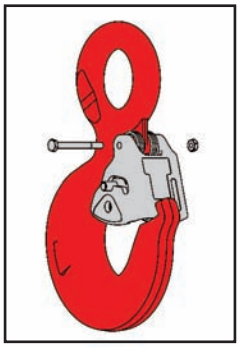
Step 1

Place hook in upright position. Position coils of spring over cam with legs of spring pointing toward tip of hook and loop of spring positioned down and lying against the hook.



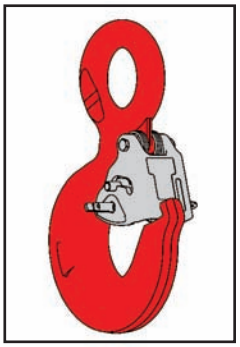
Step 2

Slip the latch over the spring until the two spring legs are positioned into the grooves located on the inside of the latch housing (legs of spring should fit between the gate and the housing).



Steps 3, 4, 5 and 6

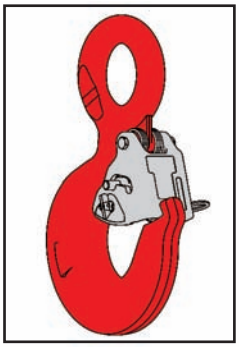
3. Slide latch housing up the spring legs until latch clears hook tip.
4. Resting latch on interlocking hook tip, line up holes in latch with hook cam.
5. Insert bolt through latch spring and cam.
6. Tighten self-locking nut on one end of bolt.



Steps 7 and 8

For Personnel Lifting:

7. Rigging should be resting in bowl of hook, with latch in closed position and gate locked.
8. Insert toggle lock pin through hole and depress spring until toggle clears hole on other side of latch.



Step 9

For Personnel Lifting:

Rotate toggle 90 degrees to secure pin (ensure toggle is in closed position as shown).

Crosby® Eye Hooks

Load Rated Fatigue Rated "QT" QUENCHED & TEMPERED QUIC-CHECK® "TA" TYPE APPROVED

All Crosby 320 Eye Hoist Hooks incorporate the following features:

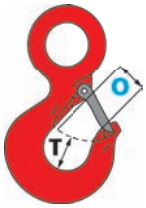
- Available in carbon steel and alloy steel.
- Design Factor for Carbon Steel - 5 to 1. Design Factor for Alloy Steel- 4 to 1.
- Eye hooks are load rated.
- Proper design, careful forging and precision controlled quenched and tempering give maximum strength without excessive weight and bulk.
- Every Crosby Eye Hook has a pre-drilled cam which can be equipped with a latch. Even years after purchase of the original hook, latch assemblies can be added.
- Chemical analysis and tensile tests performed on each PIC to verify chemistry and mechanical properties.
- Type Approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7 and ABS Guide for Certification of Cranes.
- Hoist hooks incorporate two types of strategically placed markings forged into the product which address two (2) QUIC-CHECK® features:
  - Deformation Indicators: Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a QUIC-CHECK® measurement to determine if the throat opening has changed, thus indicating abuse or overload. To check, use a measuring device (i.e. tape measure) to measure the distance between the marks. The marks should align to either an inch or half-inch increment on the measuring device. If the measurement does not meet these criteria, the hook should be inspected further for possible damage.
  - Angle Indicators: Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.

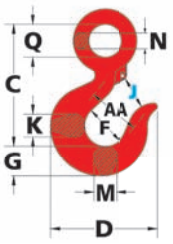


S-320 & S-320N









The following additional features have been incorporated in the new Crosby S-320N Eye Hoist Hooks. (3/4 metric ton Carbon through 22 metric ton Alloy).

- Design Factor for Carbon Steel - 5 to 1. Design Factor for Alloy Steel - 4 to 1.
- Can be proof tested to 2-1/2 times Work Load Limit.
- Low profile hook tip.
- New integrated latch (S-4320) meets the world class standard for lifting.
  - Heavy duty stamped latch interlocks with the hook tip.
  - High cycle, long life spring.
  - When secured with proper cotter pin through the hole in the tip of hook, meets the intent of OSHA Rule 1926.550(g) for personnel hoisting.
- Fatigue rated at 1-1/2 times Work Load Limit for 20,000 cycles.

⚠ WARNING **See Pages 223-225 for Important Safety, Use and Inspection Information.**

EYE HOOK SPECIFICATIONS

Carbon S320CN Self Colored		Alloy S320AN Self Colored		Hook ID	Dimensions (Inches)												Unit Weight (Lbs.)
Tons	Stock No.	Tons	Stock No.		C	D	F	G	J	K	M	N	O	Q	T	AA	
3/4	1022200	1	1022375	D*	3.34	2.83	1.25	.73	.90	.63	.63	.36	.89	.75	.87	1.5	.61
1	1022211	1-1/2	1022386	F*	3.81	3.11	1.38	.84	.93	.71	.71	.42	.91	.91	.98	2	.89
1-1/2	1022222	2	1022397	G*	4.14	3.53	1.50	1	1	.88	.88	.55	1	1.13	1.03	2	1.44
2	1022233	3	1022406	H*	4.69	3.97	1.63	1.13	1.13	.94	.94	.58	1.09	1.25	1.16	2	2.07
3	1022244	5	1022419	I*	5.77	4.81	2	1.44	1.47	1.31	1.31	.72	1.36	1.56	1.53	2.5	4.30
5	1022255	7	1022430	J*	7.37	6.27	2.50	1.81	1.75	1.66	1.66	.90	1.61	2	1.96	3	8.30
7-1/2	1022264	11	1022441	K*	9.07	7.45	3	2.25	2.29	1.88	1.63	1.11	2.08	2.44	2.47	4	15
10	1022277	15	1022452	L*	10.08	8.30	3.25	2.59	2.50	2.19	1.94	1.27	2.27	2.84	2.62	4	20.77
15	1022288	22	1022465	N*	12.53	10.30	4.25	3	3.30	2.69	2.38	1.56	3.02	3.50	2.83	5	39.50
20	1023289	30	1023546	O	14.06	13.62	5	3.62	4	3	3	1.75	3.25	3.50	3.44	6.5	60
25	1023305	37	1023564	P	18.19	14.06	5.38	4.56	4.25	4	3.19	2	3	4.50	3.88	7	105
30	1023323	45	1023582	S	20.12	15.44	6	5.06	4.75	4.50	3.25	2.18	3.38	4.94	4.75	8	148
40	1023341	60	1023608	T	23.72	18.50	7	6	5.75	5.50	3.91	2.53	4.12	5.69	5.69	10	228

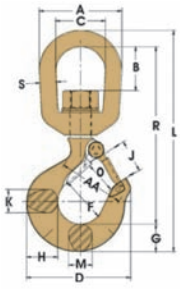
Eye Hooks (3/4 TC - 22TA), Proof load is 2.5 times Work Load Limit. Eye Hooks (20 TC - 60TA), Proof Load is 2 times Work Load Limit.
All carbon hooks-average straightening (ultimate) load is 5 times Work Load Limit. Alloy eye hooks 1 ton through 22 ton-average straightening (ultimate) load is 5 times Work Load Limit.
Alloy eye hooks 30 tons through 60 tons-average straightening (ultimate) load is 4.5 times Work Load Limit.
* New 320N Style Hook
Contact us for dimensional data for hooks with S-4320 or PL latch kits.

SWIVEL HOOKS

S-322CN / S-322AN



- Forged, Quenched and Tempered.
- Swivel hooks are load rated.
- Proper design, careful forging and precision controlled quench and tempering gives maximum strength without excessive weight and bulk.
- Low profile hook tip designed to utilize Crosby S-4320 or PL-N latch kit.
- Hoist hooks incorporate markings forged into the product which address two (2) QUIC-CHECK® features:
  - Deformation Indicators – Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a QUIC-CHECK® measurement to determine if the throat opening has changed, thus indicating abuse or overload.
  - Angle Indicators – Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.
- Type Approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7 and ABS Guide for Certification of Cranes.



WARNING **See Pages 223-225 for Important Safety, Use and Inspection Information.**

This hook is a positioning device and is not intended to rotate under load. For swivel hooks designed to rotate under load, contact us. Use in corrosive environment requires shank and nut inspection in accordance with ASME B30.10.

SWIVEL HOOK SPECIFICATIONS

Work Load Limit (Tons)*		Stock Number		Unit Weight (Lbs.)	Dimensions (Inches)														
Carbon	Alloy	S-322 CN Carbon	S-322 AN Alloy		A	B	C	D	F	G	H	J	K	L	M	O †	R	S	AA
3/4	1	1048600	1048804	.75	2	.82	1.25	2.86	1.25	.73	.81	.93	.63	5.66	.63	.89	4.55	.38	1.5
1	1-1/2	1048609	1048813	1.25	2.50	1.31	1.50	3.15	1.38	.84	.94	.97	.71	6.71	.71	.91	5.37	.50	2
1-1/2	2	1048618	1048822	2.25	3	1.50	1.75	3.59	1.50	1	1.16	1.06	.88	7.75	.88	1	6.12	.63	2
2	3	1048627	1048831	2.30	3	1.50	1.75	4	1.62	1.13	1.31	1.19	.94	8.25	.94	1.09	6.50	.63	2
3	5	1048636	1048837	4.96	3.50	1.64	2	4.84	2	1.44	1.63	1.50	1.31	9.69	1.13	1.36	7.50	.75	2.5
5	7	1048645	1048854	10.29	4.56	2.29	2.50	6.28	2.50	1.81	2.06	1.78	1.66	12.47	1.44	1.61	9.63	1	3
7-1/2	11	1048654	1048865	19.40	5	2.53	2.75	7.54	3	2.25	2.63	2.41	1.88	14.75	1.63	2.08	11.37	1.13	4
10	15	1048663	1048877	23.25	5.62	2.48	3.12	8.34	3.25	2.59	2.94	2.62	2.19	16.40	1.94	2.27	12.25	1.25	4
15	22	1048672	1048886	47	7.10	3.76	4.10	10.34	4.25	3	3.50	3.41	2.69	21.34	2.38	3.02	16.71	1.50	5
-	30	-	1025688	70.50	7.10	3.76	4.10	13.62	5	3.61	4.63	4	3	23.25	3	3.25	18.01	1.50	6.5

* NOTE: Carbon swivel hooks .75 Ton -15 Ton: proof load is 2 times Work Load Limit. Designed with a 5 to 1 design factor.
Alloy swivel hooks 1 Ton-22 Ton : proof load is 2.5 times Work Load Limit. Designed with a 4.5 to 1 design factor.
Alloy swivel hook 30 Ton: proof load is 2 times Work Load Limit. Designed with a 4 to 1 design factor.
† Dimensions for hooks 3/4 ton carbon thru 22 ton alloy are for S-4320 latch kits. Dimensions for hooks 30 ton alloy are for PL latch kit.
WARNING For Work Load Limit reduction due to side loading, See page 223. PLEASE NOTE: "J" DIMENSION IS WITHOUT LATCH.

SHUR-LOCK® HOOKS

S-1316

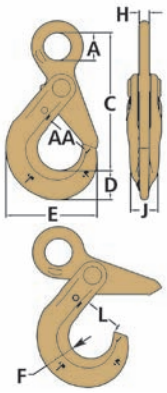


All SHUR-LOC® hooks have the following features:

- Forged Alloy Steel, Quenched and Tempered.
- Recessed trigger design is flush with the hook body, protecting the trigger from potential damage.
- Easy to operate with enlarged thumb access.
- Positive Lock Latch is Self-Locking when hook is loaded.
- The SHUR-LOC® hook, if properly installed and locked, can be used for personnel lifting applications and meets the intent of OSHA Rule 1926.550 (g) (4) (iv) (B).

Eye Style incorporates these added features:

- Individually Proof Tested to 2-1/2 times Work Load Limit with certification.
- Fatigue rated at 1-1/2 times Work Load Limit at 20,000 cycles.
- 25% stronger than Grade 80.
- Suitable for use with Grade 100 and Grade 80 chain.
- Designed with "Engineered Flat" to connect to S-1325 chain coupler.



WARNING **See Pages 223-225 for Important Safety, Use and Inspection Information.**

SHUR-LOCK® EYE HOOK SPECIFICATIONS

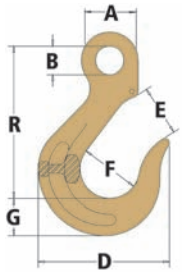
Chain Size		Work Load Limit (Lbs.)*	Stock Number	Unit Weight (Lbs.)	Dimensions (Inches)						
(Inches)	(mm)				A	C	D	E	J	L	AA
-	6	3200	1022896	.85	.78	3.95	.79	2.60	.63	1.14	1.50
1/4-5/16	7-8	5700	1022914	1.80	1.08	5.31	1.10	3.50	.81	1.48	2
3/8	10	8800	1022923	3.40	1.30	6.57	1.17	4.39	.94	1.83	2.50
1/2	13	15000	1022932	6	1.65	8.23	1.67	5.45	1.16	2.22	3
5/8	16	22600	1022941	15.10	2.20	10.06	2.04	6.56	1.50	2.65	3.50
3/4	18-20	35300	1022942	19	2.60	10.77	2.22	7.76	2.03	3.52	-
7/8	22	42700	1022943	28	2.87	12.49	2.45	8.75	2.20	3.83	-
1	26	59700	1022944	49.50	3.15	14.60	3.21	9.87	2.68	4.09	-

* Minimum Ultimate Load is 4 times Work Load Limit.
WARNING For Work Load Limit reduction due to side loading, See page 223

A327 – EYE SLING HOOK



- Alloy Steel, Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times Work Load Limit with certification.
- S-4088 Latch Kit fits hooks.



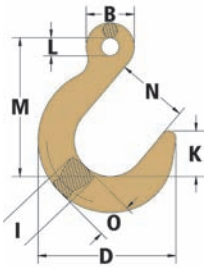
A327 EYE SLING HOOK SPECIFICATIONS										
Chain Size (Inches)	Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)						
				A	B	D	E	F	G	R
9/32-1/4	1003764	3500	.81	1.34	.56	3.47	1.44	1.76	.90	3.72
3/8	1003773	7100	2.10	1.82	.75	4.56	1.78	2.24	1.25	4.83
1/2	1003782	12000	3.71	2.26	.94	5.50	2.12	2.50	1.55	5.67
5/8	1003791	18100	6.40	2.75	1.15	6.50	2.41	2.88	1.88	6.61
3/4	1003808	28300	9.80	3.26	1.34	7.36	2.69	3.27	2.16	7.64
7/8	1003817	34200	15.40	3.72	1.44	8.48	3.06	3.62	2.45	8.56

* Ultimate Load is 4 times the Work Load Limit.

A329 – EYE FOUNDRY HOOK



- Alloy Steel, Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times Work Load Limit with certification.
- Pin locking requires no special tools.
- S-4088 Latch Kit fits 3/4" and 7/8" hooks.



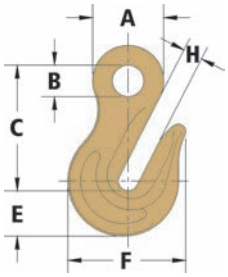
A329 EYE FOUNDRY HOOK SPECIFICATIONS											
Chain Size (Inches)	Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)							
				B	D	I	K	L	M	N	O
9/32-1/4	1026179	3500	2.40	1.56	4.75	1	1.56	.63	4.75	2.50	1.23
3/8	1026197	7100	4.50	2.00	5.69	1.27	1.88	.75	5.75	3	1.50
1/2	1026213	12000	7.10	2.50	6.75	1.50	2.22	1	6.88	3.50	1.75
5/8	1026231	18100	12.20	3	7.81	1.81	2.63	1.25	8.06	4	2.03
3/4	1026259	28300	19.30	3.50	9.13	2.20	3.50	1.50	9.25	4.50	2.56
7/8	1026277	34200	26.30	4	10.06	2.25	3.38	1.75	10.38	5	2.78

* Ultimate Load is 4 times the Work Load Limit.

A328 – EYE GRAB HOOK



- Alloy Steel, Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times Work Load Limit with certification.
- The use of A-328 Eye Grab Hook will result in a 20 percent reduction in chain capacity. When used to hook back to chain leg to form a choker, the angle of the choke must be 120 degrees or greater. When used as a chain shortener, minimize twist of chain and ensure chain is fully engaged in hook.



A-328 EYE GRAB HOOK SPECIFICATIONS									
Chain Size (Inches)	Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)					
				A	B	C	E	F	H
9/32-1/4	1026017	3500	.60	1.38	.59	2.56	.91	2.16	.38
3/8	1026035	7100	1.20	1.80	.80	3.25	1.16	3	.50
1/2	1026053	12000	3	2.25	.98	4.19	1.69	4	.63
3/4	1026099	28300	8.25	3.22	1.36	5.95	2.19	5.47	.88
7/8	1026115	34200	11.90	3.70	1.55	6.88	2.56	6.31	1.06

*Ultimate Load is 4 times Work Load Limit.

⚠ WARNING See Pages 223-225 for Important Safety, Use and Inspection Information.

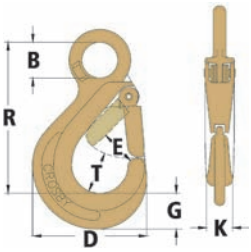
S-315A – EYE CHAIN HOOK WITH INTEGRATED LATCH

Fatigue Rated



- Forged Alloy Steel, Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times Work Load Limit with certification.
- Crosby recommends grinding the WLL (5:1 Design Factor) off the hook when using with Grade 80 chain.
- Integrated heavy duty latch.
- Large throat opening.
- Anti-fouling due to carefully designed contours.
- "Engineered Flat" for use with S-1325A Coupler Link.
- Meets ASTM A-952-96 and proposed Euronorm standards for Grade 80 chain fittings.
- Fatigue rated.
- "Look for the Gold", Crosby Alloy Hooks.

"QT" QUENCHED & TEMPERED®



S-315A – EYE CHAIN HOOK WITH INTEGRATED LATCH SPECIFICATIONS												
Chain Size		Stock Number	Grade 80 Alloy Chain Work Load Limit (Lbs.) (4/1)*	Wire Rope Work Load Limit (Tons) (5/1)	Net Unit Weight (Lbs.)*	Dimensions (Inches)						
(Inches)	(MM)					B	D	E	G	K	R	T
-	6	1029820	2500	1	.56	.79	2.60	.81	.79	.63	3.33	1.02
1/4-5/16	7-8	1029825	4500	2	1.31	1.10	3.50	1.08	1.10	.81	4.62	1.28
3/8	10	1029830	7100	3	2.60	1.42	4.35	1.42	1.16	.94	6.20	1.66
1/2	13	1029835	12000	5	4.70	1.81	5.45	1.52	1.67	1.16	7.33	1.94
5/8	16	1029840	18100	7	8.55	2.20	6.56	1.91	2.05	1.50	8.94	2.32

* Ultimate Load is 4 times the Work Load Limit.

A-1337 – LOK-A-LOY® ALLOY CONNECTING LINK

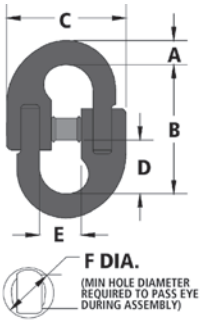
Fatigue Rated



Crosby 8/10™

- Suitable for use with both Grade 80 and Grade 100 chain.
- Individually Proof Tested to 2-1/2 times Work Load Limit with certification.
- Locking system that provides for simple assembly and disassembly - no special tools needed.
- 25% stronger than Grade 80 components.
- Meets ASTM A-952-96 standards for Grade 100 chain fittings.
- Forged Alloy Steel - Quenched and Tempered.
- Fatigue rated.

"QT" QUENCHED & TEMPERED®



A-1337 – LOK-A-LOY® ALLOY CONNECTING LINK SPECIFICATIONS											
Chain Size		Stock Number	Pkg Qty.	Net Unit Weight (Lbs.)	Work Load Limit (Lbs.)*	Dimensions (Inches)					
(Inches)	(MM)					A	B	C	D	E	F
9/32-1/4	7	1015104	60	.26	4300	.38	1.94	1.90	.81	.69	.57
5/16	8	1015113	50	.35	5700	.37	2.35	2.07	.99	.72	.64
3/8	10	1015122	40	.75	8800	.48	2.70	2.47	1.12	.90	.78
1/2	13	1015136	12	1.60	15000	.68	3.45	3.31	1.44	1.12	.97
5/8	16	1015145	10	2.68	22600	.81	4.13	3.90	1.72	1.35	1.14
3/4	20	1015154	1	5	35300	.93	4.62	4.62	2.03	1.62	1.28
7/8	22	1015163	1	7.50	42700	1.06	5.46	5.46	2.27	2	1.49
1	25	1015172	1	11.03	59700	1.22	5.98	6.13	2.44	2.25	1.76
1 1/4	32	1015181	1	20.38	90400	1.50	7.43	7.59	3.07	2.56	2.23

* Ultimate Load is 4 times the Work Load Limit.

FORGED SHOULDER NUT EYE BOLTS

G-277



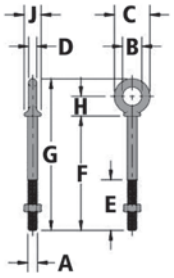
- Forged Steel, Quenched and Tempered.
- Fatigue rated at 1-1/2 times Work Load Limit for 20,000 cycles.
- Work Load Limits shown are for in-line pull. For angle loading, see page 231.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products also meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- All Bolts Hot Dip galvanized after threading (UNC).
- Furnished with standard Hot Dip galvanized, heavy hex nuts.

⚠ WARNING See Pages 231-232 for Important Safety, Use and Inspection Information.

Fatigue Rated

QUIC-CHECK® Q®

"QT" QUENCHED & TEMPERED®



G-277 SHOULDER NUT EYE BOLT SPECIFICATIONS

Shank Diameter x Length (In.)	Stock Number	Work Load Limit (Lbs.)*	Weight Per 100 (Lbs.)	Dimensions (Inches)								
				A	B	C	D	E	F	G	H	J
1/4 x 2	1045014	650	6.60	.25	.50	.88	.19	1.50	2	2.94	.50	.47
1/4 x 4	1045032	650	9.10	.25	.50	.88	.19	2.50	4	4.94	.50	.47
5/16 x 2-1/4	1045050	1200	12.50	.31	.62	1.12	.25	1.50	2.25	3.50	.69	.46
5/16 x 4-1/4	1045078	1200	18.80	.31	.62	1.12	.25	2.50	4.25	5.50	.69	.46
3/8 x 2-1/2	1045096	1550	21.40	.38	.75	1.38	.31	1.50	2.50	3.97	.78	.66
3/8 x 4-1/2	1045112	1550	26	.38	.75	1.38	.31	2.50	4.50	5.97	.78	.66
1/2 x 3-1/4	1045130	2600	43	.50	1	1.75	.38	1.50	3.25	5.12	1	.91
1/2 x 6	1045158	2600	57	.50	1	1.75	.38	3	6	7.88	1	.91
5/8 x 4	1045176	5200	69	.62	1.25	2.25	.50	2	4	6.44	1.31	1.12
5/8 x 6	1045194	5200	103	.62	1.25	2.25	.50	3	6	8.44	1.31	1.12
3/4 x 4-1/2	1045210	7200	145	.75	1.50	2.75	.62	2	4.50	7.44	1.56	1.38
3/4 x 6	1045238	7200	168	.75	1.50	2.75	.62	3	6	8.94	1.56	1.38
7/8 x 5	1045256	10600	225	.88	1.75	3.25	.75	2.50	5	8.46	1.84	1.56
1 x 6	1045292	13300	367	1	2	3.75	.88	3	6	9.97	2.09	1.81
1 x 9	1045318	13300	423	1	2	3.75	.88	4	9	12.97	2.09	1.81
1-1/4 x 8	1045336	21000	650	1.25	2.50	4.50	1	4	8	12.72	2.47	2.28
1-1/4 x 12	1045354	21000	795	1.25	2.50	4.50	1	4	12	16.72	2.47	2.28
1-1/2 x 15	1045372	24000	1425	1.50	3	5.50	1.25	6	15	20.75	3	2.75

*Ultimate Load is 5 Times Work Load Limit. Proof Load is 2 Times Work Load Limit.

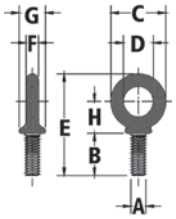
⚠ WARNING See Pages 231-232 for Important Safety, Use and Inspection Information.

FORGED MACHINERY SHOULDER NUT EYE BOLTS

S-279 / M-279



- Forged Steel, Quenched and Tempered.
- Fatigue rated at 1-1/2 times Work Load Limit for 20,000 cycles.
- Work Load Limits shown are for in-line pull. For angle loading, see page 231.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Crosby products also meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- Recommended for in-line pull.
- S-279 threaded UNC.
- M-279 metric threaded.



"QT" QUENCHED & TEMPERED®

QUIC-CHECK® Q®

Fatigue Rated

S-279 UNC SHOULDER TYPE-MACHINERY EYEBOLT SPECIFICATIONS

Nominal Size (Inches)	Stock Number	Work Load Limit (Lbs.)*	Weight Per 100 (Lbs.)	Dimensions (Inches)							
				A** Thread	B	C	D	E	F	G	H
1/4 x 1	9900182	650	5	1/4 - 20	1.02	1.13	.75	2.29	.19	.53	.77
5/16 x 1-1/8	9900191	1200	9	5/16 - 18	1.15	1.38	.88	2.74	.25	.59	.95
3/8 x 1-1/4	9900208	1550	15	3/8 - 16	1.27	1.62	1	3.07	.31	.69	1.05
1/2 x 1-1/2	9900217	2600	28	1/2 - 13	1.53	1.95	1.19	3.70	.38	.91	1.27
5/8 x 1-3/4	9900226	5200	55	5/8 - 11	1.79	2.38	1.38	4.45	.50	1.13	1.53
3/4 x 2	9900235	7200	96	3/4 - 10	2.05	2.76	1.50	5.07	.63	1.38	1.71
7/8 x 2-1/4	9900244	10600	154	7/8 - 09	2.31	3.25	1.75	5.87	.75	1.56	2
1 x 2-1/2	9900253	13300	238	1 - 8	2.57	3.76	2	6.66	.88	1.81	2.30
1-1/8 x 2-3/4	9900257	15000	320	1-1/8 - 7	2.75	4.19	2.25	7.20	.97	2.06	2.35
1-1/4 x 3	9900262	21000	399	1-1/4 - 7	3.09	4.50	2.50	7.95	1	2.28	2.73
1-1/2 x 3-1/2	9900271	24000	720	1-1/2 - 6	3.60	5.50	3	9.49	1.25	2.75	3.28
1-3/4 x 3-3/4	9900280	34000	1040	1-3/4 - 5	3.75	6.26	3.50	10.48	1.38	3	3.60
2 x 4	9900289	42000	1880	2 - 4-1/2	4	7.62	4	12.31	1.81	3.38	4.50
2-1/2 x 5	9900298	65000	3250	2-1/2 - 4	5	8.76	4.50	14.88	2.12	4.25	5.50

* Ultimate Load is 5 Times Work Load Limit. Proof Load is 2 times Work Load Limit.

** All bolts threaded UNC.

⚠ WARNING See Pages 231-232 for Important Safety, Use and Inspection Information.

M-279 METRIC SHOULDER TYPE- MACHINERY EYEBOLT SPECIFICATIONS

Shank Diameter x Length (MM)	Stock Number	Work Load Limit (Kgs.)*	Weight Per 100 (Kgs.)	Dimensions (MM)							
				A** Thread	B	C	D	E	F	G	H
M6 x 13	1045753	200	.03	M6 x 1.00	13	28.7	19.1	47	4.9	13.5	19.6
M8 x 13	1045789	400	.05	M8 x 1.25	13	35.1	22.4	54.6	6.4	15	24.1
M10 x 17	1045833	640	.07	M10 x 1.50	17	41.1	25.4	64.3	7.9	17.5	26.5
M12 x 20.5	1045869	1000	.11	M12 x 1.75	20.5	49.5	30.2	77.7	9.7	23.1	32.8
M16 x 27	1045913	1800	.25	M16 x 2.0	27	60.5	35.1	96	12.7	28.7	38.9
M20 x 30	1045995	2500	.42	M20 x 2.5	30	70	38.1	108	16	35.1	43.4
M24 x 36	1046029	4000	1.05	M24 x 3.0	36	95.5	51	142	22.4	46	58.4
M27 x 69.8	1046038	5000	1.42	M27 x 3.0	69.8	107	57.1	183	24.6	52.3	59.7
M30 x 45	1046075	6000	1.77	M30 x 3.5	45	114	63.5	171	25.4	58	69.3
M36 x 54	1046109	8500	3.12	M36 x 4.0	54	140	76	207	31.8	70	83.3
M42 x 95.2	1046118	14000	4.58	M42 x 4.5	95.2	159	88.9	266	35	76.2	91.4
M48 x 102	1046127	17300	8.71	M48 x 5.0	102	194	101	313	46	85.9	114
M64 x 127	1046136	29500	14.74	M64 x 6.0	127	223	114	378	53.8	108	140

*Ultimate Load is 5 Times Work Load Limit. Proof Load is 2 Times Work Load Limit.

** On request: Special Threading, as forged bolts for customer conversion.

⚠ WARNING See Pages 231-232 for Important Safety, Use and Inspection Information.

Crosby® Forged Eye Bolt Warnings

⚠ WARNING IMPORTANT INFORMATION: READ AND FOLLOW.



Regular Nut Eye Bolt
G-291



Shoulder Nut Eye Bolt
G-277



Machinery Eye Bolt
S-279 / M-279

Inspection/Maintenance Safety:

- Always inspect eye bolt before use.
- Never use eye bolt that shows signs of wear or damage.
- Never use eye bolt if eye or shank is bent or elongated.
- Always be sure threads on shank and receiving holes are clean.
- Never machine, grind or cut eye bolt.

Assembly Safety:

- Never exceed Work Load Limits specified in Tables 1 & 2.
- Never use regular nut eye bolts for angular lifts.
- Always use shoulder nut eye bolts (or machinery eye bolts) for angular lifts.
- For angular lifts, adjust Work Load as follows:

Direction of Pull (in-line)	Adjusted Work Load
45 degrees	30% of Work Load Limit
90 degrees	25% of Work Load Limit

- Never undercut eye bolt to seat shoulder against the load.
- Always countersink receiving hole or use washer with sufficient I.D. to seat shoulder.
- Always screw eye bolt down completely for proper seating.
- Always tighten nuts securely against the load.

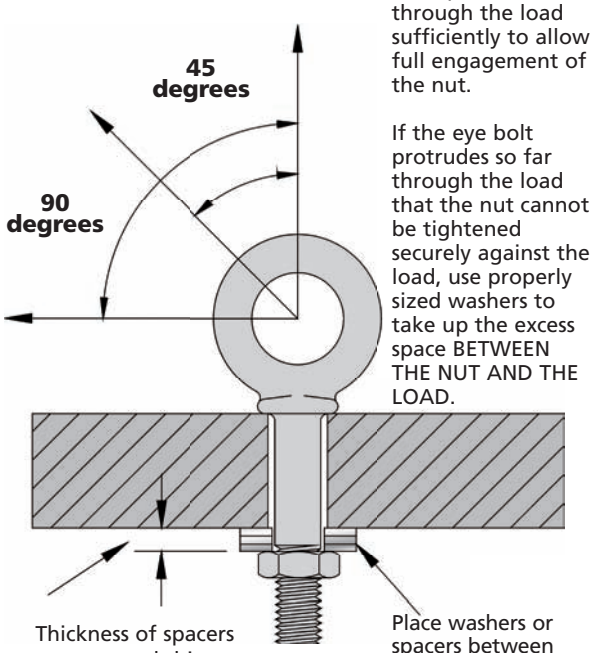
Table 1 In-Line Load

Size (Inches)	Work Load Limit (Lbs.)
1/4	650
5/16	1,200
3/8	1,550
1/2	2,600
5/8	5,200
3/4	7,200
7/8	10,600
1	13,300
1-1/8	15,000
1-1/4	21,000
1-1/2	24,000
1-3/4	34,000
2	42,000
2-1/2	65,000

⚠ WARNING

- Loads may slip or fall if proper eye bolt assembly and lifting procedures are not used.
- A falling load may cause serious injury or death.
- Read and understand these instructions and follow all eye bolt safety information presented here.
- Read, understand and follow information in diagrams and charts below before using eye bolt assemblies.

Shoulder Nut Eye Bolt: Installation for Angular Loading



The threaded shank must protrude through the load sufficiently to allow full engagement of the nut.

If the eye bolt protrudes so far through the load that the nut cannot be tightened securely against the load, use properly sized washers to take up the excess space BETWEEN THE NUT AND THE LOAD.

Thickness of spacers must exceed this distance between the bottom of the load and the last thread of the eye bolt.

Place washers or spacers between nut and load so that when the nut is tightened securely, the shoulder is secured flush against the load surface.

Table 2 In-Line Load

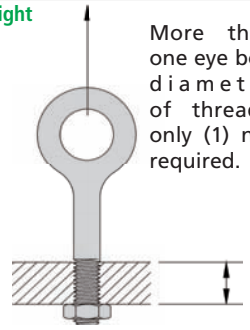
Metric Size	Work Load Limit (Kgs.)
M6	200
M8	400
M10	640
M12	1,000
M16	1,800
M20	2,500
M24	4,000
M27	5,000
M30	6,000
M36	8,500
M42	14,000
M48	17,300
M64	29,500

Crosby® Forged Eye Bolt Warnings

⚠ WARNING IMPORTANT INFORMATION: READ AND FOLLOW.

Regular Nut and Shoulder Nut Eye Bolt-Installation for In-Line Loading.

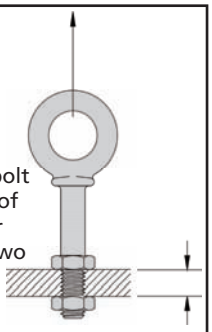
Right



More than one eye bolt diameter of threads, only (1) nut required.

Tighten hex nut securely against load.

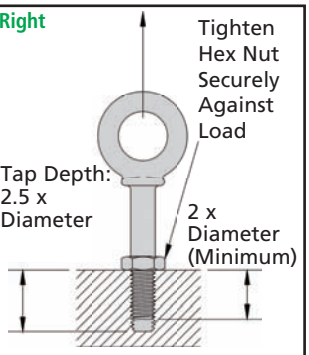
Right



One eye bolt diameter of threads or less, use two (2) nuts

Tighten hex nut securely against load.

Right

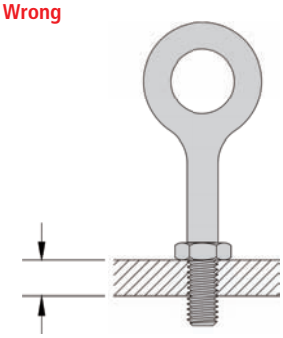


Tighten Hex Nut Securely Against Load

Tap Depth: 2.5 x Diameter

2 x Diameter (Minimum)

Wrong



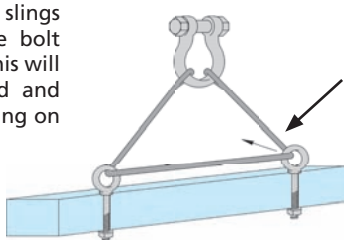
One eye bolt diameter or less.

OPERATIONAL SAFETY CONSIDERATIONS

- Always stand clear of load.
- Always lift load with steady, even pull – do not jerk.
- Always apply load to eye bolt in the plane of the eye, not at an angle.
- Never exceed the Work Load Limit of the eye bolt, see Tables I & 2.
- When using lifting slings of two or more legs, make sure the loads in the legs are calculated using the angle from the vertical to the leg and properly size the shoulder nut or machinery eye bolt for the angular load.

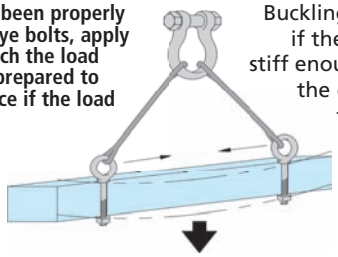
Do not reeve slings from one eye bolt to another. This will alter the load and angle of loading on the eye bolt.

Wrong



Resultant Load

After slings have been properly attached to the eye bolts, apply force slowly. Watch the load carefully and be prepared to stop applying force if the load starts buckling.



Buckling may occur if the load is not stiff enough to resist the compressive forces which result from angular loading.

MACHINERY EYE BOLT- INSTALLATIONS FOR IN-LINE AND ANGULAR LOADING.

Machinery Eye Bolts are primarily intended to be installed into tapped holes.

1. After the loads on the eye bolts have been calculated, select the proper size eye bolt for the job.

   For angular lifts, adjust Work Load Limit as follows:

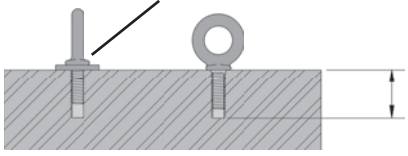
Direction of Pull (In-Line)	Adjusted Work Load
45 Degrees	30% of Work Load Limit
90 Degrees	25% of Work Load Limit

2. Drill and tap the load to the correct sizes to a minimum depth of one-half the eye bolt size beyond the shank length of the machinery eye bolt.
3. Thread the eye bolt into the load until the shoulder is flush and securely tightened against the load.
4. If the plane of the machinery eye bolt is not aligned with the sling line, estimate the amount of unthreading rotation necessary to align the plane of the eye properly. Remove the machinery eye bolt from the load and add shims (washers) of proper thickness to adjust the angle of the plane of the eye to match the sling line. Use Table 3 to estimate the required shim thickness for the amount of unthreaded rotation required.

Table 3

Eyebolt Size Inches	Shim Thickness* Inches	Eyebolt Size mm	Shim Thickness* mm
1/4	.0125	M6	.25
5/16	.0139	M8	.31
3/8	.0156	M10	.38
1/2	.0192	M12	.44
5/8	.0227	M16	.50
3/4	.0250	M20	.62
7/8	.0278	M24	.75
1	.0312	M27	.75
1-1/8	.0357	M30	.88
1-1/4	.0357	M36	1.00
1-1/2	.0417		
1-3/4	.0500	M42	1.13
2	.0556	M48	1.25
2-1/2	.0625	M64	1.50

*Shim thickness required to change rotation 90 degrees.



Minimum tap depth is basic shank length plus one-half the nominal eye bolt diameter.

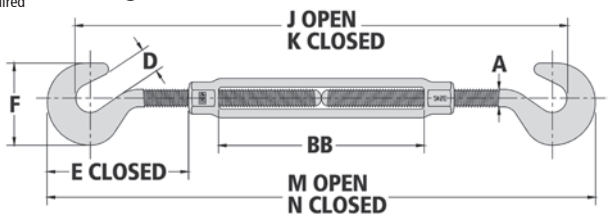
Crosby® Hook & Hook Turnbuckles

HG-223



Meets the performance requirements of Federal Specifications FF-T-791b, Type 1, Form 1 - CLASS 5, and ASTM F-1145, except for those provisions required of the contractor.

- End fittings are Quenched and Tempered; bodies are heat treated by normalizing.
- Hot Dip galvanized steel.
- Hooks are forged with a greater cross sectional area that results in a stronger hook with better fatigue properties.
- Modified UNJ thread on end fittings for improved fatigue properties.
- Body has UNC threads.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- TURNBUCKLES RECOMMENDED FOR STRAIGHT OR IN-LINE PULL ONLY.
- Lock Nuts available for all sizes.
- Fatigue Rated.



Fatigue Rated

"QT" QUENCHED & TEMPERED

HG-223 HOOK & HOOK TURNBUCKLE SPECIFICATIONS

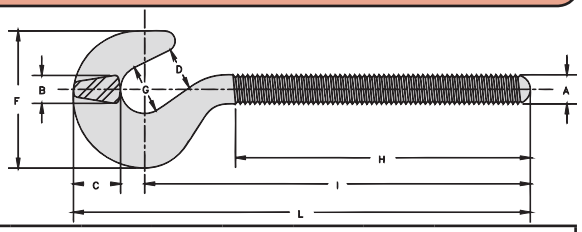
Thread Diameter & Take Up (Inches)	HG-223 Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)								
				A	D	E Closed	F	J Open	K Closed	M Open	N Closed	BB
† 1/4 x 4	1030011	400	.33	.25	.44	1.67	1.27	9.79	7.38	12.20	8.20	4.07
† 5/16 x 4-1/2	1030039	700	.52	.31	.50	2	1.50	11.58	8.58	14.08	9.58	4.58
† 3/8 x 6	1030057	1000	.83	.38	.56	2.28	1.77	15.23	10.62	17.84	11.84	6.10
1/2 x 6	1030075	1500	1.88	.50	.65	3.53	2.28	17.98	13.20	20.76	14.76	6.03
1/2 x 12	1030119	1500	2.77	.50	.65	3.51	2.28	30.27	19.49	33.05	21.05	12.36
5/8 x 6	1030137	2250	3.21	.63	.90	4.24	2.81	19.50	14.50	22.50	16.50	6.03
5/8 x 12	1030173	2250	4.58	.63	.90	4.23	2.81	31.84	20.84	34.84	22.84	12.39
3/4 x 6	1030191	3000	4.20	.75	.98	5.07	3.33	21.19	15.98	24.40	18.40	6.13
3/4 x 12	1030235	3000	6.92	.75	.98	5.04	3.33	33.59	22.38	36.80	24.80	12.59
3/4 x 18	1030253	3000	8.65	.75	.98	5.07	3.33	45.59	28.38	48.80	30.80	18.53
7/8 x 12	1030271	4000	9.85	.88	1.13	5.82	3.78	34.89	23.52	38.26	26.26	12.16
1 x 12	1030333	5000	14.80	1	1.25	6.56	4.25	36.59	25.06	40.12	28.12	12.18

Proof Load is 2.5 Times Work Load Limit. Ultimate Load is 5 Times Work Load Limit.

† Mechanical Galvanized

TURNBUCKLE - HOOK END FITTINGS

- Quenched and Tempered.
- Hot Dip galvanized steel.
- Hooks are forged with a greater cross sectional area that results in a stronger hook with better fatigue properties.
- Modified UNJ thread on end fittings for improved fatigue properties.
- Fatigue Rated.



HG-4037 HOOK END FITTING SPECIFICATIONS

Shank Diameter & Take Up (Inches)	Righthand Hook Stock Number	Lefthand Hook Stock Number	Work Load Limit (Lbs.)	Unit Weight (Lbs.)	Dimensions (Inches)								
					A	B	C	D	F	G	H	I	L
* 1/4 x 4	1070012	1070539	400	.09	.25	.25	.41	.44	1.27	.50	2.59	3.44	4.10
* 5/16 x 4-1/2	1070030	1070557	700	.15	.31	.31	.50	.50	1.50	.56	3.00	4.01	4.79
* 3/8 x 6	1070058	1070575	1000	.27	.38	.38	.61	.56	1.76	.62	3.88	5.00	5.92
1/2 x 6	1070076	1070593	1500	.59	.50	.50	.78	.65	2.28	.82	4.19	6.19	7.38
1/2 x 12	1070110	1070637	1500	.75	.50	.50	.78	.65	2.28	.82	7.19	9.19	10.68
5/8 x 6	1070138	1070655	2250	1.05	.63	.63	1.00	.90	2.81	1.00	4.44	6.75	8.25
5/8 x 12	1070174	1070691	2250	1.31	.63	.63	1.00	.84	2.81	1.00	7.44	9.75	11.25
3/4 x 6	1070192	1070717	3000	1.35	.75	.75	1.21	.98	3.33	1.13	4.56	7.43	9.20
3/4 x 12	1070236	1070753	3000	2.13	.75	.75	1.21	.98	3.33	1.13	7.56	10.43	12.20
3/4 x 18	1070254	1070771	3000	2.51	.75	.75	1.21	.98	3.33	1.13	10.56	13.43	15.20
7/8 x 12	1070272	1070799	4000	3.12	.88	.88	1.37	1.13	3.78	1.26	7.81	11.13	13.13
7/8 x 18	1070290	1070815	4000	3.62	.88	.88	1.37	1.13	3.78	1.26	10.81	14.13	16.13
1 x 6	1070316	1070833	5000	3.96	1.00	1.00	1.53	1.25	4.25	1.38	5.06	8.84	11.06
1 x 12	1070334	1070851	5000	4.72	1.00	1.00	1.53	1.25	4.25	1.38	8.06	11.84	14.06

*Mechanical Galvanized

HG-226

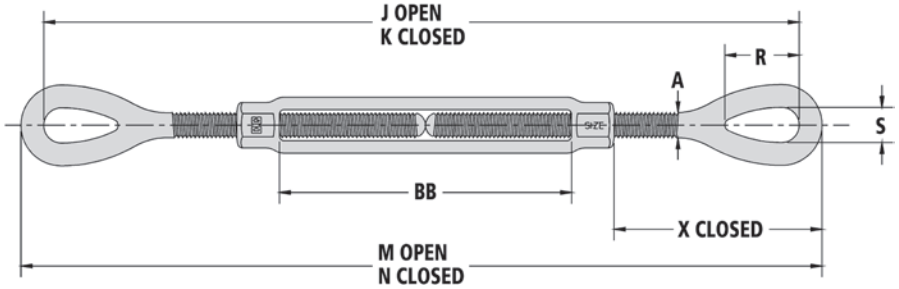


Meets the performance requirements of Federal Specifications FF-T-791b, Type 1, Form 1 - CLASS 4, and ASTM F-1145, except for those provisions required of the contractor.

- End fittings are Quenched and Tempered; bodies are heat treated by normalizing.
- Hot Dip galvanized steel.
- Turnbuckle eyes are forged elongated, by design, to maximize easy attachment in system and minimize stress in the eye. For turnbuckle sizes 1/4" through 2-1/2" a shackle one size smaller can be reeved through eye.
- Modified UNJ thread on end fittings for improved fatigue properties.
- Body has UNC threads.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- TURNBUCKLES RECOMMENDED FOR STRAIGHT OR IN-LINE PULL ONLY.
- Lock Nuts available for all sizes.
- Fatigue Rated.
- Comprehensive end fitting data provided on page 237.

Fatigue Rated

"QT" QUENCHED & TEMPERED®



HG-226 EYE & EYE TURNBUCKLE SPECIFICATIONS

Thread Diameter & Take Up (Inches)	HG-226 Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)								
				A	J Open	K Closed	M Open	N Closed	R	S	X Closed	BB
† 1/4 x 4	1031252	500	.29	.25	11.94	7.94	12.38	8.38	.81	.34	1.76	4.07
† 5/16 x 4-1/2	1031270	800	.48	.31	13.92	9.42	14.48	9.98	.95	.44	2.20	4.58
† 3/8 x 6	1031298	1200	.75	.38	17.56	11.56	18.24	12.24	1.13	.53	2.48	6.10
1/2 x 6	1031314	2200	1.72	.50	19.94	13.94	20.82	14.82	1.41	.71	3.56	6.03
1/2 x 12	1031350	2200	2.63	.50	32.23	20.23	33.11	21.11	1.41	.71	3.54	12.36
5/8 x 6	1031378	3500	2.75	.63	21.72	15.72	22.72	16.72	1.80	.88	4.35	6.03
5/8 x 12	1031412	3500	4.12	.63	34.06	22.06	35.06	23.06	1.80	.88	4.34	12.39
3/4 x 6	1031430	5200	4.22	.75	23.24	17.24	24.50	18.50	2.09	1	5.12	6.13
3/4 x 12	1031476	5200	6.12	.75	35.64	23.64	36.90	24.90	2.09	1	5.09	12.59
3/4 x 18	1031494	5200	7.83	.75	47.64	29.64	48.90	30.90	2.09	1	5.12	18.53
7/8 x 12	1031519	7200	8.83	.88	36.70	24.70	38.20	26.20	2.38	1.25	5.79	12.16
7/8 x 18	1031537	7200	11.50	.88	49.17	31.17	50.67	32.67	2.38	1.25	5.79	18.63
1 x 6	1031555	10000	9.62	1	26.24	20.24	28	22	3	1.43	6.50	6.18
1 x 12	1031573	10000	13	1	38.24	26.24	40	28	3	1.43	6.50	12.18
1 x 18	1031591	10000	16.30	1	50.24	32.24	52	34	3	1.43	6.50	18.18
1 x 24	1031617	10000	20.20	1	62.84	38.84	64.60	40.60	3	1.43	6.47	24.84
1-1/4 x 12	1031635	15200	19.90	1.25	42.14	30.14	44.38	32.38	3.59	1.82	8.49	12.06
1-1/4 x 18	1031653	15200	23.80	1.25	54.14	36.14	56.38	38.38	3.59	1.82	8.49	18.06
1-1/4 x 24	1031671	15200	27.80	1.25	66.70	42.70	68.94	44.94	3.59	1.82	8.49	24.62
1-1/2 x 12	1031699	21400	28.70	1.50	44.24	32.24	46.74	34.74	4.09	2.12	9.46	12.32
1-1/2 x 18	1031715	21400	34.10	1.50	56.24	38.24	58.74	40.74	4.09	2.12	9.46	18.32
1-1/2 x 24	1031733	21400	39.60	1.50	68.86	44.86	71.36	47.36	4.09	2.12	9.46	24.94
1-3/4 x 18	1031779	28000	50.70	1.75	57.38	39.38	60.38	42.38	4.65	2.38	9.97	18.37
1-3/4 x 24	1031797	28000	58.20	1.75	69.38	45.38	72.38	48.38	4.65	2.38	9.97	24.37
2 x 24	1031813	37000	83.50	2	75.68	51.68	79.18	55.18	5.81	2.69	13.03	24.48
2-1/2 x 24	1031831	60000	149	2.50	79.18	55.18	83.18	59.18	6.49	3.12	13.76	24.60
2-3/4 x 24	1031859	75000	174	2.75	81.34	57.34	85.84	61.84	7	3.25	15.09	24.65

*Proof Load is 2.5 Times Work Load Limit. Ultimate Load is 5 Times Work Load Limit.
† Mechanical Galvanized

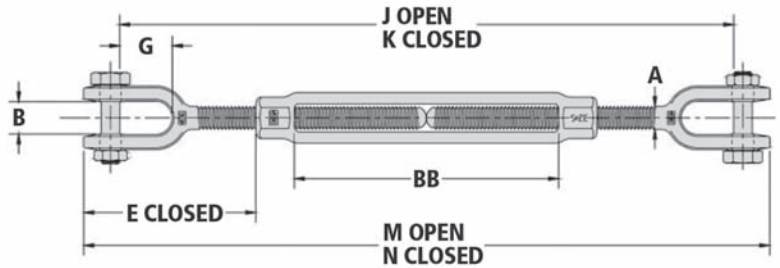
HG-228



- End fittings are Quenched and Tempered; bodies are heat treated by normalizing.
- Hot Dip galvanized steel.
- Forged jaw ends are fitted with bolts and nuts for 1/4" through 5/8" and pins with cotters for 3/4" through 2-3/4" sizes.
- Modified UNJ thread on end fittings for improved fatigue properties.
- Body has UNC threads.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability not addressed by ASME B30.26.
- TURNBUCKLES RECOMMENDED FOR STRAIGHT OR IN-LINE PULL ONLY.
- Lock Nuts available for all sizes.
- Fatigue Rated.

Fatigue Rated

Meets the performance requirements of Federal Specifications FF-T-791b, Type 1, Form 1 - CLASS 7, and ASTM F-1145, except for those provisions required of the contractor.

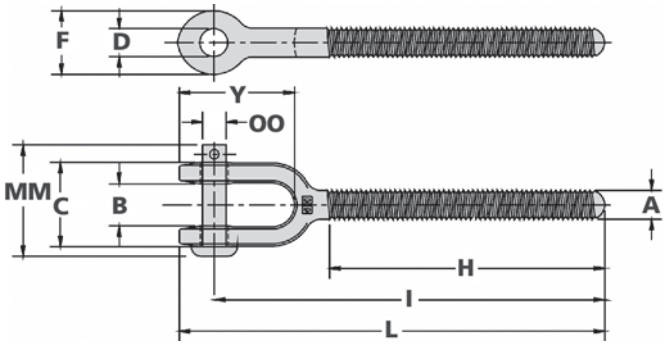


HG-228 JAW & JAW TURNBUCKLE SPECIFICATIONS

Thread Diameter & Take Up (Inches)	HG-228 Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)								
				A	B	E Closed	G	J Open	K Closed	M Open	N Closed	BB
† 1/4 x 4	1032493	500	.37	.25	.45	1.66	.64	11.19	7.19	12.18	8.18	4.07
† 5/16 x 4-1/2	1032518	800	.56	.31	.50	2.02	.87	13.07	8.57	14.12	9.62	4.58
† 3/8 x 6	1032536	1200	.85	.38	.53	2.11	.85	16.25	10.25	17.50	11.50	6.10
1/2 x 6	1032554	2200	1.82	.50	.64	3.22	1.07	18.65	12.65	20.14	14.14	6.03
1/2 x 9	1032572	2200	2.29	.50	.64	3.20	1.07	24.94	15.94	26.43	17.43	9.36
1/2 x 12	1032590	2200	2.71	.50	.64	3.20	1.07	30.94	18.94	32.43	20.43	12.36
5/8 x 6	1032616	3500	3.21	.63	.79	3.90	1.32	19.74	13.74	21.82	15.82	6.03
5/8 x 9	1032634	3500	3.95	.63	.79	3.89	1.32	26.08	17.08	28.16	19.16	9.39
5/8 x 12	1032652	3500	4.58	.63	.79	3.89	1.32	32.08	20.08	34.16	22.16	12.39
3/4 x 6	1032670	5200	4.80	.75	.97	4.71	1.52	21.09	15.09	23.68	17.68	6.13
3/4 x 9	1032698	5200	5.85	.75	.97	4.68	1.52	27.49	18.49	30.08	21.08	9.59
3/4 x 12	1032714	5200	6.72	.75	.97	4.68	1.52	33.49	21.49	36.08	24.08	12.59
3/4 x 18	1032732	5200	8.45	.75	.97	4.71	1.52	45.49	27.49	48.08	30.08	18.53
7/8 x 12	1032750	7200	9.37	.88	1.16	5.50	1.77	34.65	22.65	37.62	25.62	12.16
7/8 x 18	1032778	7200	11.80	.88	1.16	5.50	1.77	47.12	29.12	50.09	32.09	18.63
1 x 6	1032796	10000	10.40	1	1.34	6.09	2.05	23.82	17.82	27.18	21.18	6.18
1 x 12	1032812	10000	13.80	1	1.34	6.09	2.05	35.82	23.82	39.18	27.18	12.18
1 x 18	1032830	10000	17.10	1	1.34	6.09	2.05	47.82	29.82	51.18	33.18	18.18
1 x 24	1032858	10000	21	1	1.34	6.06	2.05	60.42	36.42	63.78	39.78	24.84
1-1/4 x 12	1032876	15200	21.90	1.25	1.84	8.09	2.82	39.37	27.37	43.58	31.58	12.06
1-1/4 x 18	1032894	15200	25.90	1.25	1.84	8.09	2.82	51.37	33.37	55.58	37.58	18.06
1-1/4 x 24	1032910	15200	29.80	1.25	1.84	8.09	2.82	63.93	39.93	68.14	44.14	24.62
1-1/2 x 12	1032938	21400	32.60	1.50	2.06	8.93	2.81	40.76	28.76	45.68	33.68	12.32
1-1/2 x 18	1032956	21400	38	1.50	2.06	8.93	2.81	52.76	34.76	57.68	39.68	18.32
1-1/2 x 24	1032974	21400	43.50	1.50	2.06	8.93	2.81	65.38	41.38	70.30	46.30	24.94
1-3/4 x 18	1033018	28000	53.50	1.75	2.60	9.36	3.35	53.35	35.35	59.16	41.16	18.37
1-3/4 x 24	1033036	28000	61.10	1.75	2.60	9.36	3.35	65.35	41.35	71.16	47.16	24.37
2 x 24	1033054	37000	96.30	2	2.62	11.80	3.74	69.64	45.64	76.72	52.72	24.48
2-1/2 x 24	1033072	60000	167	2.50	3.06	13.26	4.44	72.97	48.97	82.18	58.18	24.6
2-3/4 x 24	1033090	75000	199	2.75	3.69	14.92	4.19	74.75	50.75	85.50	61.50	24.65

* Proof Load is 2.5 Times Work Load Limit. Ultimate Load is 5 Times Work Load Limit.
† Mechanical Galvanized

- Quenched and Tempered.
- Hot Dip galvanized steel.
- Forged jaw ends are fitted with bolts and nuts on sizes 1/4" through 5/8" and pins with cotters on sizes 3/4" through 2-3/4".
- Modified UNJ thread for improved fatigue properties.
- Fatigue Rated.



HG-4037 JAW END FITTING SPECIFICATIONS

Shank Diameter & Take Up (Inches)	Righthand Eye Stock Number	Lefthand Eye Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)										
					A	B	C	D	F	H	Nominal (Minimum)		Y	MM	OO Bolt Pin
											I	L			
* 1/4 x 4	1072298	1072911	500	.11	.25	.45	.91	.30	.63	2.59	3.72	4.09	1.13	1.41	.25
* 5/16 x 4 1/2	1072314	1072939	800	.17	.31	.50	1.02	.30	.69	3	4.41	4.81	1.39	1.41	.25
* 3/8 x 6	1072332	1072957	1200	.28	.38	.53	1.15	.36	.81	3.88	5.28	5.75	1.47	1.58	.31
1/2 x 6	1072350	1072975	2200	.56	.50	.64	1.36	.42	1	4.19	6.51	7.07	1.81	1.87	.37
1/2 x 9	1072378	1072993	2200	.63	.50	.64	1.36	.42	1	5.69	8.01	8.57	1.81	1.87	.37
1/2 x 12	1072396	1073019	2200	.72	.50	.64	1.36	.42	1	7.19	9.51	10.07	1.81	1.87	.37
5/8 x 6	1072412	1073037	3500	1.05	.63	.79	1.75	.55	1.31	4.31	7.12	7.91	2.36	2.44	.50
5/8 x 9	1072430	1073055	3500	1.18	.63	.79	1.75	.55	1.31	5.81	8.62	9.41	2.36	2.44	.50
5/8 x 12	1072458	1073073	3500	1.31	.63	.79	1.75	.55	1.31	7.31	10.12	10.91	2.36	2.44	.50
3/4 x 6	1072476	1073091	5200	1.65	.75	.97	2.09	.69	1.63	4.56	7.86	8.84	2.81	2.56	.63
3/4 x 9	1072494	1073117	5200	1.84	.75	.97	2.09	.69	1.63	6.06	9.36	10.34	2.81	2.56	.63
3/4 x 12	1072519	1073135	5200	2.03	.75	.97	2.09	.69	1.63	7.56	10.86	11.84	2.81	2.56	.63
3/4 x 18	1072537	1073153	5200	2.41	.75	.97	2.09	.69	1.63	10.56	13.86	14.84	2.81	2.56	.63
7/8 x 12	1072555	1073171	7200	2.88	.88	1.16	2.56	.81	1.88	7.81	11.70	12.81	3.25	3.09	.75
7/8 x 18	1072573	1073199	7200	3.25	.88	1.16	2.56	.81	1.88	10.81	14.70	15.81	3.25	3.09	.75
1 x 6	1072591	1073215	10000	3.56	1	1.34	2.76	.94	2.12	5.06	9.35	10.59	3.73	3.44	.88
1 x 12	1072617	1073233	10000	4.22	1	1.34	2.76	.94	2.12	8.06	12.35	13.59	3.73	3.44	.88
1 x 18	1072635	1073251	10000	4.89	1	1.34	2.76	.94	2.12	11.06	15.35	16.59	3.73	3.44	.88
1 x 24	1072653	1073279	10000	5.56	1	1.34	2.76	.94	2.12	14.06	18.35	19.59	3.73	3.44	.88
1-1/4 x 12	1072671	1073297	15200	8.10	1.25	1.84	3.72	1.19	2.63	8.38	14.25	15.79	4.92	4.53	1.13
1-1/4 x 18	1072699	1073313	15200	9.14	1.25	1.84	3.72	1.19	2.63	11.38	17.25	18.79	4.92	4.53	1.13
1-1/4 x 24	1072715	1073331	15200	10.20	1.25	1.84	3.72	1.19	2.63	14.38	20.25	21.79	4.92	4.53	1.13
1-1/2 x 12	1072733	1073359	21400	12.30	1.50	2.06	4.16	1.47	3.12	8.75	15.07	16.84	5.27	5.13	1.38
1-1/2 x 18	1072751	1073377	21400	13.80	1.50	2.06	4.16	1.47	3.12	11.75	18.07	19.84	5.27	5.13	1.38
1-1/2 x 24	1072779	1073395	21400	15.30	1.50	2.06	4.16	1.47	3.12	14.75	21.07	22.84	5.27	5.13	1.38
1-3/4 x 18	1072813	1073439	28000	18.90	1.75	2.60	4.66	1.72	3.50	12.16	18.49	20.58	6.25	6	1.63
1-3/4 x 24	1072831	1073457	28000	21	1.75	2.60	4.66	1.72	3.50	15.16	21.49	23.58	6.25	6	1.63
2 x 24	1072859	1073475	37000	35.30	2	2.62	5.61	2.09	4.19	15.59	23.82	26.36	7.28	6.88	2
2-1/2 x 24	1072877	1073493	60000	55.80	2.50	3.06	5.84	2.38	5.62	17.20	25.61	29.09	9.04	7.50	2.25
2-3/4 x 24	1072895	1073518	75000	72.40	2.75	3.69	6.57	2.88	6.12	17.35	26.75	30.75	9.56	8.38	2.75

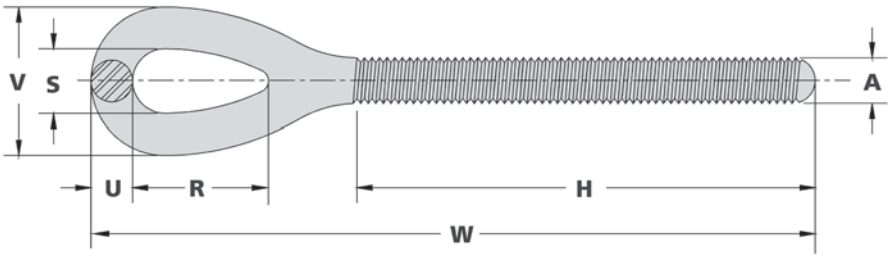
* Mechanical Galvanized

Turnbuckle - Eye End Fitting Specs.

- Quenched and Tempered.
- Hot Dip galvanized steel.
- Turnbuckle eyes are forged elongated, by design, to maximize easy attachment in system and minimize stress in the eye. For turnbuckle sizes 1/4" through 2-1/2", a shackle one size smaller can be reeved through eye.
- Modified UNJ thread for improved fatigue properties.
- Fatigue Rated.

Fatigue Rated®

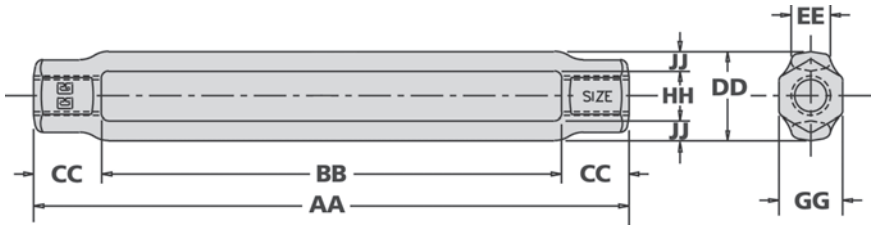
"QT" QUENCHED & TEMPERED®



HG-4037 EYE END FITTING SPECIFICATIONS											
Shank Diameter and Take Up (Inches)	Righthand Eye Stock Number	Lefthand Eye Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)						
					A	H	R	S	U	V	W
† 1/4 x 4	1071057	1071672	500	.07	.25	2.59	.81	.34	.22	.78	4.19
† 5/16 x 4-1/2	1071075	1071690	800	.13	.31	3	.95	.44	.28	1	4.99
† 3/8 x 6	1071093	1071716	1200	.23	.38	3.88	1.13	.53	.34	1.21	6.12
1/2 x 6	1071119	1071734	2200	.51	.50	4.19	1.41	.71	.44	1.59	7.41
1/2 x 9	1071137	1071752	2200	.59	.50	5.69	1.41	.71	.44	1.59	8.91
1/2 x 12	1071155	1071770	2200	.68	.50	7.19	1.41	.71	.44	1.59	10.41
5/8 x 6	1071173	1071798	3500	.82	.63	4.44	1.80	.88	.50	1.88	8.36
5/8 x 9	1071191	1071814	3500	.95	.63	5.94	1.80	.88	.50	1.88	9.86
5/8 x 12	1071217	1071832	3500	1.08	.63	7.44	1.80	.88	.50	1.88	11.36
3/4 x 6	1071235	1071850	5200	1.36	.75	4.56	2.09	1	.63	2.26	9.25
3/4 x 9	1071253	1071878	5200	1.55	.75	6.06	2.09	1	.63	2.26	10.75
3/4 x 12	1071271	1071896	5200	1.73	.75	7.56	2.09	1	.63	2.26	12.25
3/4 x 18	1071299	1071912	5200	2.10	.75	10.56	2.09	1	.63	2.26	15.25
7/8 x 12	1071315	1071930	7200	2.61	.88	7.81	2.38	1.25	.75	2.75	13.10
7/8 x 18	1071333	1071958	7200	3.12	.88	10.81	2.38	1.25	.75	2.75	16.10
1 x 6	1071351	1071976	10000	3.15	1	5.06	3	1.43	.88	3.19	11
1 x 12	1071379	1071994	10000	3.81	1	8.06	3	1.43	.88	3.19	14
1 x 18	1071397	1072010	10000	4.48	1	11.06	3	1.43	.88	3.19	17
1 x 24	1071413	1072038	10000	5.15	1	14.06	3	1.43	.88	3.19	20
1-1/4 x 12	1071431	1072056	15200	7.07	1.25	8.38	3.59	1.82	1.12	4.06	16.19
1-1/4 x 18	1071459	1072074	15200	8.12	1.25	11.38	3.59	1.82	1.12	4.06	19.19
1-1/4 x 24	1071477	1072092	15200	9.16	1.25	14.38	3.59	1.82	1.12	4.06	22.19.
1-1/2 x 12	1071495	1072118	21400	10.30	1.50	8.75	4.09	2.12	1.25	4.62	17.37
1-1/2 x 18	1071510	1072136	21400	11.80	1.50	11.75	4.09	2.12	1.25	4.62	20.37
1-1/2 x 24	1071538	1072154	21400	13.30	1.50	14.75	4.09	2.12	1.25	4.62	23.37
1-3/4 x 18	1071574	1072190	28000	17.50	1.75	12.16	4.65	2.38	1.50	5.38	21.19
1-3/4 x 24	1071592	1072216	28000	19.50	1.75	15.16	4.65	2.38	1.50	5.38	24.19
2 x 24	1071618	1072234	37000	28.90	2	15.59	5.81	2.69	1.75	6.19	27.59
2-1/2 x 24	1071636	1072252	60000	46.40	2.50	17.56	6.50	3.12	2	7.12	29.59
2-3/4 x 24	1071654	1072270	75000	60.20	2.75	17.69	7	3.25	2.25	7.75	30.92

† Mechanical Galvanized

- Quenched and Tempered.
- Hot Dip galvanized steel.
- UNC threads.
- Fatigue Rated.
- Meets the performance requirements of Federal Specifications FF-T-791b, Type 1, Form 1 - Class 2, except for those provisions required by the contractor.



HG-2510 TURNBUCKLE BODY ONLY SPECIFICATIONS											
Shank Diameter & Take Up (Inches)	HG-2510 Stock Number	Work Load Limit (Lbs.)*	Unit Weight (Lbs.)	Dimensions (Inches)							
				AA	BB	CC	DD	EE	GG	HH	JJ
* 1/4 x 4	1033893	500	.15	4.87	4.07	.40	.72	.34	.50	.38	.17
* 5/16 x 4-1/2	1033919	800	.22	5.59	4.58	.51	.82	.38	.56	.44	.19
* 3/8 x 6	1033937	1200	.29	7.29	6.10	.60	.88	.38	.63	.50	.19
1/2 x 6	1033955	2200	.70	7.70	6.03	.84	1.19	.68	.81	.63	.28
† 1/2 x 9	1033973	2200	1.03	11.03	9.36	.84	1.19	.68	.81	.63	.28
† 1/2 x 12	1033991	2200	1.27	14.03	12.36	.84	1.19	.68	.81	.63	.28
5/8 x 6	1034017	3500	1.11	8.02	6.03	1	1.43	.83	1	.75	.34
† 5/8 x 9	1034035	3500	1.59	11.38	9.39	1	1.43	.83	1	.75	.34
† 5/8 x 12	1034053	3500	1.96	14.38	12.39	1	1.43	.83	1	.75	.34
3/4 x 6	1034071	5200	1.50	8.26	6.13	1.07	1.74	.94	1.13	.94	.40
† 3/4 x 9	1034099	5200	2.17	11.72	9.59	1.07	1.74	.94	1.13	.94	.40
† 3/4 x 12	1034115	5200	2.66	14.72	12.59	1.07	1.74	.94	1.13	.94	.40
† 3/4 x 18	1034133	5200	3.63	20.66	18.53	1.07	1.74	.94	1.13	.94	.40
7/8 x 12	1034179	7200	3.61	14.62	12.16	1.23	2	1.13	1.31	1.06	.47
† 7/8 x 18	1034197	7200	5.27	21.09	18.63	1.23	2	1.13	1.31	1.06	.47
1 x 6	1034213	10000	3.32	9	6.18	1.41	2.45	1.25	1.50	1.25	.60
1 x 12	1034231	10000	5.34	15	12.18	1.41	2.45	1.25	1.50	1.25	.60
1 x 18	1034259	10000	7.35	21	18.18	1.41	2.45	1.25	1.50	1.25	.60
† 1 x 24	1034277	10000	9.85	27.66	24.84	1.41	2.45	1.25	1.50	1.25	.60
1-1/4 x 12	1034339	15200	5.72	15.40	12.06	1.67	2.62	1.25	1.88	1.50	.56
1-1/4 x 18	1034357	15200	7.58	21.40	18.06	1.67	2.62	1.25	1.88	1.50	.56
† 1-1/4 x 24	1034375	15200	9.45	27.96	24.62	1.67	2.62	1.25	1.88	1.50	.56
1-1/2 x 12	1034437	21400	8.01	15.82	12.32	1.75	2.99	1.50	2.25	1.75	.62
1-1/2 x 18	1034455	21400	10.40	21.82	18.32	1.75	2.99	1.50	2.25	1.75	.62
† 1-1/2 x 24	1034473	21400	12.90	28.45	24.94	1.75	2.99	1.50	2.25	1.75	.62
1-3/4 x 18	1034552	28000	15.70	22.44	18.37	2.04	3.62	1.75	2.62	2.12	.75
1-3/4 x 24	1034570	28000	19.20	28.44	24.37	2.04	3.62	1.75	2.62	2.12	.75
2 x 24	1034632	37000	25.80	29.13	24.48	2.33	4.14	2	3	2.38	.88
2-1/2 x 24	1034678	60000	55.90	31.66	24.60	3.53	5.62	2.75	3.88	3.12	1.25
2-3/4 x 24	1034696	75000	54	31.66	24.65	3.51	5.62	2.75	3.88	4.48	1.25

* Mechanical Galvanized
† Contains Center Rib

IMPORTANT SAFETY INFORMATION: READ, UNDERSTAND AND FOLLOW.

⚠ WARNING Columbus McKinnon Corporation assumes no responsibility for the misuse or misapplication of any of its products. Products are provided with the express understanding that the purchaser and user are thoroughly familiar with the correct application and proper use of such products in rigging.

⚠ WARNING

IMPROPER USE OR CARE OF CHAIN CAN RESULT IN LOSS OF LOAD AND/OR PERSONAL INJURY.

TO AVOID INJURY:

- Do not exceed the Work Load Limit.
- Always inspect chain before use for wear, damage and elongation. Do not impact load or jerk chain. Apply load slowly.
- Protect chain from corrosion and high temperatures.
- Use only alloy chain and attachments for lifting.
- Do not use twisted, knotted or kinked chain.
- Select the proper grade and size chain for the application.
- Select attachments such as hooks to match the grade, size and Work Load Limit of the chain.
- Be aware of the environment where chain and hardware are being used. Extreme temperatures and corrosive media can affect the Work Load Limit and the life of chain and hardware.

⚠ WARNING

IMPROPER USE OF RIGGING ATTACHMENTS CAN RESULT IN BODILY INJURY OR PROPERTY DAMAGE.

TO AVOID INJURY:

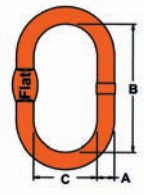
- Do not exceed the Work Load Limit.
- Do not tip load or use attachments in any manner for which they were not intended.
- Do not shock or dynamic load.
- Do not apply load to latches. Latches are to retain slack slings and chain only.
- Select attachments to match the grade, size and Work Load Limit of the chain.
- Do not use excessively worn or damaged attachments.
- Do not use mechanical coupling links to repair alloy chains used for lifting.
- When using masterlinks, do not use oversize crane hooks where the link does not fit in the saddle of the hook.
- When using shackles, do not side load. Centerline of the load must coincide with centerline of shackle.
- Do not replace pins or bolts with other than original equipment parts.
- Use only forged carbon wire rope clips for critical or lifting applications.
- Do not use malleable iron wire rope clips for critical or lifting applications.
- Use wire rope clips in conjunction with wire rope thimbles.
- When using shoulder eyebolts, always apply load in the plane of the eye.
- When using shoulder eyebolts, make sure shoulder is at 90 degrees to axis of hole and seated.
- When using hoist rings, verify full 360 degree seating and re-torque periodically.
- Do not move unbalanced loads.
- When using load binders, do not use a cheater bar or handle extension.
- Do not operate a load binder while anyone is on the load.
- Release lever type load binders with extreme care. Make sure everyone is clear of the load as handle may whip suddenly.

For complete care, use and inspection information, refer to the CM Lifting, Pulling and Binding Products Manual #PMC-10.

MASTERLINK WITH FLAT



- Designed to accept HA 800 Chain, Wire Rope and Synthetic Slings
- Use with mechanical and welded assemblies
- Sizes up to 1-¼" available with flats to accommodate Omega Link
- 100% proof tested
- Extra wide body for wire rope applications



MASTERLINK (WITH FLAT) SPECIFICATIONS

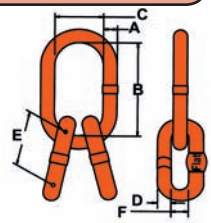
Trade Size (Inches)	Work Load Limit (Lbs.)*	Stock Number	Nominal Dimensions (Inches)			Unit Weight (Lbs.)
			Material Diameter A	Inside Length B	Inside Width C	
7/16	4,200	ML040	.437	4.13	2.29	.50
1/2	5,750	ML050	.562	4.84	2.69	.80
5/8	9,000	ML063	.625	5.29	2.98	1.34
3/4	14,200	ML075	.750	6.61	3.72	2.36
7/8	17,300	ML087	.875	7.35	4.14	3.60
1	26,500	ML100	1	7.53	4.30	5.20
1-1/4	37,400	ML125	1.25	9.26	5.29	9.60
1-1/2	53,000	ML150	1.50	11.03	6.30	16.20
1-3/4	72,150	ML175	1.75	12.86	7.35	25.10
2	94,200	ML200	2	14.70	8.40	38.40
2-1/4	119,200	ML225	2.25	16.54	9.45	54.60
2-1/2	147,150	ML250	2.50	18.38	10.50	74.90
2-3/4	178,050	ML275	2.75	20.21	11.55	99.80

*Work Load Limit is based upon a 5 to 1 Design Factor.

MASTERLINKS WITH SUB-ASSEMBLIES AND FLATS



- Designed to accept Herc-Alloy 800 chain, wire rope and synthetic slings
- Durable orange powder coated finish
- 100% proof tested
- May be used for mechanical and welded sling assemblies
- Extra wide body for wire rope applications
- Sizes up to 1-¼" intermediate links available with flats to accommodate Omega Link



MASTERLINKS WITH SUBASSEMBLIES (AND FLATS) SPECIFICATIONS

Trade Size (Inches)	Work Load Limit (Lbs.)*	Stock Number	Masterlink Nominal Dimensions (Inches)			Sub-Assy. Nominal Dimensions (Inches)			Unit Weight (Lbs.)
			Material Diameter A	Inside Length B	Inside Width C	Material Diameter D	Inside Length E	Inside Width F	
1/2	4,600	MSA050	.562	4.84	2.69	.437	4.13	2.29	1.8
5/8	7,200	MSA063	.625	5.29	2.98	.512	4.84	2.69	2.9
3/4	11,200	MSA075	.750	6.61	3.72	.625	5.29	2.98	5
7/8	13,840	MSA087	.875	7.35	4.14	.625	5.29	2.98	6.3
1	21,200	MSA100	1	7.53	4.30	.750	6.61	3.72	9.9
1-1/4	29,920	MSA125	1.25	9.26	5.29	1	7.53	4.30	19.9
1-1/2	42,400	MSA150	1.50	11.03	6.30	1	7.53	4.30	26.5
1-3/4	57,720	MSA175	1.75	12.86	7.35	1.25	9.26	5.29	44
2	75,360	MSA200	2	14.70	8.40	1.50	11.03	6.30	71
2-1/4	95,360	MSA225	2.25	16.54	9.45	1.75	12.86	7.35	105
2-1/2	117,720	MSA250	2.50	18.38	10.50	1.75	12.86	7.35	126
2-3/4	142,400	MSA275	2.75	20.21	11.55	2	14.70	8.40	177
3	192,680	MSA300	3	18.90	11.03	2.25	16.54	9.45	224
3-1/4	226,120	MSA325	3.25	20.48	11.94	2.50	18.38	10.50	295
3-1/2	262,240	MSA350	3.50	22.05	12.86	2.75	20.21	11.55	381

*Work Load Limit is based upon a 5 to 1 Design Factor.

WARNING See Page 239 for Important Safety, Use and Inspection Information.

EYE HOOKS

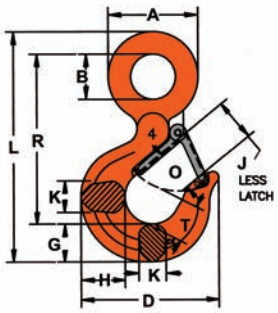


- Built in distortion detectors
- Load rating marked on each hook body
- Proof load 2 times WLL
- Design factor 5:1
- Pre-drilled latch tab allows for the installation of hook latch
- Carbon hooks have a clear protective coating to resist rust and for cleaner handling. (Use suffix "C" when ordering Carbon Clear Finish. Use suffix "G" when ordering Hot Dip Galvanized).



EYE HOOK SPECIFICATIONS

Alloy Hook		Carbon Hook		Dimensions (Inches)												Unit Weight (Lbs.)
WLL (Tons)	Stock Number	WLL (Tons)	Stock Number	A	B	C	D	G	H	J	K	L	O	R	T	
1	M6502A	3/4	M6502C	1.50	.75	.38	3.06	.87	1.05	.93	.63	4.37	.93	3.13	.87	.66
1-1/2	M6503A	1	M6503C	1.75	.88	.44	3.33	.94	1.11	.97	.71	5.04	.97	3.66	.97	1.12
2	M6504A	1-1/2	M6504C	2.13	1.13	.50	3.67	1.06	1.21	1.06	.88	5.63	1.06	4.09	1.03	1.46
3	M6505A	2	M6505C	2.50	1.25	.63	4.20	1.27	1.43	1.19	.94	6.55	1.16	4.67	1.16	2.42
5	M6507A	3	M6507C	3.06	1.56	.75	5.11	1.44	1.63	1.50	1.31	7.97	1.41	5.78	1.53	4.10
7	M6509A	5	M6509C	3.88	2	.94	6.24	1.82	2.01	1.78	1.68	10.07	1.69	7.31	1.94	8.16
11	M6511A	7-1/2	M6511C	4.69	2.44	1.13	7.89	2.25	2.63	2.38	1.88	12.41	2.19	9.03	2.52	15.60
15	M6515A	10	M6515C	5.34	2.84	1.25	8.37	2.59	2.94	2.50	2.19	14.05	2.30	10.21	2.54	21.58
22	M6522A	15	M6522C	6.63	3.50	1.56	10.19	3	3.50	3.30	2.69	17.37	3.12	12.81	2.73	39.89



SWIVEL HOOKS

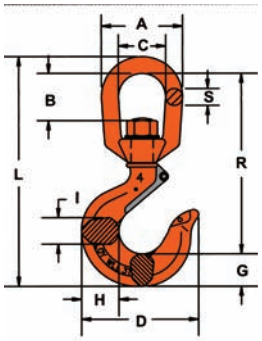


- Design factor 5:1
- Pre-drilled for latches
- Hook and latch assemblies furnished
- Powder coated orange
- Carbon swivel hooks are advanced Micro-alloy which requires no secondary heat treat
- Alloy swivel hooks are heat treated quenched and tempered



SWIVEL HOOK SPECIFICATIONS

Alloy		Carbon		Dimensions (Inches)												Unit Weight (Lbs.)
WLL (Tons)	Stock Number	WLL (Tons)	Stock Number	A	B	C	D	G	H	I	L	R	S	T	O	
1	M3502A	3/4	M3502C	2	1.11	1.25	3.06	.87	1.05	.63	5.83	4.63	.38	.87	.93	1.05
1-1/2	M3503A	1	M3503C	2.50	1.38	1.50	3.33	.94	1.11	.71	6.83	5.44	.50	.97	.97	1.56
2	M3504A	1-1/2	M3504C	3	1.65	1.75	3.67	1.06	1.21	.88	7.76	6.25	.63	1.03	1.06	2.50
3	M3505A	2	M3505C	3	1.65	1.75	4.20	1.27	1.43	.94	8.40	6.49	.63	1.16	1.16	3.20
5	M3507A	3	M3507C	3.50	1.77	2	5.11	1.44	1.63	1.31	9.76	7.53	.75	1.53	1.41	5.36
7	M3509A	5	M3509C	4.75	2.39	2.75	6.24	1.82	2.01	1.68	12.42	9.67	1	1.94	1.69	10.56
11	M3511A	7-1/2	M3511C	5.50	2.55	3.25	7.69	2.25	2.63	1.88	14.89	12.06	1.13	2.46	2.22	19
15	M3515A	10	M3515C	6	2.47	3.50	8.37	2.59	2.94	2.19	15.79	11.95	1.25	2.62	2.23	26.75
22	M3522A	15	M3522C	7.75	3.82	4.75	10.19	3	3.50	2.69	21.18	16.68	1.50	2.74	3.05	51.80



WARNING See Page 239 for Important Safety, Use and Inspection Information.

INDUSTRIAL – GOVERNMENT RATED



SCREW PIN



ROUND PIN



BOLT-NUT-COTTER (B-N-C)



SCREW PIN



ROUND PIN



BOLT-NUT-COTTER (B-N-C)

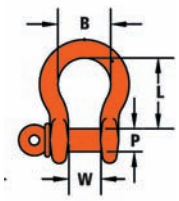
MADE IN USA

- Meets the requirements of Federal Specification RR-C-271D Amendment 1 and ASME B30.26.
- All shackle pins are forged from alloy steel and are heat treated and tempered for greater strength.
- Marked with size (inches and millimeters) and Work Load Limit in tons.
- Proof tested to 2.2 times Work Load Limit.
- Ultimate strength is five times the Work Load Limit.
- All Bolt, Nut & Cotter (B-N-C) have thread protected ends.
- Galvanized per ASTM A153.
- Standard Industry tolerances apply.
- Do not exceed Work Load Limit.
- When shackles need to be used above 400°F/204°C or below -40°(F/C), consult the factory.
- Round Pin shackles cannot be side loaded or used to collect multiple slings.

CARBON ANCHOR SHACKLE SPECIFICATIONS (Inches)

Trade Size (Inches)	Work Load Limit (Tons)	Stock No. (Screw Pin)	Stock No. (Round Pin)	Stock No. (B-N-C)	P	E	W	R	L	B Min.	Unit Weight (Lbs)
3/16	1/3	MC645G	MC345G	-	.25	.307	.375	.625	.875	.562	.06
1/4	1/2	MC646G	MC346G	MC846G	.312	.401	.469	.875	1.13	.75	.12
5/16	3/4	MC647G	MC347G	MC847G	.375	.463	.531	1.00	1.25	.812	.20
3/8	1	MC648G	MC348G	MC848G	.438	.531	.656	1.13	1.44	.937	.30
7/16	1-1/2	MC649G	MC349G	MC849G	.50	.593	.75	1.25	1.69	1.06	.50
1/2	2	MC650G	MC350G	MC850G	.625	.718	.813	1.38	1.88	1.19	.75
5/8	3-1/4	MC651G	MC351G	MC851G	.750	.843	1.06	1.88	2.38	1.50	1.3
3/4	4-3/4	MC652G	MC352G	MC852G	.875	.968	1.25	2.13	2.81	1.75	2.3
7/8	6-1/2	MC653G	MC353G	MC853G	1.00	1.11	1.44	2.38	3.31	2.00	3.5
1	8-1/2	MC654G	MC354G	MC854G	1.13	1.23	1.69	2.63	3.75	2.31	5
1-1/8	9-1/2	MC655G	MC355G	MC855G	1.25	1.38	1.81	2.88	4.25	2.63	7
1-1/4	12	MC656G	MC356G	MC856G	1.38	1.53	2.03	3.25	4.69	2.88	9.5
1-3/8	13-1/2	MC666G	MC366G	MC866G	1.50	1.66	2.25	3.50	5.25	3.25	12.5
1-1/2	17	MC657G	MC357G	MC857G	1.63	1.78	2.38	3.75	5.75	3.38	17.2
1-5/8	20	MC685G	MC385G	MC885G	1.75	1.91	2.63	4.13	6.25	4.00	23.5
1-3/4	25	MC677G	MC377G	MC877G	2.00	2.16	2.88	4.50	7.00	4.50	27.7
2	35	M658G	M358G	M858G	2.25	2.41	3.25	5.25	7.75	5.25	39

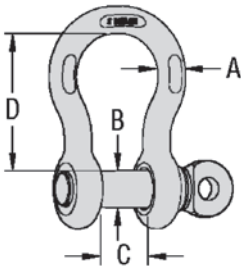




WARNING See Page 239 for Important Safety, Use and Inspection Information.

NITRONIC ANCHOR SHACKLE





Made in USA

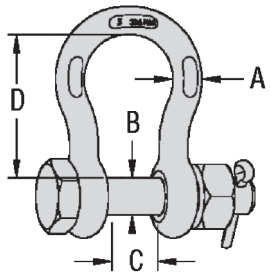
NITRONIC ANCHOR SHACKLE SPECIFICATIONS

Stock Number	Dimensional Information (Inches)				Work Load Limit (Lbs.)	Weight (Lbs.)
	A	B	C	D		
S0116-NM07	1/4	.33	.49	1.09	1,500	.12
S0116-NM10	3/8	.44	.66	1.41	2,000	.30
S0116-NM13	1/2	.63	.82	1.83	4,000	.71
S0116-NM16	5/8	.75	1.02	2.41	6,000	1.39
S0116-NM20	3/4	.87	1.25	2.84	10,000	2.31
S0116-NM22	7/8	.98	1.54	3.35	12,000	3.62
S0116-NM25	1	1.14	1.72	3.76	16,000	5.17

NOTE: I/A/W MIL-F-17280D, TYPE 1. Used by the US Navy for minesweeping operations.
Dimensions are subject to change without notice.
Work Load Limit based upon a 5:1 Design Factor.

BOLT ANCHOR SHACKLE





Made in USA

STAINLESS BOLT ANCHOR SHACKLE SPECIFICATIONS

Stock Number	Dimensional Information (Inches)				Work Load Limit (Lbs.)	Weight (Lbs.)
	A	B	C	D		
S0116-SA07	1/4	.31	.47	1.11	1,000	.12
S0116-SA08	5/16	.38	.53	1.20	1,300	.18
S0116-SA10	3/8	.44	.66	1.41	1,500	.35
S0116-SA12	7/16	.50	.72	1.77	2,000	.57
S0116-SA13	1/2	.63	.82	1.83	3,000	.84
S0116-SA16	5/8	.75	1.02	2.41	4,000	1.64
S0116-SA20	3/4	.88	1.25	2.84	6,000	2.75
S0116-SA22	7/8	1.00	1.48	3.30	8,000	4.18
S0116-SA25	1	1.13	1.70	3.80	10,000	5.61
S0116-SA32	1-1/4	1.38	2.03	4.69	14,000	9.88

NOTE: I/A/W FED SPEC RR-271D, TYPE IVA, CLASS 3, EXCEPT 316 STAINLESS.
Dimensions are subject to change without notice.
Work Load Limit is based upon a 5:1 Design Factor.
Other Sizes are available on request.

GN Sling Protector Shackle – Type H14

MATERIAL: FORGED ALLOY STEEL QUENCHED AND TEMPERED

DESIGN FACTOR: 5 TO 1

FINISH: PAINTED

ALL ITEMS PROOF TESTED

CERTIFICATES ON REQUEST: MANUFACTURER,PROOF TEST DNV, LLOYDS, ABS OR BV

SHARPY IMPACT VALUE AT -4°F/-20°C IS 31 FT./LBS. OR (42 JOULES)

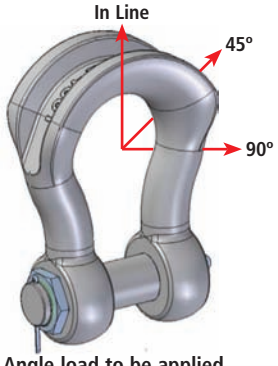
COLD TEMP SHACKLES AVAILABLE

ROUNDED BODY PROTECTS SLINGS

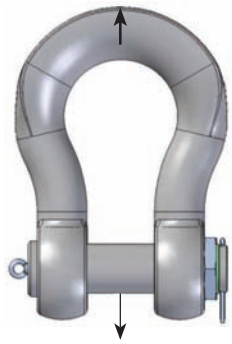
SIDE LOAD REDUCTION	
Angle of Side Load from Vertical In-Line of Shackle	**Adjusted Work Load Limit**
0° In-Line	100% of Work Load Limit
45° from In-Line	70% of Work Load Limit
90° from In-Line	50% of Work Load Limit



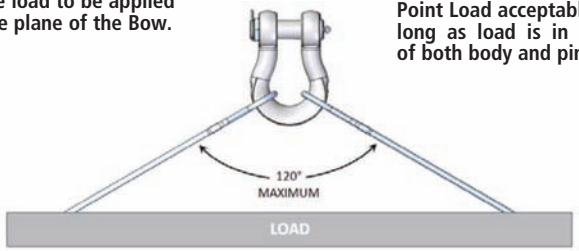
(Model is not M. Gelskey, Sr.)



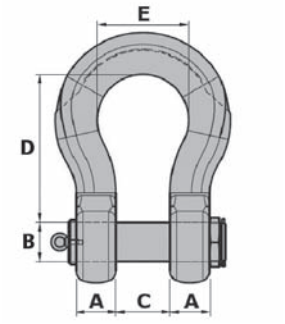
Angle load to be applied in the plane of the Bow.

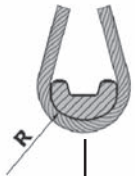


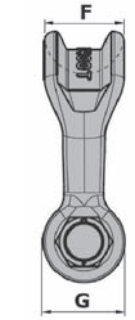
Point Load acceptable as long as load is in center of both body and pin.



Acceptable Symmetrical Load: 100% WLL is maintained at up to 120° Maximum Angle.







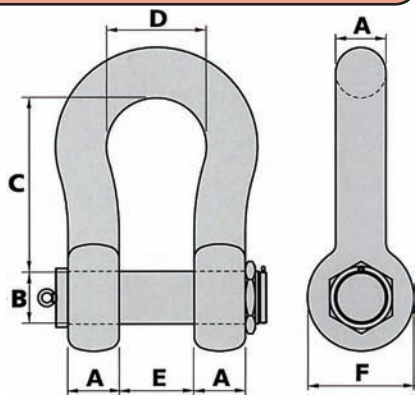
GN SLING PROTECTOR SHACKLE - TYPE H14 SPECIFICATIONS										
Stock Number	**WLL (Tons)**	**DIMENSIONS (Inches)**								**Weight (Lbs.)**
		A	**B**	**C**	**D**	**E**	**F**	**G**	**R**	
36000040	40	1.77	1.97	2.87	8.27	5.51	3.74	4.13	1.97	35
36000055	55	2.36	2.20	3.54	9.45	6.30	4.53	4.57	2.36	68
36000075	75	2.76	2.76	4.13	11.42	7.28	4.72	5.31	2.76	99
36000125	125	3.15	3.15	5.12	14.37	8.66	5.91	5.98	3.15	265
36000150	150	3.54	3.74	5.51	15.35	9.84	6.69	7.28	3.54	353
36000200	200	4.13	4.13	5.91	18.90	10.83	8.07	8.86	4.33	507
36000250	250	4.33	4.72	6.69	21.65	11.81	9.45	9.45	5.12	705
36000300	300	5.51	5.28	7.28	23.62	13.78	10.43	11.02	5.51	750
36000400	400	6.30	6.30	8.66	23.62	14.57	12.60	12.99	6.69	1367
36000500	500	6.69	7.09	9.84	25.59	17.72	13.39	13.78	7.09	1764
36000600	600	7.09	7.87	10.83	28.35	19.29	14.57	15.94	7.48	2116
36000700	700	7.87	8.46	11.81	29.53	21.26	15.75	18.31	8.27	2756
36000800	800	8.66	9.06	12.80	30.71	21.85	16.54	18.31	8.27	3086
36000900	900	9.37	9.84	13.78	33.46	23.03	17.32	18.90	8.66	4630
36001000	1000	9.45	10.63	14.96	33.46	24.21	18.11	20.87	9.06	4850
36001250	1250	10.24	11.81	16.93	36.61	25.39	20.87	22.44	10.63	6173
36001500	1500	11.02	12.60	18.11	37.40	26.77	22.05	24.02	11.42	7275

Tolerance + 5%
Dimensions subject to change without notice.
Ton = 2000 Lbs.

TYPE H10

Material: Up to and including 120 T: Forged High Strength Steel
Above 120T: Forged High Strength Alloy Steel
Design Factor: 5 to 1
Finish: Painted/Galvanized
All Items Proof Tested
Standard Certificates:
Manufacturer and 3.1B Material
Certificates on Request:
3.1C Material and proof test
DNV, Lloyds, ABS, BV, etc.





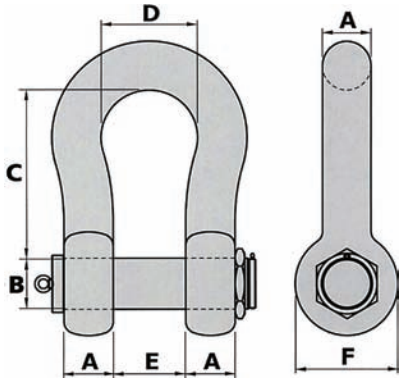
GN BOW SAFETY PIN SHACKLE - TYPE H10 SPECIFICATIONS								
Stock Number	WLL (Tons)	DIMENSIONS (Inches)						Weight (Lbs.)
		A	B	C	D	E	F	
37001209	120	3.50	3.74	15.00	9.37	5.91	7.87	242
37001509	150	4.02	4.25	15.75	10.83	6.69	9.06	352
37002009	200	4.72	4.92	19.69	11.42	7.09	10.24	517
37002509	250	4.92	5.51	21.26	12.01	7.87	10.24	627
37003009	300	5.31	5.91	23.62	12.01	7.87	12.01	748
37004009	400	6.50	6.89	25.60	12.80	8.86	13.78	1232
37005009	500	6.89	7.28	27.56	13.78	9.84	14.57	1507
37006009	600	7.68	8.07	27.56	14.76	10.83	15.94	1936
37007009	700	8.07	8.46	27.56	15.75	11.81	17.13	2156
37008009	800	8.27	8.66	27.56	15.75	11.81	17.13	2420
37009009	900	8.66	9.06	27.56	16.54	12.60	18.31	2816
37010009	1000	9.06	9.45	27.56	16.54	13.39	18.90	3212

Tolerance + 5%
Dimensions subject to change without notice.
Ton = 2000 Lbs.

TYPE H10 SUPER

Material: Forged High Strength Alloy Steel
Design Factor: 5 to 1
Finish: Painted/Galvanized
All Items Proof Tested
Standard Certificates and Certificates on Request are the same as Type H10.



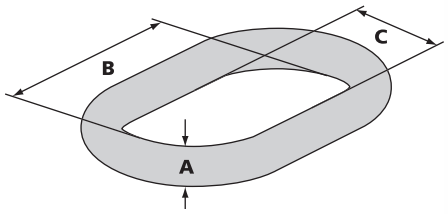


GN BOW SAFETY PIN SHACKLE - TYPE H10 SUPER SPECIFICATIONS								
Stock Number	WLL (Tons)	DIMENSIONS (Inches)						Weight (Lbs.)
		A	B	C	D	E	F	
3800300	30	1.50	1.65	5.75	3.90	2.36	3.31	18
3800400	40	1.77	1.97	7.01	4.96	2.91	4.17	31
3800550	50	2.24	2.24	7.76	5.43	3.27	4.49	42
3800850	80	2.76	2.76	10.00	7.09	4.13	5.51	84
37001109	120	3.27	3.27	12.99	7.87	5.00	5.91	130
37001409	150	3.54	3.74	15.00	9.37	5.24	7.48	243
37001759	175	4.02	4.25	15.75	9.84	5.51	9.06	331
37002008	200	4.72	4.76	19.69	11.42	7.09	10.24	496
37002508	250	4.92	5.00	20.08	12.80	8.66	10.24	661

Tolerance + 5%
Dimensions subject to change without notice.
Ton = 2000 Lbs.

SC1 MASTERLINKS

Material: High Strength Alloy Steel
Design Factor: 5 to 1
Finish: Painted
Standard Certificates:
- 3.1B Material
- Manufacturer
- Proof Test



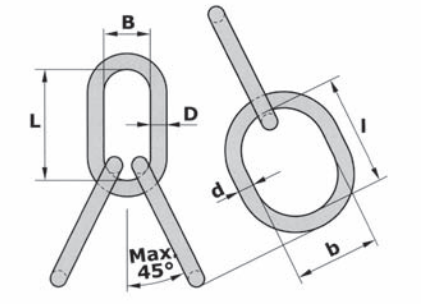


GN MASTER LINK - TYPE SC1 SPECIFICATIONS					
Stock Number	WLL (Tons)	DIMENSIONS (Inches)			Weight (Lbs.)
		A	B	C	
12220000	4	.87	6.30	3.54	3
12260000	6	1.02	7.09	3.94	5
12320000	8	1.26	7.87	4.33	9
12360000	13	1.42	10.24	5.51	14
12450000	21	1.77	13.39	7.09	29
12510000	29	2.01	13.78	7.48	37
12570000	38	2.24	15.75	7.87	55
12630000	46	2.48	16.93	9.06	71
12720000	67	2.83	17.32	9.84	101
12800000	84	3.15	17.72	9.84	137
12900000	105	3.54	18.11	11.81	165
12910000	126	3.94	19.69	11.81	227
12912500	200	4.53	23.62	15.75	419
12912510	240	4.53	23.62	11.81	353
12913500	304	4.53	27.56	9.84	364
12914000	304	4.53	19.29	9.84	293

Tolerance + 5%
Dimensions subject to change, without notice.
Ton= 2000 Lbs.

SC5 MASTERLINKS WITH SUBASSEMBLIES

Material: High Strength Alloy Steel
Design Factor: 5 to 1
Finish: Painted
Standard Certificates:
- 3.1B Material
- Manufacturer
- Proof Test





GN MASTER LINK WITH SUBASSEMBLY - TYPE SC5 SPECIFICATIONS								
Stock Number	WLL (Tons)	DIMENSIONS (Inches)						Weight (Lbs.)
		D	L	B	d	l	b	
58000070	56	2.68	18.11	8.66	2.68	16.93	11.81	386
58000100	80	3.15	19.69	9.84	3.15	18.11	12.99	492
58000125	100	3.54	22.05	10.63	3.54	19.69	12.99	668
58000175	140	3.94	23.62	10.63	3.94	22.05	12.99	884
58000250	200	4.53	23.62	15.75	4.53	23.62	15.75	1146
58000300	240	4.53	23.62	11.81	4.53	23.62	15.75	1107

Tolerance + 5%
Dimension are subject to change, without notice.
Ton= 2000 Lbs.

GN Triangle Lifting Plate – Type TR1

MATERIAL:
BODY: HIGH STRENGTH STEEL

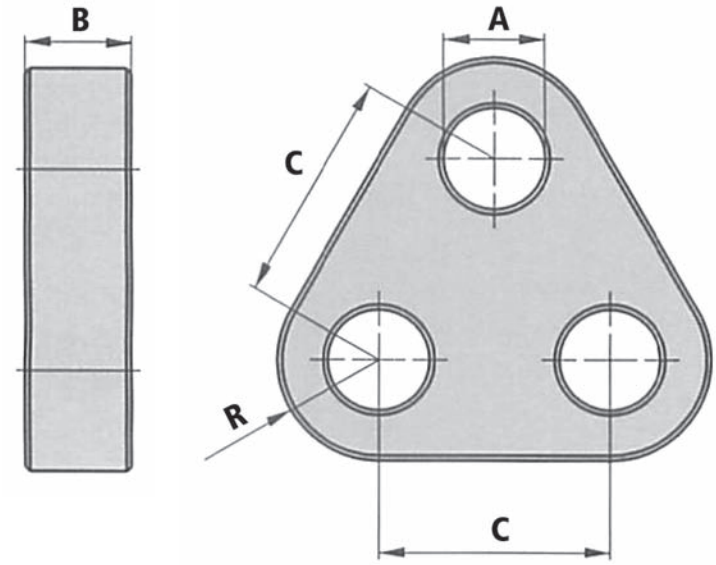
DESIGN FACTOR: 5 TO 1

FINISH: PAINTED

STANDARD CERTIFICATES:
3.1 B MATERIAL
MANUFACTURER
PROOF TEST

CERTIFICATES ON REQUEST:
3.1C MATERIAL
DNV, LLOYDS, ABS, BV or MPI.





GN TRIANGLE LIFTING PLATE - TYPE TR1 SPECIFICATIONS						
Stock Number	WLL (Tons)	DIMENSIONS (Inches)				Weight (Lbs.)
		A	B	C	R	
75001700	17	1.85	1.38	4.72	2.56	22
75002500	25	2.17	1.57	5.91	3.15	40
75003500	35	2.36	1.97	6.30	3.54	62
75005500	55	2.95	2.76	8.27	4.13	128
75008500	85	3.54	3.15	9.06	5.31	212
75012000	120	4.13	3.94	11.02	6.69	414
75015000	150	4.53	4.33	12.60	7.28	564
75017500	175	4.53	4.33	12.60	7.68	604
75020000	200	5.51	4.72	15.35	8.46	860
75025000	250	5.91	5.51	15.35	9.45	1142

Tolerance + 5%
Dimensions are subject to change, without notice.
Ton = 2000 Lbs.

GN Double Pin Connector Shackle - Type H12

MATERIAL:
BODY: HIGH STRENGTH STEEL
PIN: HIGH STRENGTH ALLOY STEEL

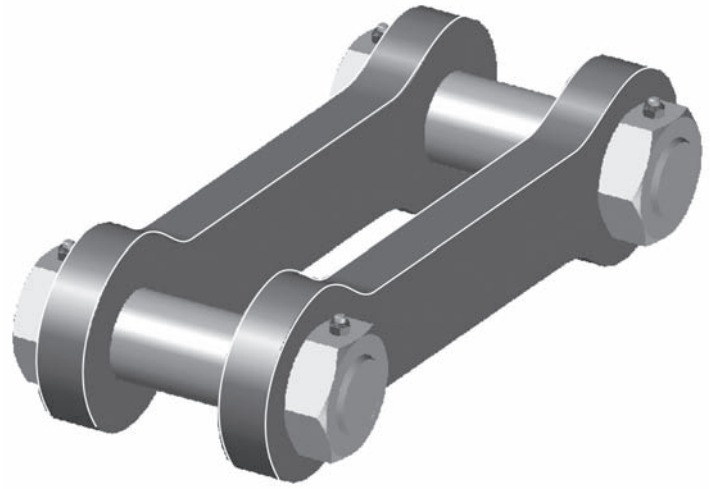
DESIGN FACTOR: 5 TO 1

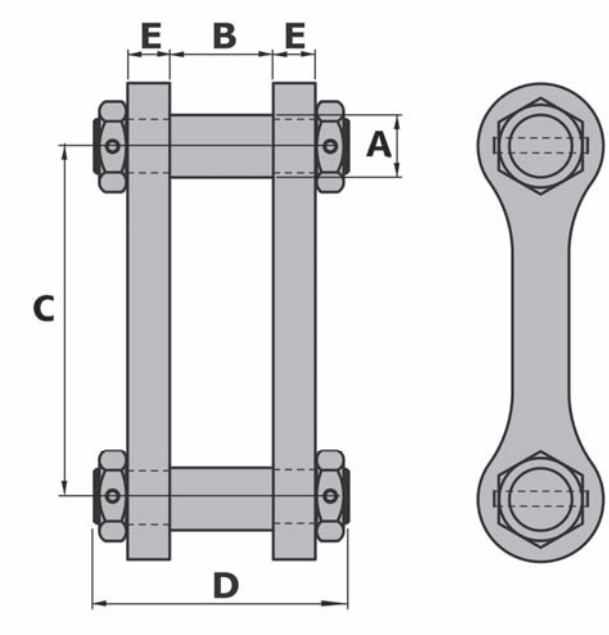
FINISH: PAINTED

STANDARD CERTIFICATES:
3.1 B MATERIAL
MANUFACTURER
PROOF TEST

CERTIFICATES ON REQUEST:
3.1C MATERIAL
DNV, LLOYDS, ABS, BV or MPI.

PLEASE NOTE:
YOU MUST ENSURE THAT THE LOAD IS CENTERED ON THE PIN. WHEN THERE IS TOO MUCH SPACE IN THE JAW (B DIMENSION), USE WASHERS TO CENTER THE LOAD.





GN DOUBLE PIN CONNECTOR SHACKLE - TYPE H12 SPECIFICATIONS								
Stock Number	Thimble Size	WLL (Tons)	DIMENSIONS (Inches)					Weight (Lbs.)
			A	B	C`	D	E	
38120000	12″	110	4.33	6.69	21.26	20.08	3.54	465
38150000	15″	110	4.33	7.87	21.26	21.26	3.54	476
38180000	18″	110	4.33	8.86	27.95	22.24	3.54	538
38210000	21″	110	4.33	9.84	27.95	23.23	3.54	551

Tolerance + 5%
Dimensions are subject to change, without notice.
Ton = 2000 Lbs.

Actek® Safety and Warning Information

Actek® products are intended for use only by trained, qualified and experienced personnel. Misuse of any Actek® product or lack of supervision and inspection can lead to serious accidents including death. Actek® has always stressed that safety is of utmost importance.

Prior to any use of Actek® product, evaluation of the product application, safety precautions, Work Load Limits and control of all field conditions is mandatory. Prevent applications that exceed the Work Load or any other product misuse. Actek® cautions that all design factors shown are approximate and apply to new and unused or in "as new" condition products. Work Load Limits should never be exceeded under any circumstance.

If you have any questions about the proper use or installation of any Actek® product, please call (800) 752-7229.

Safety Notes

Actek® ensures that all materials meet or exceed the safety requirements for lifting. Work Loads are based upon a new or in "as new" condition product. Work Load is considered to be the greatest load that should be applied to an item at any time.

INSPECTION & MAINTENANCE

In order to ensure safe lifting, Actek® products must be properly used and maintained. Hoist rings may be subject to wear, corrosion, deformation, overloading and other limiting factors which may affect the Work Load Limits. Prior to use, the product should be regularly inspected to determine if it may be used or whether it should be removed from service. It is the responsibility of the user to inspect all lifting units for signs of wear and to discard any parts showing visible signs of wear. Every user should establish a safety inspection program for routine visual inspection of all products to determine whether damage (e.g. cracks, corrosion and deformation) is present. A product inspection schedule should be established based upon factors such as frequency of use, period of use and environment. In addition to the regular safety inspection, the following safety directives must be followed:

- Prior to use, always inspect hoist rings for possible wear or damage. Never use hoist rings that show any sign of wear or damage.
- Never use hoist rings if bail is bent or elongated.
- Prior to use, threads must be clean, undamaged and must fit properly.
- Always install hoist rings using the listed torque value. Periodically check torque because screws could loosen during service.
- Bent bolts should be discarded or replaced with bolts of proper size and grade. Never straighten bent bolts; it may lead to serious injury or death.
- Never use washers or any spacers between bushing and mounting surface.
- Always make sure the hoist ring pivots and rotates in all directions freely.
- Never use hoist rings near or around corrosive materials.
- If hoist ring is exposed to extreme temperatures (hot or cold), please contact our engineering department for suggestions/consultation.
- Work Load Limits should never be exceeded under any circumstance.

If there are questions regarding the replacement or repair of worn Actek® products, please contact us.

IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.

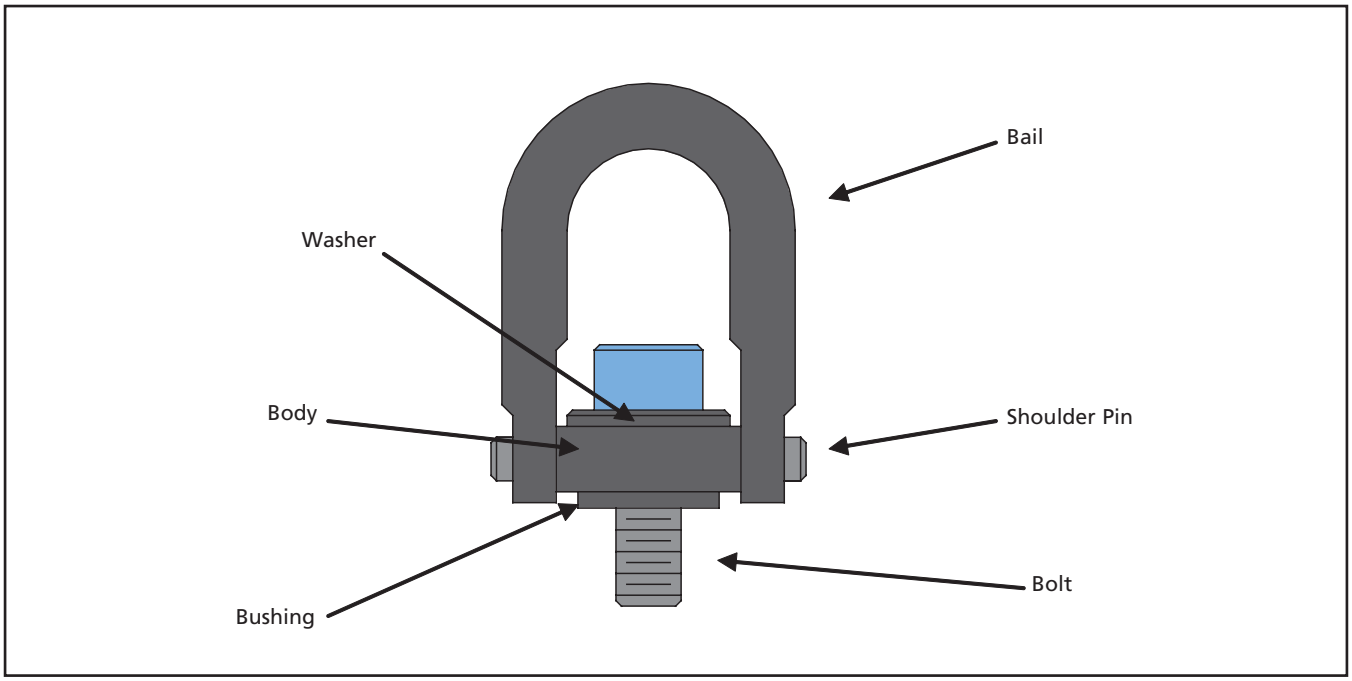
- **ALWAYS READ SAFETY PRECAUTIONS PRIOR TO USE OR INSTALLATION.** (Safety Precaution included with every hoist ring).
- **ALWAYS INSPECT THE HOIST RING BEFORE EACH USE.**
- Regularly inspect all hoist ring parts.
- Always tighten the bolt to the recommended torque value.
- Always make sure that the hoist ring is free to pivot and swivel in all directions.
- Always choose a hoist ring with the proper load rating. See the "Actual Load" equation to help you choose the appropriate hoist ring.
- Always make sure that the bushing of the hoist ring sits flush against the object being lifted.
- Install hoist rings in materials that have a tensile strength of at least 80,000 psi.
- Always make sure the thread engagement is at least 1.5 times the diameter of the hoist ring bolt.
- When installing a hoist ring in a through-hole with a nut and washer, make sure to use a Grade 8 nut that has full thread engagement.
- Consider periodic load-testing as an extra precaution.
- **NEVER EXCEED WORK LOAD LIMITS.**
- **NEVER APPLY SHOCK LOAD.**
- Never use a hoist ring that you believe is damaged.
- Never use a hoist ring that has damaged threads on the bolt.
- Never use a hoist ring in an application where it does not pivot and swivel in every direction freely.
- Never use a hoist ring that is not tightened to the recommended torque.
- Never replace the components of the hoist ring with anything other than parts recommended by Actek®.
- Never use a hook larger than the diameter of the hoist ring opening.
- Never shim or use washers between the hoist ring and surface of object being lifted.

IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.

HOIST RING INSPECTION & MAINTENANCE

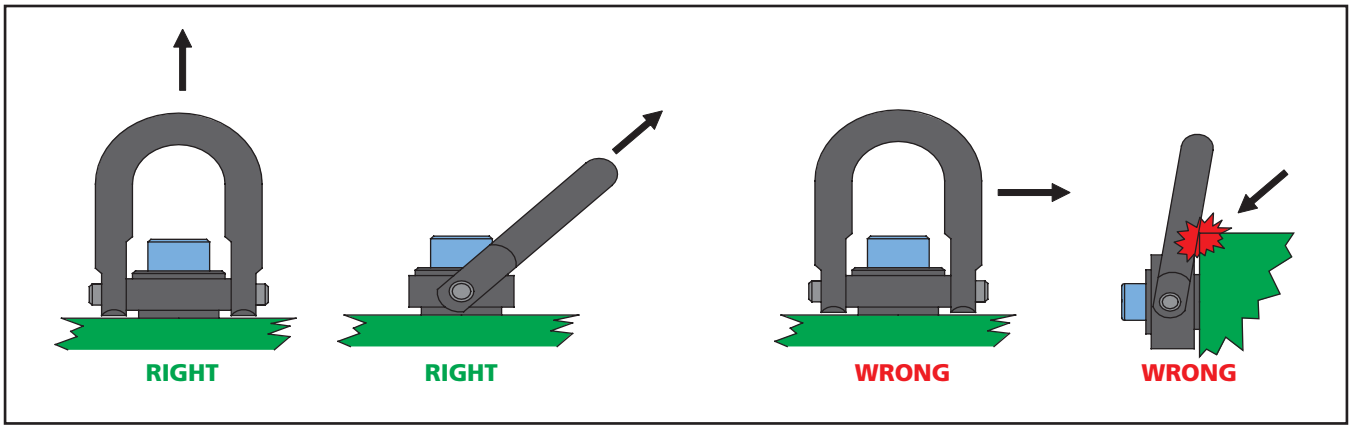
ALWAYS INSPECT THE HOIST RING BEFORE EACH USE. MAKE SURE:

- **The bolt is tightened to the recommended torque.**
  If the bolt is not tightened, the threads may be stripped during lifting.
- **The bushing of the hoist ring sits flush against the object being lifted.**
  This ensures the recommended torque puts the proper preload onto the hoist ring allowing the hoist ring to reach its full Work Load Limit.
- **The hoist ring is free to swivel and pivot in every direction.**
  If the hoist ring binds up in any direction, it should be removed from service.
- **There are no signs of corrosion**.
  Corrosion can cause deterioration to the hoist ring material allowing for fatigue or cracking to take place. Corrosion can also prevent the hoist ring from pivoting and swiveling freely.
- **There are no signs of wear or cracks, especially on the bolt, shoulder pins and bail.**
  Damage or wear on the bolt head, shoulder pins or bail may be an indication that the hoist ring is coming into contact with obstructions during use. Contact with obstructions should be avoided as it can cause binding and shock loads which exceed the rating of the hoist ring.
- **The shoulder pins are secure and do not rotate or come loose.**
  Check by using pliers to rotate the shoulder pins by hand. If the shoulder pin rotates, it is no longer securely in place and could come loose causing the hoist ring to break.



⚠ WARNING
NEVER EXCEED WORK LOAD LIMIT.

IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.



The load on each hoist ring is not simply total weight divided by the number of hoist rings. The resultant force can be significantly greater at shallow lift angles and with unevenly distributed loads. See the example below.

L = Load
W = Total weight = 2,000 Lbs.
N = Number of hoist rings = 4
A = Lifting angle

$$L = \frac{W}{N \sin A}$$

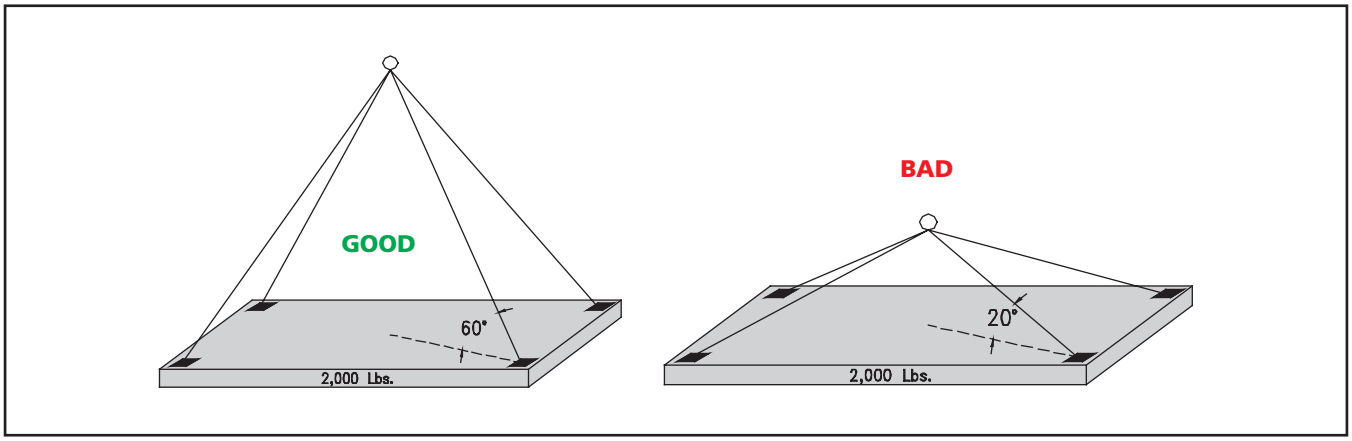
If A = 60 degrees:

$$L = \frac{2000}{4 \sin 60 \text{ deg.}} = 580 \text{ Lbs.}$$

If A = 20 degrees:

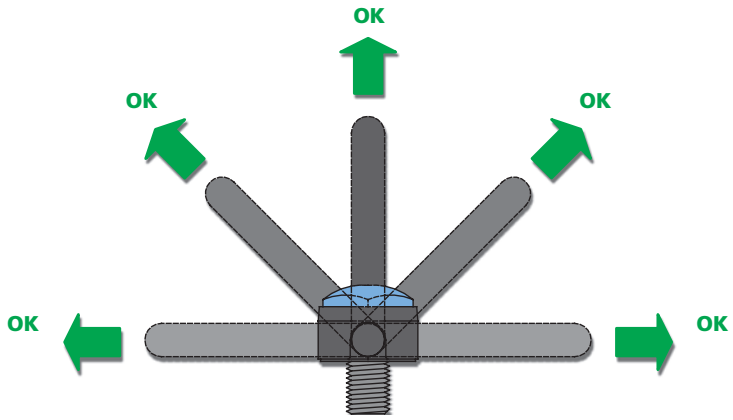
$$L = \frac{2000}{4 \sin 60 \text{ deg.}} = 1{,}465 \text{ Lbs.}$$

Lifting Angle (Degrees)	Number of Hoist Rings	Weight of Load (Lbs.)	Actual Applied Load on Hoist Ring (Lbs.)
90	4	2,000	500
80	4	2,000	510
70	4	2,000	535
60	4	2,000	580
50	4	2,000	655
40	4	2,000	780
30	4	2,000	1,000
20	4	2,000	1,465

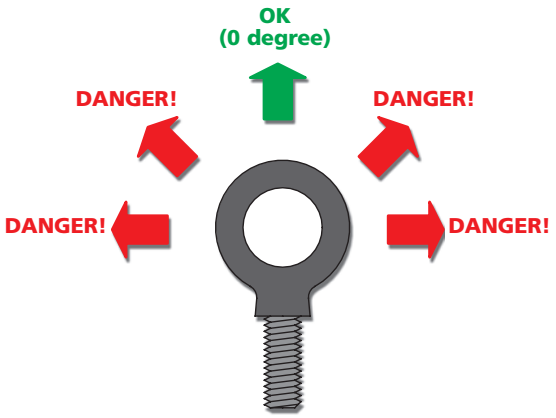


IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.

SWIVEL HOIST RING VS. SHOULDERED EYEBOLT



Swivel Hoist Ring
Full load rating at any angle.



Shouldered Eyebolt
Full load rating only at 0 degree.

Eyebolts have been used for over 100 years and have performed well when used properly, meaning the direction of loading must be at zero degrees. If the load shifts or the direction of loading on the eyebolt is as much as 10 degrees off the zero line of force, the result is a bent eyebolt.

When you bend the eyebolt, it is broken!

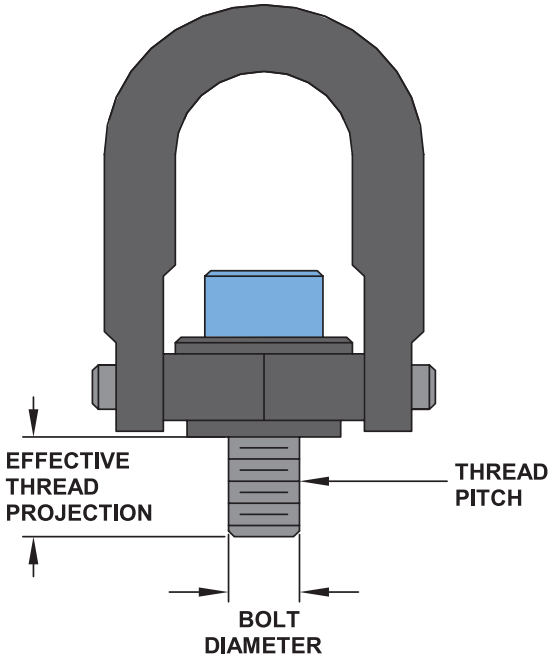
You can't see the break most of the time. If you examine the bent area using x-ray techniques, you will find the damage. Continued use of a bent eyebolt may result in failure at very little weight.

Swivel Hoist Rings are designed for lifting at any angle because they can swivel 360° and pivot 180°. Therefore, the rated load remains the same, regardless of the angle of force. As a result, you **increase safety and peace of mind.**

SWIVEL HOIST SPECIFICATION FORM

THREAD TYPE:
_____UNC_____METRIC OTHER_____

HOIST RING CAPACITY _____LBS.
(WORK LOAD LIMIT) _____KGS.



Fax or email to receive a quotation.
Fax: 909.469-2252 • Email: info@lift-it.com

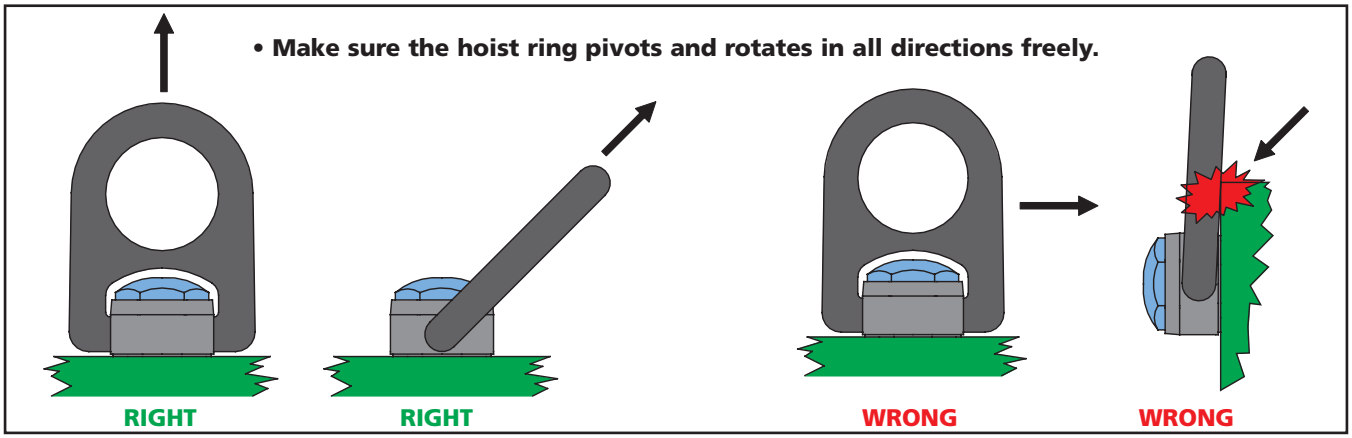
IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.

HOIST RINGS SAFETY PRECAUTIONS: Swivel, Forged and Stainless

⚠ WARNING PRIOR TO USING ANY HOIST RING, PLEASE READ THE FOLLOWING FOR PROPER INSTALLATION AND USAGE.

As with all mechanical devices, regular inspection for wear and strict adherence to use instructions is necessary to prevent misuse and failure.

- Despite the 5:1 design factor, **NEVER EXCEED THE WORK LOAD LIMIT**. The design factor is needed in case of misuse, which could drastically lower load capacity.
- Tighten mounting screws to the recommended torque. Periodically check torque because bolts could loosen during service.
- Tensile strength of parent material should be above 80,000 PSI to achieve full load rating. For weaker material, consider through-hole mounting with a nut and washer on the opposite side.
- **DO NOT APPLY SHOCK LOADS**. Always lift gradually. If shock loading ever occurs magnaflux inspection must be performed.



Important: The load on each hoist ring is not simply total weight divided by the number of hoist rings. The resultant force can be significantly greater at shallow lift angles and with unevenly distributed loads. See the example below.

L = Load
W = Total weight = 2,000 Lbs.
N = Number of hoist rings = 4
A = Lifting angle

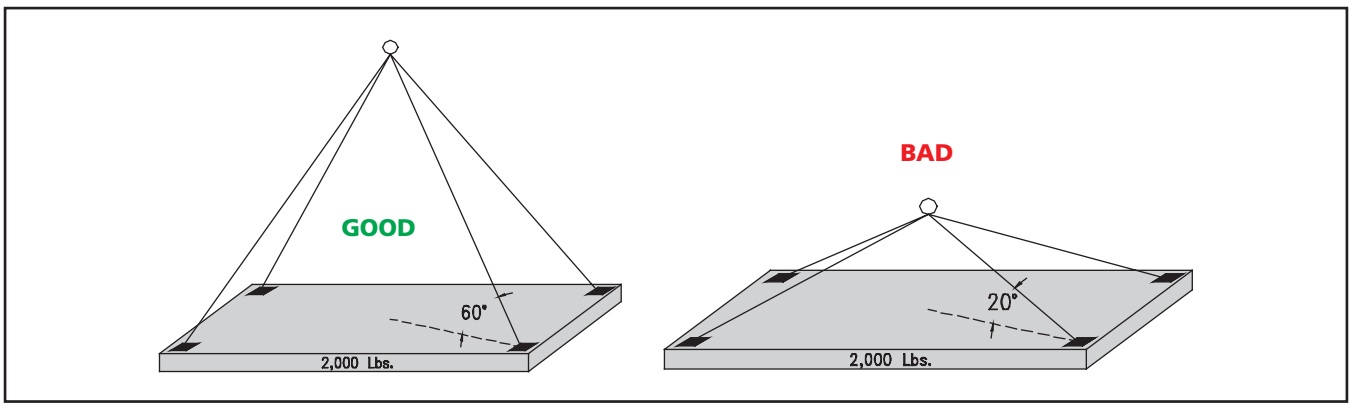
$$L = \frac{W}{N \sin A}$$

If A = 60 degrees:

$$L = \frac{2000}{4 \sin 60 \text{ deg.}} = 580 \text{ Lbs.}$$

If A = 20 degrees

$$L = \frac{2000}{4 \sin 60 \text{ deg.}} = 1{,}465 \text{ Lbs.}$$



IMPORTANT INFORMATION: READ, UNDERSTAND AND FOLLOW.

HOIST RINGS SAFETY PRECAUTIONS:
Side Load, Lifting Ring, Side Pull, Ultra and Large Opening

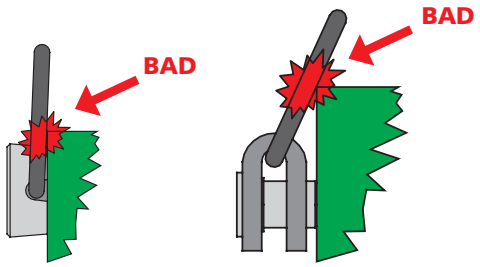
⚠WARNING PRIOR TO USING ANY HOIST RING, PLEASE READ THE FOLLOWING FOR PROPER INSTALLATION AND USAGE.

As with all mechanical devices, regular inspection for wear and strict adherence to use instructions is necessary to prevent misuse and failure.

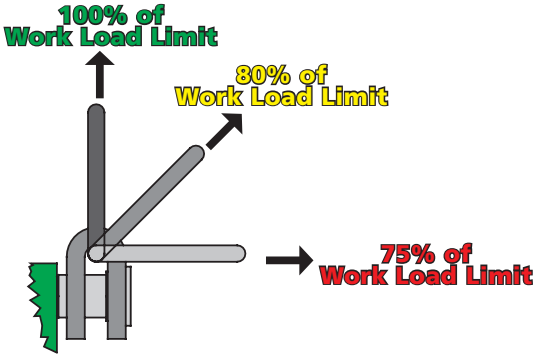
- Despite the design factor, **NEVER EXCEED THE WORK LOAD LIMIT**. The design factor is needed in case of misuse, which could drastically lower load capacity.
- Tighten mounting screws to the recommended torque. Periodically check torque because bolts could loosen during service.
- Tensile strength of parent material should be above 80,000 PSI to achieve full load rating. For weaker material, consider through-hole mounting with a nut and washer on the opposite side.
- **DO NOT APPLY SHOCK LOADS**. Always lift gradually. If shock loading ever occurs magnaflux inspection must be performed.

IMPORTANT INFORMATION FOR SIDE LOAD HOIST and LIFTING RINGS

Make sure the Hoist Ring pivots and rotates in all directions freely.

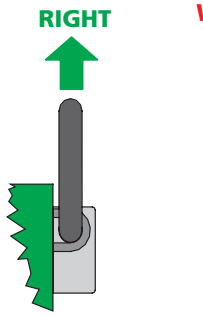


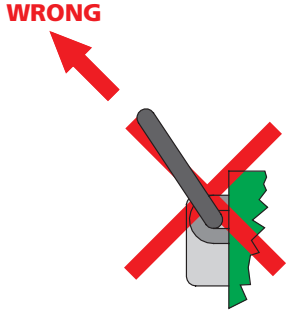
Work Load Limits are reduced with different angles of loading.



IMPORTANT INFORMATION FOR SIDE PULL, ULTRA and LARGE OPENING HOIST RINGS

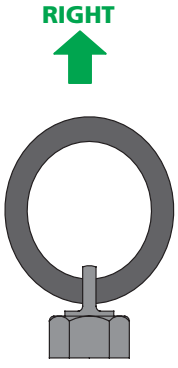
Caution: Work Load Limits are for straight lifts.



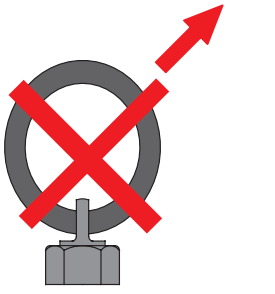


Work Load Limits are reduced by as much as 75% on angle lifts!





Angle lifts should be avoided.



Important: The load on each hoist ring is not simply total weight divided by the number of hoist rings. The resultant force can be significantly greater at shallow lift angles and with unevenly distributed loads. See the example below.

L = Load
W = Total weight = 2,000 Lbs.
N = Number of hoist rings = 4
A = Lifting angle

$$L = \frac{W}{N \text{ sine } A}$$

If A = 60 degrees:

$$L = \frac{2000}{4 \text{ sine } 60 \text{ deg.}} = 580 \text{ Lbs.}$$

If A = 20 degrees

$$L = \frac{2000}{4 \text{ sine } 60 \text{ deg.}} = 1{,}465 \text{ Lbs.}$$

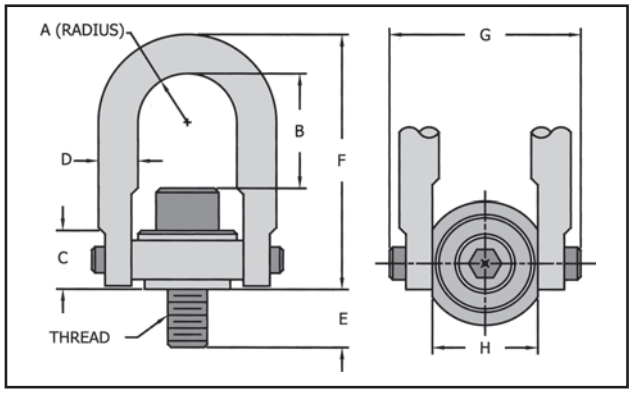
Actek® Stainless Swivel Hoist Ring

- SWIVELS 360° - PIVOTS 180°
- MATERIAL: 300 SERIES STAINLESS STEEL
- 316 STAINLESS AVAILABLE
- DESIGN FACTOR: 5:1
- LIQUID PENETRANT MIL 6866

⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.





STANDARD STAINLESS STEEL HOIST RING SPECIFICATIONS (Inches)

Work Load Limit (Lbs.)	Thread Size	A	C	D	E	Standard U-Bar			Long U-Bar			G	H	Torque Ft./Lbs.	Weight (Lbs.)
						Stock No.	B	F	Stock No.	B	F				
400	5/16-18	.43	.71	3/8	.29	58102	1.27	2.67				1.84	1	3.5	.30
400	5/16-18	.43	.71	3/8	.54	58104	1.27	2.67				1.84	1	3.5	.30
500	3/8-16	.43	.71	3/8	.54	58106	1.27	2.67				1.84	1	6	.30
1,250	1/2-13	.70	.93	1/2	.78	58602	1.84	3.77				2.58	1.49	14	1
1,250	1/2-13	.88	1.22	3/4	.78	58008	2.31	4.78	58644	4.25	6.72	3.52	1.99	14	2.6
1,250	1/2-13	.88	1.22	3/4	1.03	58010	2.31	4.78	58646	4.25	6.72	3.52	1.99	14	2.6
1,250	1/2-13	.88	1.22	3/4	1.28	58012	2.31	4.78	58648	4.25	6.72	3.52	1.99	14	2.6
2,000	5/8-11	.88	1.22	3/4	.78	58002	2.18	4.78	58641	4.12	6.72	3.52	1.99	30	2.6
2,000	5/8-11	.88	1.22	3/4	1.03	58004	2.18	4.78	58640	4.12	6.72	3.52	1.99	30	2.6
2,000	5/8-11	.88	1.22	3/4	1.28	58006	2.18	4.78	58642	4.12	6.72	3.52	1.99	30	2.6
2,500	3/4-10	.88	1.22	3/4	1.03	58014	2.06	4.78	58650	4.00	6.72	3.52	1.99	50	3
2,500	3/4-10	.88	1.22	3/4	1.53	58018	2.06	4.78	58654	4.00	6.72	3.52	1.99	50	3
3,500	3/4-10	1.40	1.71	1	1.04	58204	3.06	6.52	58658	4.65	8.11	5.14	3	50	7
3,500	3/4-10	1.40	1.71	1	1.54	58206	3.06	6.52	58660	4.65	8.11	5.14	3	50	7
4,000	7/8-9	1.40	1.71	1	1.04	58202	2.93	6.52	58656	4.52	8.11	5.14	3	80	7
4,000	7/8-9	1.40	1.71	1	1.29	58203	2.93	6.52	58652	4.52	8.11	5.14	3	80	7
5,000	1-8	1.40	1.71	1	1.29	58210	2.81	6.52	58662	4.40	8.11	5.14	3	115	7.5
5,000	1-8	1.40	1.71	1	1.54	58212	2.81	6.52	58664	4.40	8.11	5.14	3	115	7.5
5,000	1-8	1.40	1.71	1	2.29	58214	2.81	6.52	58666	4.40	8.11	5.14	3	115	7.5
7,500	1 1/4-7	1.75	2.11	1-1/4	1.89	58802	4.12	8.73				6.50	3.76	235	14
12,000	1 1/2-6	2.25	2.81	1-3/4	2.70	58404	6.41	12.47				8.55	4.87	400	34
15,000	2-4 1/2	2.25	2.81	1-3/4	2.96	58400	5.91	12.47				8.55	4.87	400	36
25,000	2 1/2-8	3.00	4.09	2-1/4	4.00	59002	8.03	16.87				11.67	6.52	1050	88
25,000	2 1/2-4	3.00	4.09	2-1/4	4.00	59006	8.03	16.87				11.67	6.52	1050	88
37,500	3-4	3.75	5.27	2-3/4	5.00	59200	8.48	19.50				14.15	8.10	2150	166
50,000	3 1/2-4	4.00	6.06	3-1/4	7.00	59402	9.28	22.09				15.90	8.60	2550	265

Dimensions are subject to change, without notice.

METRIC STAINLESS STEEL HOIST RING SPECIFICATIONS (Millimeters)

Work Load Limit (Kgs.)	Thread Size	A	C	D	E	Standard U-Bar			Long U-Bar			G	H	Torque N-m	Weight (Lbs.)
						Stock No.	B	F	Stock No.	B	F				
200	M8x1.25	11	18	10	13	58912	32	68				47	25	4	.40
250	M10x1.50	11	18	10	18	58916	30	68				47	25	8	.40
525	M12x1.75	22	30	19	19	58924	60	121	59124	110	171	89	51	18	2.5
950	M16x2.00	22	30	19	29	58930	56	121	59130	106	171	89	51	40	2.5
1,075	M20x2.50	22	30	19	34	58936	52	121	59136	102	171	89	51	68	2.5
1,500	M20x2.50	36	43	25	32	58942	78	166	59142	118	206	131	76	68	7.0
2,100	M24x3.00	36	43	25	37	58948	74	166	59148	114	206	131	76	108	7.0
2,100	M30x3.50	36	43	25	58				58950	108	206	131	76	108	7.0
3,500	M30x3.50	45	54	32	42	58956	106	222				165	95	318	15.0
3,500	M30x3.50	45	54	32	62	58958	106	222				165	95	318	15.0
5,500	M36x4.00	57	71	44	64	58966	166	317				217	124	542	35.0
6,250	M42x4.50	57	71	44	82	58968	160	317				217	124	542	36.0
6,750	M48x5.00	57	71	44	82	58970	154	317				217	124	542	38.0
11,150	M64x6.00	76	103	57	101	58972	204	428				296	165	1423	86.0
15,750	M72X6.00	95	133	70	132	58988	220	495				359	206	2915	165.0
22,300	M90X6.00	102	153	83	177	58990	235	561				404	218	3459	260.0

Dimensions are subject to change, without notice.

Actek® Swivel Hoist Ring

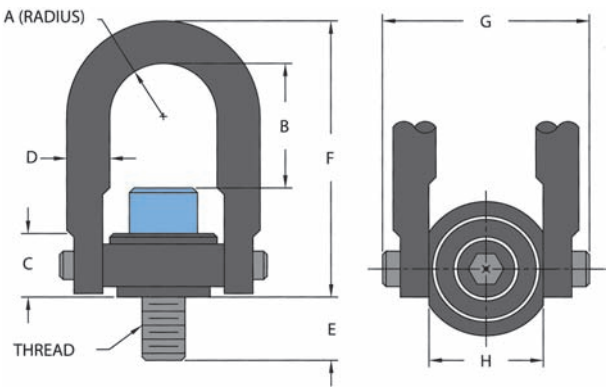


- ALL HOIST RINGS ARE PROOF TESTED TO 200% OF WORK LOAD LIMIT
- SERIALIZED FOR TRACEABILITY
- SWIVELS 360° - PIVOTS 180°
- MATERIAL: AIRCRAFT QUALITY ALLOY (180,000 PSI TENSILE STRENGTH, MININUM)
- FINISH: BLACK OXIDE PER MILITARY SPECIFICATION
  ALSO AVAILABLE: CADMIUM PLATED, ELECTROLESS NICKEL PLATED, ZINC PLATED
- DESIGN FACTOR: 5:1
- MAGNETIC PARTICLE INSPECTED
- CERTIFIED HEAT TREATMENT
- RATED AT 100% FROM 0° to 90°
- FATIGUE TESTED TO 20,000 CYCLES AT 1-1/2 TIMES WORK LOAD LIMIT
- MEETS OR EXCEEDS THE REQUIREMENTS OF ASME B30.26
- THREAD: LONGER THREAD PROJECTION AND FINE THREAD AVAILABLE
- SEE PAGES 249-255 FOR IMPORTANT SAFETY, USE AND INSPECTION INFORMATION.

HOIST RING SPECIFICATIONS (Inches)

Work Load Limit (Lbs.)	Thread Size	A	C	D	E	Standard U-Bar			Long U-Bar			G	H	Torque Ft./Lbs.	Weight (Lbs.)
						Stock No.	B	F	Stock No.	B	F				
600	1/4-20	.43	.71	3/8	.54	46100	1.27	2.67				1.84	1.00	6	.30
800	5/16-18	.43	.71	3/8	.29	46102	1.27	2.67				1.84	1.00	7	.30
800	5/16-18	.43	.71	3/8	.54	46104	1.27	2.67				1.84	1.00	7	.30
1,000	3/8-16	.43	.71	3/8	.54	46106	1.27	2.67				1.84	1.00	12	.30
1,250	7/16-14	.43	.71	3/8	.79	46351	1.20	2.67				1.84	1.00	22	.40
1,500	1/2-13	.43	.71	3/8	.79	46352	1.15	2.67				1.84	1.00	28	.40
2,000	7/16-14	.70	.93	1/2	1.07	46606	1.90	3.77				2.58	1.49	22	1
2,500	1/2-13	.70	.93	1/2	1.07	46602	1.84	3.77				2.58	1.49	28	1
2,000	7/16-14	.88	1.22	3/4	.78	46000	2.37	4.78	46638	4.34	6.72	3.52	1.99	22	2.6
2,500	1/2-13	.88	1.22	3/4	.78	46008	2.31	4.78	46644	4.25	6.72	3.52	1.99	28	2.6
2,500	1/2-13	.88	1.22	3/4	1.03	46010	2.31	4.78	46646	4.25	6.72	3.52	1.99	28	2.6
2,500	1/2-13	.88	1.22	3/4	1.28	46012	2.31	4.78	46648	4.25	6.72	3.52	1.99	28	2.6
2,500	9/16-12	.88	1.22	3/4	.78	46007	2.25	4.78	46651	4.19	6.72	3.52	1.99	30	2.6
4,000	5/8-11	.88	1.22	3/4	.78	46002	2.18	4.78	46641	4.12	6.72	3.52	1.99	60	2.6
4,000	5/8-11	.88	1.22	3/4	1.03	46004	2.18	4.78	46640	4.12	6.72	3.52	1.99	60	2.6
4,000	5/8-11	.88	1.22	3/4	1.28	46006	2.18	4.78	46642	4.12	6.72	3.52	1.99	60	2.6
4,000	5/8-11	.88	1.22	3/4	1.53	46005	2.18	4.78	46643	4.12	6.72	3.52	1.99	60	2.6
5,000	3/4-10	.88	1.22	3/4	1.03	46014	2.06	4.78	46650	4.00	6.72	3.52	1.99	100	3
5,000	3/4-10	.88	1.22	3/4	1.53	46018	2.06	4.78	46654	4.00	6.72	3.52	1.99	100	3
6,000	7/8-9	.88	1.22	3/4	1.53	46353	1.94	4.78	41604	3.88	6.72	3.52	1.99	160	3
6,500	1-8	.88	1.22	3/4	1.53	46354	1.71	4.78	41606	3.75	6.72	3.52	1.99	230	3

Dimensions are subject to change without notice.



⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.

SWIVEL HOIST RING SPECIFICATIONS (Inches)

Work Load Limit (Lbs.)	Thread Size	A	C	D	E	Standard U-Bar			Long U-Bar			G	H	Torque Ft./Lbs.	Weight (Lbs.)
						Stock No.	B	F	Stock No.	B	F				
7,000	3/4-10	1.40	1.71	1	1.04	46204	3.06	6.52	46658	4.65	8.11	5.14	3	100	7
7,000	3/4-10	1.40	1.71	1	1.54	46206	3.06	6.52	46660	4.65	8.11	5.14	3	100	7
8,000	7/8-9	1.40	1.71	1	1.04	46202	2.93	6.52	46656	4.52	8.11	5.14	3	160	7
8,000	7/8-9	1.40	1.71	1	1.29	46203	2.93	6.52	46657	4.52	8.11	5.14	3	160	7
8,000	7/8-9	1.40	1.71	1	1.54	46205	2.93	6.52	46655	4.52	8.11	5.14	3	160	7
10,000	1-8	1.40	1.71	1	1.29	46210	2.81	6.52	46662	4.40	8.11	5.14	3	230	7.50
10,000	1-8	1.40	1.71	1	1.54	46212	2.81	6.52	46664	4.40	8.11	5.14	3	230	7.50
10,000	1-8	1.40	1.71	1	2.29	46214	2.81	6.52	46666	4.40	8.11	5.14	3	230	7.50
10,000	1 1/8-7	1.40	1.71	1	2.29	46216	2.69	6.52	46668	4.28	8.11	5.14	3	230	7.50
10,000	1 1/8-8	1.40	1.71	1	2.29	46217	2.69	6.52	46669	4.28	8.11	5.14	3	230	7.50
11,500	1 1/4-7	1.40	1.71	1	2.10	46355	2.44	6.52	41612	4.24	8.11	5.14	3	470	8
12,000	1 3/8-6	1.40	1.71	1	2.10	46356	2.31	6.52	41614	4.13	8.11	5.14	3	470	8
12,500	1 1/2-6	1.40	1.71	1	2.00	46357	2.19	6.52	41616	4.00	8.11	5.14	3	800	8
15,000	1 1/4-7	1.75	2.11	1-1/4	1.89	46802	4.12	8.73				6.50	3.76	470	14
15,000	1 1/4-8	1.75	2.11	1-1/4	1.89	46805	4.12	8.73				6.50	3.76	470	14
15,000	1 3/8-6	1.75	2.11	1-1/4	1.89	46806	4.06	8.73				6.50	3.76	470	14.50
15,000	1 3/8-8	1.75	2.11	1-1/4	1.89	46807	4.06	8.73				6.50	3.76	470	14.50
16,500	1 1/2-6	1.75	2.11	1-1/4	2.80	46359	4.02	8.73				6.50	3.76	800	16
17,000	1 5/8-5 1/2	1.75	2.11	1-1/4	2.80	46360	3.90	8.73				6.50	3.76	800	16
17,500	1 3/4-5	1.75	2.11	1-1/4	2.80	46361	3.77	8.73				6.50	3.76	800	16
18,000	1 7/8-5	1.75	2.11	1-1/4	2.80	46362	3.65	8.73				6.50	3.76	800	16
18,500	2-4 1/2	1.75	2.11	1-1/4	2.80	46363	3.52	8.73				6.50	3.76	800	16
20,000	1 3/8-6	2.00	2.40	1-1/2	2.50	46702	5.50	10.20				7.46	4.31	540	23
24,000	1 1/2-6	2.25	2.81	1-3/4	2.70	46404	6.41	12.47				8.55	4.87	800	34
24,000	1 1/2-8	2.25	2.81	1-3/4	2.70	46405	6.41	12.47				8.55	4.87	800	34
24,000	1 3/4-5	2.25	2.81	1-3/4	3.20	46408	6.16	12.47				8.55	4.87	800	34
24,000	1 3/4-8	2.25	2.81	1-3/4	3.20	46406	6.16	12.47				8.55	4.87	800	34
30,000	2-4 1/2	2.25	2.81	1-3/4	3.20	46400	5.91	12.47				8.55	4.87	800	36
30,000	2-8	2.25	2.81	1-3/4	3.20	46440	5.91	12.47				8.55	4.87	800	36
30,000	2 1/4-4 1/2	2.25	2.81	1-3/4	3.20	46431	5.66	12.47				8.55	4.87	800	40
30,000	2 1/4-8	2.25	2.81	1-3/4	3.20	46435	5.66	12.47				8.55	4.87	800	40
32,500	2 1/4-4 1/2	2.25	2.81	1-3/4	2.90	46364	5.86	12.47				8.55	4.87	800	40
35,000	2 1/2-4	2.25	2.81	1-3/4	3.90	46365	5.63	12.47				8.55	4.87	2100	40
35,000	2 1/2-8	2.25	2.81	1-3/4	3.90	46368	5.63	12.47				8.55	4.87	2100	40
50,000	2 1/2-8	3	4.09	2-1/4	4	47002	8.03	16.87				10.67	6.52	2100	88
50,000	2 1/2-4	3	4.09	2-1/4	4	47006	8.03	16.87				10.67	6.52	2100	88
50,000	2 3/4-4	3	4.09	2-1/4	4	47008	7.75	16.87				10.67	6.52	2100	90
50,000	2 3/4-8	3	4.09	2-1/4	4	47010	7.75	16.87				10.67	6.52	2100	90
55,000	2 3/4-4	3	4.09	2-1/4	4	46366	6.16	16.87				11.67	6.52	2100	92
60,000	3-4	3	4.09	2-1/4	5	46367	6.16	16.87				11.67	6.52	4300	92
75,000	3-4	3.75	5.27	2-3/4	5.25	47200	8.48	19.50				14.15	8.10	4300	166
75,000	3-8	3.75	5.27	2-3/4	5.25	47202	8.48	19.50				14.15	8.10	4300	166
80,000	3 1/2-4	3.75	5.27	2-3/4	5	46332	7.98	19.50				14.15	8.10	5100	172
80,000	3 1/2-8	3.75	5.27	2-3/4	5	46334	7.98	19.50				14.15	8.10	5100	172
100,000	3 1/2-4	4	6.06	3-1/4	7	47402	9.28	22.09				15.90	8.60	5100	265
100,000	3 1/2-8	4	6.06	3-1/4	7	47406	9.28	22.09				15.90	8.60	5100	265
250,000	6-4	6	14	5	9	47602	14.00	33.00				25	13	9900	790

Dimensions are subject to change, without notice.

Actek® Metric Swivel Hoist Ring



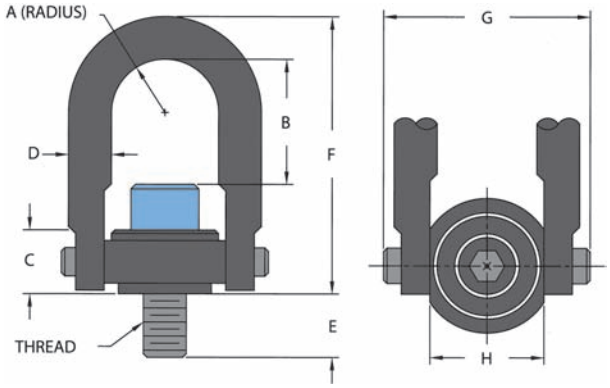
- ALL HOIST RINGS ARE PROOF TESTED TO 200% WORK LOAD LIMIT
- SERIALIZED FOR TRACEABILITY
- SWIVELS 360° - PIVOTS 180°
- MATERIAL: AIRCRAFT QUALITY ALLOY
- FINISH: BLACK OXIDE PER MILITARY SPECIFICATION
  ALSO AVAILABLE:
  CADMIUM PLATED, ELECTROLESS
  NICKEL PLATED, ZINC PLATED
- DESIGN FACTOR: 5:1
- MAGNETIC PARTICLE INSPECTED
- CERTIFIED HEAT TREATMENT
- RATED AT 100% FROM 0° to 90°
- FATIGUE TESTED TO 20,000 CYCLES AT 1-1/2 TIMES WORK LOAD LIMIT
- MEETS OR EXCEEDS THE REQUIREMENTS OF ASME B30.26
- THREAD: LONGER THREAD PROJECTION AND FINE THREAD AVAILABLE
- SEE PAGES 249-255 FOR IMPORTANT SAFETY, USE AND INSPECTION INFORMATION.

CONVERSION FACTORS			
	To Convert From	**To**	**Multiply by**
LENGTH	Millimeter (mm)	Inches (In.)	.03937
FORCE	Newton (N)	Pounds (Force) (Lbs.)	.22481
STRESS	Newton/mm² (N/mm²)	Pound/Inch² (PSI)	145.04
TORQUE	Newton-Meter (Nm)	Pound-Foot (Lbs.-Ft.)	.7376
WEIGHT	Kilogram (Kg)	Pounds (Lbs.)	2.204

METRIC HOIST SWIVEL RING SPECIFICATIONS (Millimeters)

Work Load Limit (Kgs.)	Thread Size	A	C	D	E	Standard U-Bar			Long U Bar		F	G	H	Nm	Weight (Lbs.)
						Stock No.	B	F	Stock No.	B					
400	M8x1.25	11	18	10	13	46912	32	68				47	25	9	.40
400	M8x1.25	11	18	10	18	46913	32	68				47	25	9	.40
500	M10x1.50	11	18	10	18	46916	30	68				47	25	16	.40
625	M12x1.75	11	18	10	23	49301	28	68				47	25	37	.40
1,050	M12x1.75	18	24	13	27	46608	48	96				66	38	37	1.0
1,050	M12x1.75	22	30	19	19	46924	60	121	47124	110	171	89	51	37	2.5
1,050	M14x2.00	22	30	19	29	46928	58	121	47128	108	171	89	51	40	2.5
1,900	M16x2.00	22	30	19	24	46933	56	121	47126	106	171	89	51	80	2.5
1,900	M16x2.00	22	30	19	29	46930	56	121	47130	106	171	89	51	80	2.5
1,900	M18x2.50	22	30	19	29	46934	54	121	47134	104	171	89	51	90	2.5
2,150	M20x2.50	22	30	19	29	46938	52	121	47132	102	171	89	51	135	2.7
2,150	M20x2.50	22	30	19	34	46936	52	121	47136	102	171	89	51	135	2.7
2,650	M22x2.50	22	30	19	39	49302	50	121	49351	100	171	89	51	311	3.0
2,850	M24x3.00	22	30	19	39	49303	48	121	49353	98	171	89	51	311	3.0
3,000	M20x2.50	36	43	25	27	46941	78	166	47140	118	206	131	76	135	6.7
3,000	M20x2.50	36	43	25	32	46942	78	166	47142	118	206	131	76	135	6.7
3,000	M22x2.50	36	43	25	37	46944	76	166	47144	116	206	131	76	135	7.0
4,200	M24x3.00	36	43	25	32	46947	74	166	47146	114	206	131	76	311	7.0
4,200	M24x3.00	36	43	25	37	46948	74	166	47148	114	206	131	76	311	7.0
4,200	M30x3.50	36	43	25	58				46950	108	206	131	76	637	7.0
5,000	M33x3.50	36	43	25	42	49304	65	166	49355	105	206	131	76	637	8.5
5,500	M36x4.00	36	43	25	52	49305	62	166	49357	102	206	131	76	1085	8.5

Dimensions are subject to change, without notice.



⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.

METRIC SWIVEL HOIST RING SPECIFICATIONS (Millimeters)

Work Load Limit (Kgs.)	Thread Size	A	C	D	Standard U-Bar			Long U-Bar				G	H	Torque Nm	Weight (Lbs.)
					E	Stock No.	B	F	Stock No.	B	F				
7,000	M30x3.50	45	54	32	42	46956	106	222				165	95	637	15
7,000	M30x3.50	45	54	32	46	46955	106	222				165	95	637	15
7,000	M30x3.50	45	54	32	62	46958	106	222				165	95	637	15
7,000	M30x3.50	45	54	32	67	46957	106	222				165	95	637	15
7,000	M33x3.50	45	54	32	67	46960	103	222				165	95	637	15
8,500	M36x4.00	45	54	32	56	49306	100	222				165	95	1085	16
9,000	M39x4.00	45	54	32	56	49307	97	222				165	95	1085	17
9,250	M42x4.50	45	54	32	66	49308	94	222				165	95	1085	18
9,500	M45x4.50	45	54	32	66	49309	91	222				165	95	1085	18
9,500	M46x5.00	45	54	32	66	49310	90	222				165	95	1085	18
10,000	M48x5.00	45	54	32	66	49311	88	222				165	95	1085	18
10,000	M33x3.50	50	62	38	58	46961	140	259				189	109	637	23
10,000	M33x3.50	50	62	38	68	46962	140	259				189	109	637	23
11,000	M36x4.00	57	71	44	58	46963	166	317				217	124	1085	35
11,000	M36x4.00	57	71	44	63	46966	166	317				217	124	1085	35
11,000	M36x4.00	57	71	44	68	46964	166	317				217	124	1085	35
12,500	M42x4.50	57	71	44	68	46965	160	317				217	124	1085	36
12,500	M42x4.50	57	71	44	83	46968	160	317				217	124	1085	36
13,500	M48x5.00	57	71	44	68	46980	154	317				217	124	1085	38
13,500	M48x5.00	57	71	44	83	46970	154	317				217	124	1085	38
13,500	M48x5.00	57	71	44	88	46979	154	317				217	124	1085	38
13,500	M56x5.50	57	71	44	88	46973	154	317				217	124	1085	38
14,500	M52x5.00	57	71	44	83	49312	150	317				217	124	1085	42
15,500	M56x5.50	57	71	44	83	49313	146	317				217	124	1085	42
16,500	M64x6.00	57	71	44	93	49314	138	317				217	124	2847	42
22,300	M64x6.00	76	103	57	101	46972	204	428				271	165	2847	86
24,500	M72x6.00	76	103	57	100	49315	196	428				296	165	5830	92
26,500	M80x6.00	76	103	57	110	49316	188	428				296	165	5830	92
31,500	M72X6.00	95	133	70	132	46988	220	495				359	206	5830	165
31,500	M80X6.00	95	133	70	132	46989	200	495				359	206	5830	165
33,000	M90x6.00	95	133	70	140	49317	200	495				359	206	6914	280
33,000	M100x6.00	95	133	70	150	49318	200	495				359	206	6914	280
44,600	M90X6.00	102	153	83	177	46990	235	561				404	218	6914	260
44,600	M100X6.00	102	153	83	200	46994	235	561				404	218	6914	280

Dimensions are subject to change, without notice.









Actek® Forged Swivel Hoist Ring

- ALL HOIST RINGS ARE PROOF TESTED TO 200% WORK LOAD LIMIT
- SWIVELS 360° - PIVOTS 180°
- MATERIAL: AIRCRAFT QUALITY ALLOY
- FINISH: PHOSPHATE PER DOD-P-16232F CADMIUM PLATED, ELECTROLESS NICKEL, and GALVANIZED AVAILABLE.
- DESIGN FACTOR: 5:1
- MAGNETIC PARTICLE INSPECTED
- CERTIFIED HEAT TREATMENT
- IDEAL FOR OUTDOOR USE



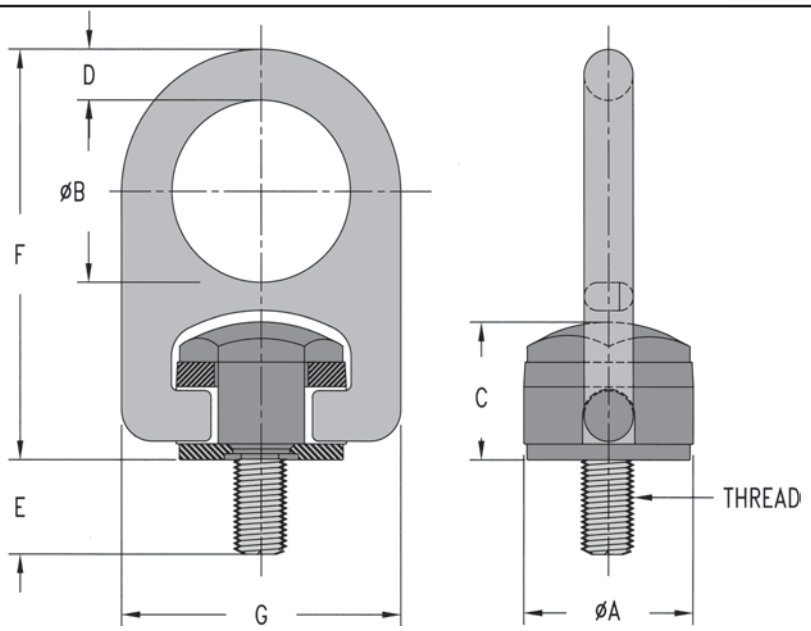
⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.

STANDARD - FORGED SWIVEL HOIST RING SPECIFICATIONS (Inches)

Stock Number	Work Load Limit (Lbs.)	Thread Size	A	B	C	D	E	F	G	Torque (Ft. /Lbs.)	Weight (Lbs.)
56100	600	1/4"-20	1.32	1.40	1.16	.44	.50	3.29	2.38	5	1
56102	800	5/16"-18	1.32	1.40	1.16	.44	.50	3.29	2.38	7	1
56104	800	5/16"-18	1.32	1.40	1.16	.44	1.00	3.29	2.38	7	1
56106	1,000	3/8"-16	1.32	1.40	1.16	.44	.50	3.29	2.38	12	1
56107	1,000	3/8"-16	1.32	1.40	1.16	.44	1.00	3.29	2.38	12	1
56008	2,500	1/2"-13	2.23	2.40	1.97	.75	.75	5.60	4.05	28	4
56010	2,500	1/2"-13	2.23	2.40	1.97	.75	1.00	5.60	4.05	28	4
56012	2,500	1/2"-13	2.23	2.40	1.97	.75	1.25	5.60	4.05	28	4
56002	4,000	5/8"-11	2.23	2.40	1.97	.75	.75	5.60	4.05	60	4
56004	4,000	5/8"-11	2.23	2.40	1.97	.75	1.00	5.60	4.05	60	4
56006	4,000	5/8"-11	2.23	2.40	1.97	.75	1.25	5.60	4.05	60	4
56014	5,000	3/4"-10	2.23	2.40	1.97	.75	1.00	5.60	4.05	100	4
56018	5,000	3/4"-10	2.23	2.40	1.97	.75	1.50	5.60	4.05	100	4
56204	7,000	3/4"-10	2.95	3.20	2.62	1.00	1.00	7.48	5.40	100	9
56203	7,000	3/4"-10	2.95	3.20	2.62	1.00	1.25	7.48	5.40	100	9
56206	7,000	3/4"-10	2.95	3.20	2.62	1.00	1.50	7.48	5.40	100	9
56202	8,000	7/8"-9	2.95	3.20	2.62	1.00	1.00	7.48	5.40	160	9
56205	8,000	7/8"-9	2.95	3.20	2.62	1.00	1.25	7.48	5.40	160	9
56210	10,000	1"-8	2.95	3.20	2.62	1.00	1.25	7.48	5.40	230	9
56212	10,000	1"-8	2.95	3.20	2.62	1.00	1.50	7.48	5.40	230	9
56214	10,000	1"-8	2.95	3.20	2.62	1.00	2.25	7.48	5.40	230	9
56802	15,000	1 1/4"-7	3.73	4.00	3.28	1.25	2.00	9.35	6.75	470	18
56804	15,000	1 1/4"-7	3.73	4.00	3.28	1.25	2.75	9.35	6.75	470	18
56702	20,000	1 3/8"-6	3.73	4.00	3.28	1.25	2.75	9.35	6.75	540	19
56404	24,000	1 1/2"-6	3.73	4.00	3.28	1.25	2.75	9.35	6.75	800	19

Dimensions are subject to change, without notice.



⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.

METRIC - FORGED SWIVEL HOIST RING SPECIFICATIONS (Millimeters)

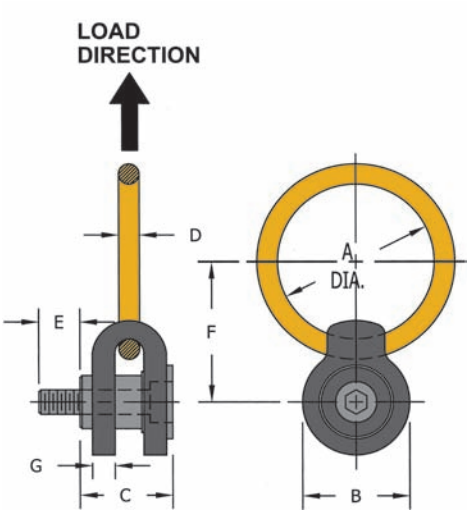
Stock Number	Work Load Limit(Kgs.)	Thread Size	A	B	C	D	E	F	G	Torque (N-m)	Weight (Lbs.)
56912	400	M8X1.25	33.52	35.56	29.46	11.17	15	83.56	60.45	9	1
56914	400	M8X1.25	33.52	35.56	29.46	11.17	20	83.56	60.45	9	1
56916	500	M10X1.50	33.52	35.56	29.46	11.17	15	83.56	60.45	16	1
56918	500	M10X1.50	33.52	35.56	29.46	11.17	25	83.56	60.45	16	1
56923	1,050	M12X1.75	56.64	60.96	50.03	19.05	20	142.24	102.87	37	4
56924	1,050	M12X1.75	56.64	60.96	50.03	19.05	25	142.24	102.87	37	4
56926	1,050	M12X1.75	56.64	60.96	50.03	19.05	35	142.24	102.87	37	4
56928	1,050	M14x2.00	56.64	60.96	50.03	19.05	30	142.24	102.87	40	4
56930	1,900	M16x2.00	56.64	60.96	50.03	19.05	25	142.24	102.87	80	4
56932	1,900	M16x2.00	56.64	60.96	50.03	19.05	35	142.24	102.87	80	4
56936	2,150	M20X2.50	56.64	60.96	50.03	19.05	25	142.24	102.87	135	4
56937	2,150	M20X2.50	56.64	60.96	50.03	19.05	35	142.24	102.87	135	4
56938	2,150	M20X2.50	56.64	60.96	50.03	19.05	40	142.24	102.87	135	4
56942	3,000	M20X2.50	74.93	81.28	66.54	25.40	30	189.99	137.16	135	9
56946	4,200	M24X3.00	74.93	81.28	66.54	25.40	30	189.99	137.16	311	9
56948	4,200	M24X3.00	74.93	81.28	66.54	25.40	40	189.99	137.16	311	9
56949	4,500	M30X3.50	74.93	81.28	66.54	25.40	40	189.99	137.16	637	9
56950	4,500	M30X3.50	74.93	81.28	66.54	25.40	50	189.99	137.16	637	9
56956	7,000	M30X3.50	94.74	101.60	83.31	31.75	50	237.49	171.45	637	19
56958	7,000	M30X3.50	94.74	101.60	83.31	31.75	65	237.49	171.45	637	19
56960	7,000	M33X3.50	94.74	101.60	83.31	31.75	55	237.49	171.45	637	19
56966	11,000	M36X4.00	94.74	101.60	83.31	31.75	65	237.49	171.45	1085	20
56968	12,500	M42X4.50	94.74	101.60	83.31	31.75	80	237.49	171.45	1085	21

Dimensions are subject to change without notice.

Actek® Sideload Hoist Ring



- DESIGNED FOR SIDE MOUNTED APPLICATIONS
- EXTRA LARGE RING ACCEPTS MANY HOOK SIZES AND STYLES
- IDEAL FOR STAMPING AND INJECTION MOLD HANDLING
- SWIVELS 360° - PIVOTS 180°
- MATERIAL: AIRCRAFT QUALITY ALLOY
- FINISH: BLACK OXIDE PER MILITARY SPECIFICATION
- CADMIUM & ELECTROLESS NICKLE PLATING AVAILABLE
- DESIGN FACTOR: 5:1
- MAGNETIC PARTICLE INSPECTED
- CERTIFIED HEAT TREATMENT
- ALSO AVAILABLE WITH MASTERLINKS
- LONGER THREAD LENGTH AND FINE THREAD AVAILABLE



⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.

STANDARD SIDELOAD HOIST RING SPECIFICATIONS (Inches)

Stock Number	Work Load Limit (Lbs.)	Thread Size	A	B	C	D	E	F	G	Torque Ft/Lbs	Weight (Lbs.)
43510	650	5/16-18	2	1-1/2	1-7/16	3/8	9/16	1-15/16	3/8	3.5	.50
43515	800	3/8-16	2	1-1/2	1-7/16	3/8	5/8	1-15/16	3/8	4.5	.50
43520	1,800	1/2-13	3	2-3/8	2-1/4	5/8	1	3	1/2	15	3.5
43525	2,500	5/8-11	3	2-3/8	2-1/4	5/8	1-1/4	3	1/2	25	3.5
43530	4,000	3/4-10	4	3-3/4	3-3/8	1	1-1/2	4-1/2	3/4	50	11.5
43535	5,500	7/8-9	4	3-3/4	3-3/8	1	1-7/8	4-1/2	3/4	80	11.5
43540	7,000	1-8	4	3-3/4	3-3/8	1	2	4-1/2	3/4	90	11.5
43545	14,000	1-1/4-7	6	4-5/8	4-5/8	1-3/8	2-1/8	6-1/4	1	150	28
43547	14,000	1-1/4-8	6	4-5/8	4-5/8	1-3/8	2-1/2	6-1/4	1	150	28
43550	17,000	1-1/2-6	6	4-5/8	4-5/8	1-3/8	2-1/2	6-1/4	1	250	31.5
43552	17,000	1-1/2-8	6	4-5/8	4-5/8	1-3/8	2-1/2	6-1/4	1	250	31.5
43555	29,000	2-4-1/2	5-1/4 x 10-1/2	4-5/8	6-5/8	1-1/2	3-1/8	11-1/8	1	300	42
43557	29,000	2-8	5-1/4 x 10-1/2	4-5/8	6-5/8	1-1/2	3-1/8	11-1/8	1	300	42

Dimensions are subject to change without notice.

METRIC SIDELOAD HOIST RING SPECIFICATIONS (Millimeters)

Stock Number	Work Load Limit (Kgs.)	Thread Size	A	B	C	D	E	F	G	Torque Nm	Wt. (Lbs.)
43560	325	M8x1.25	50.8	38.1	36.49	9.65	16	49.21	9.65	5	.50
43565	500	M10x1.50	50.8	38.1	36.49	9.65	20	49.21	9.65	6	.50
43570	725	M12x1.75	76.2	60.45	57.15	15.75	27	76.20	12.70	20	3.5
43575	1,400	M16x2.00	76.2	60.45	57.15	15.75	31	76.20	12.70	33	3.5
43580	2,290	M20x2.50	101.6	95.25	85.85	25.40	40	114.30	19.05	68	11.5
43585	3,050	M24x3.00	101.6	95.25	85.85	25.40	47	114.30	19.05	108	11.5
43590	4,850	M30x3.50	152.4	117.34	117.34	35.05	50	158.75	25.40	203	28
43595	7,700	M36x4.00	152.4	117.34	117.34	35.05	63	158.75	25.40	339	29
43600	8,200	M42x4.50	152.4	117.34	117.34	35.05	84	158.75	25.40	339	29.5
43605	11,300	M48x5.00	152.4	117.34	117.34	35.05	95	158.75	25.40	407	32

Dimensions are subject to change without notice.

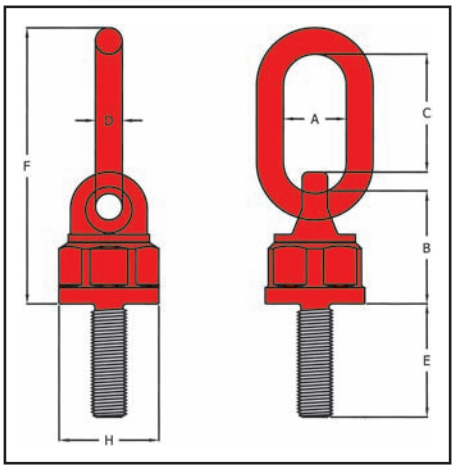
Actek® Ultra Lifting Ring

- ALL ULTRA LIFTING RINGS ARE PROOF TESTED
- SERIALIZED FOR TRACEABILITY
- EXTRA LARGE LIFT LUG ACCOMODATES MANY HOOK SIZES AND STYLES
- BALL BEARINGS PROVIDE SMOOTH SWIVELING AND PIVOTING
- SWIVELS 360° - PIVOTS 180°
- MATERIAL: AIRCRAFT QUALITY ALLOY
- DESIGN FACTOR: 4:1
- MAGNETIC PARTICLE INSPECTED
- CERTIFIED HEAT TREATMENT

⚠ WARNING

See Pages 249-255 for Important Safety, Use and Inspection Information.





STANDARD ULTRA LIFTING RING SPECIFICATIONS (Inches)

Stock Number	Work Load Limit (Lbs.)	A	B	C	D	E	F	H	Thread Size	Weight (Lbs)
44104	800	1-1/8	1-1/2	1-1/4	5/16	1/2	3.45	1.42	5/16"-18	.60
44106	1,000	1-1/8	1-1/2	1-1/4	5/16	1/2	3.45	1.42	3/8"-16	.60
44110	2,000	1-3/8	2-1/2	2-1/4	1/2	3/4	5.83	2.36	7/16"-14	2.6
44112	2,500	1-3/8	2-1/2	2-1/4	1/2	3/4	5.83	2.36	1/2"-13	2.6
44114	3,000	1-3/8	2-1/2	2-1/4	1/2	7/8	5.83	2.36	9/16"-12	2.6
44116	4,000	1-3/8	2-1/2	2-1/4	1/2	1	5.83	2.36	5/8"-11	2.6
44120	5,000	1-1/2	3	2-3/4	3/4	1-1/4	7.05	2.76	3/4"-10	5
44122	8,000	1-1/2	3	2-3/4	3/4	1-1/2	7.05	2.76	7/8"-9	5
44124	10,000	1-1/2	3	2-3/4	3/4	1-1/2	7.05	2.76	1"-8	5
44146	11,000	2	3-1/2	3-1/2	7/8	2	8.90	2.90	1-1/4"-7	9
44150	17,600	2	3-1/2	3-1/2	7/8	2-1/8	8.90	2.90	1-1/2"-6	9
44160	22,000	2-1/2	4	4-1/2	1	3	9.45	3.67	2"-4-1/2	14
44163	22,000	2-1/2	4	4-1/2	1	6	9.45	3.67	2"-4-1/2	17
44166	22,000	2-1/2	4	4-1/2	1	12	9.45	3.67	2"-4-1/2	22
44162	22,000	2-1/2	4	4-1/2	1	3	9.45	3.67	2"-8	14
44164	22,000	2-1/2	4	4-1/2	1	6	9.45	3.67	2"-8	17
44168	22,000	2-1/2	4	4-1/2	1	12	9.45	3.67	2"-8	22
44170	33,000	2-3/4	5-3/16	5	1-1/4	4	11.18	4.13	2-1/2"-4	24
44176	33,000	2-3/4	5-3/16	5	1-1/4	8	11.18	4.13	2-1/2"-4	30
44178	33,000	2-3/4	5-3/16	5	1-1/4	12	11.18	4.13	2-1/2"-4	35
44172	33,000	2-3/4	5-3/16	5	1-1/4	4	11.18	4.13	2-1/2"-8	24
44177	33,000	2-3/4	5-3/16	5	1-1/4	8	11.18	4.13	2-1/2"-8	30
44179	33,000	2-3/4	5-3/16	5	1-1/4	12	11.18	4.13	2-1/2"-8	35

Additional sizes available upon request.
Dimensions subject to change without notice.

METRIC ULTRA LIFTING RING SPECIFICATIONS (Millimeters)

Stock Number	Work Load Limit (Kgs.)	A	B	C	D	E	F	H	Thread Size	Weight (Lbs.)
44302	400	28.57	38.1	31.75	7.94	12	87.63	36.06	M8x1.25	.60
44304	500	28.57	38.1	31.75	7.94	19	87.63	36.06	M10x1.50	.60
44310	1,050	35.05	63.5	57.15	12.7	20	148.08	59.94	M12x1.75	2.6
44312	1,150	35.05	63.5	57.15	12.7	31	148.08	59.94	M14x2.00	2.6
44314	1,900	35.05	63.5	57.15	12.7	31	148.08	59.94	M16x2.00	2.6
44320	2,150	38.10	76.2	69.85	19.05	38	179.07	70.10	M20x2.50	5
44322	2,250	38.10	76.2	69.85	19.05	38	179.07	70.10	M22x2.50	5
44324	4,200	38.10	76.2	69.85	19.05	38	179.07	70.10	M24x3.00	5
44346	5,000	50.8	88.9	88.9	22.22	50	226.06	73.66	M30x3.50	9
44348	7,000	50.8	88.9	88.9	22.22	50	226.06	73.66	M33x3.50	9
44350	8,000	50.8	88.9	88.9	22.22	54	226.06	73.66	M36x4.00	9
44355	8,000	50.8	88.9	88.9	22.22	58	226.06	73.66	M39x4.00	9
44360	10,000	63.5	101.6	114.30	24.4	63	240.00	93.21	M42X4.50	13
44362	10,000	63.5	101.6	114.30	24.4	152	240.00	93.21	M42X4.50	15
44363	10,000	63.5	101.6	114.30	24.4	304	240.00	93.21	M42X4.50	19
44367	10,000	63.5	101.6	114.30	24.4	68	240.00	93.21	M45X4.50	14
44365	10,000	63.5	101.6	114.30	24.4	68	240.00	93.21	M48X5.00	14
44366	10,000	63.5	101.6	114.30	24.4	152	240.00	93.21	M48X5.00	17
44364	10,000	63.5	101.6	114.30	24.4	304	240.00	93.21	M48X5.00	21
44370	15,000	69.85	131.76	127	31.75	84	283.97	104.9	M56X5.50	22
44376	15,000	69.85	131.76	127	31.75	203	283.97	104.9	M56X5.50	27
44384	15,000	69.85	131.76	127	31.75	304	283.97	104.9	M56X5.50	31
44372	15,000	69.85	131.76	127	31.75	90	283.97	104.9	M60X5.50	23
44378	15,000	69.85	131.76	127	31.75	203	283.97	104.9	M60X5.50	28
44386	15,000	69.85	131.76	127	31.75	304	283.97	104.9	M60X5.50	33
44375	15,000	69.85	131.76	127	31.75	95	283.97	104.9	M64X6.00	24
44380	15,000	69.85	131.76	127	31.75	203	283.97	104.9	M64X6.00	30
44388	15,000	69.85	131.76	127	31.75	304	283.97	104.9	M64X6.00	35

Additional sizes available upon request.
Dimensions subject to change without notice.

ALLOY STEEL J HOOKS

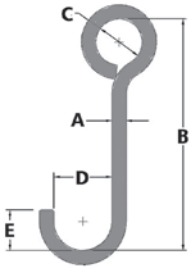
Made in USA.
All eyes are welded.
ASME B30.20 Compliant.
Powder coated and painted black.

+/- 4% dimensional variation.
Square and hex stock available.
Proof load and certification available.
Custom lettering and designs available.


STYLE 1


STYLE 2

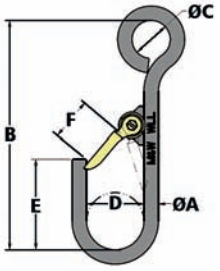

STYLE 3



ALLOY STEEL J HOOK SPECIFICATIONS										
MATERIAL DIAMETER (Inches)	STOCK NUMBER			DIMENSIONS (INCHES)					WORK LOAD LIMIT (Lbs.)
	STYLE 1	STYLE 2	STYLE 3	A	B	C	D	E	
1/4	11653	11621	11637	.25	5	1	1.25	.87	100
5/16	11654	11622	11638	.31	5	1	1.25	.87	200
3/8	11655	11623	11639	.38	6	1	1.50	1.12	365
1/2	11656	11624	11640	.50	8	1	2	1.50	650
5/8	11657	11625	11641	.62	9	1	2.50	1.87	1,000
3/4	11658	11626	11642	.75	10	1	3	2.25	1,450
7/8	11659	11627	11643	.87	12	1	3.5	2.62	1,900
1	11660	11628	11644	1	14	1.25	4	3	2,600

ROUND BODY LATCH HOOKS

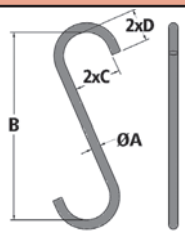




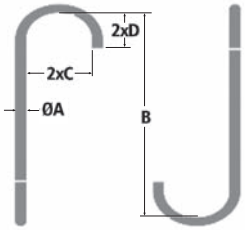


ROUND BODY LATCH HOOK SPECIFICATIONS									
MATERIAL DIAMETER (Inches)	STOCK NUMBER	DIMENSIONS (INCHES)						UNIT WEIGHT (Lbs.)	WORK LOAD LIMIT (Lbs.)
		A	B	C	D	E	F		
5/16	16016	.313	5	1	1.25	2	1.01	.30	450
3/8	14924	.375	6	1	1.50	2.38	1.10	.51	900
1/2	14767	.500	8	1	2	3.13	1.48	1.03	1400
5/8	14930	.625	9	1	2.50	4.32	1.72	1.89	2000

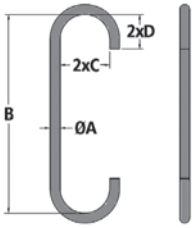
ALLOY STEEL S HOOKS



STYLE 4



STYLE 5



STYLE 6

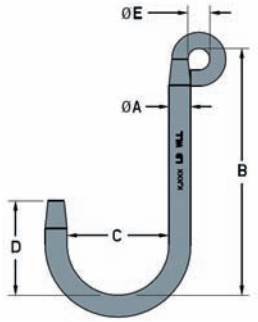
ALLOY STEEL S HOOK SPECIFICATIONS									
MATERIAL DIAMETER (Inches)	STOCK NUMBER			DIMENSIONS (INCHES)				UNIT WEIGHT (Lbs.)	WORK LOAD LIMIT (Lbs.)
	STYLE 4	STYLE 5	STYLE 6	A	B	C	D		
1/4	14189	14198	14207	.25	2.75	.75	.75	.10	195
5/16	14190	14199	14208	.31	2.75	.75	.75	.10	365
3/8	14191	14200	14209	.38	4.13	1.12	1.12	.30	445
1/2	14192	14201	14210	.50	5.50	1.50	1.50	.60	795
9/16	14193	14202	14211	.56	6.50	1.50	1.50	.90	980
5/8	14194	14203	14212	.62	7	1.87	1.87	1.2	1,245
3/4	14195	14204	14213	.75	8.25	2.25	2.25	2.1	1,790
7/8	14196	14205	14214	.87	9.50	2.62	2.62	3.3	2,440
1	14197	14206	14215	1	11	3	3	5	3,190

FOUNDRY HOOKS

Tapered Tip.
Made in USA.
All eyes are welded.
ASME B30.20 Compliant.
Available in long and short reach.

+/- 4% dimensional variation.
Square and hex stock available.
Powder coated and painted black.
Proof load and certification available.
Custom lettering and designs available.





FOUNDRY HOOK (SHORT) SPECIFICATIONS

MATERIAL DIAMETER (Inches)	STOCK NUMBER	DIMENSIONS (INCHES)					UNIT WEIGHT (Lbs.)	LOK-LOY SIZE (Inches)	WORK LOAD LIMIT (Lbs.)
		A	B	C	D	E			
1/2	14782	.50	6	3	3	.75	.80	9/32	450
5/8	14783	.63	6	3	3	.75	1.3	9/32	900
3/4	14784	.75	6	3	3	.75	2	9/32	1400
13/16	14785	.81	6	3	3	.88	2.4	3/8	2000
1	14786	1	6	3	3	1	3.8	3/8	3000

FOUNDRY HOOK (LONG) SPECIFICATIONS

MATERIAL DIAMETER (Inches)	STOCK NUMBER	DIMENSIONS (INCHES)					UNIT WEIGHT (Lbs.)	LOK-LOY SIZE (Inches)	WORK LOAD LIMIT (Lbs.)
		A	B	C	D	E			
1/2	14601	.50	6	2.50	2.31	.75	.80	9/32	500
5/8	14602	.63	8.50	3.50	3.38	.75	1.4	9/32	800
3/4	14603	.75	8.50	3.50	3.38	.75	2.2	9/32	1,250
13/16	14604	.81	8.50	3.50	3.38	.88	2.6	3/8	1,600
1	14605	1	8.50	4	3.81	1	4	3/8	2,500

DESIGN A HOOK

ALL HOOKS HAVE WELDED EYES AND ARE LOAD RATED.
ALL HOOKS ARE ASME COMPLIANT.

J HOOK INFORMATION

Select Hook Style: 1 , 2 or 3

Material Diameter: (A)_____

Work Load Limit:_____

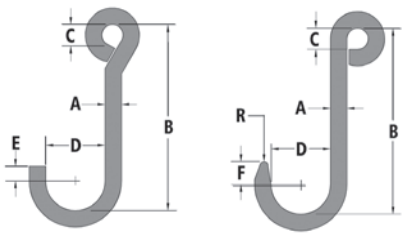
Chain Size:_____

Tip: Flat or Tapered?

B_____ C_____ D_____

E_____ F_____ R_____





S HOOK INFORMATION

Material Diameter: (D)_____

Overall Length: (A)_____

Chain Size: (Inches)_____

Top

Radius: (R)_____

(B)_____

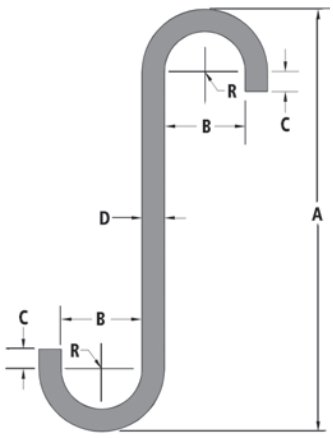
(C)_____

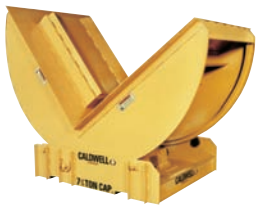
Bottom
(If different from top)

Radius: (R)_____

(B)_____

(C)_____



Lifting Beams 	**Twin Basket Beams** 	**Two Hoist Lift Beams** 	**Adjustable Bail Lifting Beams** 	**Three and Four Point Lifting Beams** 
Motorized Load Leveling Beams 	**Fixed Spreader Beams** 	**Adjustable Spreaders** 	**Adjustable Spreader/Lifters** 	**Fixed and Adjustable Pallet Lifters** 
Coil Upenders 	**Two Sided Coil Lifters** 	**Coil Hooks** 	**Concrete Housing Lifter** 	**Manhole Sleeve Lifter** 
Sheet Lifter 	**Beam Tong** 	**Pallet Puller** 	**Rail Tong** 	**Pipe Grab** 
Fork Hook / Beams 	**Adjust-a-Leg Two or Four Point** 	**Concrete Barrier Tool** 	**Blocks and Swivels** 	**Plate Clamps** 

QUALITY AND ENGINEERING IN EVERY LIFT

Lift-It® Manufacturing offers the largest range of standard products available to satisfy many different lifting applications. In addition to our standard line is the ability to create a custom designed solution to meet your lifting challenges.

We are proud to distribute products designed and manufactured by The Caldwell Group. They have been manufacturing engineered Material Handling Equipment for over 55 years. The goal is to design and manufacture high quality, long lasting lifting products that will safely increase productivity and reduce operating cost.

BENEFITS OF MATERIAL HANDLING EQUIPMENT

- Increased productivity.
- Reliability.
- Increased safety from an engineered product that is compliant to applicable regulations and standards.
- Durability for long lasting service.
- Registered metal tags with unique serial numbers for traceability.
- Rated capacities and safety warnings.

INDUSTRY STANDARDS

The American Society of Mechanical Engineers (ASME) has developed standards that apply specifically to the Material Handling Equipment we supply. ASME B30.20 provides detailed information on the classifications, marking, construction, installation, inspection, testing, maintenance and operation of Below the Hook (BTH) Lifting Devices.

ASME BTH-1 provides detailed information on the design criteria of Below the Hook Lifting Devices.

ASME B30.9 provides detailed information on the fabrication, markings, usage, inspection and maintenance of lifting slings. These standards serve as a guide to government authorities, manufacturers, purchasers and users of lifting devices.

PROOF TESTING AND CERTIFICATION

Please specify if new material handling devices are to be proof tested and certified. There is a nominal charge for this service.

SERVICES

Experienced engineers and technicians provide first-class service to keep your equipment running at peak performance. From training and maintenance, consultations to inspections, modernizations and repairs, we are committed to helping you prolong the life of your lifting equipment and accessories. We will save you time and money, improve safety and productivity and reduce downtime. Our team utilizes the latest technologies and adheres to all American Society of Mechanical Engineers (ASME) standards, keeping you and your equipment safe.

TRAINING & MAINTENANCE CONSULTATIONS

A Service Team member works with your operators to ensure proper use of equipment and can create a customized maintenance plan around key considerations and trouble spots to keep your equipment running at peak performance.

Our custom maintenance programs minimize costly downtime, increase safety and dramatically extend the life of your lifting equipment, protecting your investment. Maintenance is extremely important because identifying small repair issues early can prevent major damage and failure later in the life of your equipment.

INSPECTIONS

Once the Service Team has completed an inspection, we will provide a complete report describing the extent of damages and repairs required, including a firm quote, for your review before any repairs are made to the equipment. An experienced technician can be sent to your location to inspect equipment through operational tests and visual examination. Minor repairs, once identified and approved, often can be performed on-site to help minimize downtime.

REPAIRS

Once major repairs are complete, the equipment is tested; repainted and new capacity and safety labels are applied. Our commitment to quality and service holds true for our repairs, as each piece of equipment repaired by our team carries with it the same new product warranty that accompanies all of our products.

MODERNIZATIONS

Our team uses the latest design technologies to determine if your equipment can be: upgraded, modified or refurbished to help you tackle bigger loads, severe duty cycles, extreme weather, correct recurring issues and improve performance. After modernization, equipment is tested, repainted, labeled and covered by the same new product warranty that accompanies all of our products.

KEY ASME STANDARDS

DESIGN OF BELOW-THE-HOOK LIFTING DEVICES (BTH-1)

ASME BTH-1 designates design criteria for Below-the-Hook Lifting Devices (ASME B30.20) and serves as a guide to designers, manufacturers, purchasers and users of these types of Material Handling Devices.

All Below-the-Hook Lifting Devices shall be designed for specific rated loads and load stresses as they affect the components of the lifting device.

A design category and service class shall be designated and marked on lifters and all quotations, drawings and other documents relating to the Material Handling Device.

Design Category B should be designated when conditions of the lift are not always defined or predictable or when load conditions could be severe. Design factors for Design Category B Lifting Devices shall not be less than 3 for limit states of yielding or buckling.

Service class is the specified fatigue life of the lifter.
- Service Class 0: 0 to 20,000 load cycles
- Service Class 1: 20,001 to 100,000 load cycles
- Service Class 2: 100,001 to 500,000 load cycles
- Service Class 3: 500,001 to 2,000,000 load cycles
- Service Class 4: Over 2,000,000 load cycles

STRUCTURAL AND MECHANICAL LIFTING DEVICES (B30.20)

DESIGN FACTORS

Structural and mechanical lifting devices shall be designed according to ASME BTH-1, Design Category B, taking into consideration the load, including the weight of the Lifting Device. The design service class is determined by the expected fatigue life of a lifter based on the number of load cycles.

FABRICATION

- All welding shall comply with ANSI/AWS D14.1 and ASME BTH-1.
- Guards should be provided for exposed moving parts.
- Electrical equipment and wiring shall comply with ANSI/NFPA 70 and ASME BTH-1.
- Contact us for information on modifications or repairs to maintain compliance with ASME standards.

MARKING

- The rated capacity shall be marked on the Lifting Device.
- Lifting Devices shall be marked with the following information:
  - Manufacturer's name and address
  - Serial number
  - Lifter weight, if over 100 lbs. (45 kg)
  - Cold current (amps), when applicable
  - Rated voltage (when applicable)
  - Rated load
  - ASME BTH-1 Design Category
  - ASME BTH-1 Service Class
- Product Safety Labels.
  - When possible, all Lifting Devices shall have labels that include the appropriate signal word, according to ANSI Z535.4, including the proper cautionary notice to operators warning against improper use. When it is not possible to include the above, a label shall be affixed, referring users to the manufacturer's instruction manual for product safety information.

LOAD TEST

Before use, a new, altered, modified or repaired Lifting Device should be load tested and inspected. Contact the manufacturer for information regarding the appropriate test load for the Lifting Device.

Please Note: Definitions: Should = a recommended procedure. Shall = a required procedure.

CARE AND USE

Material Handling Devices purchased from Lift-It® Manufacturing have been designed for specific tasks and to withstand particular forces imposed. Product specific information will be sent with each product. Guidelines for installation, inspection, maintenance and repair, safe operation and operator training follows:

INSTALLATION

Lifting equipment shall be assembled and installed in accordance with the manufacturer's instructions, unless other specific arrangements have been approved in writing by manufacturer. When lifter/auxiliary power supply is required, user inspection shall ensure that the power source complies with ANSI/NFPA 70, National Electrical Code and shall include a power disconnect switch as required by ANSI/NFPA 70, based on the equipment requirements. If electrical connections are made, the power supply and corresponding power disconnects shall be connected to the line side (power supply side) of the crane disconnect or to an independent circuit as specified in the manufacturer's operating instructions.

Check for correct rotation of all pumps and power units, lubrication of moving parts and filling of reservoirs, all in accordance with manufacturer's instructions.

OPERATOR TRAINING

Material Handling Devices shall be operated in accordance with manufacturer's instruction manual and by personnel who have received instructions described in the "Operating Practices" section of these guidelines. Training shall also include instruction regarding:

1. Details of the lifting cycle.
2. Application of the lifter to the load including (according to the manufacturer's instructions) adjustments to the lifter, if any, to adapt it to various sizes and types of loads.
3. Instruction in any special operations or precautions that may be required.
4. Recognition of proper load configuration, i.e., preferred operation requires an orderly pattern of stacking.
5. Before assuming responsibility for using lifters, an operator shall demonstrate an understanding of the lifting procedure to the instructor. The instructor should record notes of the operator's demonstrated ability.

INSPECTION

Material Handling Devices shall be visually inspected by or under the direction of a qualified person on a daily or weekly schedule depending on the lifter type and severity of the service cycle.

Details to look for include, but are not limited to:

1. Structural deformation.
2. Cracks in the structural frame, welds or hoist hook attachment points.
3. Malfunctions during operation of mechanically operating lifters.
4. Loose covers, fasteners and stops.
5. Faulty operation of automatic hold and release mechanisms.
6. Wear of hoist hooking points, load supporting clevises, pins, slings, linkages and mechanical parts.
7. Missing nameplates and markings. Contact us for replacements.

MAINTENANCE AND REPAIRS

1. A preventive maintenance program should be established for each Material Handling Device by a qualified person based on manufacturer recommendations.
2. A qualified person shall have responsibility for repairs. Dated records and details of repairs and parts replacement should be carefully maintained by a qualified person.
3. Replacement parts shall be at least equivalent to the original manufacturer's specifications.
4. Keep products clean of dirt and debris to ensure proper and safe operation.
5. Oil pins and moving parts as required.

OPERATING PRACTICES

ACCEPTABLE

1. The operator shall receive, read and understand the manufacturer's instruction manual.
2. The operator shall watch carefully that the device is performing properly during the lifting procedure.
3. The operator shall know standard crane hand signals.
4. The operator shall only respond to signals from an appointed person. However, stop signals from anyone shall be obeyed.
5. The operator shall notify a designated person when he considers a load to be unsafe.
6. The operator shall inspect devices before using. Defects shall be examined by a qualified person to determine if it is hazardous.

NOT ACCEPTABLE

1. The operator shall not operate a malfunctioning lifter or one tagged, "OUT OF SERVICE".
2. The operator shall not use the Material Handling Device for any purpose(s) other than those designated by the manufacturer's instruction manual.
3. The operator shall not use a Material Handling Device when capacity, weight or product safety labels are missing or are no longer legible.
4. No one shall make alterations or modifications to devices without consulting the manufacturer.
5. No one shall obscure or paint over manufacturer's capacity, weight or product safety labels.
6. Loads shall not be lifted higher than necessary nor be left suspended and unattended.
7. Material Handling Devices shall not lift loads that are not properly balanced for safe lifting.

HANDLING THE LOAD

1. Material Handling Devices shall not be loaded in excess of rated capacity.
2. The combined weight of the device and load shall not exceed the rated capacity of the crane or hoist.
3. The Material Handling Device shall be applied to the load in accordance with the manufacturer's recommended operating procedure.
4. Ropes and chains used with Material Handling Devices shall not be kinked and multiple part lines shall not be twisted about each other.
5. The Material Handling Device shall not touch obstructions during load movement.
6. The device shall not be loaded with loose material that might fall during movement.
7. The operator or other personnel shall not place themselves or any part of their bodies beneath suspended loads.
8. Material Handling Devices shall not be used to handle loads for which they are not designed.
9. Loads while engaged by Material Handling Devices shall not be slid on the floor or other surfaces.
10. If suspended loads are moved manually, they shall be pushed, not pulled.
11. A preliminary lift of a few inches shall be made to establish load stability.
12. All loads shall be accelerated and decelerated smoothly and slowly.

Modifications or repairs performed on Material Handling Devices without prior written approval voids warranty. Refer to ASME standards for information regarding the liability for repaired or modified lifters.

M20 & M20H - LOW HEADROOM MULTIPLE SPREAD BEAM



PRODUCT FEATURES:

- Ideal where headroom is limited.
- 3′ and 4′ beams have 2 spreads.
- Beams over 4′ have 3 spreads.
- Swivel hooks with hook latches standard.
- Wide range of sizes and capacities available.
- Complies with ASME Standards.

STANDARD FEATURE:

Three Spreads to adjust to the load:

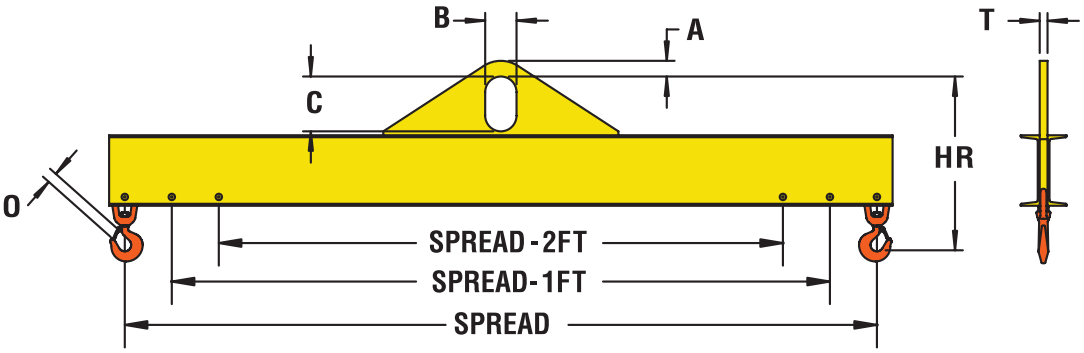
- Outside Spread
- Middle spread (outside spread less 1′)
- Inside spread (outside spread less 2′)

M20 & M20H LIFTING BEAM SPECIFICATIONS

CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	OUTSIDE SPREAD IN FEET					
		3	4	6	8	10	12
1/2	O.C. H.R. WT.	20-1/2-3 12-3/4 40	20-1/2-4 12-3/4 50	20-1/2-6 12-3/4 65	20-1/2-8 12-3/4 95	20-1/2-10 13-3/4 140	20-1/2-12 13-3/4 160
1	O.C. H.R. WT.	20-1-3 12-3/4 40	20-1-4 12-3/4 50	20-1-6 13-3/4 85	20-1-8 13-3/4 115	20-1-10 14-3/4 165	20-1-12 15-3/4 230
2	O.C. H.R. WT.	20-2-3 13-3/4 50	20-2-4 13-3/4 65	20-2-6 14-3/4 100	20-2-8 16-1/2 165	20-2-10 17-1/2 230	20-2-12 18-1/4 315
3	O.C. H.R. WT.	20-3-3 15-1/4 70	20-3-4 15-1/4 80	20-3-6 16-1/4 140	20-3-8 17-1/4 200	20-3-10 18-1/4 275	20-3-12 22-1/2 415
5	O.C. H.R. WT.	20-5-3 19-1/2 115	20-5-4 20-1/2 145	20-5-6 21-1/2 205	20-5-8 25-1/2 325	20-5-10 25-1/2 390	20-5-12 27-1/2 580
7-1/2	O.C. H.R. WT.	20-7 1/2-3 22-1/2 135	20-7 1/2-4 23-1/2 170	20-7 1/2-6 25-1/4 265	20-7 1/2-8 27-1/4 415	20-7 1/2-10 27-1/4 500	20-7 1/2-12 30-1/4 910
10	O.C. H.R. WT.	20-10-3 23-1/4 150	20-10-4 25-1/4 205	20-10-6 27-1/4 335	20-10-8 27-1/4 420	20-10-10 30-1/4 775	20-10-12 30-1/4 910
15	O.C. H.R. WT.	20-15-3 28-1/2 215	20-15-4 30-1/2 295	20-15-6 30-1/2 375	20-15-8 33-1/2 685	20-15-10 33-1/2 820	20-15-12 40-1/4 1180
20	O.C. H.R. WT.	20-20-3 38-3/4 370	20-20-4 38-3/4 435	20-20-6 38-3/4 575	20-20-8 38-3/4 710	20-20-10 41-1/2 1070	20-20-12 41-1/2 1235
25	O.C. H.R. WT.		20-25-4 41-3/8 470	20-25-6 41-3/8 590	20-25-8 44-3/8 925	20-25-10 44-3/8 1100	20-25-12 44-3/8 1650
30	O.C. H.R. WT.		20-30-4 45-1/2 525	20-30-6 45-1/2 660	20-30-8 48-1/4 1010	20H-30-10 54-1/2 1150	20H-30-12 56-1/2 1395
40	O.C. H.R. WT.		20-40-4 44-3/4 600	20-40-6 47-3/4 930	20H-40-8 65-3/4 1200	20H-40-10 66-1/4 1550	20H-40-12 66-1/4 1840

Red ORDER CODES denote M20 Beams. Available Options: A,B,C,D and E.
Blue ORDER CODES denote M20H Beams (I Beam) construction. Available options: A, F or G.
WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

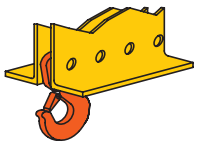
M20 & M20H - LOW HEADROOM MULTIPLE SPREAD BEAM



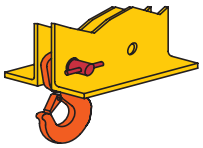
M20 & M20H LIFTING BEAM SPECIFICATIONS

CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	OUTSIDE SPREAD IN FEET						DIMENSIONS (Inches)
		14	16	18	20	24	30	
1/2	O.C. H.R. WT.	20-1/2-14 14-3/4 230	20-1/2-16 15-3/4 305	20-1/2-18 16-3/4 400	20-1/2-20 16-3/4 450	20-1/2-24 20-1/4 830	20-1/2-30 22-1/4 1340	A= 7/8 T=3/4 B= 3 O=7/8 C= 5
1	O.C. H.R. WT.	20-1-14 16-3/4 320	20-1-16 18-1/2 415	20-1-18 20-1/4 605	20-1-20 20-1/4 675	20-1-24 22-1/4 1095	20H-1-30 27-1/2 1500	A= 7/8 T=3/4 B= 3 O=7/8 C= 5
2	O.C. H.R. WT.	20-2-14 20-1/4 480	20-2-16 20-1/4 540	20-2-18 24-3/4 800	20-2-20 24-3/4 900	20-2-24 27-3/4 1730	20H-2-30 27-1/2 1600	A= 7/8 T=3/4 B= 3 O=7/8 C= 5
3	O.C. H.R. WT.	20-3-14 24-1/2 650	20-3-16 24-1/2 730	20-3-18 27-1/2 1295	20-3-20 27-1/2 1450	20-3-24 27-1/2 1765	20H-3-30 29-1/2 1900	A= 1-1/4 T=1 B= 3 O=1 C= 5
5	O.C. H.R. WT.	20-5-14 27-1/2 690	20-5-16 30-1/4 1210	20-5-18 30-1/4 1340	20-5-20 30-1/4 1505	20-5-24 33-1/4 2275	20H-5-30 31-3/4 2310	A= 2 T=1-1/4 B= 4 O=1-15/16 C= 7
7-1/2	O.C. H.R. WT.	20-7 1/2-14 30-1/4 1070	20-7 1/2-16 30-1/4 1210	20-7 1/2-18 33 1665	20H-7 1/2-20 34-3/4 1325	20H-7 1/2-24 34-3/4 1890	20H-7 1/2-30 35 2790	A= 2 T=1-1/4 B= 4 O=1-1/2 C= 7
10	O.C. H.R. WT.	20-10-14 30-1/4 1075	20-10-16 33 1500	20-10-18 33 1670	20H-10-20 35-3/4 1465	20H-10-24 36 2075	20H-10-30 37-3/4 3150	A= 2 T=1-1/4 B= 4 O=1-9/16 C= 7
15	O.C. H.R. WT.	20-15-14 40-1/4 1385	20H-15-16 41-1/2 1361	20H-15-18 41-3/4 1610	20H-15-20 42 1915	20H-15-24 43-1/2 2690	20H-15-30 42-1/4 4255	A= 2-1/2 T=1-1/2 B= 5 O=2-1/16 C= 9
20	O.C. H.R. WT.	20H-20-14 45-3/4 1210	20H-20-16 46 1510	20H-20-18 46-1/4 1885	20H-20-20 48 2225	20H-20-24 48-1/2 3155	20H-20-30 49-1/4 5040	A= 2-1/2 T=1-1/2 B= 5 O=2-1/4 C= 9
25	O.C. H.R. WT.	20H-25-14 54-3/4 1540	20H-25-16 55 1900	20H-25-18 56-3/4 2230	20H-25-20 59-3/4 2725	20H-25-24 60 3685	20H-25-30 60-3/4 5530	A= 3 T=1-3/4 B= 6 O=2-1/4 C= 12
30	O.C. H.R. WT.	20H-30-14 56-1/2 1695	20H-30-16 56-3/4 2050	20H-30-18 62-1/4 2380	20H-30-20 62-1/2 2850	20H-30-24 63 4040	20H-30-30 68-3/4 5725	A= 3-1/2 T=2 B= 7 O=2-1/4 C= 16
40	O.C. H.R. WT.	20H-40-14 66-1/4 2220	20H-40-16 68-3/4 2400	20H-40-18 69-1/4 3100	20H-40-20 72 3680	20H-40-24 75-1/4 4920	20H-40-30 78-1/2 6810	A= 3-1/2 T=2-1/2 B= 7 O=3 C= 16

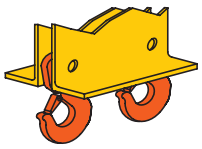
Other Sizes are available, contact us.
Dimensions and specifications are subject to change.
WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**



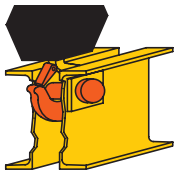
OPTION A
Extra Holes or Different Placement of Holes.
Allows multiple hook positioning beyond standard 3 spreads. Specify number and spread(s) required.



OPTION B
Faspins
For ease of positioning hooks with quick release. Specify number required. Recommended for frequent hook position changes.



OPTION C
Extra Hooks
Allows for multiple pick points. Specify number required.

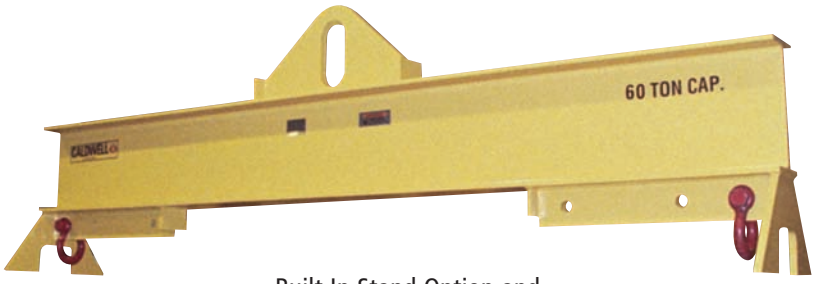


OPTION D
Pin Type Bail
Lifting pin located between structural channel. (Hoist hook information must be supplied).



OPTION E
Shackle Lug
Lifting lug with shackle. (Headroom may change).

M20 & M20H - LOW HEADROOM MULTIPLE SPREAD BEAM



Built In Stand Option and
custom hole placement depicted.

PRODUCT FEATURES:

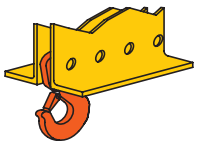
- "I" Beam Construction.
- Ideal where headroom is limited.
- Three spreads to adjust to the load:
  Outside Spread
  Middle Spread (outside less 1 ft.)
  Inside Spread (outside less 2 ft.)
- Swivel hooks with hook latches standard.
- Wide range of sizes and capacities available.
- Complies with ASME Standards.

M20 & M20H LOW HEADROOM MULTIPLE SPREAD BEAM SPECIFICATIONS

CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	OUTSIDE SPREAD IN FEET									DIMENSIONS (Inches)	
		8	10	12	14	16	18	20	24	30		
1	O.C. H.R. WT.	20-1-8 13-3/4 115	20-1-10 14-3/4 165	20-1-12 15-3/4 230	20-1-14 16-3/4 320	20-1-16 18-1/2 415	20-1-18 20-1/4 605	20-1-20 20-1/4 675	20-1-24 22-1/4 1095	20H-1-30 27-1/2 1500	A=7/8 B=3 C= 5	T=3/4 O=7/8
2	O.C. H.R. WT.	20-2-8 16-1/2 165	20-2-10 17-1/2 230	20-2-12 18-1/4 315	20-2-14 20-1/4 480	20-2-16 20-1/4 540	20-2-18 24-3/4 800	20-2-20 24-3/4 900	20-2-24 27-3/4 1730	20H-2-30 27-1/2 1600	A=7/8 B=3 C=5	T=3/4 O=7/8
3	O.C. H.R. WT.	20-3-8 17-1/4 200	20-3-10 18-1/4 275	20-3-12 22-1/2 415	20-3-14 24-1/2 650	20-3-16 24-1/2 730	20-3-18 27-1/2 1295	20-3-20 27-1/2 1450	20-3-24 27-1/2 1765	20H-3-30 29-1/2 1900	A=1-1/4 B=3 C=5	T=1 O=1
5	O.C. H.R. WT.	20-5-8 25-1/2 325	20-5-10 25-1/2 390	20-5-12 27-1/2 580	20-5-14 27-1/2 690	20-5-16 30-1/4 1210	20-5-18 30-1/4 1340	20-5-20 30-1/4 1505	20-5-24 33-1/4 2275	20H-5-30 31-3/4 2310	A=2 B=4 C=7	T=1-1/4 O=1-15/16
7-1/2	O.C. H.R. WT.	20-7 1/2-8 27-1/4 415	20-7 1/2-10 27-1/4 500	20-7 1/2-12 30-1/4 910	20-7 1/2-14 30-1/4 1070	20-7 1/2-16 30-1/4 1210	20-7 1/2-18 33 1665	20H-7 1/2-20 34-3/4 1325	20H- 7 1/2-24 34-3/4 1890	20H-7 1/2-30 35 2790	A=2 B=4 C=7	T=1-1/4 O=1-1/2
10	O.C. H.R. WT.	20-10-8 27-1/4 420	20-10-10 30-1/4 775	20-10-12 30-1/4 910	20-10-14 30-1/4 1075	20-10-16 33 1500	20-10-18 33 1670	20H-10-20 35-3/4 1465	20H-10-24 36 2075	20H-10-30 37-3/4 3150	A=2 B=4 C=7	T=1-1/4 O=1-9/16
15	O.C. H.R. WT.	20-15-8 33-1/2 685	20-15-10 33-1/2 820	20-15-12 40-1/4 1180	20-15-14 40-1/4 1385	20H-15-16 41-1/2 1361	20H-15-18 41-3/4 1610	20H-15-20 42 1915	20H-15-24 43-1/2 2690	20H-15-30 42-1/4 4255	A=2-1/2 B=5 C=9	T=1-1/2 O=2-1/16
20	O.C. H.R. WT.	20-20-8 38-3/4 710	20-20-10 41-1/2 1070	20-20-12 41-1/2 1235	20H-20-14 45-3/4 1210	20H-20-16 46 1510	20H-20-18 46-1/4 1885	20H-20-20 48 2225	20H-20-24 48-1/2 3155	20H-20-30 49-1/4 5040	A=2-1/2 B=5 C=9	T=1-1/2 O=2-1/4
25	O.C. H.R. WT.	20-25-8 44-3/8 925	20-25-10 44-3/8 1100	20-25-12 44-3/8 1650	20H-25-14 54-3/4 1540	20H-25-16 55 1900	20H-25-18 56-3/4 2230	20H-25-20 59-3/4 2725	20H-25-24 60 3685	20H-25-30 60-3/4 5530	A=3 B=6 C=12	T=1-3/4 O=2-1/4
30	O.C. H.R. WT.	20-30-8 48-1/4 1010	20H-30-10 54-1/2 1150	20H-30-12 56-1/2 1395	20H-30-14 56-1/2 1695	20H-30-16 56-3/4 2050	20H-30-18 62-1/4 2380	20H-30-20 62-1/2 2850	20H-30-24 63 4040	20H-30-30 68-3/4 5725	A=3-1/2 B=7 C=16	T=2 O=2-1/4
40	O.C. H.R. WT.	20H-40-8 65-3/4 1200	20H-40-10 66-1/4 1550	20H-40-12 66-1/4 1840	20H-40-14 66-1/4 2220	20H-40-16 68-3/4 2400	20H-40-18 69-1/4 3100	20H-40-20 72 3680	20H-40-24 75-1/4 4920	20H-40-30 78-1/2 6810	A=3-1/2 B=7 C=16	T=2-1/2 O=3

Red ORDER CODES denote M20 Beams. Available Options: A,B,C,D and E.
Blue ORDER CODES denote M20H Beams (I Beam) construction. Available options: A, F or G.
WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**
Other Sizes are available, contact us. Dimensions and Specifications are subject to change.

OPTION A



Extra Holes or Different Placement of Holes.
Allows multiple hook positioning beyond standard 3 spreads. Specify number and spread(s) required.

OPTION F

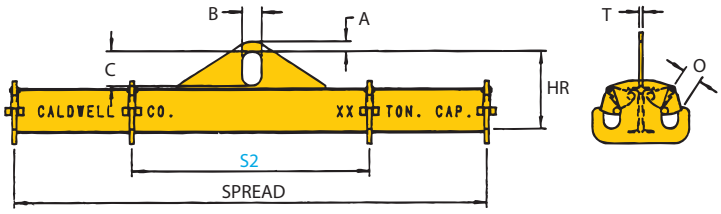
Extra Shackles and Swivel Hooks
Allows for multiple pick points or eliminates the need to move hardware for different size loads. Specify number and type required.

OPTION G

Built In Stand
Keeps beam upright for easy crane hook attachment.

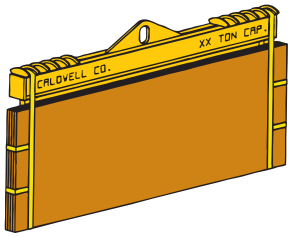
M22 - HEAVY DUTY TWIN BASKET BEAM





PRODUCT FEATURES:

- Designed to be used with slings in a basket hitch.
- Specially designed hooks with hook latches minimize potential sling damage.
- Two sets of fixed hooks are standard for all lengths over 4'.
- The inner set of hooks (S2) are 1/2 the overall spread.
- Extra spreads available upon request.
- Complies with ASME standards.
- Model No. M22G made specifically for handling sheets or packages of glass, wood or wood crates.



M22 HEAVY DUTY TWIN BASKET BEAM SPECIFICATIONS

CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	SPREAD IN FEET												OTHER DIMENSIONS (Inches)
		3	4	6	8	10	12	14	16	18	20	24	30	
1/2	O.C. H.R. WT.	22-1/2-3 8-1/2 50	22-1/2-4 8-1/2 65	22-1/2-6 8-1/2 110	22-1/2-8 8-1/2 150	22-1/2-10 9-1/2 200	22-1/2-12 9-1/2 220	22-1/2-14 10-1/2 298	22-1/2-16 10-1/2 331	22-1/2-18 11-1/2 424	22-1/2-20 11-1/2 463	22-1/2-24 12-1/2 627	22-1/2-30 13-1/2 855	A=7/8 T=3/4 B=3 O=1-1/16 C=5
1	O.C. H.R. WT.	22-1-3 8-1/2 50	22-1-4 8-1/2 65	22-1-6 9-1/2 145	22-1-8 10-1/2 210	22-1-10 10-1/2 230	22-1-12 11-1/2 290	22-1-14 11-1/2 338	22-1-16 12-1/2 390	22-1-18 13-1/2 539	22-1-20 13-1/2 588	22-1-24 15-1/2 907	22-1-30 15-1/2 1150	A=7/8 T=3/4 B=3 O=1-1/8 C=5
2	O.C. H.R. WT.	22-2-3 9-1/2 70	22-2-4 10-1/2 90	22-2-6 10-1/2 160	22-2-8 11-1/2 225	22-2-10 12-1/2 300	22-2-12 13-1/2 375	22-2-14 13-1/2 447	22-2-16 14-1/2 515	22-2-18 15-1/2 725	22-2-20 15-1/2 815	22-2-24 17-1/2 1221	22-2-30 20-1/2 2272	A=7/8 T=3/4 B=3 O=1-1/8 C=5
5	O.C. H.R. WT.	22-5-3 13-1/2 90	22-5-4 14-1/2 160	22-5-6 15-1/2 275	22-5-8 16-1/2 350	22-5-10 16-1/2 450	22-5-12 16-1/2 500	22-5-14* 19 854	22-5-16* 19-1/2 940	22-5-18* 22-1/2 1398	22-5-20* 22-1/2 1650	22-5-24* 22-1/2 2144	22-5-30* 25-1/2 2330	A=2 T=1 B=4 T=1-1/4 C=7 O=1-1/8
7-1/2	O.C. H.R. WT.	22-7 1/2-3 14-1/2 155	22-7 1/2 4 15-1/2 180	22-7 1/2 - 6 16-1/2 330	22-7 1/2-8 17-1/2 410	22-7 1/2-10 17-1/2 500	22-7 1/2-12 19-1/2 700	22-7 1/2-14 22-1/2 1162	22-7 1/2-16 22-1/2 1300	22-7 1/2-18 22-1/2 1468	22-7 1/2-20 22-1/2 1606	22-7 1/2-24 25-1/2 2354	22-7 1/2-30 25-1/2 2877	A=2 T=1-1/4 B=4 O=1-3/4 C=7
10	O.C. H.R. WT.	22-10-3 15-1/2 150	22-10-4 16-1/2 200	22-10-6 17-1/2 320	22-10-8 19-1/2 500	22-10-10 22-1/2 850	22-10-12 19-1/2 1000	22-10-14 22-1/2 1147	22-10-16 22-1/2 1299	22-10-18 25-1/2 1741	22-10-20 25-1/2 1943	22-10-24 25-1/2 2335	22-10-30 25-1/2 2962	A=2 T=1-1/4 B=4 O=1-3/4 C=7
15	O.C. H.R. WT.	22-15-3 18-1/2 397	22-15-4 19-1/2 471	22-15-6 21-1/2 970	22-15-8 21-1/2 1240	22-15-10 24-1/2 1256	22-15-12 27-1/2 1980	22-15-14 27-1/2 2065	22-15-16 27-1/2 2100	22-15-18 27-1/2 2391	22-15-20 27-1/2 2584	22-15-24 27-1/2 4045	22-15-30 30 4100	A=2-1/2 T=1-1/2 B=5 O=4 C=9
20	O.C. H.R. WT.	22-20-3 19-1/2 253	22-20-4 21-1/2 328	22-20-6 21-1/2 910	22-20-8 24-1/2 1000	22-20-10 24-1/2 1150	22-20-12 24-1/2 1740	22-20-14 27-1/2 1935	22-20-16 27-1/2 2210	22-20-18 27-1/2 2480	22-20-20 27-1/2 2755	22-20-24 31 3500	22-20-30 31 4500	A=2-1/2 T=1-1/2 B=5 O=4 C=8

Dimensions and specifications are subject to change.

WARNING See Pages 269 and 270 for Important Safety, Use and Inspection Information.

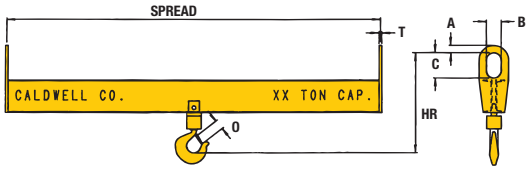
M25 - TWIN HOIST BEAM



OPTION D
Roller bearing hook shown.
(Standard on 30 and 40 Ton models).

PRODUCT FEATURES:

- Use two or more hoists to increase lifting capacity.
- Swivel hook with hook latch.
- Several options are available for added versatility.
- Complies with ASME Standards.
- Model M21-Twin Hoist Rotating Beam is available.



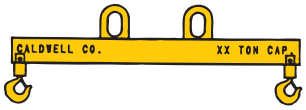
M25 TWIN HOIST LIFT BEAM SPECIFICATIONS

CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	SPREAD IN FEET									OTHER DIMENSIONS (Inches)
		6	8	10	12	14	16	18	20	24	
2	O.C. H.R. WT.	25-2-6 16-3/4 125	25-2-8 16-3/4 160	25-2-10 17-3/4 240	25-2-12 17-3/4 280	25-2-14 18-3/4 360	25-2-16 18-3/4 400	25-2-18 18-3/4 530	25-2-20 18-3/4 660	25-2-24 19-3/4 790	A=1-1/2 T=5/8 B=3 O=1-1/8 C=5
4	O.C. H.R. WT.	25-4-6 20 160	25-4-8 21 240	25-4-10 22 310	25-4-12 23 410	25-4-14 23 500	25-4-16 25 725	25-4-18 25 805	25-4-20 25 890	25-4-24 26 1695	A=1-1/2 T=5/8 B=3 O=1-1/2 C=5
6	O.C. H.R. WT.	25-6-6 27-1/2 220	25-6-8 28-1/2 300	25-6-10 28-1/2 380	25-6-12 30-1/2 550	25-6-14 30-1/2 640	25-6-16 30-1/2 780	25-6-18 30-1/2 1310	25-6-20 30-1/2 1450	25-6-24 31-1/2 1735	A=1-1/2 T=3/4 B=3 O=2-1/16 C=5
10	O.C. H.R. WT.	25-10-6 29 340	25-10-8 29 420	25-10-10 32 800	25-10-12 32 920	25-10-14 32 1100	25-10-16 32 1220	25-10-18 32 1705	25-10-20 32 1840	25-10-24 33 2230	A=2 T=1 B=4 O=2-1/4 C=7
15	O.C. H.R. WT.		25-15-8 38-1/4 740	25-15-10 38-1/4 865	25-15-12 38-1/4 1050	25-15-14 41-1/4 1930	25-15-16 41-1/2 2158	25-15-18 41-1/2 2290	25-15-20 41-1/2 2500		A=2 T=1-1/4 B=4 O=2-1/4 C=7
20	O.C. H.R. WT.		25-20-8 35-1/2 830	25-20-10 38-1/2 1130	25-20-12 38-1/2 1266	25-20-14 38-1/2 1926	25-20-16 38-1/2 2196	25-20-18 38-1/2 2430			A=2 T=1-1/4 B=4 O=3 C=7
30	O.C. H.R. WT.		25-30-8 54 1120	25-30-10 54 1325	25-30-12 54 1610						A=2-1/2 T=1-1/2 B=5 O=3-3/4 C=9
40	O.C. H.R. WT.		25-40-8 58-1/2 1165	25-40-10 58-1/2 1470	25-40-12 58-1/2 1700						A=2-1/2 T=1-1/2 B=5 O=4-1/4 C=9

Dimensions and specifications are subject to change.
WARNING See Pages 269 and 270 for Important Safety, Use and Inspection Information.



OPTION A
Offset hook for hoists of different capacities.



OPTION B
Multiple load hooks, some outside the bale span.



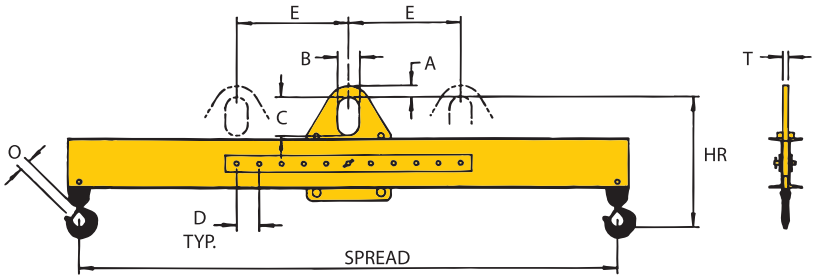
OPTION C
Center bail and extra pair of hooks for maximum versatility.

M24 - ADJUSTABLE BAIL BEAM



PRODUCT FEATURES:

- Handles off center loads by adjusting bail before lift.
- Adjustment of bail within range.
- Swivel hooks with hook latches standard.
- Wide range of sizes and capacities available.
- Complies with ASME standards.

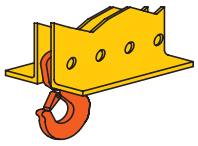


M24 ADJUSTABLE BAIL LIFTING BEAM SPECIFICATIONS

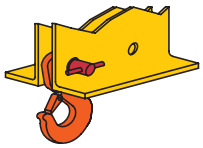
CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	SPREAD IN FEET 3	4	6	8	10	12	14	16	18	20	OTHER DIMENSIONS (Inches)
1/2	O.C. H.R. WT.	24-1/2-3 13-1/2 47	24-1/2-4 13-1/2 56	24-1/2-6 13-1/2 75	24-1/2-8 12-5/8 82	24-1/2-10 13-1/2 95	24-1/2-12 13-1/2 147	24-1/2-14 13-1/2 168	24-1/2-16 14-1/2 255	24-1/2-18 14-1/2 278	24-1/2-20 14-1/2 304	A=1-1/2 T=5/8 B=3 O=1 C=5
1	O.C. H.R. WT.	24-1-3 13-1/2 47	24-1-4 13-5/8 56	24-1-6 13-5/8 83	24-1-8 14-5/8 126	24-1-10 14-5/8 170	24-1-12 14-5/8 198	24-1-14 15-5/8 268	24-1-16 15-5/8 298	24-1-18 16-1/2 409	24-1-20 16-1/2 449	A=1-1/2 T=5/8 B=3 O=1 C=5
2	O.C. H.R. WT.	24-2-3 14 48	24-2-4 15-1/8 89	24-2-6 15-1/8 117	24-2-8 16-1/8 170	24-2-10 18-1/2 240	24-2-12 17-1/8 278	24-2-14 18-1/4 369	24-2-16 18-1/4 416	24-2-18 19-1/2 547	24-2-20 19-1/2 605	A=1-1/2 T=3/4 B=3 O=1 C=5
5	O.C. H.R. WT.	24-5-3 21-1/2 140	24-5-4 21-1/2 160	24-5-6 21-1/2 215	24-5-8 22-1/2 304	24-5-10 23-1/2 430	24-5-12 27 633	24-5-14* 27 664	24-5-16* 28 746	24-5-18* 29 1321	24-5-20* 30-3/8 1525	A=2 T=1 B=4 O=1 C=7 O=1-1/2*
10	O.C. H.R. WT.	24-10-3 25-3/4 210	24-10-4 25-3/4 211	24-10-6 28-3/4 432	24-10-8 28-3/4 522	24-10-10 31-3/4 759	24-10-12 31-3/4 993	24-10-14 31-3/4 1128	24-10-16 31-3/4 1257	24-10-18 34-3/4 1738	24-10-20 34-3/4 1908	A=2 T=1-1/4 B=4 O=1-3/4 C=7
15	O.C. H.R. WT.	24-15-3 28-1/4 252	24-15-4 30-1/2 330	24-15-6 33-1/2 502	24-15-8 33-1/2 542	24-15-10 33-1/2 882	24-15-12 37 1455	24-15-14 37 1630	24-15-16 37 1800			A=2-1/2 T=1-1/2 B=5 O=2 C=9
20	O.C. H.R. WT.	24-20-3 31 315	24-20-4 34 399	24-20-6 37 735	24-20-8 34 720	24-20-10 37 1276	24-20-12 37 1251					A=2-1/2 T=1-1/2 B=5 O=2 C=9
OTHER DIMENSIONS (Inches)		D= 3 E = 6	D= 3 E = 9	D= 3 E = 12	D= 4 E = 16	D= 4 E = 20	D= 4 E = 24	D= 6 E = 30	D= 6 E = 36	D= 6 E = 42	D= 6 E = 48	OTHER DIMENSIONS (Inches)

Dimensions and specifications are subject to change.

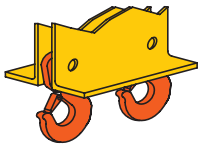
⚠ WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**



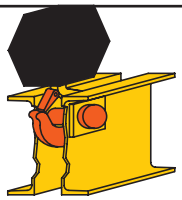
OPTION A
EXTRA HOLES
Allows for multiple hook positioning. Specify number and spread(s) required. *Could increase headroom.



OPTION B
FASPINS
For ease of positioning hooks with quick release. Specify number of faspins required.



OPTION C
EXTRA HOOKS
Allows for multiple pick points. Specify number of hooks required.

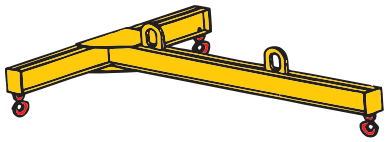


OPTION D
LOWER HEADROOM
Lifting Pin located between structural channel. (Hoist hook information must be supplied.)

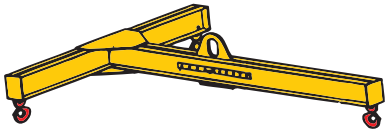
M27T - THREE POINT BEAM



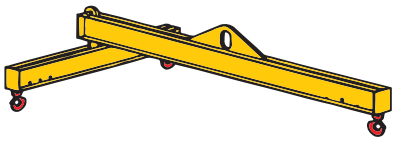
Three and Four Point Lifting Beams handle large loads using multiple pick points. Each unit is designed for your specific application and complies with ASME standards.



OPTION A
MULTIPLE BAILS
Use 2 hoists to increase lifting stability.



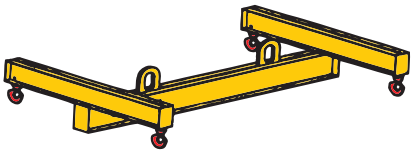
OPTION B
ADJUSTABLE BAIL
Use when load-leveling capability is required along length of load.



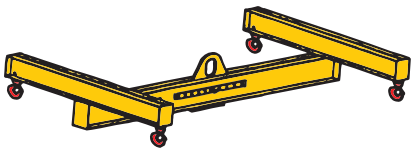
OPTION C
ADJUSTABLE SPREAD
Use when adjustment in length and width is required.

M27F - FOUR POINT BEAM

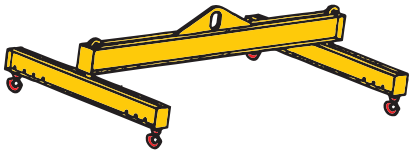




OPTION A
MULTIPLE BAILS
Use 2 or 4 hoists to increase lifting stability.

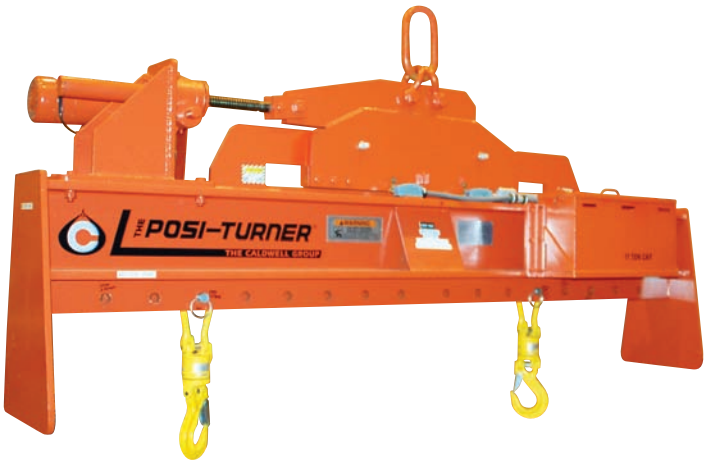


OPTION B
ADJUSTABLE BAIL
Use when load-leveling capability is required along length of load.



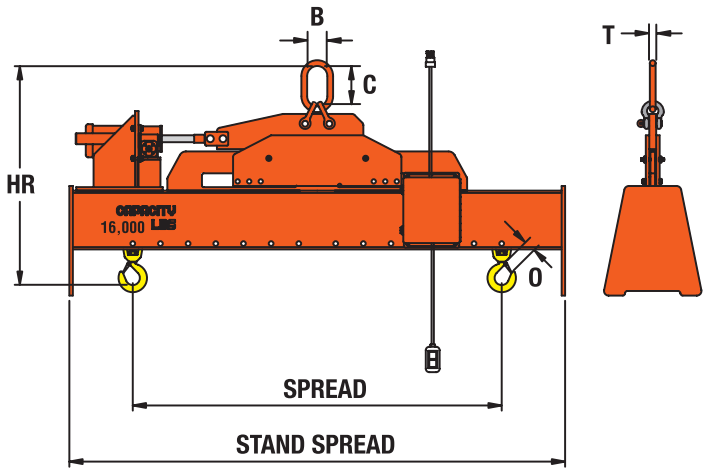
OPTION C
ADJUSTABLE SPREAD
Use when adjustability in length and width is required.

M26 – MOTORIZED LOAD LEVELING BEAM



PRODUCT FEATURES:

- Motorized Load Leveling Beam adjusts to center of gravity during the lift.
- Swivel hooks with hook latch are standard.
- Custom Sizes are available.
- Push button pendent control with radio control option.
- Standard bail adjustment 6" each side of center, with optional 12" adjustment each side of center available.
- Complies with ASME Standards.
- Shown with special swivel bearing load hooks..



MODEL 26 - MOTORIZED LOAD LEVELING BEAM SPECIFICATIONS

CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	OUTSIDE SPREAD IN FEET								DIMENSIONS (Inches)
		8	10	12	14	16	18	20	24	
2	O.C. H.R. WT.	26P-2-8 28.7 370	26P-2-10 29.7 435	26P-2-12 29.7 465	26P-2-14 33 575	26P-2-16 33 620	26P-2-18 35 805	26P-2-20 35 880	26P-2-24 37.4 1300	B=2.8 T=3/4 C=4.8 O=1
3	O.C. H.R. WT.	26P-3-8 30.3 405	26P-3-10 31.3 480	26P-3-12 33.3 610	26P-3-14 33.3 695	26P-3-16 33.3 760	26P-3-18 33.3 820	26P-3-20 35.3 1015	26P-3-24 38.3 1300	B=2.8 T=3/4 C=4.8 O=1
5	O.C. H.R. WT.	26P-5-8 36.8 620	26P-5-10 36.8 680	26P-5-12 38.8 875	26P-5-14 38.8 990	26P-5-16 38.8 1070	26P-5-18 43.8 1640	26P-5-20 43.8 1800	26P-5-24 44.8 2380	B=3.5 T=1 C=6.0 O=1
7-1/2	O.C. H.R. WT.		26P-7 1/2-10 46.8 1105	26P-7 1/2-12 46.8 1185	26P-7 1/2-14 49.5 1680	26P-7 1/2-16 49.5 1815	26P-7 1/2-18 49.5 1950			B=4.4 T=1-1/4 C=7.5 O=1-3/4
10	O.C. H.R. WT.		26P-10-10 49.5 1475	26P-10-12 49.5 1610	26P-10-14 49.5 1780	26P-10-16 49.5 1915	26P-10-18 52.5 2375			B=4.4 T=1-1/4 C=7.5 O=1-3/4
15	O.C. H.R. WT.		26P-15-10 52.7 1625	26P-15-12 55.7 1980	26P-15-14 55.7 2190					B=5.3 T=1-1/2 C=9.6 O=1-3/4
20	O.C. H.R. WT.		26P-20-10 64 1965	26P-20-12 64 2130						B=6.0 T=1-3/4 C=10.0 O=2

Dimensions and specifications are subject to change.

WARNING See Pages 269 and 270 for Important Safety, Use and Inspection Information.

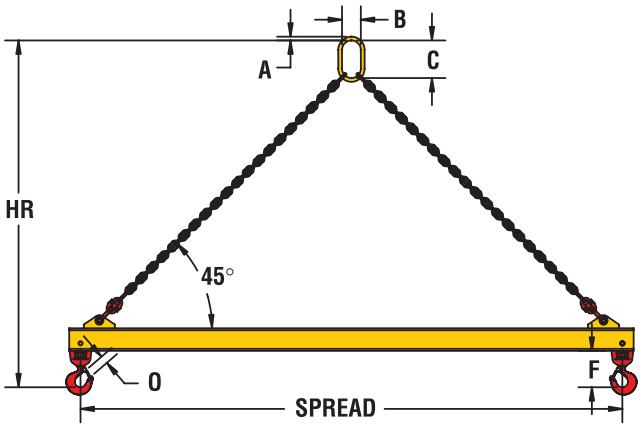
M30 – FIXED SPREADER BEAM



PRODUCT FEATURES:

- Ideal where headroom is not limited.
- Adds stability to the lift.
- Available with standard chain or wire rope rigging. (You must specify Top Rigging).
- Available with Adjust-A-Leg® rigging for off center loads. (Minimum lifting capacity will be 10-15% of beam capacity).
- Swivel hook with hook latch.
- Wide range of additional sizes and capacities available.
- Complies with ASME Standards.

TOP RIGGING OPTIONS		
OPTION A Adjust-A-Leg® Top Rigging for off center load adjustment.	**OPTION C (Depicted)** Chain top rigging from beam to crane hook.	**OPTION W** Wire Rope rigging from beam to crane hook.

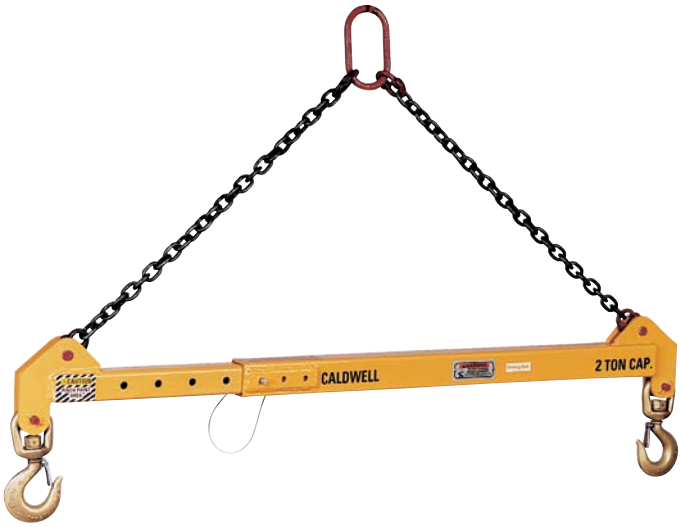


M30 - FIXED SPREADER BEAM SPECIFICATIONS										
CAPACITY IN TONS	(O.C.) ORDER CODE (H.R.) HEADROOM (In.) (WT.) WEIGHT (Lbs.)	SPREAD IN FEET								OTHER DIMENSIONS (Inches)
		4	6	8	10	12	16	20	24	
2	O.C. H.R. WT.	30-2-4 34 45	30-2-6 46 60	30-2-8 58 82	30-2-10 70 95	30-2-12 82 115	30-2-16 106 225	30-2-20 132 408	30-2-24 156 445	A=1/2 F=4-1/4 B=2-1/2 O=31/32 C= 5
5	O.C. H.R. WT.	30-5-4 37 62	30-5-6 49 78	30-5-8 61 100	30-5-10 73 117	30-5-12 83 168	30-5-16 110 305	30-5-20 134 435	30-5-24 158 661	A=1 F=6 B=3-1/2 O=1-1/16 C=7
10	O.C. H.R. WT.	30-10-4 41 100	30-10-6 53 122	30-10-8 64 156	30-10-10 77 180	30-10-12 86 240	30-10-16 113 380	30-10-20 138 532	30-10-24 163 915	A=1-1/4 F=8-1/8 B=4-3/8 O=1-1/2 C=8-3/4
15	O.C. H.R. WT.	30-15-4 43 126	30-15-6 55 155	30-15-8 65 185	30-15-10 80 242	30-15-12 92 270	30-15-16 116 420	30-15-20 140 665	30-15-24 167 953	A=1-1/2 F=9-1/4 B=5-1/4 O=1-3/4 C=10-1/2
20	O.C. H.R. WT.	30-20-4 46 170	30-20-6 58 200	30-20-8 69 233	30-20-10 82 315	30-20-12 94 350	30-20-16 118 540	30-20-20 140 775	30-20-24 170 1341	A=1-3/4 F=9-3/4 B=6 O=2 C=12
30	O.C. H.R. WT.	- - -	30-30-6 60 285	30-30-8 70 402	30-30-10 83 440	30-30-12 95 530	30-30-16 120 888	30-30-20 145 1390	- - -	A=1-3/4 F=9-3/4 B=6 O=2 C=12
40	O.C. H.R. WT.	- - -	30-40-6 65 563	30-40-8 77 695	30-40-10 89 781	30-40-12 102 1058	30-40-16 127 1364	- - -	- - -	A=2 F=13 B=7 O=2-3/4 C=14

Note: Weight = Beam and Hooks only. The weight of the Top Rigging must be added for total fixture weight.
Dimensions and Specifications are subject to change.

⚠ WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

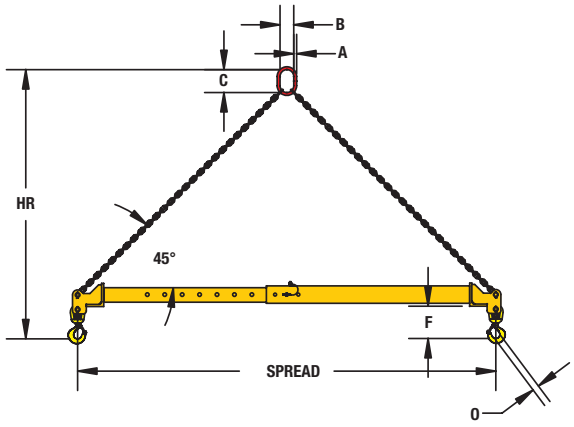
M32 – ADJUSTABLE SPREADER BEAM



PRODUCT FEATURES:

- Ideal where headroom is not limited.
- Adds stability to the lift.
- Telescoping spread is standard.
- Available with standard chain or wire rope rigging. (You must specify Top Rigging).
- Available with Adjust-A-Leg® rigging for off center loads. (Minimum lifting capacity will be 10-15% of beam capacity).
- Swivel hooks with hook latch.
- Wide range of additional sizes and capacities available.
- Complies with ASME Standards.

TOP RIGGING OPTIONS		
OPTION A Adjust-A-Leg® Top Rigging for off center load adjustment.	**OPTION C (Depicted)** Chain top rigging from beam to crane hook.	**OPTION W** Wire Rope rigging from beam to crane hook.

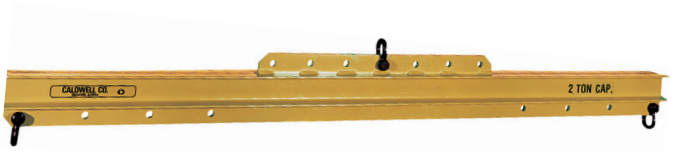


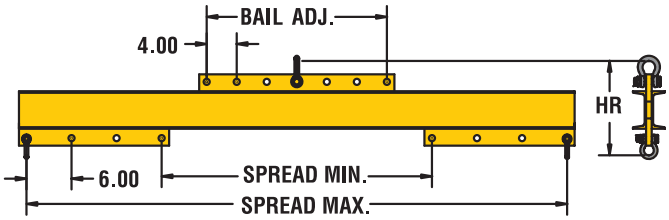
M32 - ADJUSTABLE SPREADER BEAM SPECIFICATIONS										
CAPACITY IN TONS	ORDER CODE	SPREAD (Ft.) MIN./MAX.	HEADROOM MIN./MAX. With CHAIN (Inches)	WEIGHT BEAM & HOOKS (Lbs.)	LINK DIA. (Inches) A	LINK WIDTH (Inches) B	LINK HEIGHT (Inches) C	HOOK TO BEAM BOTTOM (Inches) F	HOOK OPENING W/LATCH (Inches) O	CHAIN RIGGING WEIGHT (Lbs.)
2	32-2-4/6 32-2-6/10 32-2-8/14 32-2-12/20	4 / 6 6 / 10 8 / 14 12 / 20	48 / 57 72 / 88 96 / 113 132 / 166	70 85 175 245	1/2 "	2.36	3.94	5.5	.97	9 13 17 23
5	32-5-4/6 32-5-6/10 32-5-8/14 32-5-12/20	4 / 6 6 / 10 8 / 14 12 / 20	55 / 64 79 / 95 102 / 126 138 / 172	105 160 205 670	1"	3.94	7.09	8.4	1.41	34 47 61 82
10	32-10-4/6 32-10-6/10 32-10-8/14 32-10-12/20	4 / 6 6 / 10 8 / 14 12 / 20	60 / 69 74 / 111 108 / 132 144 / 163	95 175 460 680	1-1/4"	5.38	10.83	10.6	1.78	49 69 88 118
15	32-15-4/6 32-15-6/10 32-15-8/14 32-15-12/20	4 / 6 6 / 10 8 / 14 12 / 20	64 / 72 87 / 104 111 / 135 147 / 180	165 365 478 700	1-1/2"	5.90	10.50	13.6	2.22	78 111 145 194

Dimensions and Specifications are subject to change.

WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

M16 – ADJUSTABLE SPREADER/LIFTING BEAM





PRODUCT FEATURES:

- Adjustable lifting points.
- Handles both wide and unbalanced loads.
- Low headroom capability.
- Shackles included.
- Converts to Spreader Beam with the addition of top rigging.
- Optional swivel hooks are available.
- Complies with ASME Standards.

PRODUCT OPTIONS:

OPTION "C" – Chain Top Rigging

OPTION "S" – Pair of Swivel Hooks

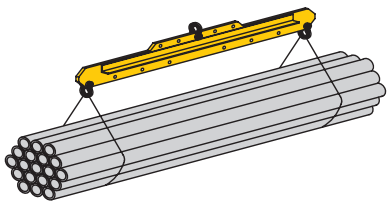
MODEL 16 - ADJUSTABLE SPREADER/LIFTING BEAM SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	Dimensions in Inches				BOLT TYPE ANCHOR SHACKLE (Tons)		WEIGHT (Lbs.)
		SPREAD		BAIL ADJUSTMENT	HEADROOM HR			
		Min.	Max.			Top	Bottom	
16-1/4-4	1/4	48	12	16	7.1	1-1/2	1-1/2	37
16-1/2-6	1/2	72	36	24	9.94	1-1/2	1-1/2	76
16-1-6	1	72	36	24	9.94	1-1/2	1-1/2	76
16-2-6	2	72	36	24	12.60	3-1/4	2	128
16-4-8	4	96	48	32	16.60	4-3/4	4-3/4	270
16-5-10	5	120	60	40	20.20	6-1/2	4-3/4	445
16-7-12	7	144	72	48	23.80	8-1/2	6-1/2	755

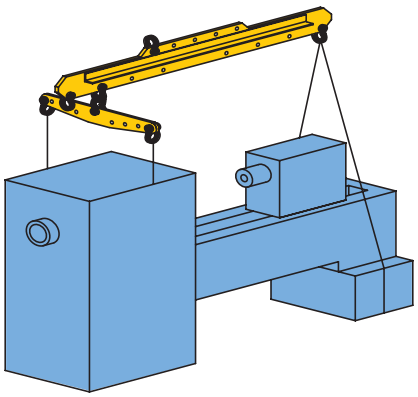
Dimensions and Specifications are subject to change.

WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

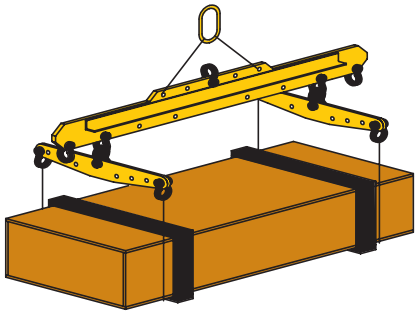
OPERATION



Standard
2 Point Lift



Custom
3 Point Lift



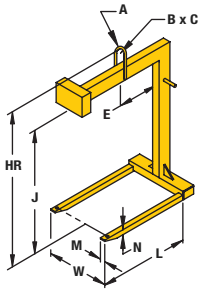
Custom
4 Point Lift

M90 – STANDARD FIXED

PRODUCT FEATURES:

- Converts overhead crane to lift truck.
- Counter balanced to hang level when empty.
- Facilitates loading/unloading in inaccessible areas.
- Larger capacity models are available.
- Complies with ASME Standards.





MODEL 90 - FIXED FORK PALLET LIFTER SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	Dimensions in Inches										WEIGHT (Lbs.)
		FORKS			W	E	BAIL			J*	HR	
		L	M	N			A	B	C			
90-1-36	1	36	2	2	25	18	1	6	5	48	57-1/2	292
90-1-42	1	42	2	2	25	21	1	6	5	48	57-1/2	310
90-1-48	1	48	2	2	25	24	1	6	5	48	58-1/2	371
90-1 1/2-36	1-1/2	36	3	2	25	18	1	6	5	48	58-1/2	388
90-1 1/2-42	1-1/2	42	3	2	25	21	1	6	5	48	58-1/2	432
90-1 1/2-48	1-1/2	48	3	2	25	24	1	6	5	48	58-1/2	459
90-2-36	2	36	3	2	25	18	1	6	5	48	59-1/2	448
90-2-42	2	42	4	2	25	21	1	6	5	48	59-1/2	536
90-2-48	3	48	4	2	25	24	1	6	5	48	59-1/2	627
90-3-42	3	42	4-1/2	2-1/2	25	21	1-1/2	6-1/8	7	48	61-1/2	766
90-3-48	3	48	4-1/2	2-1/2	27	24	1-1/2	6-1/8	7	48	61-1/2	823
90-3-54	3	54	4-1/2	2-1/2	30	27	1-1/2	6-1/8	7	48	61-1/2	969
90-4-48	4	48	5	3	27	24	1-1/2	6-1/8	7	48	63-1/2	1176
90-4-60	4	60	5	3	30	30	1-1/2	6-1/8	7	60	75-1/2	1393
90-5-48	5	48	5	3	30	24	1-1/2	6-1/8	7	48	63-1/2	1193
90-5-60	5	60	4-1/2	2-1/2	38	30	1-1/2	8-1/8	7	60	75-1/2	1403

*We recommend an additional 3 to 4 inches of clearance above the load for ease of loading and unloading the lifter.

M96 – HEAVY DUTY ADJUSTABLE

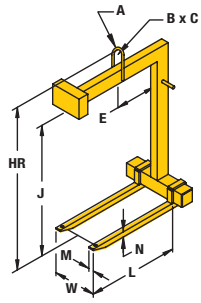
PRODUCT FEATURES:

- Forged Forks provide for ease of handling.
- Forged Forks provide smaller fork size.
- Double Frame design for increased capacity.
- Complies with ASME Standards.

⚠ WARNING

Center of Hoist and Bail must be in-line with the load's center of gravity.





MODEL 96 - HEAVY DUTY ADJUSTABLE FORK PALLET LIFTER SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	Dimensions in Inches											WEIGHT (Lbs.)
		FORKS			W		E	BAIL			J*	HR	
		L	M	N	Min.	Max.		A	B	C			
96-7 1/2-48	7-1/2	48	6	2-1/2	20	48	24	2	5	9	48	64-1/2	2400
96-7 1/2-60	7-1/2	60	6	3	20	48	30	2	5	9	60	77-1/2	3300
96-7 1/2-72	7-1/2	72	6	3	20	48	36	2	5	9	60	80	3750
96-10-48	10	48	6	3	20	48	24	2	5	9	48	68	2900
96-10-60	10	60	6	3	20	48	30	2	5	9	60	79-1/2	4300
96-10-72	10	72	7	3	20	48	36	2	5	9	60	79-1/2	4900
96-12 1/2-48	12-1/2	48	6	3	20	48	24	2	6	12	48	82	3900
96-12 1/2-60	12-1/2	60	6	3	20	42	30	2	6	12	60	82	4700
96-12 1/2-72	12-1/2	72	7	3-1/2	20	38	36	2	6	12	60	82	5500

*We recommend an additional 3 to 4 inches of clearance above the load for ease of loading and unloading the lifter.
Dimensions and Specifications are subject to change.

⚠ WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

M88 – HEAVY DUTY COIL UPENDER



Shown with V-Block Option

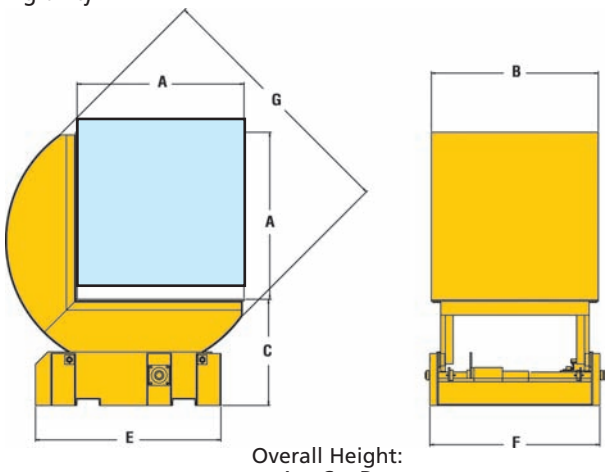
PRODUCT FEATURES:

- Fast and convenient way to manipulate coils.
- Heavy duty disc brake will stop load in any position.
- Reversing Magnetic Starter with 115 volt pendant control.
- Stop travel/over travel limit switches.

PRODUCT OPTIONS:

- Larger platforms, sizes and capacities are available.
- V-Block can be furnished standard or urethane faced.
- 180 degree horizontal rotation for use from same side.
- Fork lift truck pick up pockets.
- Note: If load is not a coil, specify the load's center of gravity.





Overall Height:
A + C = D

MODEL 88 - COIL UPENDER SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	DIMENSIONS (Inches)							WEIGHT (Lbs.)
		A	B	C	D	E	F	G	
88-1-36	1	36	36	24*	60	48	36	51	1500
88-2-36	2	36	36	24*	60	48	36	51	1600
88-3-42	3	42	42	24*	66	56	42	60	2000
88-4-42	4	42	42	24*	66	56	42	60	2200
88-5-48	5	48	48	30	78	61	48	66	2750
88-7 1/2-48	7-1/2	48	48	30	78	61	48	66	2900
88-10-54	10	54	54	30	84	60	55	74	3700
88-12 1/2-54	12-1/2	54	54	36	90	69	55	74	4000
88-15-60	15	60	60	36	96	73	60	80	4500
88-20-60	20	60	60	36	96	73	60	80	6200
88-25-72	25	72	72	43	115	88	72	96	10000
88-30-72	30	72	72	48	120	88	72	96	12000

*Platforms over 42" x 42" will have a height of 30 inches.
Dimensions and Specifications are subject to change.
Pallets must not extend over platform sides.

WARNING See Page 269 and 270 for Important Safety, Use and Inspection Information.

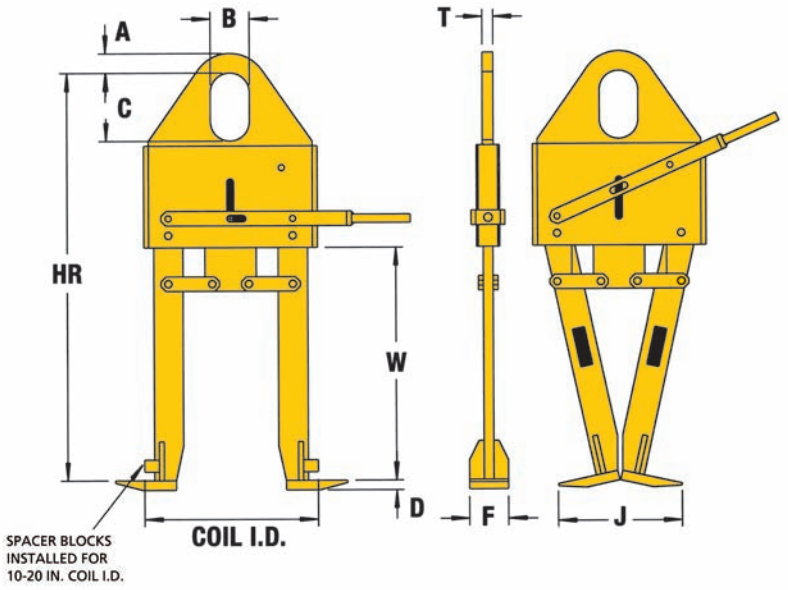
M83 – VERTICAL "EYE" COIL LIFTER



Spacer Blocks installed for 16 to 18 in. Coil I.D. See Instruction Manual for details.

PRODUCT FEATURES:

- Efficient handling of vertically stacked coils.
- Leg positioning handle is easy to operate and has a positive locking feature.
- For 16 in. to 20 in. Coil Inside Diameters.
- Other sizes and capacities are available.
- Complies with ASME standards.



MODEL 83 - VERTICAL "EYE" COIL LIFTER SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	DIMENSIONS (Inches)											WEIGHT (Lbs.)
		COIL I.D.		COIL WIDTH	HR HEADROOM	BAIL DIMENSIONS				FOOT DIMENSIONS			
		MIN.	MAX.	"W"		A	B	C	T	F	D	J	
83-1/2-20	1/2	16	20	20	36	1-1/4	3	5	5/8	4	3/4	13	110
83-1.5-20	1-1/2	16	20	24	36	1-1/2	3	5	5/8	4	3/4	13	125
83-3-20	3	16	20	24	40	1-1/2	3	5	3/4	5	3/4	13-1/2	180
83-5-20	5	16	20	30	49	2	4	7	1	6	3/4	14-1/4	195

Dimensions and Specifications are subject to change.

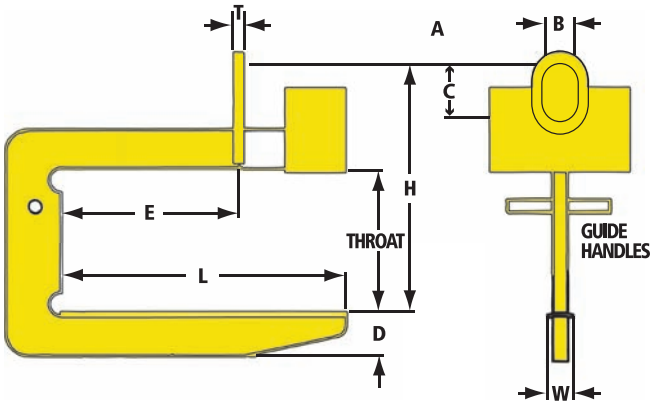
WARNING See Page 269 and 270 for Important Safety, Use and Inspection Information.

M82 – HEAVY DUTY C-HOOK



PRODUCT FEATURES:

- Designed for heavy duty applications.
- High tensile alloy steel plate reduces physical size and weight.
- Counter balanced to hang level when empty.
- Inside radius helps to prevent coil damage.
- Curved coil saddle is standard.
- Guide Handles for ease of hook positioning.
- Versatile: Handles a wide range of coil widths.
- Other sizes and capacities are available.
- Available with optional padding for additional coil protection.
- Complies with ASME standards.



NOTE: E dimension is always one-half (50%) of maximum coil width.

⚠ WARNING

Center of Hoist and Bail must be in-line with the load's center of gravity.

MODEL 82 - HEAVY DUTY C-HOOK SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	DIMENSIONS (Inches)											WEIGHT (Lbs.)
		COIL WIDTH		THROAT	LIFTING ARM			HEADROOM	BAIL DIMENSIONS				
					LENGTH	DEPTH	WIDTH		OPENING			THK.	
		MAX.	MIN.		L	D	W	H	A	B	C	T	
82-5-36	5	36	24	24	30	5-5/16	4	37-3/8	1-1/2	4	7	1-1/4	420
82-5-48		48	30	24	39	6-1/8	4	38	1-1/2	4	7	1-1/4	584
82-5-60		60	36	24	48	6-9/16	4	38-1/2	1-1/2	4	7	1-1/4	680
82-7 1/2-36	7-1/2	36	24	24	30	5-5/8	4	37-1/2	1-1/2	4	7	1-1/2	615
82-7 1/2-48		48	30	24	39	6-5/16	4	38-1/4	1-1/2	4	7	1-1/2	774
82-7 1/2-60		60	36	24	48	6-5/16	4	39	1-1/2	4	7	1-1/2	942
82-10-48	10	48	30	24	39	7-1/4	4	41-1/4	2	5	9	1-3/4	928
82-10-60		60	36	24	48	7-1/2	4	41-3/8	2	5	9	1-3/4	1295
82-10-72		72	42	24	57	7-1/4	4	42-1/2	2	5	9	1-3/4	1616
82-15-48	15	48	30	30	39	7-1/4	4	47-7/8	2	5	9	1-3/4	1450
82-15-60		60	36	30	48	8	4	48	2	5	9	1-3/4	1824
82-15-72		72	42	30	57	8-3/4	4	48-3/4	2	5	9	1-3/4	2227
82-20-60	20	60	36	30	48	9-1/8	4	52-1/8	2-1/4	6	12	2	2175
82-20-72		72	42	30	57	10	4	52-5/16	2-1/4	6	12	2	2625
82-25-60	25	60	36	34	48	9	4	57-3/4	2-1/2	6	14	2-1/4	2820
82-25-72		72	42	34	57	9-3/4	4	58-1/2	2-1/2	6	14	2-1/4	3570
82-30-60	30	60	36	34	48	9-7/8	4	58-3/4	2-3/4	6	14	2-1/2	3180
82-30-72		72	42	34	57	10-5/8	4	59-3/8	2-3/4	6	14	2-1/2	3800
82-40-72	40	72	42	38	57	11	5	68	3-1/4	7	18	3	5350
82-50-84	50	84	48	40	64-1/2	13	6	71-7/8	3-3/4	7	18	3	7470

Dimensions and Specifications are subject to change.

⚠ WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**

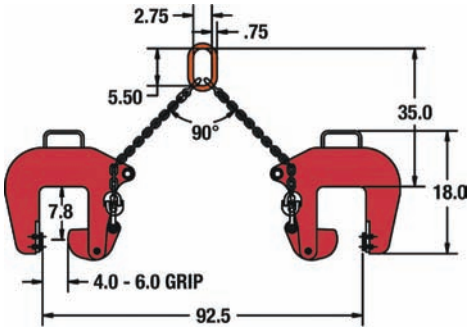
MHL – CONCRETE MANHOLE HOUSING LIFTER

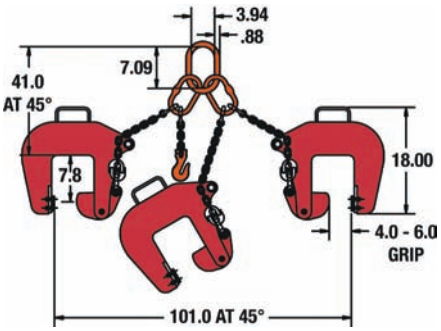


PRODUCT FEATURES:

- Handles concrete pipe efficiently without damage to concrete seats.
- Legs can be quickly positioned to safely balance the load.
- 2 or 3 leg models available.
- Handles 4 to 6 inch concrete wall thickness.
- Requires constant tension to maintain positive load contact.
- Other housing configurations are available.
- Complies with ASME Standards.



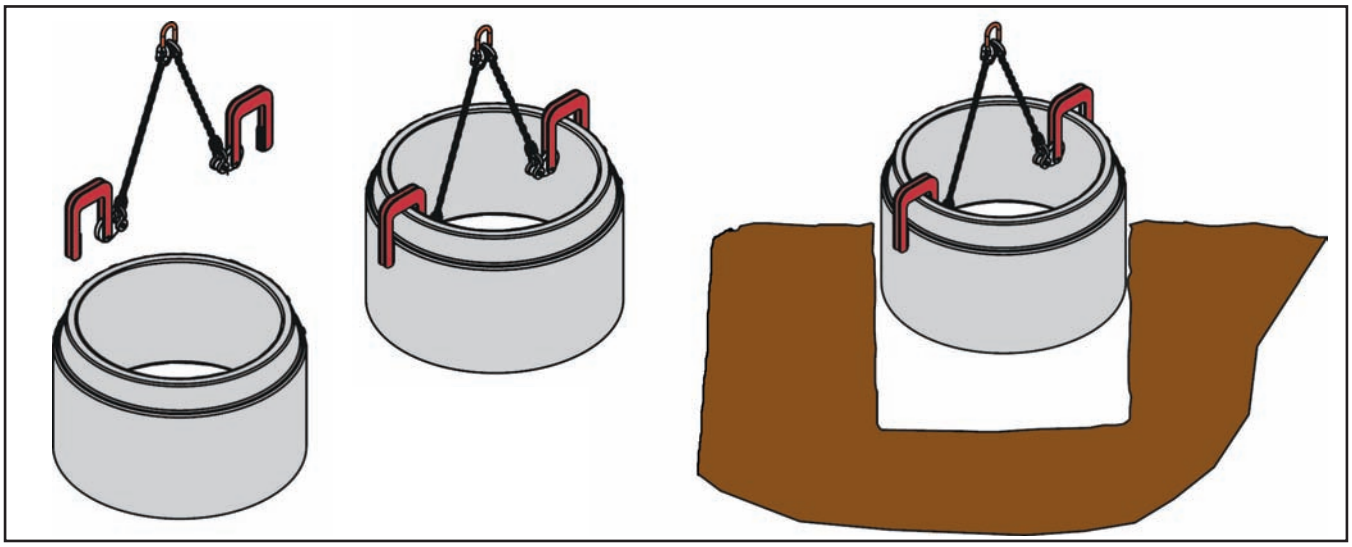




MHL - CONCRETE MANHOLE HOUSING LIFTER SPECIFICATIONS				
ORDER CODE	DESCRIPTION	MAX. DIAMETER (Inches)	CAPACITY (Lbs.)	WEIGHT (Lbs.)
MHL-5	TWO LEG MODEL: TWO 42" LEGS	92.5	10,000	131
MHL-7.5	THREE LEG MODEL: TWO 42" LEGS ONE 72" LEG WITH CHAIN SHORTENER	101	15,000	181
MHL-C	CLAMP ONLY		5,000	45

NOTE: Reverse cam action eliminates slippage tendency.
Manhole Housing Lifters available for other housing configurations.
Dimensions and Specifications are subject to change.
WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**

OPERATION

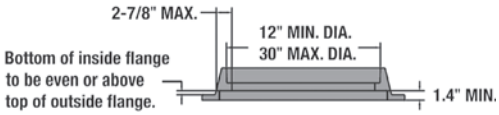


MODEL MCL – MANHOLE SLEEVE LIFTER

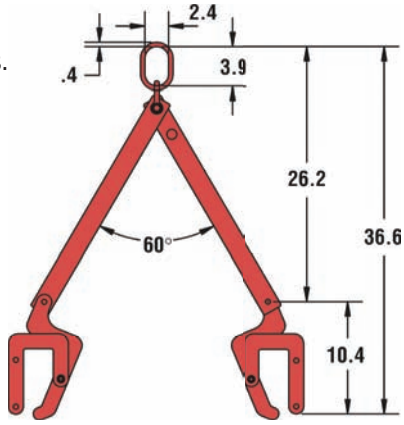


PRODUCT FEATURES:

- Quick and efficient way to place cast manhole sleeves.
- Easily attaches to and releases from the load.
- 2 or 3 leg models available.
- Contact us for other frame configurations.
- Magnetic Manhole Cover Lifters are available.
- Complies with ASME Standards



Consult factory for other frame configurations.



MODEL MCL - MANHOLE SLEEVE LIFTER SPECIFICATIONS			
ORDER CODE	DESCRIPTION	CAPACITY (Lbs.)	WEIGHT (Lbs.)
MCL-1/2	2-LEG VERSION	1,000	24
MCL-3/4	3-LEG VERSION: Two 18" LEGS, 1 Leg @ 30" LEG WITH SHORTENER	1,500	26
MCL-C	CLAMP ONLY	500	6

Note: Reverse cam action eliminates slippage tendency.

⚠WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**



MODEL MML – MAGNETIC MANHOLE LIFTER

Moving heavy manhole covers becomes a one person operation, reducing potential for injuries on the job.

PRODUCT FEATURES:

- Dolly Handle breaks down for easy storage
- Use for covers or grates
- Models available to accomodate a variety of lid sizes

MODEL MML - MAGNETIC MANHOLE LIFTER SPECIFICATIONS		
ORDER CODE	LID SIZE	WEIGHT (Lbs.)
MML-26	UP TO 26 INCH DIAMETER	77
MML-35	30" TO 35" DIAMETER	108
MML-36	36" DIAMETER & UP	106

Note: Reverse cam action eliminates slippage tendency.



Model MML-26 or MML-35



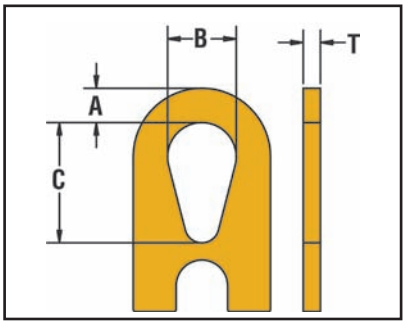
Model MML-36

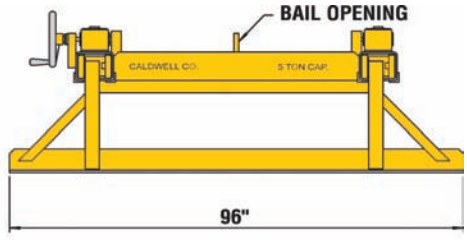
MODEL 60 – HEAVY DUTY SHEET LIFTERS



⚠ WARNING

Do not lift loosely bundled, thin or oily sheets.



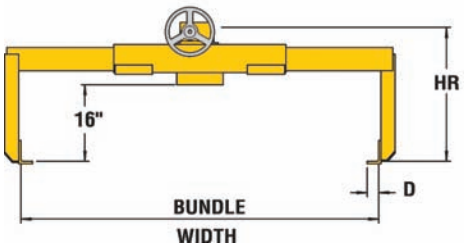


PRODUCT FEATURES:

- Versatile handling of bundles, sheets, plates and other materials stacked horizontally.
- Low headroom design for optimum lifting capabilities.
- One person operation minimizes handling costs.
- Self-locking worm gear drive for leg adjustment is standard.
- Easy adjustment for different sheet widths.
- Rack and pinion leg drive.
- Designed for ease of maintenance.
- Designed for greater width range.
- Contact us for other available sizes.
- Complies with ASME Standards.

PRODUCT OPTIONS:

- Hand wheel lockout.
- Motorized leg adjustment.
- Chain-wheel leg adjustment.
- Extended length hand wheel leg adjustment.
- End chains with plate hooks. (Recommended for all widths 72" and greater).
- Extended grab shoe lengths available.
- Additional bundle clearance available (longer legs).



MODEL 60 - HEAVY DUTY SHEET LIFTER SPECIFICATIONS

ORDER CODE	CAPACITY (Tons)	DIMENSIONS (Inches)									WEIGHT (Lbs.)
		BUNDLE WIDTH		HEADROOM	SHOE	MIN. AISLE	BAIL OPENING				
		Min.	Max.	HR	D		A	B	C	T	
60-3-48	3	16	48	28	2.63	9	1.5	3	5	.75	920
60-3-60		16	60								950
60-3-72		16	72								980
60-5-48	5	16	48	29	2.63	9	2	4	6	1	1125
60-5-60		16	60								1170
60-5-72		16	72								1220
60-5-84		16	84								1270
60-5-96		16	96								1550
60-10-48	10	16	48	30	3.5	11	2	4	7	1.50	1510
60-10-60		16	60								1570
60-10-72		16	72								1640
60-10-84		16	84								1700
60-10-96		16	96								1770
60-15-48	15	16	48	32	3.5	12	2.5	5	9	1.50	1570
60-15-60		16	60								1640
60-15-72		16	72								1700
60-15-84		38	84								1960
60-15-96		38	96								2030

Dimensions and Specifications are subject to change.

⚠ WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**

MODEL BT – BEAM TONGS



PRODUCT FEATURES:

- Tong provided with lifting shackle.
- Load must be balanced and controlled when lifting.
- Use only for vertical lifting.
- For added stability when handling longer loads, use in pairs with a spreader bar.
- Complies with ASME Standards.



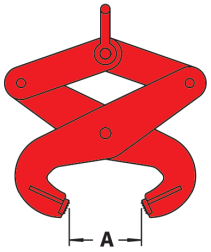
MODEL BT - BEAM TONG SPECIFICATIONS						
ORDER CODE	CAPACITY (Tons)	DIMENSIONS (Inches)				WEIGHT (Lbs.)
		BEAM WIDTH		FLANGE THICKNESS (Maximum)	A	
		Min.	Max.			
111-1	1	5	6	5/8 Inches	17	15
111-2	2	6-1/2	8	3/4 Inches	19	18
111-3	3	7-1/2	10	3/4 Inches	19	21

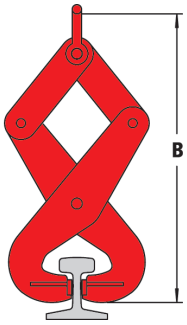
MODEL RLT – RAIL TONGS



PRODUCT FEATURES:

- Designed to handle standard size rails.
- Tongs are provided with non-slip, machined, diamond face gripping pads.
- Load must be balanced and controlled when lifting.
- Complies with ASME standards.





MODEL RLT - RAIL TONG SPECIFICATIONS				
ORDER CODE	CAPACITY (Tons)	A (Inches)	B (Inches)	WEIGHT (Lbs.)
109-1	1	3	18	15
109-2	2	5	20	18

MODEL MPP – PALLET PULLER



⚠ WARNING
Do not use for overhead lifting.

PRODUCT FEATURES:

- Used for moving hard to reach loaded pallets on flat surfaces, such as truck trailers or loading docks.
- Extends reach capability of fork lift trucks.
- Single scissor action.
- Heavy duty steel design.
- NOT FOR OVERHEAD LIFTING.
- Work Load Limit- 1250 Lbs.
- 3/8 in. proof coil chain.

MODEL MPP - PALLET PULLER SPECIFICATIONS			
ORDER CODE	JAW OPENING Min. Max.	CHAIN LENGTH	WEIGHT (Lbs.)
MPP-1	1.00 In. 4.00 In.	24 in.	14

Dimensions and Specifications are subject to change.

⚠ WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**

MODEL C & S – PIPE GRABS

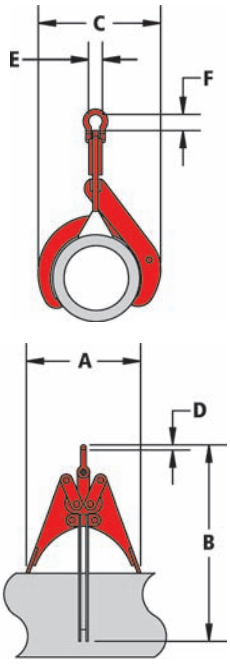


PRODUCT FEATURES:

- Heavy duty, automatic clamping design.
- Outriggers stabilize pipe, during the lift.
- No blocking is required.
- The operator only has to guide the clamp into place.
- Pipes are handled quickly and efficiently when properly balanced.
- Excellent for cast iron, steel pipe, tubing and other cylindrical objects.
- Pipe Grabs listed handle ASA cast iron pipe: Standard, extra strong and double strong. (All must have the same O.D.)
- Complies with ASME standards.

⚠ WARNING

The lifter shall not touch obstructions during load movement. The load or lifter shall not be slid on the floor or other surface.



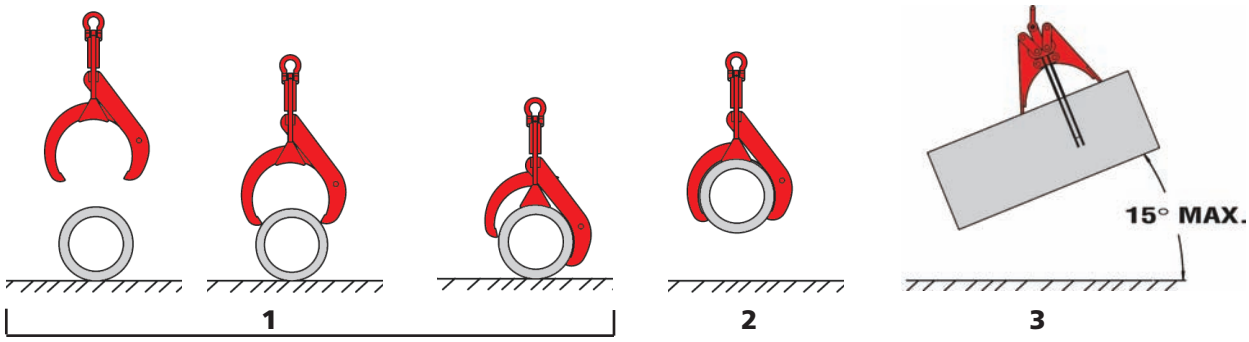
MODEL C & S - PIPE GRAB SPECIFICATIONS

RATED CAPACITY (Lbs)	CAST IRON		STEEL		DIMENSIONS (Inches)						WEIGHT (Lbs.)
	ORDER CODE	PIPE O.D. (In.)	ORDER CODE	PIPE O.D. (In.)	A	B	C	D	E	F	
450	C-3	4.0	S-3	3.50	5	10	6	.38	1.03	1.44	7
600	C-4	4.8	S-4	4.50	8	14	7	.44	1.16	1.69	9
1000	C-6	6.9	S-6	6.63	11	17	11	.50	1.31	1.88	15
1400	C-8	9.05	S-8	8.63	13	22	14	.50	1.31	1.88	25
2000	C-10	11.1	S-10	10.75	15	27	17	.63	1.69	2.38	47
2500	C-12	13.2	S-12	12.75	18	32	20	.63	1.69	2.38	72
3500	C-14	15.3	S-14	14	22	38	23	.88	2.28	3.31	105

Dimensions and Specifications are subject to change.

⚠WARNING **See Page 269 and 270 for Important Safety, Use and Inspection Information.**

OPERATION



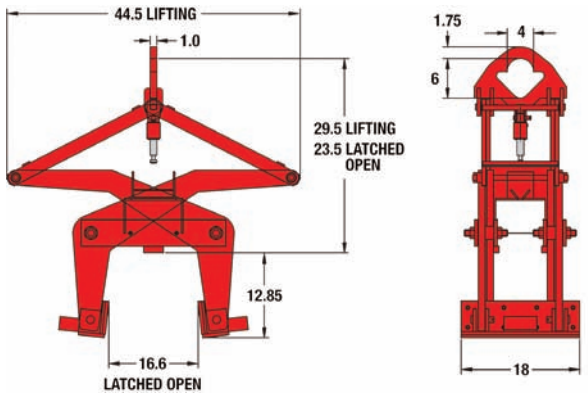
1. Lower the Pipe Grab and place on pipe. As rope is loosened, grab will open and seat on pipe.
2. Lift slowly with Pipe Grab engaged to check for balance.
3. Load should be level when transported. Maximum 15 degree angle when positioning pipe.

MODEL 74 – BARRIER GRABS



PRODUCT FEATURES:

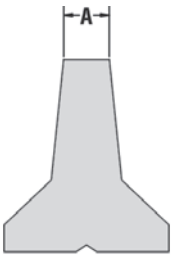
- Special Auto-Latch mechanism makes operation hands free.
- No need to latch or secure lifting chains or slings.
- Barriers incur far less damage resulting in longer life and reduced costs.
- Barrier Grab moves barriers quicker and easier than manual methods, resulting in less labor.
- There is no need to drill holes in barriers to accommodate chains or slings.
- Replaceable polyurethane lifting pads are designed for unpainted barriers.
- Replaceable steel "Dog Point" lifting pads are designed for painted barriers (typical in coastal areas).
- Complies with ASME standards.



MODEL 74 - BARRIER GRAB SPECIFICATIONS		
ORDER CODE	RATED CAPACITY (Lbs.)	WEIGHT (Lbs.)
With Polyurethane Lifting Pads		
74-4 1/4	8,500	450
74-7 1/4	14,500	505
With Steel "Dog Point" Lifting Pads		
74-4 1/4-DP	8,500	450
74-7 1/4-DP	14,500	505

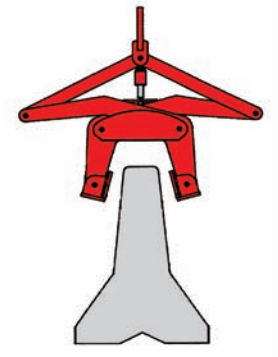
Dimensions and Specifications are subject to change.

WARNING See Page 269 and 270 for Important Safety, Use and Inspection Information.

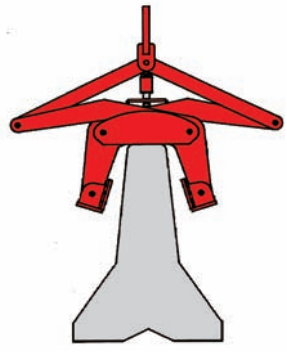


Standard Barrier Grabs will handle 6" to 12" nominal widths at the top, ("A" Dimension)

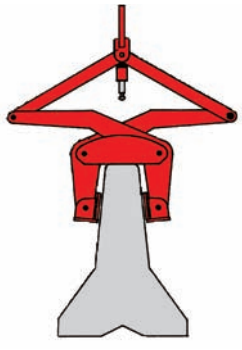
OPERATION



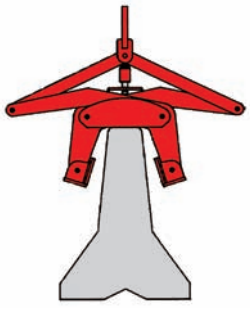
Tong is placed on load in open position. Hoist line must be slack for Auto-Latch to disengage.



Crane Hook is then raised allowing pads to grip barrier.



Barrier is placed in position. Hoist line must be slack for Auto-Latch to engage.

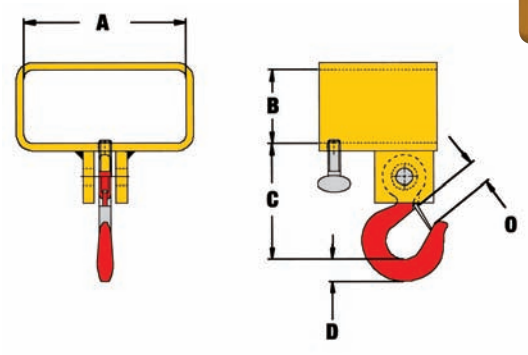


With Auto-latch engaged, Barrier Grab is held open to allow removal from the barrier.

MODEL 5 – SINGLE FORK HOOK BEAM



Fixed Hook





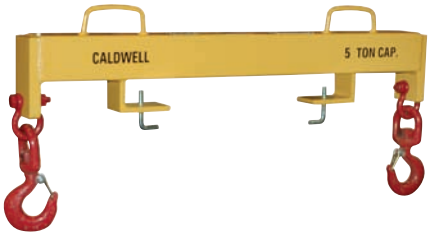
Swivel Hook



Model 10 - Single Hook Beam

PRODUCT FEATURES:

- Easy attachment, no special wrenches or tools needed.
- Strong, sturdy, all welded construction.
- Easy to see, highly visible, yellow paint.
- Fixed or Swivel Hooks available.
- Custom designs available.
- Model 10 & 15 available on request.



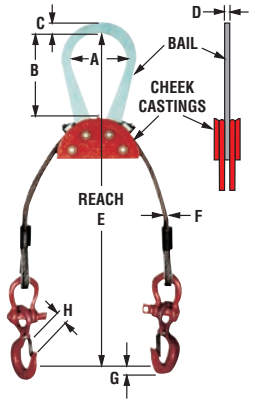
Model 15 - Double Hook Beam

MODEL 5 - FORK LIFT BEAM SPECIFICATIONS									
ORDER CODE FIXED	ORDER CODE SWIVEL	RATED CAPACITY (Lbs.)	DIMENSIONS (Inches)						WEIGHT (Lbs.)
			A	B	FIXED C	SWIVEL C	D	O	
5-1 1/2-4	5S-1 1/2-4	3000	4-1/2	2-1/2	4-11/16	6-9/16	1	1	7
5-1 1/2-5	5S-1 1/2-5	3000	5-1/2	2-1/2	4-11/16	6-9/16	1	1	8
5-1 1/2-6	5S-1 1/2-6	3000	6-1/2	2-1/2	4-11/16	6-9/16	1	1	9

Dimensions and Specifications are subject to change.

⚠ WARNING		
Capacity of truck and attachment combination may be less than capacity shown on attachment. Consult truck nameplate.	See Page 269 and 270 for Important Safety, Use and Inspection Information.	Before purchase and use, contact forklift manufacturer or refer to owner manual to ensure that rigging from forklift blades is approved by forklift manufacturer.

MODEL AL2 – ADJUST-A-LEG® TWO POINT LIFT



PRODUCT FEATURES:

- Allows crane hook to be over the load's center of gravity in unbalanced or non-symmetrical two point lifts.
- Quickly adjusts to the center of gravity.
- Can be locked into place for constant lifts.
- Can be used in conjunction with spreader beams.
- Ideal for use in rigging applications and machinery moving.
- Complies with ASME standards.

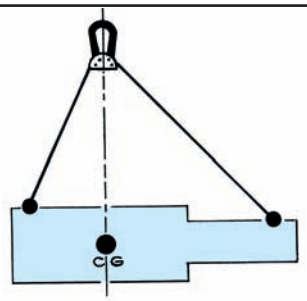
MODEL AL-2 - ADJUST-A-LEG® TWO POINT LIFT SPECIFICATIONS

ORDER CODE	CAPACITY (Tons) @ 45 DEG. Horizontal*	STANDARD REACH	WIRE ROPE DIAMETER	TOP ASSEMBLY (Dimensions in Inches)				ALLOY HOOKS WITH LATCHES			ANCHOR SHACKLE SIZE (Inches)	WEIGHT (Lbs.)
		E	F	A	B	C	D	SIZE (Tons)	H (Inches)	G (Inches)		
52-1	1	3′	5/16″	3-1/8	5	1-1/8	5/8	1	1	3/4	3/8	7-1/2
52-2	2	4′	5/16″	3-1/8	5	1-1/8	5/8	1-1/2	1-1/16	27/32	1/2	20
52-4	4	6′	7/16″	3-1/8	5	1-1/8	5/8	3	1-1/4	1-1/8	5/8	32
52-6	6	9′	9/16″	5-1/4	8-3/8	1-3/4	13/16	5	1-1/2	1-3/8	3/4	76
52-8	8	9′	5/8″	5-1/4	8-3/8	1-3/4	7/8	7	1-7/8	1-7/8	7/8	90
52-12	12	9′	3/4″	5-5/8	8-3/4	2-3/8	1-1/16	11	2-1/4	2-1/8	1-1/8	152
52-15	15	9′	7/8″	5-5/8	8-3/4	2-3/8	1-1/16	11	2-1/4	2-1/8	1-1/4	175
52-15L	15	9′	7/8″	9	15	2-1/2	1-1/16	11	2-1/4	2-1/8	1-1/4	188
52-22	22	9′	1-1/8″	9	15	3-1/2	1-1/2	NO HOOKS FURNISHED			1-1/2	350
52-28	28	9′	1-1/4″	9	15	3-1/2	1-3/4	NO HOOKS FURNISHED			1-3/4	385
52-36	36	9′	1-1/2″	9	15	3-1/2	2	NO HOOKS FURNISHED			2	450
52-50	50	9′	1-3/4″	9	15	3-1/2	2-1/4	NO HOOKS FURNISHED			2	525
52-62	62	12′	2″	9	15	6-1/4	3	NO HOOKS FURNISHED			2-1/2	1200
52-75	75	15′	2-1/4″	9	15	6-1/4	4	NO HOOKS FURNISHED			3	1500

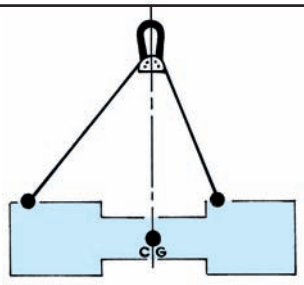
Note: Reach Calculation-Approximately 70% distance between the pick points.
*Unit must be loaded with at least 10% of capacity.
Dimensions and Specifications are subject to change.
⚠ WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

OPERATION

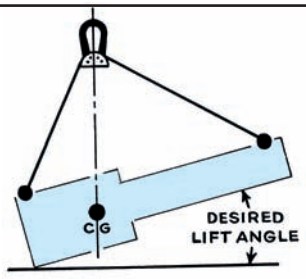
Many ways to use Model AL-2 Adjust-A-Leg® - Two Point Lifts



For loads that are heavier on one end, with center of gravity off-center.



For loads that are balanced and symmetrical, but with lifting points not located in a position for a level lift.



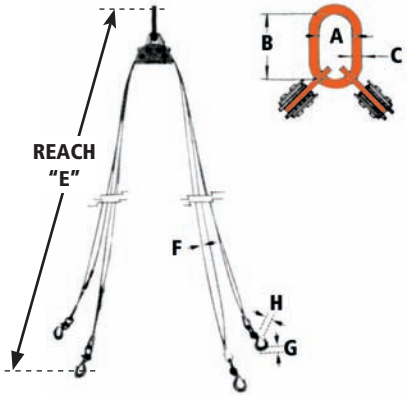
For lifting loads at any desired angle, simply lift with sling legs at desired angle.

MODEL AL4 – ADJUST-A-LEG® FOUR POINT LIFT



PRODUCT FEATURES:

- Allows crane hook to be over the load's center of gravity in unbalanced or non-symmetrical four point lifts.
- Quickly adjusts to the center of gravity.
- Can be locked into place for constant lifts.
- Can be used in conjunction with box type spreader beams.
- Ideal for use in rigging applications and machinery moving.
- Complies with ASME standards.



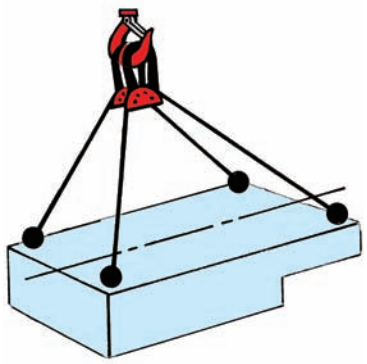
MODEL AL4- ADJUST-A-LEG® FOUR POINT LIFT SPECIFICATIONS

ORDER CODE	CAPACITY (Tons) @ 45 DEG. Horizontal*	STANDARD REACH	WIRE ROPE DIAMETER	TOP ASSEMBLY (Dimensions in Inches)			ALLOY HOOKS WITH LATCHES			ANCHOR SHACKLE SIZE (Inches)	WEIGHT (Lbs.)
		E	F	A	B	C	SIZE (Tons)	H (Inches)	G (Inches)		
54-2	2	4′	5/16″	3	6	5/8	1-1/2	1-1/16	27/32	1/2	18
54-4	4	6′	5/16″	3-1/2	7	1	1-1/2	1-1/16	27/32	5/8	45
54-8	8	9′	7/16″	3-1/2	7	1	5	1-1/2	1-3/8	5/8	70
54-12	12	9′	9/16″	4-3/8	8-3/4	1-1/4	7	1-7/8	1-11/16	1-1/8	170
54-16	16	9′	5/8″	5-1/2	10-1/2	1-1/2	7	1-7/8	1-11/16	1-1/8	210
54-24	24	9′	3/4″	6	12	1-3/4	11	2-1/4	2-1/8	1-1/4	345
54-30	30	9′	7/8″	7	14	2	NO HOOKS FURNISHED			1-1/4	410
54-44	44	9′	1-1/8″	7	14	2	NO HOOKS FURNISHED			1-3/4	770
54-56	56	9′	1-1/4″	8	16	2-1/2	NO HOOKS FURNISHED			1-3/4	850
54-72	72	12′	1-1/2″	9-1/2	16	2-3/4	NO HOOKS FURNISHED			2	980
54-100	100	15′	1-3/4″	10	20	3-1/4	NO HOOKS FURNISHED			2	1180
54-150	150	20′	2-1/4″	14	22	4-1/2	NO HOOKS FURNISHED			3	3600

NOTE: Reach Calculation- Approximately 70% distance between pick up points (diagonally).
*Unit must be loaded with at least 10% of capacity.
Dimensions and Specifications are subject to change.
⚠ WARNING **See Pages 269 and 270 for Important Safety, Use and Inspection Information.**

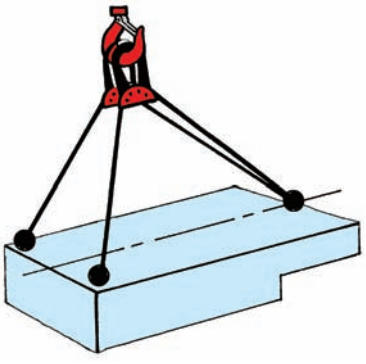
OPERATION

Many ways to use Model AL-4 Adjust-A-Leg® - Four Point Lifts



To achieve balance in one plane and stability in another for a four point lift.





To achieve balance in one plane and stability in another for a three point lift.

DESIGN • ENGINEERING • MANUFACTURING

Modulift offers complete lifting and engineering services from start to finish. Solutions to your lifting problems with custom designed equipment made to the highest quality specifications and advice on rigging plans are just a phone call away. We are there every step of the way to ensure your lift runs smoothly, on time and on budget.

- All equipment conforms to the highest engineering standards and meets or exceeds government and industry regulations such as: ASME B30.20 Below the Hook Lifting Devices and LOLER Section 20-1.6, Lifting Operations and Lifting Equipment Regulations.
- Modulift is an ISO 9001 registered company with membership in Specialized Carriers and Rigging Association (SC&RA) and Lifting Equipment Engineers Association (LEEA).
- Every Modulift Spreader System is proof tested and all products comply with the relevant standards as detailed below:

  USA Compliance: ASME B30.20 for Below-the Hook Lifting Devices.
  Our Spreader Systems have a minimum design factor of 3:1 on material yield strength.

  UK & Europe Compliance:

  BS2573: Rules for the Design of Cranes: Part 1:
  Specification for classification, stress calculations and design criteria for structures.

  BS5950: Structural Use of Steelwork in Building: Part 1.

  DNV Standard for Certification No.2.22-Lifting Appliances.

  When your project demands the highest level of certification, we offer a full DNV approval service, which can include options such as DNV witnessed testing.

ENGINEERING CONSULTATION

Whether you require advocacy in safe and effective procedures for the use of heavy lifting equipment or need RFID training to enable you to remotely take control of your assets, we can assist you.



CUSTOM DESIGN SERVICES

Not every load fits into a standard lifting model. Our team of engineers are lifting industry experts capable of coming up with the ideal solution for your lifting requirements. With innovative thinking we will meet your lifting requirements for height, environment, price, weight, versatility and speed of assembly or transportation requirements.

Additional Services available:

- Engineering Design and Drafting
- Lifting and Rigging Consultation
- Lifting and Rigging Training
- Lift Management
- Site Supervision
- Assessment and Benchmarking

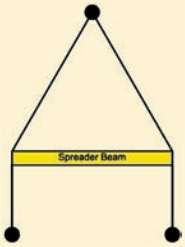
RIGGING PLANNING SERVICES

We design and manufacture custom solutions for all your lifting needs.

We understand that organizing a lift can be a complicated process with many important factors that must be considered. Of paramount significance is the Rigging Plan. Highly trained and experienced Modulift lifting engineers will assist you.

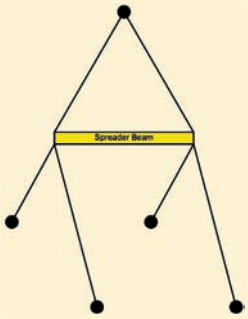
Your requirements may be a simple configuration or a more complicated system comprised of multiple components. With specific details of your lift including: load type, dimension, weight, attachment points, overhead restrictions, center of gravity (COG), crane type and lifting environment, we can begin to develop the best plan for you.

AVAILABLE CONFIGURATIONS



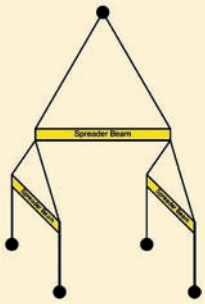
SINGLE SYSTEM- 2 POINT LIFT

A single Spreader is the simplest configuration and is suitable for 2 point lifts. The Spreader absorbs compression forces to protect the load.



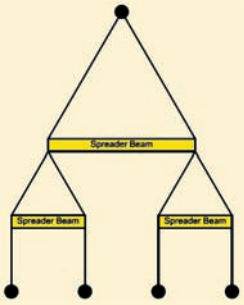
SINGLE SYSTEM- 4 POINT LIFT

A single beam with the load being lifted at four individual points.



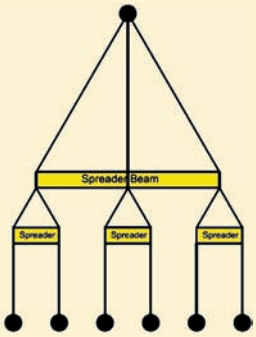
ONE OVER TWO LIFT SYSTEM

Use this configuration when vertical slings are essential. By varying the sling lengths, an offset center of gravity can be controlled.



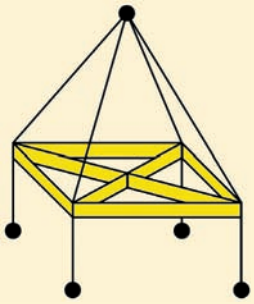
ONE OVER TWO INLINE SYSTEM

Ideal solution for those lifts where long spans and potential bending of the load is a problem.



MULTI-SPREADER SYSTEMS

Combinations of products to fit specific applications and complicated circumstances.



LIFTING FRAMES

A custom designed solution for specific applications.

LIFTING AND RIGGING TRAINING

As a premier supplier of Below the Hook Lifting Equipment, there is no one better than our expert trainers to advise you on the use of Modulift Spreaders in a safe, efficient manner. We offer a variety of courses at various levels and can tailor instruction to suit your specific lifting and rigging training needs.

Safe Use of Modulift Spreaders for Riggers.

Use, Inspection and Maintenance of Modulift Spreaders for Supervisors.

Use, Inspection and Maintenance of Modulift Spreaders, including Rigging.

Design, for Designated Persons and Managers.

Lifting and Rigging Courses to suit your specific requirements.

At Lift-It, it's like Christmas every day.
(Santa Ginger)



Lifting safety and efficiency are paramount. Modulift Training Services will assist you to achieve your goals. Course duration can last from half a day to a full week depending on your needs, with varying rates. Contact us to discuss your training requirements.

Modulift Spreader Systems

Modulift Systems feature a wide range of Modular Spreader System components, offering a variety of different spans for your lifting needs. The versatility of Modular Spreader Systems enables efficient reuse and adaptability with cost-effective savings when compared to "static" spreader bar designs.

Spreader capacities range from 2 to 5,000 tons with spans available from 1 Ft. to 170 Ft.

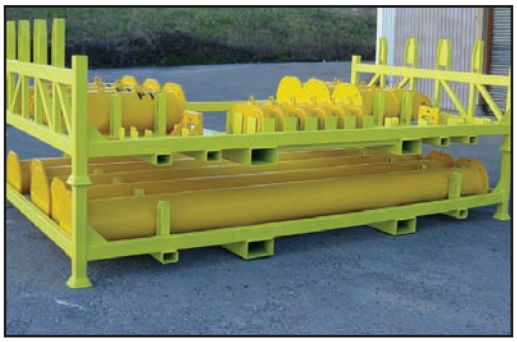
What size Beam do I need?

First select the span you require, then select the WLL you need for that span.

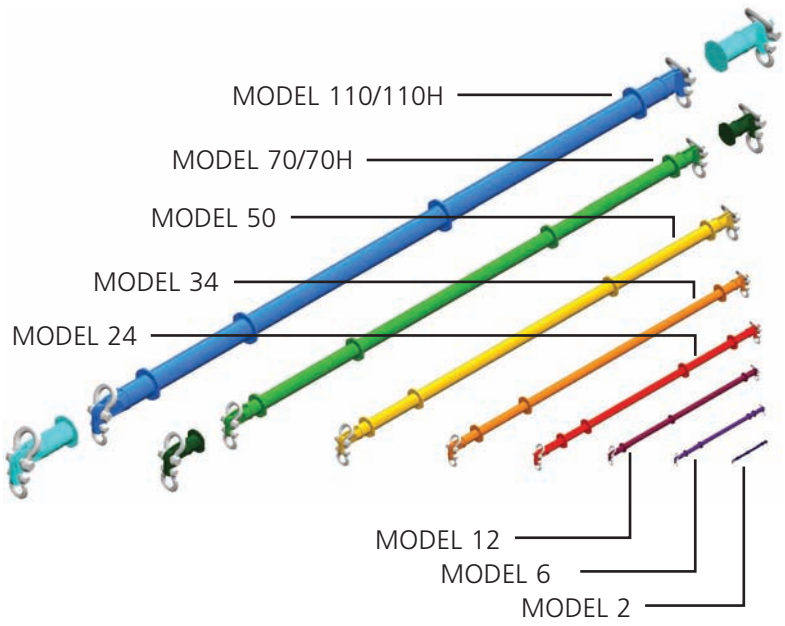
MODULIFT RANGE CLASSIFICATION	
RANGE	MODEL NUMBERS
Maintenance	2, 6
Portable	12, 24, 34
Heavy	50, 70, 70H, 110, 110H
Super Heavy	110SH, 250, 400, 600, 1000, 1600



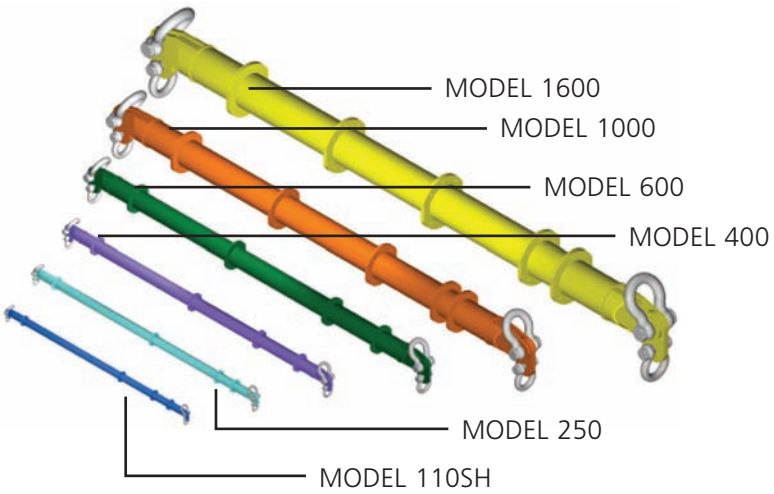




MODULIFT STANDARD RANGE



MODULIFT SUPER HEAVY RANGE



PRODUCT LINES

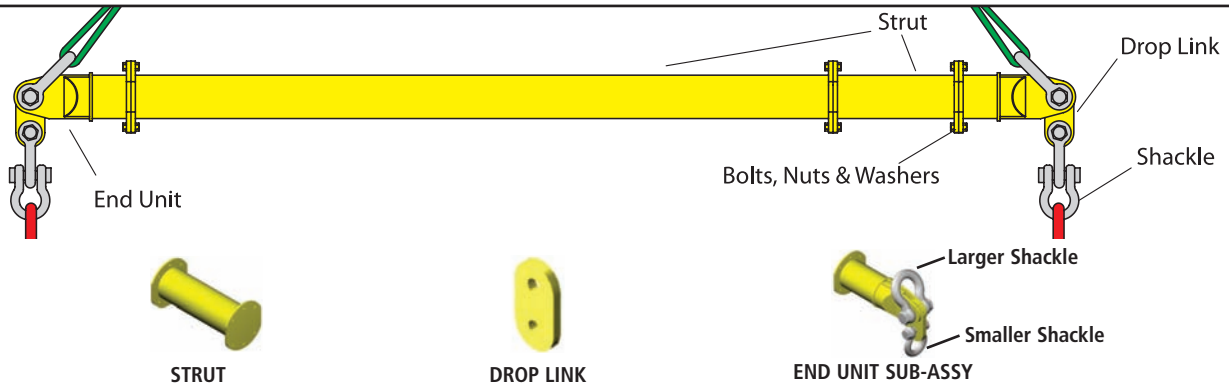
Safety is of paramount importance and Modulift Spreader Systems are manufactured to comply with all appropriate design standards and safety regulations. Each Modulift Spreader System is proof tested in the Modulift compression test rig.

Maintenance Range	Portable Range	Heavy Range	Superheavy Range	Lattice Range
MOD 6 Up to 6 tons at 100”.	**MOD 12** Up to 12 tons at 13’.	**MOD 50** Up to 50 tons at 26’. Up to 36 ft. (At a lower capacity).	**MOD 110SH** Up to 240 tons at 24’. Up to 52 ft. (At a lower capacity).	**Lattice Spreaders** Up to 20 tons with a span from 20’ to 150’.
	MOD 24 Up to 24 tons at 15’. Up to 20 ft. (At a lower capacity).	**MOD 70** Up to 70 tons at 31’. Up to 39 ft. (At a lower capacity).	**MOD 250** Up to 300 tons at 42’. Up to 64 ft. (At a lower capacity).	**Lattice XL** Up to 300 tons with a span from 20’ to 300’.
	MOD 34 Up to 34 tons at 18’. Up to 26 ft. (At a lower capacity).	**MOD 70H** Up to 100 tons at 26’. Up to 39 ft. (At a lower capacity).	**MOD 400** Up to 700 tons at 28’. Up to 76 ft. (At a lower capacity).	
		MOD 110 Up to 110 tons at 38’. Up to 52 ft. (At a lower capacity).	**MOD 600** Up to 800 tons at 46’. Up to 85 ft. (At a lower capacity).	
		MOD 110H Up to 170 tons at 28’. Up to 52 ft. (At a lower capacity).	**MOD 1000** Provisionally up to 1000 tons at 75 ft. Up to 2200 tons @ 40’. Up to 98 ft. (At a lower capacity).	
			MOD 1600 Provisionally up to 1600 tons at 62 ft. Up to 3000 tons at less span. Up to 111ft. (At a lower capacity).	



ADVANTAGES AND BENEFITS

Modulift Spreader Systems provide the ultimate in versatility and value. With an imaginative approach you can build and easily store a stock of components to deal with an array of lifts varying from 1 ft. to 170 ft. with strength requirements ranging from 2 tons to 5000 tons!



MODULIFT SPREADERS OUTPERFORM THE COMPETITION

INTERCHANGEABLE	Modular Struts allow multiple lengths to be configured for a a variety of lifts. Mix and match end units when additional length and lighter lifts are to be handled.
ECONOMICAL	One Modulift can be used for mulitple applications, spanning many years.
PORTABLE	The heaviest and longest strut is only 20 ft. and is easily transported. Many of our Spreader System components can be handled by one person.
ADAPTABILITY	Drop Links provide plus or minus 6 degrees rotation for less sling misalignment.
LIGHTWEIGHT	Modulift Spreader Systems are specifically designed to provide a light weight solution, allowing cranes to work at maximum capacity.
QUICK SHIPPING	Call us today, most standard sizes are in stock for immediate shipment.
EASY STORAGE	Improved inventory control is attained through organized components, quick retrieval and mobilization. Storage systems are readily available.

NEW PRODUCTS WITH OLD FASHIONED QUALITY AND INNOVATION!

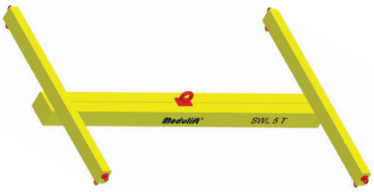
Fixed Spreader Beams

A traditional , cost effective beam for lifts of the same size. Lifting capacities up to 5000 tons.



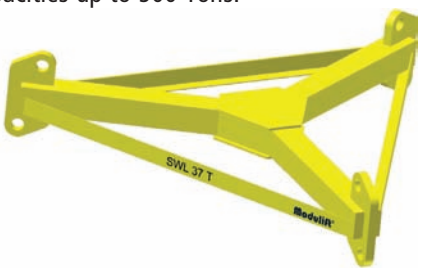
"H" Lifting Frames

Four Point Frames are ideal when little headroom is available. Lifting capacities up to 100 tons.



Spreader Frames

A perfect solution for loads requiring multiple lift points. Lifting capacities up to 500 Tons.



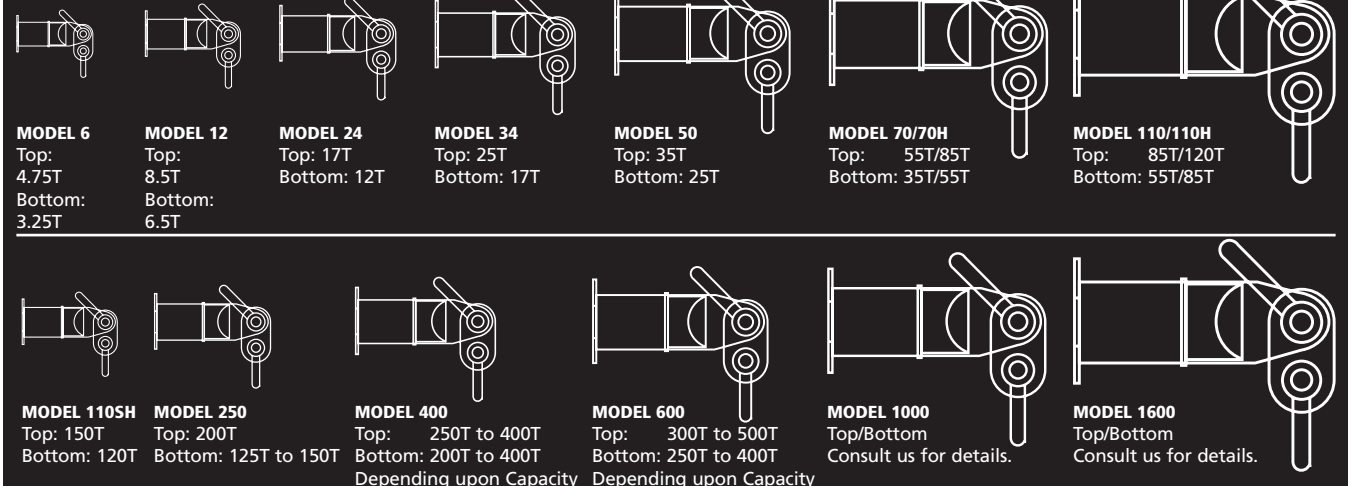
Telescoping Spreader Beams

Ideal when storage space is a scarce commodity. Expansion and retraction are easy. Lifting capacities up to 100 tons.



COMPONENTS REQUIRED PER SET							
	Maintenance Range	Portable Range			Heavy Range		
ITEM	MODEL 6	MODEL 12	MODEL 24	MODEL 34	MODEL 50	MODEL 70/H	MODEL 110/H
4 In.	1	-	-	-	-	-	-
8 In.	1	-	-	-	-	-	-
12 In.	1	-	-	-	-	-	-
24 In.	1	-	-	-	-	-	-
40 In.	1	-	-	-	-	-	-
1 Ft.	-	1	1	1	1	1	1
2 Ft.	-	1	1	1	1	1	1
3 Ft.	-	1	-	-	1	-	-
4 Ft.	-	-	1	1	-	1	1
5 Ft.	-	1	-	-	-	-	-
6 Ft.	-	-	2	3	1	1	1
8 Ft.	-	-	-	-	-	-	1
10 Ft.	-	-	-	-	-	-	1
12 Ft.	-	-	-	-	2	2	-
20 Ft.	-	-	-	-	-	-	2
End Unit	2	2	2	2	2	2	2
Drop Link	2	2	2	2	2	2	2

WHAT SIZE SHACKLE DO I NEED?



MODEL 6
Top: 4.75T
Bottom: 3.25T

MODEL 12
Top: 8.5T
Bottom: 6.5T

MODEL 24
Top: 17T
Bottom: 12T

MODEL 34
Top: 25T
Bottom: 17T

MODEL 50
Top: 35T
Bottom: 25T

MODEL 70/70H
Top: 55T/85T
Bottom: 35T/55T

MODEL 110/110H
Top: 85T/120T
Bottom: 55T/85T

MODEL 110SH
Top: 150T
Bottom: 120T

MODEL 250
Top: 200T
Bottom: 125T to 150T

MODEL 400
Top: 250T to 400T
Bottom: 200T to 400T
Depending upon Capacity

MODEL 600
Top: 300T to 500T
Bottom: 250T to 400T
Depending upon Capacity

MODEL 1000
Top/Bottom
Consult us for details.

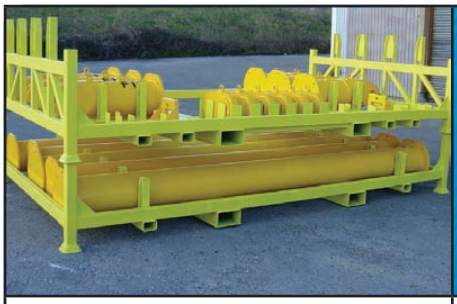
MODEL 1600
Top/Bottom
Consult us for details.

Weight	Model 6	Model 12	Model 24	Model 34	Model 50	Model 70/H	Model 110/H
Max. Component Weight	18	41.5	80	103	285	486.5	1170
Min. Component Weight	1	3	9	15.5	24	37.5	99
Weight per Set	64	136	367	594	1223	2028	5712

Weight	Model 110SH	Model 250	Model 400	Model 600	Model 1000	Model 1600
Max. Component Weight	1425	1900	3049	TBD	TBD	TBD
Min. Component Weight	168	168	397	TBD	TBD	TBD
Weight per Set	6767	8620	19,021	TBD	TBD	TBD

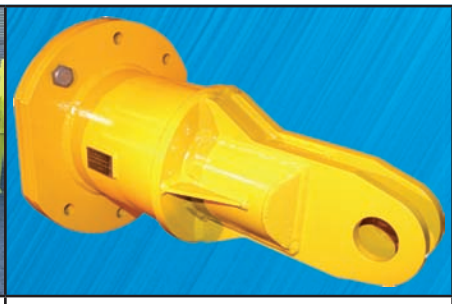
TBD-To be determined.

ACCESSORIES FOR THE SPREADER SYSTEM RANGE



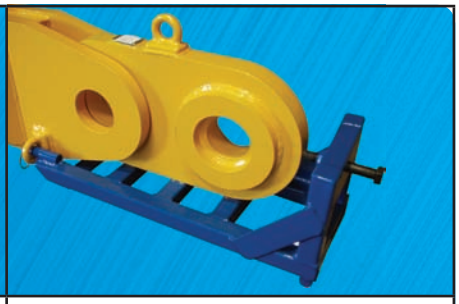
Drop Link Cradles

- Heavy spreader accessory
- Drop Link support
- Easy alignment for shackle
- Standard for heavier models



Step-Down End Units

- For longer span and lighter loads
- Enable versatility for lifts
- Best for smaller Modulift sizes



Logistics Cradles

- Safe storage
- Efficient handling
- Instant component recognition
- Locking security case



Cone Adaptors

- For longer spans and lighter loads
- Enable versatility for lifts
- Best for larger Modulift sizes



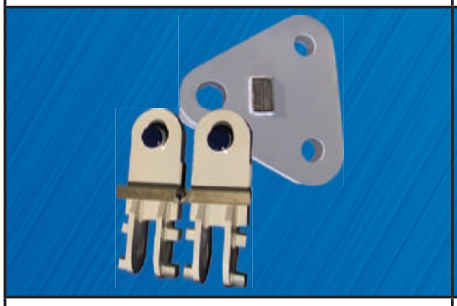
Shackles and Slings

- For all Modulift Spreaders
- For all rigging requirements



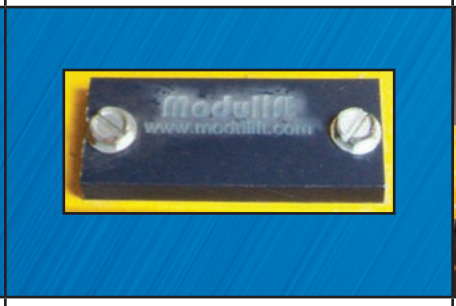
Tool Kits

- Optimized for rapid assembly and disassembly
- Portable storage tool box
- Improved safety and speed of rigging operations



Delta and Clevis Drop Links

A range of options for standard Drop Links.



RFID Tags

RFID Tags are compatible with RFID asset management systems from Crosby, InfoChip, Field ID and iTraax.



Semi Spreader End Units

- End unit to extend spreader
- Best for long, light loads

COMPLIANCE AND WARNING INFORMATION

Harrington LB and LX Lever Hoists comply with:

- ANSI/ASME B30.21 Safety Standard: Manually Lever Operated Hoists.
- ANSI/ASME HST–3M Performance Standard for Manually Lever Operated Chain Hoists.



Harrington CF, CB, and CX Hand Chain Hoists and NTH Trolley Hoists are produced to comply with:

- ANSI/ASME B30.16, Safety Standard: Overhead Hoists (Underhung).
- ANSI/ASME HST-2M, Performance Standard for Hand Chain Manually Operated Chain Hoists.

Harrington PT and GT Manual Trolleys and NTH Trolley Hoists are produced to comply with the trolley-related requirements:

- OSHA Title 29, Section 1910.179: Occupational Safety and Health Regulations: Overhead and Gantry Cranes.
- ANSI/ASME B30.11, Safety Standard: Monorails and Underhung Cranes.
- ANSI/ASME B30.17, Safety Standard: Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist).



⚠ WARNING

The "definitive" source documents for hoist safety are ANSI/ASME standards B30.16 and B30.21 and publications available from HMI. To obtain copies of these documents, contact ASME at 800-843-2763 or visit www.asme.org. HMI can be reached at 704-676-1190 or at www.mhia.org.

The operation of a hoist involves more than activating its controls. As stated in the ANSI/ASME B30 standards, the use of a hoist is subject to certain hazards that cannot be mitigated by engineered features, but only by the exercise of: intelligence, care, common sense and experience in anticipating the effects and results of activating the hoist's controls. Use this guidance in conjunction with the warnings, cautions and safety instructions sent out in the Owner's Manual supplied with the hoist. This governs how you operate and use your hoist. If a replacement Owner's Manual is needed, contact Harrington Hoists, Inc. at 800-233-3010.

⚠ WARNING: A pointing out and notice of danger. The purpose of a "warning" is to apprise operators and all other affected persons of the existence of danger of which they should be, but may not be aware of; and to enable operators to protect themselves and others, where applicable, against such danger. An attempt is made herein to warn against reasonable and reasonably foreseeable danger in the proper use and possible misuse of Harrington products.

LB LEVER HOISTS - ¾ TO 9 TON CAPACITY

LB Series Lever Hoists offer low headroom and compact design that is perfect for use in tight quarters. Regarded as the best lever hoist in the industry, the LB Lever Hoist is recommended for use in heavy-duty construction, mining, manufacturing, shipbuilding and day-to-day maintenance and repair operations.

Many Benefits and More Features:

- Rugged, all-steel construction that actually weighs less than comparable aluminum models.
- Positive braking action with Weston-style load brake incorporating two moisture-resistant brake pads with four braking surfaces. Double brake pawls provide additional reliability.
- Protection against dirt and moisture with a totally enclosed brake mechanism.
- Longer service life with machined, heat-treated, split load double reduction gears.
- Operate in close quarters with short steel handle and 15 degree recovery strokes.
- Patented, spring-loaded, freewheel mechanism permits easy adjustment of the load chain and safeguards against accidental freewheeling under load.
- Equipped with standard rubber grip for non-slip operation.

Capabilities to Count On:

- 5-foot lift is standard. 10, 15 and 20 foot lifts are also stocked; nonstandard lifts are available as well.
- Grade 100 heat-treated load chain is nickel plated for corrosion resistance.
- Forged and heat-treated alloy steel hooks open slowly without fracturing under excessive loads. Top and bottom hooks rotate 360°.
- Test certificate verifies that every hoist has been factory load tested to 125% of rated capacity, in accordance with ASME B30.21 requirements.

Options: (See page 313).

- Load limit warning handle
- Top hook extender
- Point load hook
- Slip clutch
- Inspection hook
- Bullard® and Shur-Loc® hooks



LB with Optional Load Limit Warning Handle



LB with Standard handle



3/4 to 3 Ton
Single chain fall



The First 2-3/4 Ton
Single chain fall



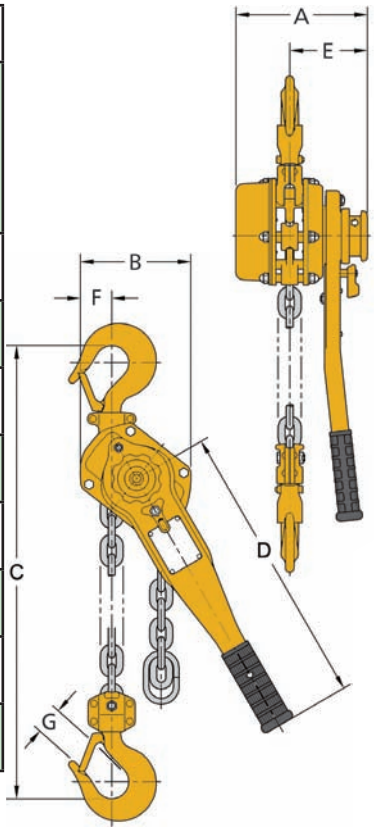
6 Ton
Double chain fall



9 Ton
Triple chain fall

LB LEVER HOIST - SPECIFICATIONS & DIMENSIONS (Inches)

Capacity (Tons)	Stock Number	Headroom "C" (Inches)	Std. Lift (Ft.)	Pull to Lift Load* (Lbs.)	"A"	"B"	"D"*	"E"	"F"	"G"	Load Chain Diameter (mm) x Chain Fall Lines	Chain Fall Lines	Net Weight (Lbs.)	Shipping Weight Approx. (Lbs.)	Weight for Additional Foot of Lift (Lbs.)
3/4	LB008	11.0	5	54 (36)	5.7	4.7	9.6 (14.4)	3.8	1.6	0.9	5.6 x 1	1	13	13	.5
1	LB010	11.8	5	72 (46)	5.7	4.7		3.8	1.6	1.1	5.6 x 1	1	13	14	.5
1 1/2	LB015	13.2	5	64 (45)	6.3	5.0	10.4 (14.4)	3.9	1.5	1.3	7.1 x 1	1	18	18	.7
2	LB020	14.8	5	59 (42)	6.8	5.9		4.0	1.8	1.4	8.8 x 1	1	25	26	1.1
2 3/4	LB028	14.8	5	81 (57)	6.8	5.9		4.0	1.8	1.4	8.8 x 1	1	25	26	1.1
3	LB030	15.6	5	69	7.5	6.3	16.3 (16.9)	4.4	1.8	1.5	10 x 1	1	33	35	1.5
6	LB060	21.3	5	72	7.5	8.5		4.4	2.3	2.0	10 x 2	2	57	60	3.2
9	LB090	26.8	5	78	7.5	12.0		4.4	4.1	2.9	10 x 3	3	88	93	4.7



*Figures in parenthesis indicate hoists equipped with optional Load Limit Warning Handle.

CB HAND CHAIN HOIST - ½ TO 100 TON CAPACITY

Harrington CB Hand Chain Hoists combine a rugged exterior shell with machined interior components to handle your most demanding lifting operations. An efficient drive train minimizes manual effort, while a double enclosed brake cover, standard slip clutch and double pawl springs enhance performance and reliability.

MANY BENEFITS AND MORE FEATURES

- Exceptional durability as a result of the all-steel construction featuring rugged gear case enclosure and hand wheel cover.
- Increased lifting height thanks to low headroom.
- Compact design results in lightweight and easy portability.
- An efficient drive train results in minimum manual effort.
- Standard slip clutch device prevents the hoist from being used to lift loads beyond rated capacity.
- Double pawl springs provide redundancy for reliable operation of brake mechanism.
- Reliable braking with double enclosed brake cover that keeps out dust, rain and dirt.

Available Options (See page 313)



Inspection Hook



Chain Container

CAPABILITIES TO COUNT ON

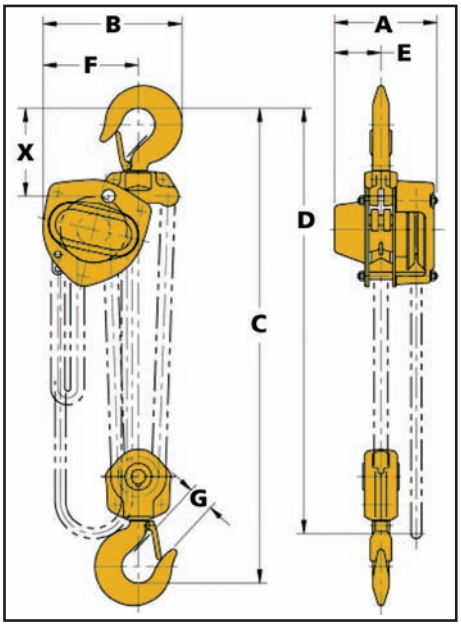
- 8-foot standard lift (12-foot for 10 Tons and greater), nonstandard lifts and hand chain drops are also readily available.
- Grade 100 heat-treated, manganese alloy load chain resists abrasion and wear while minimizing chain weight.
- Forged and heat-treated, alloy steel hooks are designed to open slowly, without fracturing under excessive loads.
- Test certificate verifies that every hoist has been factory load tested to 125% of rated capacity, in accordance with ASME B30.16 requirements.



CB HAND CHAIN HOIST - SPECIFICATIONS									
CAPACITY (TONS)	STOCK NUMBER	HEADROOM C (Inches)	STD. LIFT (Ft.)	PULL TO LIFT LOAD (Lbs.)	OVERHAUL RATIO	LOAD CHAIN DIAMETER (mm)	CHAIN FALL LINES	NET WEIGHT (Lbs.)	WEIGHT FOR ADDITIONAL FOOT OF LIFT (Lbs.)
1/2	CB005	11.2	8	48	25	5	1	22	1.0
1	CB010	11.6		58	43	6.3	1	25	1.2
1-1/2	CB015	13.8		70	57	7.1	1	32	1.4
2	CB020	14.8		72	70	8	1	41	1.6
2-1/2	CB025	16.5		66	99	9	1	56	1.8
3	CB030	20.1		72	114	7.1	2	49	2.1
5	CB050	23.6		68	198	9	2	85	3.0
8	CB080	30.3		75	297	9	3	124	4.2
10	CB100	29.9	12	72	396	9	4	186	5.5
15	CB150	40.2		74	594	9	6	346	7.9
20	CB200	46.5		72 x 2	396 x 2	9	8	524	10.9
30	CB300	51.2		86 x 2	495 x 2	9	10	690	13.3
40	CB400	58.3		86 x 2	693 x 2	9	14	1068	18.2
50	CB500	61.4		98 x 2	792 x 2	9	16	1422	20.6
80	CB800	100.8		86 x 4	693 x 4	9	28	3392	36.3
100	CB1000	125.2		98 x 4	792 x 4	9	32	6525	41.2

Please Note: Special lengths of load and hand chain available upon request.
Weights are approximate.

CB HAND CHAIN HOIST - DIMENSIONS								
CAPACITY (TONS)	STOCK NUMBER	A	B	D	E	F	G	X
1/2	CB005	6.2	6.3	8	2.7	3.9	1.1	3.5
1	CB010	6.4	6.3	8	2.8	3.9	1.1	4
1-1/2	CB015	6.7	7.2	8	3.1	4.4	1.3	4.7
2	CB020	7.2	8.0	8	3.4	4.9	1.4	4.9
2-1/2	CB025	7.6	9.2	8	3.6	5.6	1.6	5.4
3	CB030	6.7	9.3	8.3	3.1	6.4	1.7	5.8
5	CB050	7.6	11.1	10	3.6	7.6	1.8	6.8
8	CB080	7.6	14.7	10.3	3.6	10	2.9	10.8
10	CB100	7.6	17.2	14.9	4.4	12.1	2.9	11.6
15	CB150	10.6	19.4	15.9	4.7	13.3	3.1	12.6
20	CB200	14.7	29.4	16.3	7.4	14.7	3.2	13.8
30	CB300	15.9	29.4	16.3	8.0	14.7	4.1	15.7
40	CB400	19.8	29.9	16.6	9.9	15.0	4.1	17.5
50	CB500	21.4	31.3	16.6	10.7	15.7	4.4	18.4
80	CB800	29.9	55.2	15.9	13.8	27.6	5.1	-
100	CB1000	31.3	56.9	14.6	15.7	28.4	7.3	-





Justin Michael Gelskey leaves no detail undone as he dutifully records all requirements for the large, Harrington Hoist order. He and the third generation will continue to make Lift-It your first choice for rigging.

CF HAND CHAIN HOIST - ½ TO 5 TON CAPACITY

Harrington CF Hand Chain Hoists give you a practical alternative based on an economical design using fewer parts for trouble-free service. Outstanding durability results from a die-cast aluminum body and high-strength, heat-treated main pinion shaft and load gear. Pre-lubricated ball bearings, precision machined gears and Weston-style load brake make lifting smooth and easy, providing long service and low maintenance.

MANY BENEFITS AND MORE FEATURES

- Experience exceptional strength with a thick die-cast aluminum body.
- Handle tough demands with high-strength, heat-treated main pinion shaft and load gear.
- Positive braking action with Weston-style load brake incorporating two moisture-resistant brake pads with four braking surfaces.
- Manual effort is minimized thanks to smooth running, pre-lubricated ball bearings and precision machined drive train components.
- Maintenance is simplified with fewer parts and an easy-to-work-on design.

CAPABILITIES TO COUNT ON

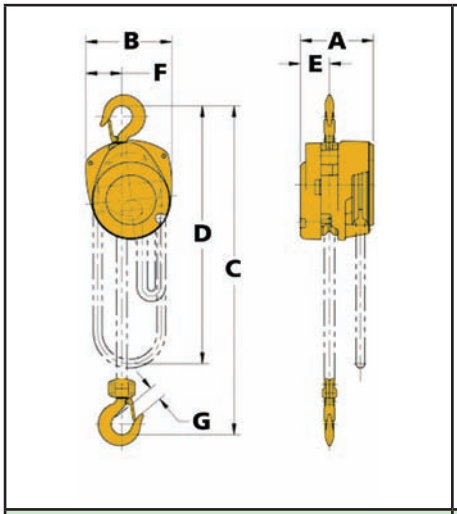
- 10-foot lift is standard, 15 and 20-foot lifts are also stocked; nonstandard lifts and hand chain drops available as well.
- Grade 100, heat-treated, manganese alloy load chain resists abrasion and wear while minimizing chain weight.
- Forged and heat-treated, alloy steel hooks are designed to open slowly and not fracture under excessive loads.
- Test certificate verifies that every hoist has been factory load tested to 125% of rated capacity, in accordance with ASME B30.16 requirements.



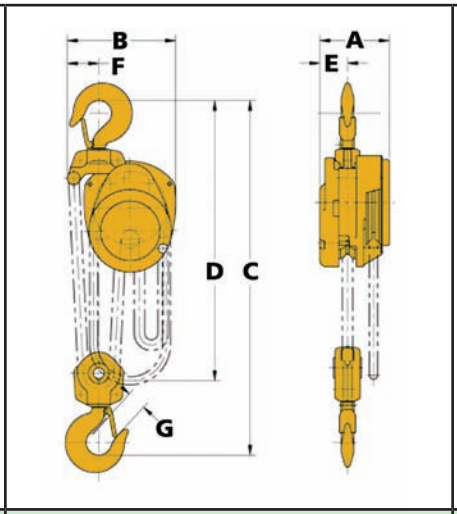
Custom Hoist Storage Crates, another "Junior" creation.



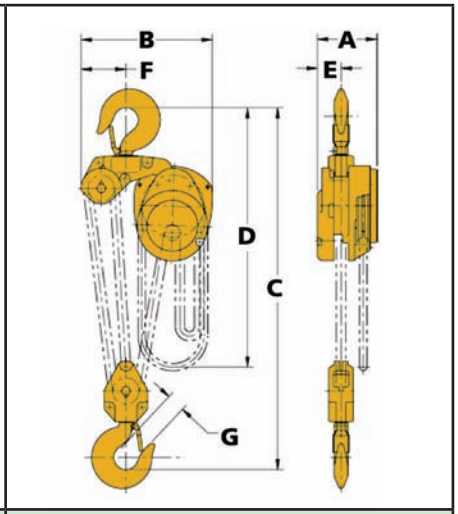
CF HAND CHAIN HOIST - SPECIFICATIONS									
CAPACITY (TONS)	STOCK NUMBER	HEADROOM C (Inches)	STD. LIFT (Ft.)	PULL TO LIFT LOAD (Lbs.)	OVERHAUL RATIO	LOAD CHAIN DIAMETER (mm)	CHAIN FALL LINES	NET WEIGHT (Lbs.)	WEIGHT FOR ADDITIONAL FOOT OF LIFT (Lbs.)
1/2	CF005	12.8	10	60	19	5	1	24	1
1	CF010	14.6	10	72	31	6.3	1	29	1.2
1-1/2	CF015	17.3	10	84	41	7.1	1	40	1.4
2	CF020	20.1	10	80	63	6.3	2	47	1.8
3	CF030	23.2	10	92	81	7.1	2	62	2.1
5	CF050	24.4	10	92	134	7.1	3	82	2.9



1/2 to 1-1/2 Ton



2 to 3 Ton



5 Ton

CF HAND CHAIN HOIST - DIMENSIONS							
CAPACITY (Tons)	STOCK NUMBER	A Inches	B Inches	D Feet	E Inches	F Inches	G Inches
1/2	CF005	5.4	5.9	10	2	2.4	1.1
1	CF010	5.8	6.9	10	2.3	2.9	1.1
1-1/2	CF015	6	8	10	2.4	3.4	1.3
2	CF020	5.8	8	10	2.3	2.3	1.4
3	CF030	6	9.4	10	2.4	2.7	1.7
5	CF050	6	13.5	10	2.4	4.5	1.8

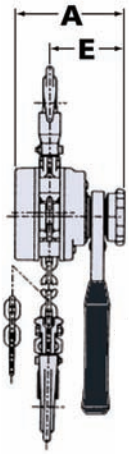
LX LEVER PULLER - ¼ AND ½ TON CAPACITY

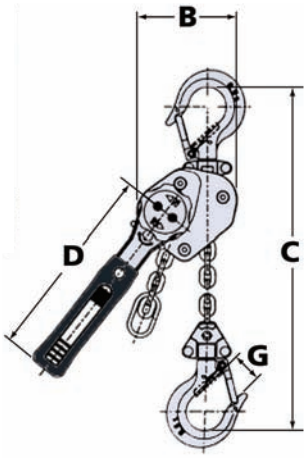
Harrington LX Mini Pullers are lightweight, compact and built to perform. LX Mini Pullers fit conveniently in a toolbox and will easily handle pulling and moving jobs in many applications including transportation, construction and plumbing. Available in two capacities, the ½ Ton model is unique to the industry.

Many Benefits and More Features

- Durable die-cast aluminum body with steel frame is compact and lightweight.
- Very low headroom design for use in tight spaces.
- Free-chain mechanism allows for quick adjustments.
- Extremely low pulling force is required for operation.
- Weston-style brake is totally enclosed to protect against dirt, dust and rain.
- Single step reduction gear ensures load holding performance.
- Load chain guide mechanism permits smooth and quiet guiding of chain.
- Rubber handle grip for ease of use.
- Effortless to transport, install and store.







Capabilities to Count On:

- Grade 100, nickel-plated load chain is corrosion and wear resistant.
- Hooks furnished with latches and include notched tip.
- 5-foot lift is standard.
  Longer lifts are available for both models.
- Test certificate verifies that every hoist has been factory load tested to 125% of rated capacity in accordance with ASME B30.21 requirements.

LX LEVER PULLER - SPECIFICATIONS and DIMENSIONS

Capacity (Tons)	Stock Number	Headroom C (Inches)	Std. Lift (Ft.)	Pull to Lift Load	A (In.)	B (In.)	D (In.)	E (In.)	G (In.)	Load Chain Diameter (mm)	Chain Fall Lines	Net Weight (Lbs.)	Weight for Additional Foot of Lift (Lbs.)
1/4	LX003	8.1	5	40 Lbs.	3.5	2.9	5.9	2.4	0.8	3.2	1	3.5	.15
1/2	LX005	9.7	5	62 Lbs.	3.9	3.7	7.1	2.7	0.9	4.3	1	5.7	.25

Weights are approximate.

CX MINI HAND CHAIN HOIST - ¼ TON CAPACITY

The Harrington CX Mini Hand Chain Hoist is the world's smallest industrial hoist. This uniquely compact and lightweight hoist is the perfect choice for jobs with light loads in high or difficult to reach places such as: duct installation, plumbing and heating, home automobile maintenance and crane repair.

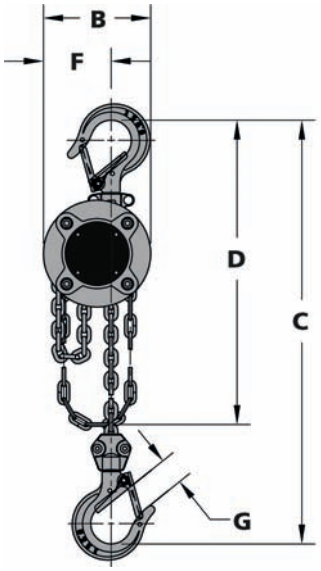
Many Benefits and More Features:

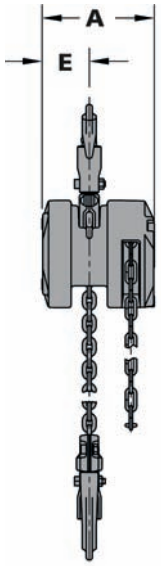
- Unique design is extremely compact and lightweight.
- Aluminum body with steel frame provides superior strength.
- Load limiter prevents the hoist from being used to lift loads beyond rated capacity.
- Very low force is required to lift load.
- Metal chain guide allows smooth operation.
- Effortless to transport, install and store.

Capabilities to Count On:

- Grade 100, nickel-plated load chain is corrosion and wear resistant.
- Durable stainless steel hand chain.
- Hooks furnished with latches and include notched tip.
- Available in 10 or 20 foot lifts.
- Test certificate verifies that every hoist has been factory load tested to 125% of rated capacity in accordance with ASME B30.16 requirements.







CX MINI HAND CHAIN HOIST - SPECIFICATIONS and DIMENSIONS															
Capacity (Tons)	Stock Number	Headroom C (Inches)	Std. Lift (Ft.)	Pull to Lift Load	Overhaul Ratio	A (In.)	B (In.)	D (Ft.)	E (In.)	F (In.)	G (In.)	Load Chain Diameter (mm)	Chain Fall Lines	Net Weight (Lbs.)	Weight for Additional One Foot of Lift (Lbs.)
1/4	CX003	8.5	10	33 Lbs.	34	3.5	3.3	6.8	1.5	2.1	.80	3.2	1	6.1	.30
1/4	CX005	8.5	20	33 Lbs.	34	3.5	3.3	16.6	1.5	2.1	.80	3.2	1	10	.30

Weights are approximate.

.

PT PUSH TROLLEY - ½ THROUGH 10 TON CAPACITY

Harrington Push and Geared Trolleys help you maneuver easily for your most demanding lifting operations. They feature specially designed, contoured wheels that ensure reliable tracking and their sealed ball bearings avoid maintenance issues providing smooth operation.

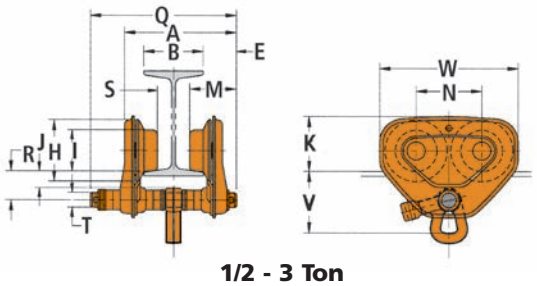
Many Benefits and More Features:

- Sure trolley tracking with specially designed, contoured wheels that fit both tapered and flat-flange beams.
- Maintenance-free, sealed, precision ball bearings are lubed-for-life and offer smooth movement with low friction and long life.
- Strength and rigidity from a lightweight, compact design.
- Easily adjustable trolley to fit a wide variety of beam flange widths.
- Load equalizing suspension distributes the load to all wheels.
- Wide standard flange ranges reduce the need for optional extended shaft kits.
- Match the needs of the job with a variety of trolley hoist suspenders.

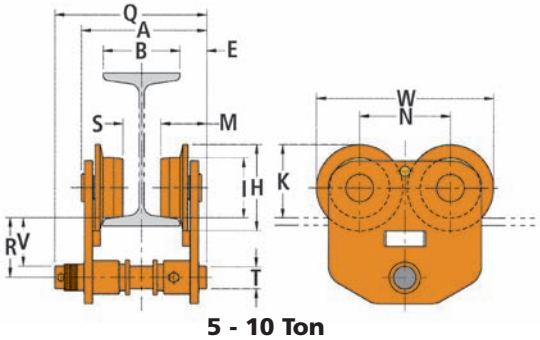
Capabilities to Count On:

- Use Push Trolleys for applications involving longer traversing distances.
- Use Geared Trolleys for precise load control and shorter traversing distances.
- ½ to 3 Ton capacity Trolleys are supplied with Suspender C, which is suitable for most applications. Alternate suspenders may be required for your application.





1/2 - 3 Ton



5 - 10 Ton

PT PUSH TROLLEY - SPECIFICATIONS AND DIMENSIONS (INCHES)																				
Capacity (Tons)	Stock Number	Min. Radius for Curve (In.)	Flange Width Adjustability B (Inches)		A Max	Q	W	E	H	I	J	K	M	N	R	S	T	V	Net Weight (Lbs.)
			Standard	Option																
1/2	PTF2005	13.8	2.28 to 4.00	4.01 to 8.00 or 8.01 to 12	6.8	8	7.2	1.8	3.2	2.36	.80	3	2.7	3.3	1.5	B-1.8	.87	3.7	9
1	PTF2010	17.7	2.28 to 5.00	5.01 to 8.00 or 8.01 to 12	8.5	9.8	9.3	2.2	4.2	2.8	1.1	3.7	3.1	4.4	2	B-1.9	.98	4.2	16
1-1/2 & 2	PTF2020	21.7	3.23 to 6.02	6.03 to 12.00	10.4	11.8	11	2.7	5	3.35	1.4	4.4	3.8	5.2	2.4	B-2.3	1.26	5.1	30
2-1/2 & 3	PTF2030	25.6			11	12.6	12.8	3.1	5.8	3.94	1.4	5.3	4.3	6	2.7	B-2.3	1.42	6.7	47
5	PTF2050	78.7	4.92 to 7.02	7.03 to 12.00	10.7	11.7	13.7	2.1	5.7	4.65	-	5.7	3.6	7	4.6	B-3.0	1.73	3.7	98
8	PT080	118.1	5.50 to 8.66	8.67 to 12.00	14.4	17.6	18.9	4.1	7.3	6.1	-	6.7	5.9	7.7	6	B-3.6	2.76	4.6	254
10	PT100				14.4	17.6	18.9	4.1	7.3	6.1	-	6.7	5.9	7.7	6	B-3.6	2.76	4.6	254

Weights are approximate.

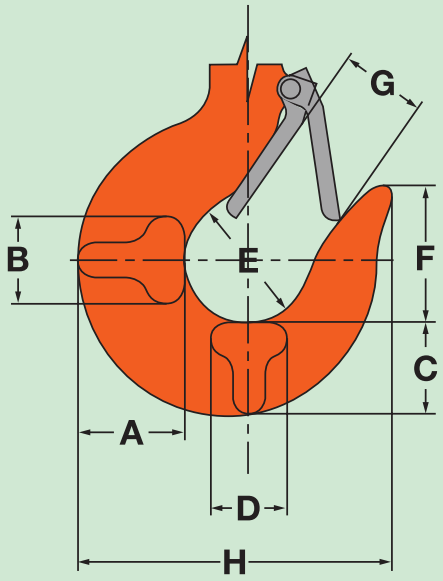
HOOK DIMENSIONS

LB TOP AND BOTTOM HOOK - DIMENSIONS (INCHES)								
Capacity (Tons)	A	B	C	D	E	F	G	H
3/4	.9	.6	.8	.6	1.4	1.4	.93	3.2
1	.9	.6	.8	.6	1.7	1.7	1.14	3.7
1-1/2	1.2	.7	1	.7	1.7	1.8	1.26	4.1
2 & 2-3/4	1.4	.8	1.14	.8	1.9	2	1.44	4.7
3	1.6	1	1.2	1.0	2	2.2	1.54	5
6	2.1	1.3	1.6	1.3	2.4	2.7	1.97	6.2
9	2.6	1.6	2	1.6	3.4	3.5	2.85	8.5

CB and CF TOP AND BOTTOM HOOK - DIMENSIONS (INCHES)								
Capacity (Tons)	A	B	C	D	E	F	G	H
1/2	.8	.5	.7	.5	1.4	1.4	1.1	3
1	1	.6	.9	.6	1.7	1.6	1.1	3.7
1-1/2	1.2	.8	1	.8	1.9	1.9	1.3	4.2
2	1.4	.9	1.2	.9	2	1.9	1.4	4.6
2-1/2	1.6	1	1.3	1	2.1	2.1	1.6	5
3	1.8	1.1	1.5	1.1	2.2	2.2	1.7	5.4
5	2.2	1.4	1.9	1.4	2.5	2.7	1.8	6.3
8	3	1.9	2.5	1.9	3.3	3.8	2.9	9.1
10	3	1.9	2.5	1.9	3.3	3.8	2.9	9.1
15	3.7	2.4	3.1	2.4	3.9	4.3	3.1	10.8
20	4.2	2.6	3.5	2.6	4.3	4.9	3.2	11.9
30	5.2	3.3	4.4	3.3	4.9	5.6	4.1	14.4
40	5.9	3.7	4.9	3.7	5.5	6.3	4.1	16.5
50	6.7	4.2	5.5	4.2	6.1	7	4.4	18.4
80	-	5.7	8	5.7	7.5	10	5.1	21.9
100	-	8.3	9.8	8.3	9.4	12.2	7.3	28

LX and CX TOP AND BOTTOM HOOK - DIMENSIONS (INCHES)								
Capacity (Tons)	A	B	C	D	E	F	G	H
1/4	.57	.43	.49	.43	1.26	1.18	.80	2.55
1/2	.69	.47	.59	.47	1.40	1.37	.90	2.90

Hook diagram applies to all charts on page.



WARNING

The "definitive" source documents for hoist safety are ANSI/ASME standards B30.16 and B30.21 and publications available from HMI. To obtain copies of these documents, contact ASME at 800-843-2763 or visit www.asme.org. HMI can be reached at 704-676-1190 or at www.mhia.org.

The operation of a hoist involves more than activating its controls. As stated in the ANSI/ASME B30 standards, the use of a hoist is subject to certain hazards that cannot be mitigated by engineered features, but only by the exercise of: intelligence, care, common sense and experience in anticipating the effects and results of activating the hoist's controls. Use this guidance in conjunction with the warnings, cautions and safety instructions sent out in the Owner's Manual supplied with the hoist. This governs how you operate and use your hoist. If a replacement Owner's Manual is needed, contact Harrington Hoists, Inc. at 800-233-3010.

Product Options - Harrington Hoist

CORROSION RESISTANT CHAIN

Harrington's Nickel-Diffused (ND) Chain is designed for use in corrosive environments where: saltwater, rain, steam and many acidic and alkaline solutions are prevalent. The specific temperature, concentration and duration of exposure will affect the corrosion rate of the chain. Please consult us for assistance.

CHAIN CONTAINERS

Harrington offers a broad range of chain containers for use with manual hoist products. Manual Chain Containers feature the same industrial quality construction as those available for our electric hoists.



- Chain containers are available in three basic sizes: 5, 10 and 15 ft.
- Constructed from vinyl-coated canvas with a steel frame on top.
- Chain Containers are prepared differently depending on the hoist model.
- CF and NTH hoists must be disassembled to install containers and must be load tested after assembly. Containers should be installed by Harrington or a repair company capable of performing load tests.

LATCH KITS

Each Harrington latch kit contains a steel latch, stainless steel latch spring, attachment clamp and required hardware. Latch clamp attaches tightly to hook neck, while finger lugs on each side of the latch allow it to be opened easily with one hand. A centering indentation on the bottom of the latch prevents latch from slipping off the hook point. Harrington latch kits come in 13 standard sizes and can be custom manufactured for other neck and throat openings. Stainless steel hook latches are available for specialty applications. Contact us for more information.

LOAD LIMIT WARNING HANDLE

LB Lever Hoists equipped with Load Limit Warning Handles alert operators when hoists are being used to lift loads beyond rated capacity. Load Limit Warning Handles signal operators in three ways:



- Sight: Green signal changes to red.
- Feel: Load Limit Warning Handle deflects 15 degrees.
- Sound: Load Limit Warning Handles emit a click when deflected. Handles reset when hoists are operated in the down direction.

POINT LOAD HOOK

Harrington offers a special, Point Load Hook for 1-½ and 3 Ton LB Lever Hoists that is designed to accommodate point loading. Point Load Hooks are popular in ship and rail yards, where pulling operations can result in hook point loading.

TOP HOOK EXTENDERS

LB Lever Hoists are available with Top Hook Extenders that position the hoist body away from its attachment point. The Top Hook Extender is 18 inches long and is available for ¾ through 3 Ton LB Lever Hoists.



SLIP CLUTCH

Harrington offers Slip Clutch devices for LB Lever Hoists which prevent hoists from being used to lift loads beyond rated capacity. Factory installed Slip Clutches are available for: ¾, 1-½, 3 and 6 Ton capacity hoists. Hoists equipped with slip clutches are clearly marked and the free knob is black in color to easily identify the installation.

INSPECTION HOOKS

Inspection Hooks are suitable for applications where inspection of the internal parts of the hook set is required. Inspection Hooks use the standard Harrington hook set, but are assembled with high-strength locking fasteners instead of rivets. Inspection Hooks are available in top and bottom versions for single fall LB, CB, CF and NTH model hoists.



BULLARD® AND SHUR-LOC® HOOKS

Bullard® and Shur-Loc® Hooks offer a positive locking latch feature. Contact us for full details.

DAILY INSPECTION CHECKLIST FOR HOISTS

The first step in finding any abnormalities in the equipment is a visual inspection, which should be a part of a hoist owner's daily operation. During an inspection, the following checkpoints for manually operated chain hoists are vital to ensuring proper operation. Read the hoist user's manual for the specific requirements of your equipment.

- Check to ensure that hoists are not tagged, "Out of Service".
- Verify hoist nameplates are present and complete.
- Ensure that all warning and safety labels are not missing and are legible.
- Test run to ensure that all motions agree with control device markings.
- Run the hoist through the full range of motions, all the way up and down.
- Check to make sure that there is no load drift; the hoist must hold load without any drift.
- Check for hook damage. Inspect for: cracks, nicks, gouges, twisting, deformation of the throat opening and wear on saddle or load bearing point. Refer to the owner's manual provided by the original manufacturer.
- Check hook latch operation and inspect for wear or deformation. The latch must be present and operational.
- Deformation between the hook fitting and shank.
- Load chain inspection. Check for: nicks, gouges, deformation, flaws, heat damage, bent links, wear, stretch, corrosion, pitch elongation and proper lubrication.
- Inspect Hand Chain for deformation and pitch elongation.
- Inspect Cable Hoist wire rope for: broken wire, broken strands, kinks and any deformation to the rope structure.
- Reeving: Ensure that the chain or wire rope is properly reeved and that the rope or chain is not twisted around each other.
- Limit Switches: Check to ensure that the upper limit device stops the lifting motion of the hoist load block before striking any part of the hoist.
- Deformation and corrosion of the body frame, gear case, gears, sheaves, bearings and chain stopper pin.
- Presence of bolts and nuts.
- Wear of brake screws, linings and ratchet wheels.
- Check for any sign of oil leakage on the hoist and/or on the ground beneath the hoist.
- Check for any unusual sounds from the hoist mechanism while operating the hoist.

Additionally, visual examinations on electric hoists may include the following:

- Check for missing bolts, nuts, screws, split pins, etc. on the trolley, as well as applying oil when necessary.
- Check for deformation, breakage, loose screws, etc. on the push-button switch and cord.
  Markings also should be clearly shown and the switches and interlocks should operate correctly.
- Ensure the power source connection is working properly.
- Inspect for abnormal wear or deformation on the sling fixtures.

CM Lodestar Electric Chain Hoist

The balanced, integrated, proven design of CM Lodestar Electric Chain Hoists has made them the most popular electric chain hoists in the industry. Lodestar gives you more value for your money including:

- Up to 3 ton capacities for heavy-duty industrial applications.
- Gear train: lifetime lubricated with non-oxidizing grease.
- Precision machined and hardened liftwheel with hardened chain guides for precise chain liftwheel fit.
- Gearing designed for exceptionally long life and quiet operation.
- H4 duty standard.
- Rugged control station (NEMA 4X).
- Heavy duty motor, standard Protector Overload Device and standard screw type limit switches.
- Hardened, forged steel, latch type hooks and Hoistaloy load chain for long, dependable service.
- Easy to install and maintain.
- No special tools required to disassemble.
- Lifetime warranty.
- Each hoist thoroughly inspected and factory tested to 125% of rated load.
- Meets ASME B30.16.
- Metric rated.
- Made in U.S.A.



Special Applications

- Harsh environment hoists available for severe duty in plating, galvanizing and washdown applications.
- Hoists with climbing capability available for temporary rigging or lifting applications. (Must be used in inverted position only).
- Hoists with creep control allow precise positioning through field adjustment within the time delay range of .05 sec. to 3 sec.
- Articulating suspension available for 3 ton only.

Lodestar Electric Chain Hoist Specifications-Two Speed

Rated Capacity (Tons)	Standard Lift (Ft.)	Lift Speed (F.P.M.)	Motor H.P.	Model Number	Chain Fall Lines	Stock Number † (Less Suspension)		Approximate Shipping Weight (Lbs.)
						230-3-60	460-3-60	
1/8	10	10/32	1/4	A2	1	2707	2708	70
	10	20/60	1/2	AA2	1	2717	2718	74
1/4	10	5/16	1/4	B2	1	2727	2728	70
	10	10/32	1/2	C2	1	2737	2738	74
1/2	10	2.5/8	1/4	E2	2	2747	2748	79
	10	5/16	1/2	F2	1	2757	2758	74
	10	10/32	1	J2	1	3502	3503	116
	10	21/64	2	JJ2	1	3549	3550	130
1	10	2.5/8	1/2	H2	2	2767	2768	83
	10	5/16	1	L2	1	3504	3505	116
	10	10/32	2	LL2	1	3553	3554	130
2	10	2.5/8	1	R2	2	3506	3507	136
	10	5/16	2	RR2	2	3561	3562	150
3	10	1.75/5.5	1	RT2	3	9511	9513	161
	10	3.5/11	2	RRT2	3	9512	9514	175

† Specify voltage: 230 or 460.

Lodestar Electric Chain Hoist Specifications-Single Speed								
Rated Capacity (Tons)	Standard Lift (Ft.)	Lift Speed (F.P.M.)	Motor H.P.	Model Number	Chain Fall Lines	Stock Number † (Less Suspension)		Approximate Shipping Weight (Lbs.)
						115-1-60	230/460-3-60	
1/8	10	32	1/4	A	1	2702	2705	60
	10	60	1/2	AA	1	2712	2715	66
	15	32	1/4	A	1	3101	3103	64
	15	60	1/2	AA	1	3111	3113	70
	20	32	1/4	A	1	3102	3104	68
	20	60	1/2	AA	1	3112	3114	74
1/4	10	16	1/4	B	1	2722	2725	60
	10	32	1/2	C	1	2732	2735	66
	15	16	1/4	B	1	3121	3123	64
	15	32	1/2	C	1	3131	3133	70
	20	16	1/4	B	1	3122	3124	68
	20	32	1/2	C	1	3132	3134	74
1/2	10	8	1/4	E	2	2742	2745	69
	10	16	1/2	F	1	2752	2755	66
	10	32	1	J	1	3512	3515	110
	10	64	2	JJ	1	-	3545	117
	15	8	1/4	E	2	3141	3143	76
	15	16	1/2	F	1	3151	3153	70
	15	32	1	J	1	4212	4214	116
	15	64	2	JJ	1	-	4244	123
	20	8	1/4	E	2	3142	3144	83
	20	16	1/2	F	1	3152	3154	74
	20	32	1	J	1	4213	4215	121
	20	64	2	JJ	1	-	4245	128
1	10	8	1/2	H	2	2762	2765	75
	10	16	1	L	1	3522	3525	110
	10	32	2	LL	1	-	3555	117
	15	8	1/2	H	2	3161	3163	82
	15	16	1	L	1	4222	4224	116
	15	32	2	LL	1	-	4254	123
	20	8	1/2	H	2	3162	3164	89
	20	16	1	L	1	4223	4225	121
	20	32	2	LL	1	-	4255	128
2	10	8	1	R	2	3532	3535	130
	10	16	2	RR	2	-	3565	137
	15	8	1	R	2	4232	4234	140
	15	16	2	RR	2	-	4264	147
	20	8	1	R	2	4233	4235	150
	20	16	2	RR	2	-	4265	157
3	10	5.5	1	RT	3	9501	9505	155
	10	11	2	RRT	3	-	9508	162
	15	5.5	1	RT	3	9502	9506	169
	15	11	2	RRT	3	-	9509	176
	20	5.5	1	RT	3	9503	9507	183
	20	11	2	RRT	3	-	9510	190

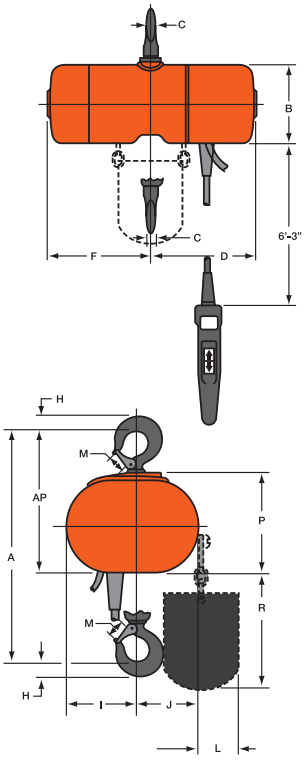
† Single Speed Hoists-Factory Wired 460V, convertible to 230V.

CM Lodestar Electric Chain Hoist

CLEARANCE DIMENSIONS (INCHES)

	Lodestar Model Numbers					
Dimension	**A, B, C, F AA**	**E, H**	**J, L, JJ, LL**	**R**	**RR**	**RT, RRT**
A	16-1/4	19-5/8	18-9/16	24-1/8	24-1/8	29-9/16
B	6-1/8	6-1/8	7-5/8	7-5/8	7-5/8	7-5/8
C	11/16	7/8	7/8	1-1/8	1-1/8	1-1/8
D	11	11	9-1/2	9-1/2	9-1/2	9-1/2
F	7-3/4	7-3/4	10-11/16	10-11/16	10-11/16	10-11/16
H	1	1-3/16	1-3/16	1-1/2	1-1/2	1-1/2
I	4-13/16	3-7/8	7-1/4	6-3/16	6-3/16	6-3/16
J	3-15/16	4-7/8	5-7/16	6-1/2	6-1/2	6-1/2
L	1-11/16	1-11/16	7/16	7/16	7/16	7/16
M	1	1-1/8	1-1/8	1-5/16	1-5/16	1-5/16
P	6-5/8	6-9/16	7-13/16	7-13/16	7-13/16	7-13/16
R*	9-7/8	12-7/8	12-7/8	18-7/8	18-7/8	24-7/8
AP	9-1/4	9-9/16	10-11/16	11-3/16	11-3/16	12-9/16

*Based on 10 ft. lift and increases proportionately with longer lifts.



SUSPENSION SPECIFICATIONS

Type	Order Code	Models
Swivel hook	2792	A-AA-B-C-F
Swivel hook	2793	E-H
Swivel hook	3661	J-L-JJ-LL
Swivel hook	3660	R-RR
Swivel hook	9557	RT-RRT
Swivel latchlock hook	2796	A-AA-B-C-F
Swivel latchlock hook	3662	J-L-JJ-LL
Swivel latchlock hook	3663	R-RR
Rigid lug for low head trolley	2778	A-AA-B-C-F
Rigid lug for low head trolley	2779	E-H
Rigid lug for low head trolley	3677	J-L-JJ-LL
Rigid lug for low head trolley	3668	R-RR
Rigid lug for low head trolley	9561	RT-RRT
Rigid hook	2788	A-AA-B-C-F
Rigid hook	2789	E-H
Rigid hook	3651	J-L-JJ-LL
Rigid hook	3658	R-RR
Rigid hook	9559	RT-RRT
Rigid latchlock hook	2790	A-AA-B-C-F
Rigid latchlock hook	3652	J-L-JJ-LL

Note: 3 ton lug suspension prevents hoist from rotating but allows hoist to articulate below trolley.



NEW FEATURES FOR IMPROVED PERFORMANCE

- Redesigned Control Panel for easy access
- Lifetime Grease-Lubricated Gear Box (No changing and disposing of hazardous oil)
- Adjustable Limit Switch & Built In Overload Protection
- Easy Access Overload Clutch for Total Operator Control
- Five Pocket Lift Wheel for minimal chain wear

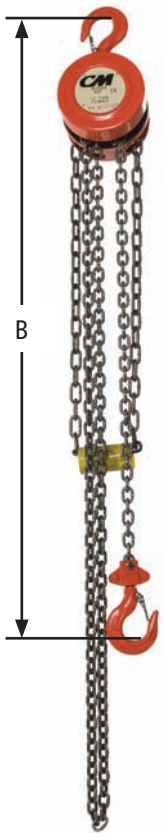


CYCLONE HAND CHAIN HOIST

One of the most popular and reliable hoists available, providing efficiency and durability.

- High Strength Aluminum Alloy Frame and Covers.
- High efficiency Spur Gear.
- Rugged Hoistaloy Lifting Chain.
- Enclosed, Contoured Weston Braking System.
- Load Limiter is standard, not an option.
- Forged and machined Lift Pockets.
- Hand chain is 2 ft. less in length than Lift Chain.
- Metric rated.
- Lifetime warranty Made in the USA.

OPTIONS:
Chain Containers
Zinc Plated Load and Hand Chain
Aluminum, Unwelded Hand Chain
Latchlok Hooks
Bronze Hooks
Bullard Hooks
Eye Type Suspension



622 HAND CHAIN HOIST

- Simple, efficient, economical design.
- Equipped with hardened Load Chain for flexibility and long wear.
- Compact design, low headroom and lightweight steel construction for easy installation, even in confined spaces.
- Weston-Type Load Brake requires no lubrication.
- Hand Wheel Cover with Guide Slots minimizes jamming and slipping.
- Forged Swivel Hooks with latches reduce twisting of chain and unintentional unhooking of load when chain is slack.
- Hand Chain is 2 ft. less in length than Lift Chain.
- One-year warranty.
- Metric rated.
- Imported.

Stock Number	Standard Lengths (Ft.)	Work Load Limit (Tons)	Strands of Load Chain	Hand Chain		A Overall Width (Inches)	B Minimum (Inches)	Throat Opening (Inches)	8 Ft. Net Weight (Lbs.)
				Pull (Lbs.)*	Overhaul (Ft.)**				
CYCLONE CHAIN HOIST									
CM 4621	8	1/4	1	23	22-1/2	10-7/8	12-7/8	1-1/32	33
CM 4622	8	1/2	1	46	22-1/2	10-7/8	12-7/8	1-1/32	33
CM 4624	8	1	1	69	30	10-7/8	14	1-1/8	36
CM 4625	8	1-1/2	1	80	40-1/2	10-7/8	17-5/16	1-5/16	59
CM 4626	8	2	1	83	52	10-7/8	17-5/16	1-5/16	60
CM 4627	8	3	2	85	81	12-1/4	21-1/2	1-5/8	84
CM 4628	8	4	2	88	104	12-1/4	21-1/2	1-5/8	91
CM 4629	8	5	3	75	156	14-1/2	24-1/4	1-5/8	122
CM 4630	8	6	3	90	156	14-1/2	25-1/4	1-3/4	127
CM 4631	8	8	4	89	208	17-1/2	34-1/2	2-1/16	207
CM 4632	8	10	5	95	260	17-1/2	35-1/2	2-5/16	219
622 CHAIN HOIST									
CM 62250	10, 12, 15, 20, 30	1/2	1	53	29	4-15/16	11-5/8	1-1/16	15
CM 622100	10, 12, 15, 20, 30	1	1	77	37	5-19/32	13	1-1/32	22
CM 622200	10, 12, 15, 20, 30	2	1	82	80	8-5/16	18-1/8	1-1/4	57
CM 622300	10, 12, 20	3	2	65	154	8-5/16	21-29/32	1-5/16	85
CM 622500	10, 12, 20	5	2	105	147	8-5/16	23-7/8	1-13/16	82
CM 6221000	10	10	4	109	289	14-3/32	27-9/16	2-1/2	164

YOU MUST SPECIFY CHAIN LENGTH FOR 622 CHAIN HOISTS. *PULL REQUIRED TO LIFT WORK LOAD LIMIT. **OVERHAUL DISTANCE TO LIFT LOAD ONE FOOT.

Available Options


CHAIN CONTAINER


LATCHLOK HOOK

⚠ WARNING

Overloading and improper use can result in injury

To avoid injury:
- Do not exceed Work Load Limit, load rating capacity.
- Do not use to lift people or loads over people.
- Use only alloy chain for lifting.
- Read and follow all instructions.

CM PULLER

CM Pullers are designed for heavy duty construction and industrial applications. Used to pull, lift, drag or stretch.



- Tough Aluminum Alloy Construction and Powder Coat finish.
- Hoistaloy, hardened link, Load Chain.
- Weatherized Automatic Braking.
- Forged Hooks with Latches.
- Fewer Parts for Repair and Inventory.
- Easy One Hand Operation.
- Metric Rated.
- Free Wheeling for Fast Attachment.
- Lifetime Warranty Made in the USA.
- Can be supplied with lifts longer than 5ft.

CM PULLER OPTIONS (Not for 653 Lever Hoist).

		
OPTIONAL LOAD LIMITER	ANCHOR SLING	LATCHLOK HOOK

⚠ WARNING

Overloading and improper use can result in injury

To avoid injury:
- Do not exceed Work Load Limit, load rating capacity.
- Do not use to lift people or loads over people.
- Use only alloy chain for lifting.
- Read and follow all instructions.

⚠ WARNING

Can fail if damaged, misused or overloaded. Inspect before use. Use by untrained personnel is hazardous. OBSERVE AND DO NOT EXCEED WORK LOAD LIMIT. DEATH and INJURY can occur from improper use or maintenance.

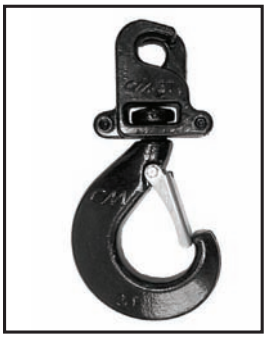


653 LEVER HOIST

Series 653 Lever Hoist are rugged tools for close quarters operation. The short handle and minimal lever pull effort, make the 635 ideal for a broad range of lifting, pulling and stretching operations.



- Impact Resistant, Stamped Steel.
- Powder Coated for Corrosion Resistance.
- Hardened Steel Load Sharing Gears.
- Weston Type Braking System.
- Hardened Steel Chain.
- Forged Hooks with Latches.
- Rubber Handle Grip.
- Double Pawl for Load Control.
- Two Chain Guide Rollers.
- One Handed Free Chaining.
- Minimal Maintenance.
- Metric Rated.
- 5 Year Warranty against defects in materials and/or workmanship.
- You must specify chain length.
- Lifts longer than 20ft. are available.
- ASME B30.21 compliant.



OPTIONS:
Shipyard Hooks on request
Upper Shipyard Hooks replace standard hooks and easily attach to the hoist body. Lower Hooks are furnished with chain blocks for direct attachment of the load to hoist. Shipyard Hooks are excellent for positioning steel plate and fixtures.

CM PULLER & 653 HOIST SPECIFICATIONS

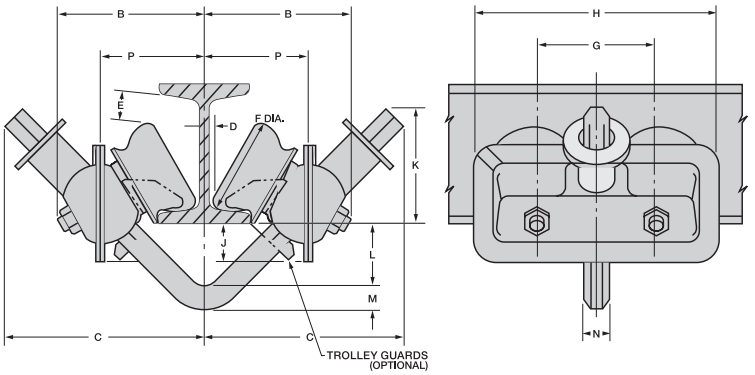
Stock Number	Standard Lengths (Ft.)	Work Load Limit (Tons)	Lever Pull (Lbs.)	Min. Hook Distance (In.)	Lever Length (In.)	Hook Throat Opening (In.)	5 Ft. Net Wt. (Lbs.)
CM PULLER							
CM 4043	5	3/4	58	10-3/4	21-1/4	1-1/32	16
CM 4045	5	1-1/2	89	14-1/4	21-1/4	1-1/8	26
CM 4047	5	3	95	16-15/16	21-1/4	1-7/32	38
CM 4050	5	6	96	21-3/8	21-1/4	1-3/4	73
653 LEVER HOIST							
CM 63575	5,10,15,20	3/4	33	12-5/8	11	1-1/8	15
CM 635100	5	1	44	14-13/16	11	1-1/8	15
CM 635150	5,10,15,20	1-1/2	51	14-13/16	16-1/4	1-1/4	27
CM 635200	5	2	68	14-13/16	16-1/4	1-1/4	27
CM 635300	5, 10	3	77	18-11/16	16-1/4	1-9/16	45
CM 635600	5,10,15,20	6	77	23-1/4	16-1/4	2-3/16	78

CM 632 Close Radius Trolley

With revolutionary advances, the 632 Close Radius Trolley is shorter, more compact and 50% lighter than competitive trolleys, yet every bit as tough.

- Negotiates radius curves as tight as 7 to 10 inches.
- Made of highest quality, rolled steel.
- Unique double row, ball bearing wheel design for greater wear capacity.
- Larger V-bars available for wider flange adjustment.
- For low headroom applications.
- Bearings pre-packed with lifetime lubricant.
- Exclusive Dial-Fit Collar quickly adapts trolley to wide range of beams and patented rails.
- Dust Covers shield and protect bearings.
- Trolleys are available for larger beams, rails or tracks.
- Cast iron Trolley Guards available, (except for 3 ton).
- Lifetime warranty.
- Made in U.S.A.





CLEARANCE DIMENSIONS (Inches)

Dimension	Rated Capacity (Tons)			
	1/4 & 1/2	1	1-1/2 & 2	3
B	4-1/4	4-3/8	5-5/8	6-3/16
C	5-7/8	6	7-1/2	8-1/16
D	3/16	3/16	3/8	11/16
E	13/16	13/16	2-3/16	4-1/16
F	2-3/4	2-3/4	3-1/2	3-1/2
G	3-3/8	3-3/8	4-1/2	4-1/2
H	7	7	9	9
J	1-1/8	1-1/8	1-1/2	1-5/8
K	3-3/8	3-1/2	4-3/8	4-13/16
L	1-13/16	1-5/8	2	2-5/8
M	11/16	7/8	1-1/8	1-1/8
N	7/8	1	1-1/4	1-1/4
P	3	3-1/8	3-7/8	4-15/16

Dimensions are for minimum S-beams and will vary with larger beams.

⚠ WARNING

Overloading and improper use can result in injury

To avoid injury:
- Do not exceed Work Load Limit, load rating capacity.
- Do not use to lift people or loads over people.
- Use only alloy chain for lifting.
- Read and follow all instructions.

SERIES 632 CLOSE RADIUS TROLLEY SPECIFICATIONS

Rated Capacity (Tons)	Stock Number	Adjustment for Standard S-beams		Tread Diameter (Inches)	Net Weight (Lbs.)	Shipping Weight (Lbs.)	Minimum Radius Curve (Inches)
		Beam Depth (Inches)	Flange Width (Inches)				
1/4 & 1/2	3222	4-12	2-5/8 to 5-1/16	2-3/4	9	10	7
1	3224	4-12	2-5/8 to 5-1/16	2-3/4	10	12	7
1-1/2 & 2	3226	6-15	3-3/8 to 5-5/8	3-1/2	23	25	10
3	3230	8-18	4 to 6-1/4	3-1/2	29	33	10

All capacities can be supplied for S-beams larger than listed and also for wide flange beams, rails or tracks with approximately equivalent flange widths.

WARNING INFORMATION

LUG-ALL Web Strap Pullers have one-hand portability and are simple to use in most positions. The Replaceable Stress Link is a critical overload warning, allowing the operator to back off the load before injury or damage occur. Winch Hoists with Hot Stick Rings eliminate direct contact with hoists. Six rings (1 Inch Diameter) on the hooks, handle and pawl shafts allow linemen to position hoists using approved hot sticks. Experienced linemen choose LUG-ALL.

⚠WARNING The use of web strap hoists on or around energized lines may result in serious injury or death.

LUG-ALL Web Strap Pullers may have optional Hot-Stick Rings on hooks and latches, as well as Hot Stick Operating Levers. One inch diameter, Hot Stick Rings eliminate direct contact with hoists. The Strap and Fiberglass Handles are intended to provide an extra measure of safety when working around energized lines.

LUG-ALL WEB STRAP PULLERS ARE NOT INSULATING LIVE-LINE TOOLS.

When Straps are clean and dry, they may have dielectric properties typical of nylon or polyester fibers. However, when Straps become wet and/or dirty, they lose these dielectric properties. Use appropriate insulating hot sticks in conjunction with Web Strap Hoists and when necessary to achieve proper working distance per OSHA Regulation Subpart V, 1926.950 or company work practices. When handles swing closer to an energized conductor than OSHA working distance requirements or company work practices permit, use rubber gloves rated for the appropriate voltage.

AVOID PERSONAL INJURY OR EQUIPMENT DAMAGE

- Do not use if web strap is twisted, kinked, frayed or damaged.
- Do not use to lift people or loads over people.
- Do not leave an unattended load suspended in the air.
- Do not lengthen or make any substitution for the LUG-ALL reversible handle.
- Do not remove or obscure warning labels.
- Do not use hoist as a load binder.
- Do not snag or pull the strap over edges, as serious weakening may result.
- Do not use LUG-ALL hoists as a tow line.
- Close latches on hooks before using.
- Use only LUG-ALL replacement parts on LUG-ALL equipment.



LUG-ALL® Web Strap Pullers

Since the 1960's, LUG-ALL has been the world's leading manufacturer of Web Strap Winch Hoists, with quality and reliability built into every Web Strap Puller. LUG-ALL Web Strap Pullers are instantly recognized by the distinctive shape of their cast aluminum frames which is a federally registered trademark. LUG-ALL Web Strap Pullers are made with 100% USA made castings and are manufactured and assembled in the United States.

DESIGNED FOR MAINTENANCE AND CONSTRUCTION OF ENERGIZED LINES

ANSI B30.21 Compliant.

Proof tested to 125% of Work Load.

Forged Hooks with Latches.

Double Flanged Drum prevents the Web Strap from contacting ratchet teeth.

Exclusive Breakable Stress Link signals users of an overload, prior to the Fiberglass Handle breaking and/or an overload of hoist load carrying components.

POSITIVE LOAD HOLDING IN ALL ENVIRONMENTS

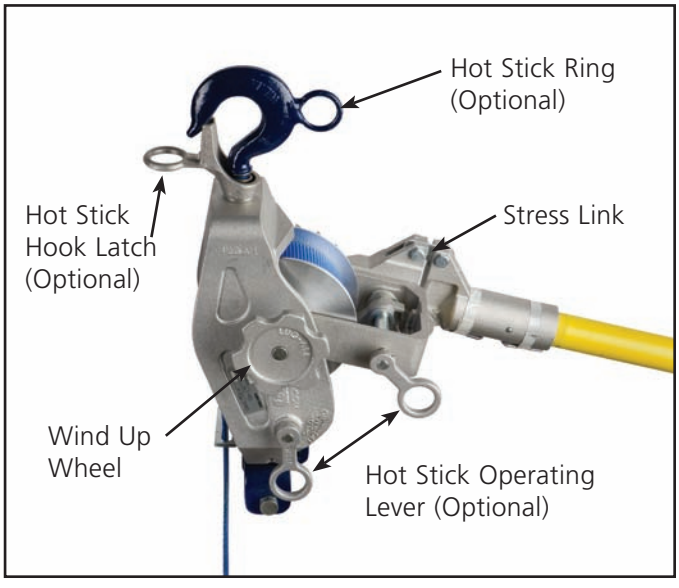
Double, interlocking Pawl Mechanism. No load brakes to slip or foul.

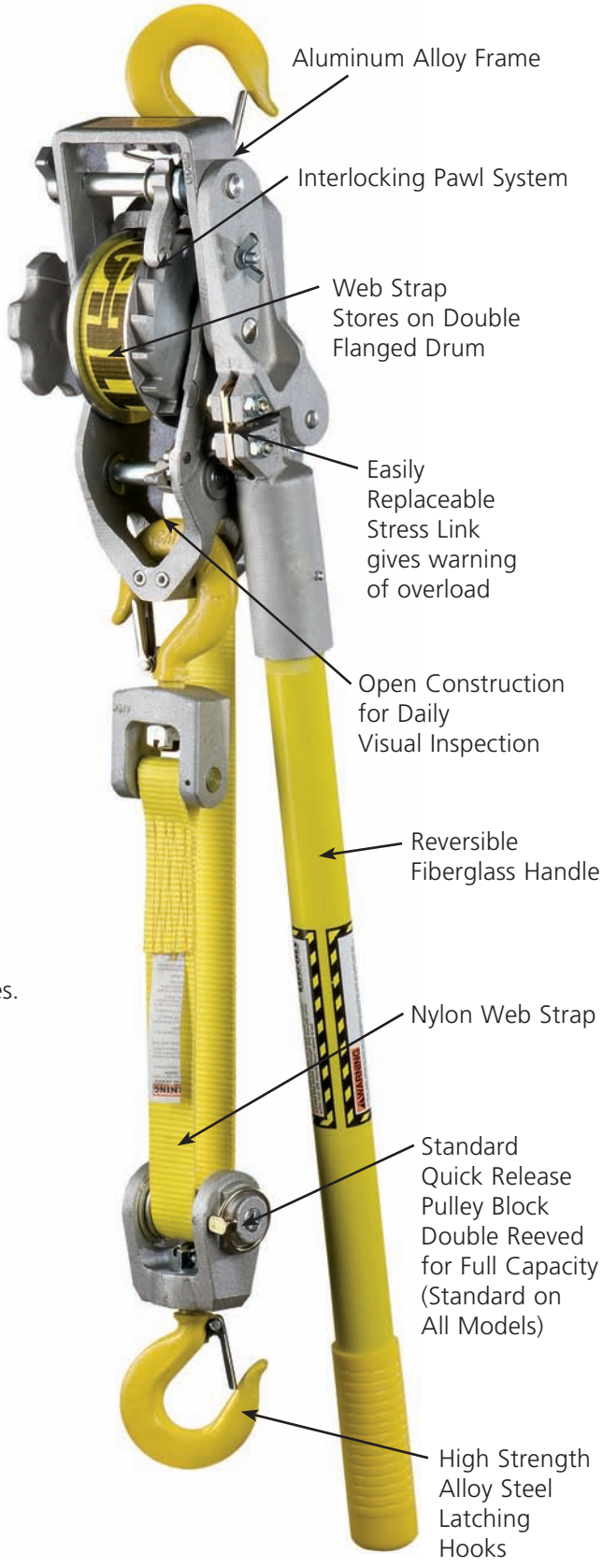
EASE OF OPERATION

Open frame construction allows for cleaning and visual inspection. Self-lubricating bearings throughout the Housing and Pulley safeguard smooth operation.

USEFUL COST EFFECTIVE OPTIONS

Five hook styles designed to meet your application requirements and work practices. Models can be equipped with Hot Stick Levers, Rings and Hot Stick Latches for remote operation when using approved hot line tools. Smooth operation is realized even with heavy, insulated gloves.

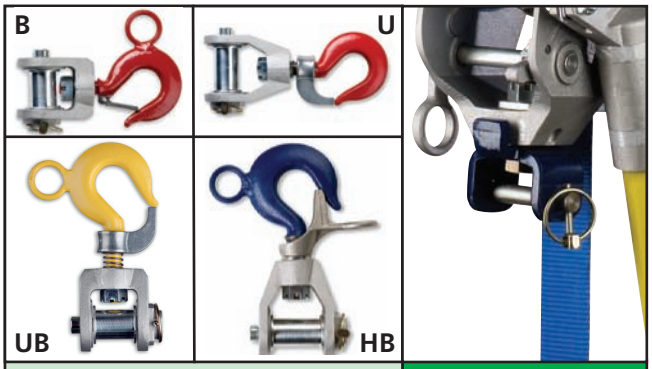




LUG-ALL® Web Strap Pullers

All New Model 1-1/2 Ton Small Frame Convertible	1-1/2 Ton Medium Frame With Convertible Kit	2 Ton Medium Frame With Convertible Kit
		

All models equipped with quick release pulley block.
LUG-ALL grips, straps and hooks are color coded by capacity.



Five Hook Styles

A - Standard Latching Hooks (Shown on 1-1/2 Ton Models.)

B - Hot Stick Rings and Latching Hooks

U - Gate Type Hooks

UB- Gate Type Hooks and Hot Stick Rings

HB- Hot Stick Rings and Hook Latches

With LUG-ALL's new convertible Webstrap Pullers, all the parts needed to switch from a double line to single line are on the hoist, lessening the possibility of misplacing or losing parts.

CONVERTIBLE WEB STRAP PULLER SPECIFICATIONS

STOCK NUMBER	SINGLE LINE CAPACITY	SINGLE LINE DISTANCES*		DOUBLE LINE CAPACITY	DOUBLE LINE DISTANCES*		STRAP LENGTH	HANDLE LENGTH	NET WEIGHT (Lbs.)
		Minimum	Maximum		Minimum	Maximum			
2-CA	3/4 Ton	20″	7′-2″	1-1/2 Ton	18″	3′-6″	8′	30″	9.50
2-CB	3/4 Ton	20″	7′-2″	1-1/2 Ton	18″	3′-6″	8′	32″	9.75
2-CU	3/4 Ton	22″	7′-2″	1-1/2 Ton	20″	3′-5″	8′	30″	10
2-CUB	3/4 Ton	22″	7′-2″	1-1/2 Ton	20″	3′-5″	8′	32″	10.25
2-CHB	3/4 Ton	22″	7′-2″	1-1/2 Ton	20″	3′-5″	8′	32″	10.25
2-CA-1000	3/4 Ton	20″	7′-2″	1-1/2 Ton	18″	3′-6″	8′	20″	9.25
2-CB-1000	3/4 Ton	20″	7′-2″	1-1/2 Ton	18″	3′-6″	8′	22″	9.50
2-CU-1000	3/4 Ton	22″	7′-2″	1-1/2 Ton	20″	3′-5″	8′	20″	9.75
2-CUB-1000	3/4 Ton	22″	7′-2″	1-1/2 Ton	20″	3′-5″	8′	22″	10
2-CHB-1000	3/4 Ton	22″	7′-2″	1-1/2 Ton	20″	3′-5″	8′	22″	10
3-CA	3/4 Ton	21″	11′-1″	1-1/2 Ton	21″	5′-4″	11′-5″	30″	13.25
3-CB	3/4 Ton	21″	11′-1″	1-1/2 Ton	21″	5′-4″	11′-5″	32″	13.50
3-CU	3/4 Ton	23″	11′-1″	1-1/2 Ton	23″	5′-3″	11′-5″	30″	13.75
3-CUB	3/4 Ton	23″	11′-1″	1-1/2 Ton	23″	5′-3″	11′-5″	32″	14
3-CHB	3/4 Ton	23″	11′-1″	1-1/2 Ton	23″	5′-3″	11′-5″	32″	14
4-CA	1 Ton	21″	9′-2″	2 Ton	21″	4′-5″	10′	36″	14.50
4-CB	1 Ton	21″	9′-2″	2 Ton	21″	4′-5″	10′	38″	14.75
4-CU	1 Ton	23″	9′-2″	2 Ton	23″	4′-4″	10′	36″	15
4-CUB	1 Ton	23″	9′-2″	2 Ton	23″	4′-4″	10′	38″	15
4-CHB	1 Ton	23″	9′-2″	2 Ton	23″	4′-4″	10′	38″	15

Specifications are subject to change without notice.
*Pull Distances

LUG-ALL® Web Strap Pullers

1 Ton Small Frame	1-1/2 Ton Small Frame	1-1/2 Ton Medium Frame	2 Ton Medium Frame
			

All models equipped with quick release pulley blocks.
LUG-ALL grips, straps and hooks are color coded by capacity.



Five Hook Styles

A - Standard Latching Hooks (Depicted Left)

B - Hot Stick Rings and Latching Hooks

U - Gate Type Hooks

UB- Gate Type Hooks and Hot Stick Rings

HB- Hot Stick Rings and Hook Latches

STANDARD WEB STRAP PULLER SPECIFICATIONS

STOCK NUMBER	SINGLE LINE CAPACITY	SINGLE LINE DISTANCES*		DOUBLE LINE CAPACITY	DOUBLE LINE DISTANCES*		STRAP LENGTH	HANDLE LENGTH	NET WEIGHT (Lbs.)
		Minimum	Maximum		Minimum	Maximum			
2-A	1/2 Ton	16″	9′-6″	1 Ton	21″	4′-5″	10′	30″	10.25
2-B	1/2 Ton	16″	9′-6″	1 Ton	21″	4′-5″	10′	32″	10.50
2-U	1/2 Ton	18″	9′-6″	1 Ton	24″	4′-4″	10′	30″	10.75
2-UB	1/2 Ton	18″	9′-6″	1 Ton	24″	4′-4″	10′	32″	11
2-HB	1/2 Ton	18″	9′-6″	1 Ton	24″	4′-4″	10′	32″	11
25-A	3/4 Ton	16″	7′-6″	1-1/2 Ton	21″	3′-5″	8′	20″	10
25-B	3/4 Ton	16″	7′-6″	1-1/2 Ton	21″	3′-5″	8′	22″	10.50
25-U	3/4 Ton	18″	7′-6″	1-1/2 Ton	24″	3′-4″	8′	20″	10.50
25-UB	3/4 Ton	18″	7′-6″	1-1/2 Ton	24″	3′-4″	8′	22″	10.75
25-HB	3/4 Ton	18″	7′-6″	1-1/2 Ton	24″	3′-4″	8′	22″	11
3-A	3/4 Ton	19″	11′-3″	1-1/2 Ton	27″	5′-1″	11′-5″	30″	14
3-B	3/4 Ton	19″	11′-3″	1-1/2 Ton	27″	5′-1″	11′-5″	32″	14.50
3-U	3/4 Ton	21″	11′-3″	1-1/2 Ton	30″	5′-0″	11′-5″	30″	15
3-UB	3/4 Ton	21″	11′-3″	1-1/2 Ton	30″	5′-0″	11′-5″	32″	15
3-HB	3/4 Ton	20″	11′-3″	1-1/2 Ton	29″	5′-0″	11′-5″	32″	15.25
4-A	1 Ton	19″	9′-4″	2 Ton	27″	4′-1″	10′	36″	15.50
4-B	1 Ton	19″	9′-4″	2 Ton	27″	4′-1″	10′	38″	16
4-U	1 Ton	21″	9′-4″	2 Ton	31″	4′-0″	10′	36″	16
4-UB	1 Ton	21″	9′-4″	2 Ton	31″	4′-0″	10′	38″	16.50
4-HB	1 Ton	20″	9′-4″	2 Ton	29″	4′-0″	10′	38″	16.25

Specifications are subject to change without notice.
*Pull Distances

ACCESSORIES AND OPTIONS

THE RIGHT HOOK FOR ANY APPLICATION



(A)- Standard Latching Hook
Forged alloy steel hooks for strength and durability. Latches are standard.



(U)- Swivel Gate Hook
Hook latch revolves on hook shank and locks under spring tensions in open or closed position.



(B)- Hot Stick Ring with Standard Latching Hook
Hot stick hooks have a welded ring (1" diameter) and standard latches for use with approved hot stick tools.



(HB)- Hot Stick Ring with Hot Stick Hook Latch
Hot Stick Hook Latch models have rings on the hook and latch for use on energized lines. Latch and hook can be easily maneuvered when using approved hot stick tools.



(UB)- Swivel Gate Hook with Hot Stick Ring
Offers the same revolving and locking hook shank features as the standard, "U" Swivel Gate Hook, but incorporates a welded Hot Stick Ring (1" diameter).

BREAKABLE STRESS LINK

LUG-ALL Web Strap Pullers feature a breakable Stress Link next to the Overload Link. The Stress Link snaps when the hoist is overloaded warning the user to back off the load before injury or damage occurs. The Overload Link has elongated holes which allow enough movement for the Stress Link to snap, while still holding the Handle Socket Assembly together.
<u>The Stress Link must be replaced immediately.</u>

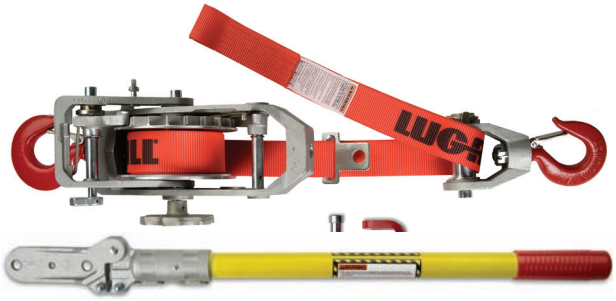


MEDIUM FRAME CONVERSION KIT

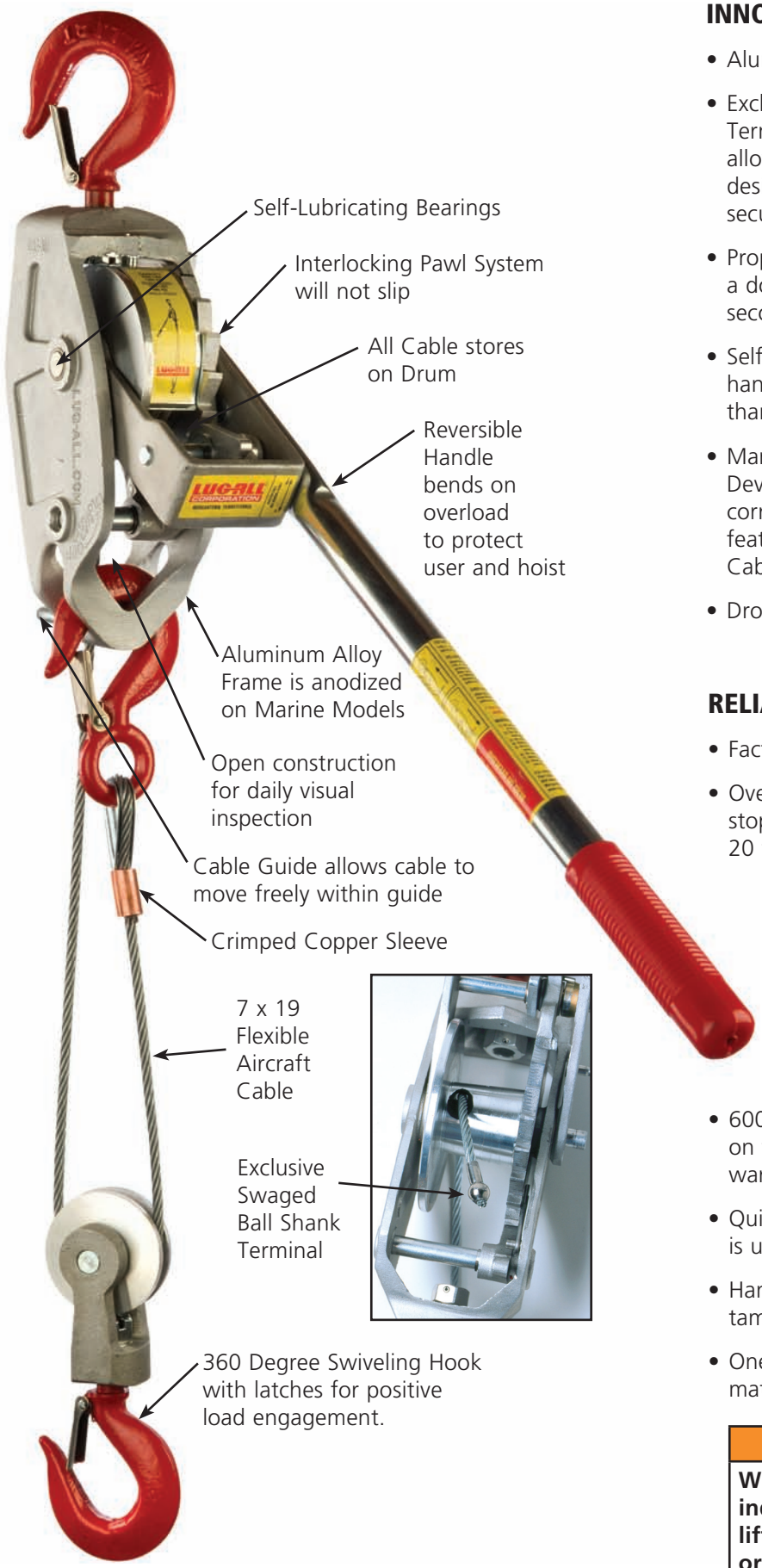
Older Style LUG-ALL Medium Frame Web Strap Hoists (manufactured prior to 2009, with eye bolt at the bottom of the main frame) can easily be converted to take advantage of all the benefits of the newer convertible hoists.

All standard conversion kits include a lynch pin and shaft, convertible bracket and hex bolt assembly.

Please Note: All Pulley Blocks supplied after 9/08 are convertible.
Hoists purchased prior to 9/08 may require a new Pulley Block or Web Strap.
Small Frame Models (Stock No. 2C) have a completely new frame with cast bracket.




Conversion Kit

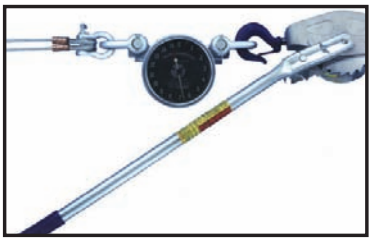


INNOVATIVE DESIGN

- Aluminum Alloy Frame.
- Exclusive Drum Anchor-Swaged Ball Shank Terminal locks cable securely in drum and allows for full cable extension. A superior design to set screws and cable wraps for securing cable to drum.
- Proprietary Reversible Handle ALWAYS has a downward pull and switches positions in seconds.
- Self-Storing Aircraft Cable - No chains are hanging or being dragged. Much lighter than chain pullers.
- Marine Grade Models Available Developed specifically for marine or other corrosive conditions, Marine Grade Models feature: Anodized Casting, Stainless Steel Cables and Cadmium Plated Steel Shafts.
- Drop forged, Steel Hooks.

RELIABLE OPERATION

- Factory tested to 125% of rated capacity.
- Overload Handle bends to alert user to stop immediately at approximately a 20 to 50% overload.



- 6000 Model features a “shear pin design” on the two position, Telescope Handle to warn user of overload.
- Quick Release will not function while cable is under load.
- Handle can be removed to prevent tampering.
- One Year Guarantee against defects in materials and/or workmanship.

⚠ WARNING

Winch Hoists are intended for industrial use only and are not for lifting or supporting human, alien or animal cargo.

LUG-ALL® Cable Winch Hoists

MODELS

Small Frame



Medium Frame

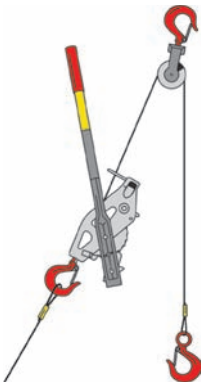


Medium Large Frame

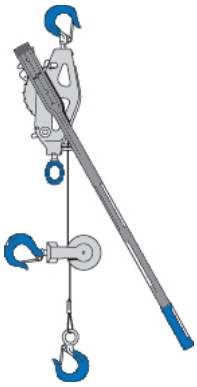


USAGE

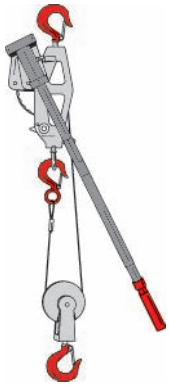
Single Line Application



Single Line Application



Double Line Application



Double Line Application



OPTIONS

THE RIGHT HOOK FOR THE APPLICATION

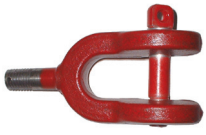
CLEVIS HOOK- "C"
Removable Clevis Hook



GATE HOOK- "U"
Hook latch revolves on hook shank and locks under spring tension in open or closed position.



CLEVIS JAW- "PS"
Jaw fitting provides positive attachment. High strength, forged, steel jaws and screw pins.



MARINE GRADE CABLE HOISTS



Developed specifically for marine or other corrosive conditions, Marine Grade Cable Hoists feature: Anodized Casting, Stainless Steel Cables and Cadmium Plated Steel Shafts.

To order "Marine" grade models, select any Small Frame or Medium Frame model and add "M" as a suffix to the Stock Number. Marine grade is not available for the Medium Large Frame (6000-15 model).

LUG-ALL® Cable Winch Specifications

SMALL FRAME - 1/2 to 1-1/2 TON CAPACITY

STOCK NUMBER	SINGLE LINE SPECIFICATIONS				DOUBLE LINE SPECIFICATIONS				CABLE DIAMETER	CABLE LENGTH	NET WEIGHT
	Capacity	Min.**	Lifting†	Pull Force	Capacity	Min**	Lifting†	Pull Force			
1000-15*	1000 Lbs.	16"	15'	77 Lbs.					3/16"	16'	7 Lbs.
115-R*	1000 Lbs.	16"	15'	77 Lbs.					3/16"	16'	7 Lbs.
1500-25	750 Lbs.	16"	25'	65 Lbs.	1500 Lbs.	21"	12'-6"	67 Lbs.	5/32"	26'	8.5 Lbs.
125-R	750 Lbs.	16"	25'	65 Lbs.	1500 Lbs.	21"	12'-6"	67 Lbs.	5/32"	26'	8.5 Lbs.
2250-15	1125 Lbs.	16"	15'	83 Lbs.	2250 Lbs.	21"	7'-6"	86 Lbs.	3/16"	16'	8.75 Lbs.
215-R	1125 Lbs.	16"	15'	83 Lbs.	2250 Lbs.	21"	7'-6"	86 Lbs.	3/16"	16'	8.75 Lbs.
2250-20	1125 Lbs.	16"	20'	83 Lbs.	2250 Lbs.	21"	10'	86 Lbs.	3/16"	21'	9.25 Lbs.
3000-10	1500 Lbs.	16"	10'	97 Lbs.	3000 Lbs.	21"	5'	100 Lbs.	7/32"	11'-6"	9 Lbs.
310-R	1500 Lbs.	16"	10'	97 Lbs.	3000 Lbs.	21"	5'	100 Lbs.	7/32"	11'-6"	9 Lbs.

Pull Force is the Handle Pull Necessary to attain full capacity.
*Without Pulley Block.
**Minimum distance between hooks.
†Lifting distance.

Options

- Rapid Lowering-Permits release four times faster. Winches with this option have "R" as a stock number suffix.
- Cable Return Crank: Attaches directly to drum shaft for slack cable take up.
- Marine Grade Models: Add suffix "M" to the stock number.
- Hook options add to Cable Winch Hoist flexibility, see page 327.

MEDIUM FRAME - 1-1/8 TON to 2 TON CAPACITY

STOCK NUMBER	SINGLE LINE SPECIFICATIONS				DOUBLE LINE SPECIFICATIONS				CABLE DIAMETER	CABLE LENGTH	NET WEIGHT
	Capacity	Min.**	Lifting†	Pull Force	Capacity	Min.**	Lifting†	Pull Force			
2250-38	1125 Lbs.	18"	38'	83 Lbs.	2250 Lbs.	23-1/2"	19'	100 Lbs.	3/16"	39'-6"	13.75 Lbs.
238-R	1125 Lbs.	18"	38'	83 Lbs.	2250 Lbs.	23-1/2"	19'	100 Lbs.	3/16"	39'-6"	13.75 Lbs.
3000-30	1500 Lbs.	18"	30'	97 Lbs.	3000 Lbs.	23-1/2"	15'	100 Lbs.	7/32"	31'-6"	13.75 Lbs.
330-R	1500 Lbs.	18"	30'	97 Lbs.	3000 Lbs.	23-1/2'	15'	100 Lbs.	7/32"	31'-6"	13.75 Lbs.
4000-20	2000 Lbs.	18-1/2"	20'	110 Lbs.	4000 Lbs.	26-1/2"	10'	115 Lbs.	1/4"	22'	15.50 Lbs.
420-R	2000 Lbs.	18-1/2"	20'	110 Lbs.	4000 Lbs.	26-1/2"	10'	115 Lbs.	1/4"	22'	15.50 Lbs.

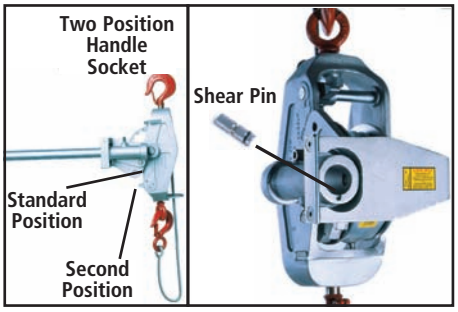
Pull Force is the Handle Pull Necessary to attain full capacity.
**Minimum distance between hooks.
†Lifting Distance.

Options

- Rapid Lowering-Permits release four times faster. Winches with this option have "R" as a stock number suffix.
- Cable Return Crank: Attaches directly to drum shaft for slack cable take up.
- Marine Grade Models: Add suffix "M" to the stock number.
- Hook options add to Cable Winch Hoist flexibility, see page 327.

MEDIUM LARGE FRAME – 3 TON CAPACITY

- Reversible Telescoping Handle
  Provides for better leverage and permits pulling from a standing position. Expands quickly from 37-1/2 inches to 57 inches.
- Two Position Handle Socket
  Most lifting, pulling, lowering and backing off operations can be accomplished with the socket in the standard position. For additional leverage the Handle Socket can be moved to the second position.
- Shear Pin
  Breaks and provides an audible noise to warn of serious overload. The hoist remains operational so loading can be reduced as soon as possible.



STOCK NUMBER	SINGLE LINE SPECIFICATIONS				DOUBLE LINE SPECIFICATIONS				CABLE DIAMETER	CABLE LENGTH	NET WEIGHT
	Capacity	Min.**	Lifting	Pull Force	Capacity	Min**	Lifting	Pull Force			
6000-15	3000 Lbs.	26-1/2"	15'	105 Lbs.	6000 Lbs.	34"	7'-6"	110 Lbs.	5/16"	18'	34 Lbs.

Pull Force is the Handle Pull Necessary to attain full capacity.
**Minimum Distance between hooks.

USAGE GUIDELINES

1. **DO** consult Operator's Manual or Renfroe when in doubt. Renfroe factory representatives are available upon request at no charge to train and assist in establishing the proper use of RENFROE products.

2. **DO** Lock clamp closed before lifting load.
   NEVER lift with lock in open or "lock open" position.

3. **DO** use hooks with latches.
   NEVER use a connection that may release clamp.

4. **DO** inspect clamp before each lift. Follow inspection and maintenance instructions outlined in this manual and use RENFROE replacement parts to ensure proper clamp operation.

5. **DO** use correct clamp for job.
   NEVER use large capacity clamps to lift light loads.

6. **DO** use an adequate number of clamps to balance load.
   NEVER lift loads that are not balanced.

7. **DO** use clamps within their rated capacity.
   NEVER overload clamps.

8. **DON'T** attach clamp directly to crane hook, always use a sling between crane hook and clamp.

9. **DON'T** side load with a straight shackle clamp.
   NEVER lift from the side with vertical clamps.

10. **DON'T** lift loads over people.
    NEVER lift over Safety Areas or Personnel.

11. **DON'T** misuse.
    NEVER lift plate from bottom of plate stack.

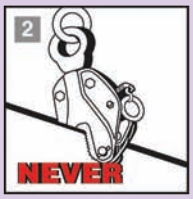
12. **DON'T** rush.
    NEVER lift more than one plate at a time with vertical clamps.

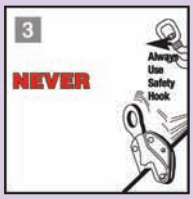
13. **DON'T** improvise. Always use correct clamp for the job.
    NEVER lift horizontally with a vertical clamp.

14. **DON'T** use clamps that have been over-loaded.

15. **DON'T** alter clamp.
    NEVER grind, weld or modify the clamp in any manner.





















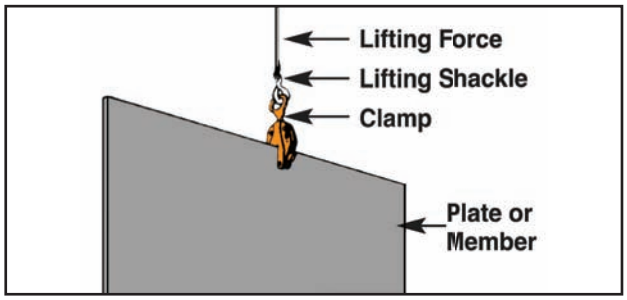




⚠ WARNING A pointing out and notice of danger. The purpose of a "warning" is to apprise operators and all other affected persons of the existence of danger of which they should be, but may not be aware of; and to enable the operators to protect themselves and others, where applicable, against such danger. An attempt is made herein to warn against reasonable and reasonably foreseeable danger in the proper use and possible misuse of Renfroe products depicted in our catalog.

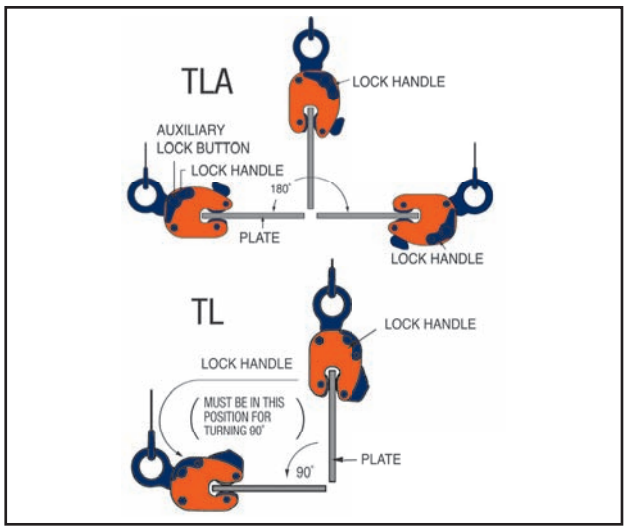
DEFINITIONS AND WARNINGS

VERTICAL LIFT: The lifting of a single plate or member in which the lifting force exerted by the rigging is directly above and in line with the lifting shackle as shown in the illustration below.



VERTICAL TURN/LIFT CLAMP: A Vertical Turn/Lift Clamp is a vertical lifting clamp specifically intended to turn a single plate or member through a 90° arc and back to vertical through the same 90° arc or from horizontal to vertical to horizontal through a 180° arc. Refer to specific Turn/Lift Clamps for further detail.

During the turning operation the edge of the plate opposite the edge to which the clamp is attached should always be in contact with a supporting surface such as a floor and the load on the clamp should not exceed one half of the clamp's rated capacity. Refer to illustrations shown below.



HORIZONTAL LIFT: Clamps (used in pairs or multiples) are attached to the side edges of a plate or bundle of plates positioned horizontally to floor level. The rigging attached to clamps is generally multi-legged slings with the connecting point of the slings being approximately centered between the distance separating the clamps. Refer to illustrations shown below.

STEEL PLATES: Unless otherwise specified, lifting clamps are manufactured to handle hot-rolled steel plates with a Brinell Hardness not exceeding 300.

⚠WARNING Do not lift plates with coatings or mill scale that prevents clamp gripping surfaces from making positive contact with the base metal.

For applications not covered by the above information, secure written recommendations from Renfroe.

FINISHED AND POLISHED STEEL PLATES: Steel plates in this category having other than hot-rolled surfaces such as stainless steel, etc., are generally handled using non-marring clamps incorporating smooth gripping surfaces.

⚠WARNING For applications using clamps with serrated gripping surfaces on finished or polished plates, secure written recommendations from Renfroe.

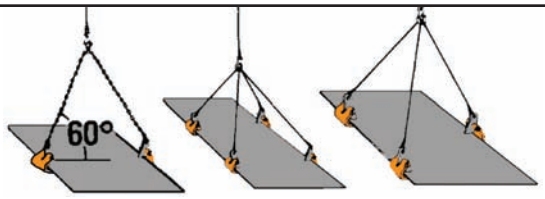
STRUCTURAL MEMBERS – FABRICATED SECTIONS: Unless otherwise specified, clamps described as capable of handling structural members and fabricated sections are limited to hot-rolled steel with a Brinell Hardness not exceeding 300.

⚠WARNING For applications not covered by the above information, you must in all cases secure written recommendations from Renfroe.

RATED CAPACITY:
ALL RENFROE CLAMPS ARE RATED INDIVIDUALLY.
The rated capacity of Renfroe products is based on the product being in "new or as new" condition and represents the maximum load products are to be subjected to when utilized in the manner described in this manual. Wear, misuse, abuse and other factors relating to usage may reduce the rated capacity. Shock loading must be avoided and all factors must be taken into consideration when selecting a Renfroe product for a given application.

PLATE THICKNESS: The minimum and maximum plate thickness a clamp specified for handling plates is capable of lifting.

⚠WARNING The capacity of all horizontal clamps is based on a sling angle of sixty degrees. Sling angles less than sixty degrees (60°) increase the load exerted on the clamps. Sling angles greater than 60° reduce gripping force, DO NOT EXCEED 60°.



DEFINITIONS AND WARNINGS

⚠ WARNING Never use clamps for lifting a plate when the plate thickness is less than or greater than the minimum and maximum thickness indicated on the clamp.

JAW OPENING: The minimum and maximum thickness of a member of a clamp, referred to as JAW OPENING is capable of handling.

⚠ WARNING Never use a clamp on a member whose thickness is less than or greater than range of jaw opening stenciled on the clamp.

OPERATING TEMPERATURES: Unless specified for the individual model, the approved operating temperature of Renfroe clamps is from 0°F/(-18°C) to a maximum of 200°F/(93°C). Minimum and maximum temperatures apply to both ambient and contact temperatures.

⚠ WARNING Secure written authorization from Renfroe before using clamps in temperatures outside the acceptable range.

HOT LIFTS: Model R and S clamps are available with modifications that make them capable for lifts where the contact temperature exceeds 200°F/(93°C). The exact application and temperature of the plates to be handled are critical in selecting the proper plate clamp.

⚠ WARNING Secure written instructions from Renfroe for all hot lift applications.

LOCKING CLAMPS: Locking Clamps are divided into the following categories. With the exception of the "Locking Wedge" and "Locking Screw" type, the purpose of the locks is to facilitate the attaching and removing of the clamp from the member being handled.

LOCK CLOSED: An over-center spring loaded mechanism in which the spring exerts a force on the gripping cam when the lock handle is moved to the "Lock Closed" position. When the handle is moved to unlocked position the force exerted by the spring is relaxed and the gripping cam may be retracted by pushing the lifting shackle into the body of clamp. Refer to the specific models of "Lock Closed" clamps for additional details. Typical "Lock Closed" clamps are Models: DG, FR, M and HRS.

LOCK OPEN ONLY: Normally used on "Hot Lift" clamps and consists of a manually operated "Lock Stop Pin" that is inserted when gripping cam of clamp is retracted and removed when the clamp is positioned on the plate. Tag lines may allow the operator to remove pin from a greater distance from clamp. Refer to the specific models of "Lock Open Only" clamps for additional details. Typical "Lock Open Only" clamp is Model RO.

LOCK OPEN-LOCK CLOSED: An over-center spring loaded mechanism in which the spring exerts a force on the gripping cam when the lock handle is moved to the "Lock Closed" position. When the handle is moved to the "Lock Open" position, the gripping cam is maintained in the retracted position for ease in installing the clamp on a plate or member. Model FRD clamps contain individual "Lock Open" and "Lock Closed" mechanisms that must be operated separately. Refer to the specific models of the "Lock Open-Lock Closed" clamps for additional details. Typical "Lock Open-Lock Closed" clamps are Models: FRD, R, S, SD, SEA, SX, TL, TLA and the J-Series.

LOCKING WEDGE: A fluted steel wedge that is driven in place with a hammer. The wedge body is positioned in the clamp body slot with the fluted edges contacting the member being attached to the clamp. Refer to the specific models of "Locking Wedge" clamps for additional details. Typical "Locking Wedge" clamps are Models: A1, B1, B2 and PB.

LOCKING SCREW: "Locking Screw" clamps depend on the manual adjustment of a screw to hold the gripping surface in place for lifting and clamp removal. Refer to the specific models of "Locking Screw" clamps for additional details. Typical "Locking Screw" clamps are Models: AC, ACP, BC, NM, PC, SCP, SCPA and RSC.

NON-LOCKING: "Non-Locking" clamps have no mechanisms to aid in attaching or removing clamp from member being lifted. It is necessary to have the position of clamp maintained on the member being lifted until a properly applied force is exerted to the lifting shackle. Refer to the specific models of "Non-Locking" clamps for additional details. Typical "Non Locking" clamps are Models: AST, ASTL, BD, HR, HDR, HRS and WHSR.

⚠ WARNING A pointing out and notice of danger. The purpose of a "warning" is to apprise operators and all other affected persons of the existence of danger of which they should be, but may not be aware of; and to enable the operators to protect themselves and others, where applicable, against such danger. An attempt is made herein to warn against reasonable and reasonably foreseeable danger in the proper use and possible misuse of Renfroe products depicted in our catalog.

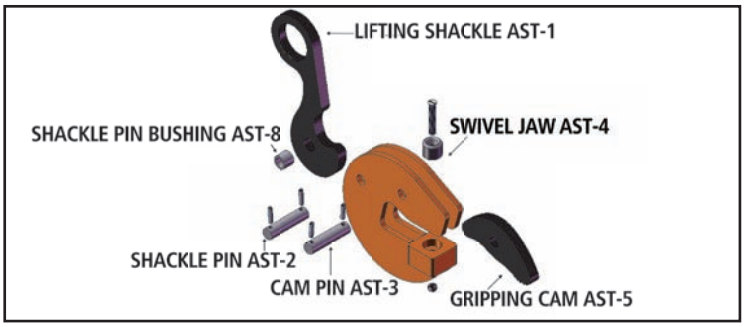
VERTICAL LIFTING-NON-LOCKING-MODELS AST and ASTL

Both AST and ASTL plate clamps were developed primarily for lifting, turning and stacking lightweight beams and structural shapes while constant tension is applied to the lifting shackle. The horizontal shackle permits a beam to be lifted with the web in a near horizontal position by placing the clamp on the load with the shackle positioned over the web and between the flanges. With beam lying in a horizontal position and clamp laced with the shackle overhanging the flange, the beam can be lifted, turned 90 degrees and lifted to a vertical position.

Model ASTL includes all of the features of Model AST plus a linkage which permits the clamp to be removed remotely by setting the load down with the sling slack, then lifting the crane hook.

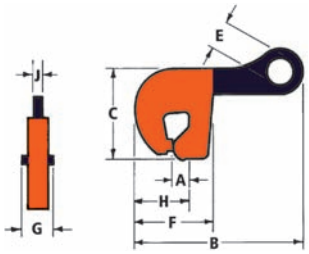
MODEL AST





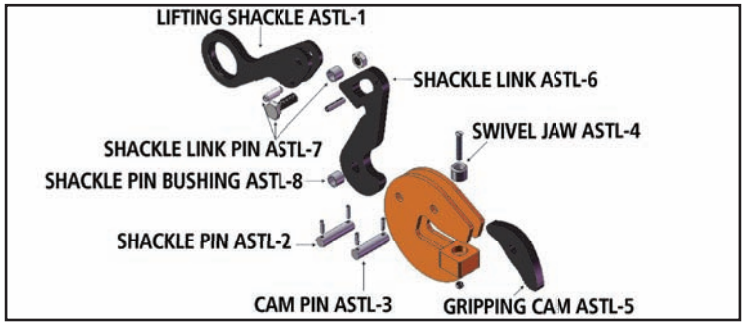
MODEL AST SPECIFICATIONS (INCHES)										
Rated Capacity (Tons)	Plate Thickness A	Max. B	C	D	E	F	G	H	J	Weight (Lbs.)
1/2	0 - 3/4	10-3/4	6-11/16	-	1-3/4	6-3/16	1-5/8	2-1/2	1/2	10
1-1/2	0 - 3/4	13	8-1/2	-	2-1/2	7	2-9/16	3	5/8	20
3	0 - 1-1/2	19-1/4	12-1/2	-	3-3/4	11	3	4-5/8	3/4	50

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



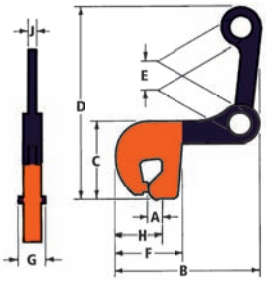
MODEL ASTL





MODEL ASTL SPECIFICATIONS (INCHES)										
Rated Capacity (Tons)	Plate Thickness A	Max. B	C	D	E	F	G	H	J	Weight (Lbs.)
1/2	0 - 3/4	10-3/4	6-11/16	14	1-3/4	6-3/16	1-5/8	2-1/2	1/2	10
1-1/2	0 - 3/4	13	8-1/2	18-1/2	2-1/2	7	2-9/16	3	5/8	24
3	0 - 1-1/2	19-1/4	12-1/2	25	3-3/4	11	3	4-5/8	3/4	61

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



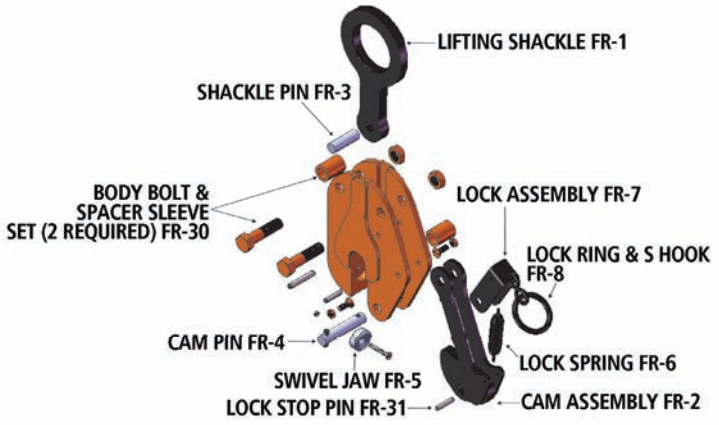
WARNING See Pages 329-331 for Important Safety, Use and Inspection Information.

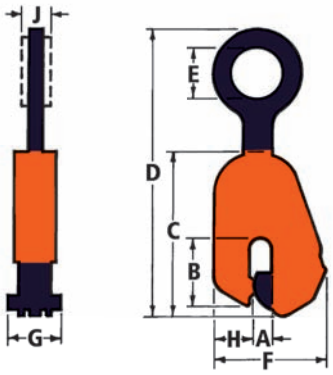
VERTICAL LOCKING-MODEL FR

MODEL FR IS A VERTICAL LIFTING CLAMP FOR RELATIVELY LIGHT WORK. IT IS SMALL AND EASY TO HANDLE WITH CAPACITIES THROUGH THREE TONS.

MODEL FR VERTICAL LOCKING CLAMPS INCORPORATE A "LOCK CLOSED" FEATURE WHICH FACILITATES ATTACHING THE CLAMP TO THE PLATE.







MODEL FR SPECIFICATIONS (INCHES)

Rated Capacity (Tons)	Plate Thickness A	B	C	Max. D	E	F	G	H	J	Weight (Lbs.)
1/2	0 - 3/4	2-13/16	7	11-1/4	2-3/8	4-5/8	2-1/2	1-1/2	1/2	8
	1/2 - 1	2-13/16	7	11-1/4	2-3/8	4-7/8	2-1/2	1-1/2	1/2	8
	3/4 - 1-1/4	2-13/16	7	11-1/4	2-3/8	5-1/8	2-1/2	1-1/2	1/2	9
	1 - 1-1/2	2-13/16	7	11-1/4	2-3/8	5-3/8	2-1/2	1-1/2	1/2	10
	1-1/4 - 1-3/4	2-13/16	7	11-1/4	2-3/8	5-3/8	2-1/2	1-1/2	1/2	11
1	0 - 3/4	3-3/16	9	13-3/4	2-5/8	5-7/8	3-3/16	1-5/8	5/8	14
	1/2 - 1	3-3/16	9	13-3/4	2-5/8	6-1/8	3-3/16	1-5/8	5/8	15
	3/4 - 1-1/4	3-3/16	9	13-3/4	2-5/8	6-3/8	3-3/16	1-5/8	5/8	15
	1 - 1-1/2	3-3/16	9	13-3/4	2-5/8	6-5/8	3-3/16	1-5/8	5/8	16
	1-1/4 - 1-3/4	3-3/16	9	13-3/4	2-5/8	6-7/8	3-3/16	1-5/8	5/8	17
	1-1/2 - 2	3-3/16	9	13-3/4	2-5/8	7-1/8	3-3/16	1-5/8	5/8	18
2	0 - 1	3-1/2	9	16-3/8	3-5/8	6-3/4	3-3/8	2-1/8	3/4	23
	3/4 - 1-1/2	3-1/2	9	16 3/8	3 5/8	7-1/4	3-3/8	2-1/8	3/4	23
	1-1/4 - 2	3-1/2	9	16 3/8	3 5/8	7-3/4	3-3/8	2-1/8	3/4	23
	1-3/4 - 2-1/2	3-1/2	9	16 3/8	3 5/8	8-1/4	3-3/8	2-1/8	3/4	24
3	0 - 1-1/4	4-3/16	10-3/4	18-3/8	3-5/8	7-5/8	3-9/16	2-7/16	3/4	30
	3/4 - 1-1/2	4-3/16	10-3/4	18-3/8	3-5/8	7-7/8	3-9/16	2-7/16	3/4	31
	1-1/4 - 2	4-3/16	10-3/4	18-3/8	3-5/8	8-3/8	3-9/16	2-7/16	3/4	32
	1-3/4 - 2-1/2	4-3/16	10-3/4	18-3/8	3-5/8	8-7/8	3-9/16	2-7/16	3/4	33

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

⚠ WARNING **See Pages 329-331 for Important Safety, Use and Inspection Information.**

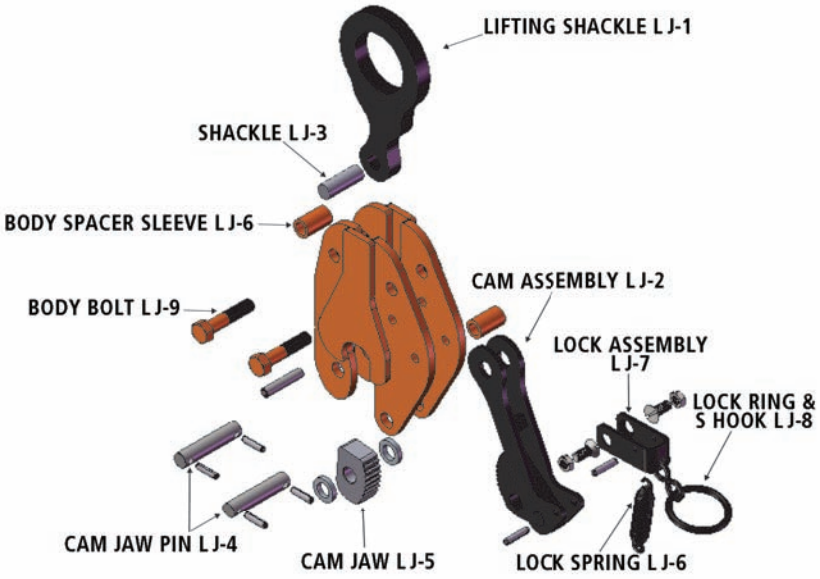
VERTICAL LOCKING and 90 DEGREE TURN - MODEL L J

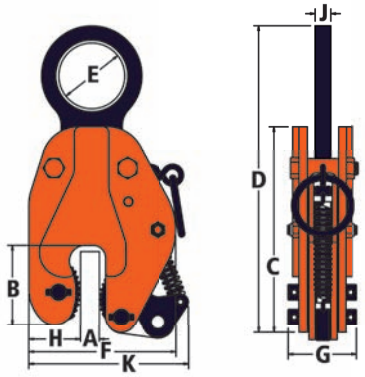
MODEL L J IS A VERTICAL LIFTING CLAMP CAPABLE OF TURNING A PLATE FROM HORIZONTAL TO VERTICAL AND BACK THROUGH THE SAME 90° ARC.

MODEL L J CLAMPS ARE SMALL AND EASY TO HANDLE WITH CAPACITIES THROUGH THREE TONS.

MODEL L J VERTICAL LOCKING AND 90° TURN PLATE CLAMPS INCORPORATE A "LOCK CLOSED" FEATURE, WHICH FACILITATES ATTACHING THE CLAMP TO THE PLATE.







MODEL L J SPECIFICATIONS (INCHES)											
Rated Capacity (Tons)	Plate Thickness A	B	C	Max. D	E	F	G	H	J	Max. K	Weight (Lbs.)
1/2	0 - 3/4	2-5/8	6-5/8	10-1/4	2-1/4	5	2-3/8	1-7/8	1/2	5	9
1	0 - 3/4	3-3/16	8-1/4	13-7/16	2-5/8	5-7/8	2-7/8	2-1/16	5/8	6-7/16	15
2	0 - 1	3-5/8	9	15-13/16	3-5/8	7-1/4	3-1/4	2-7/8	3/4	7-5/8	26
3	0 - 1-1/4	4-1/4	10-3/4	18	3-5/8	8-3/16	3-5/8	3	3/4	8-3/8	34

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

WARNING See Pages 329-331 for Important Safety, Use and Inspection Information.

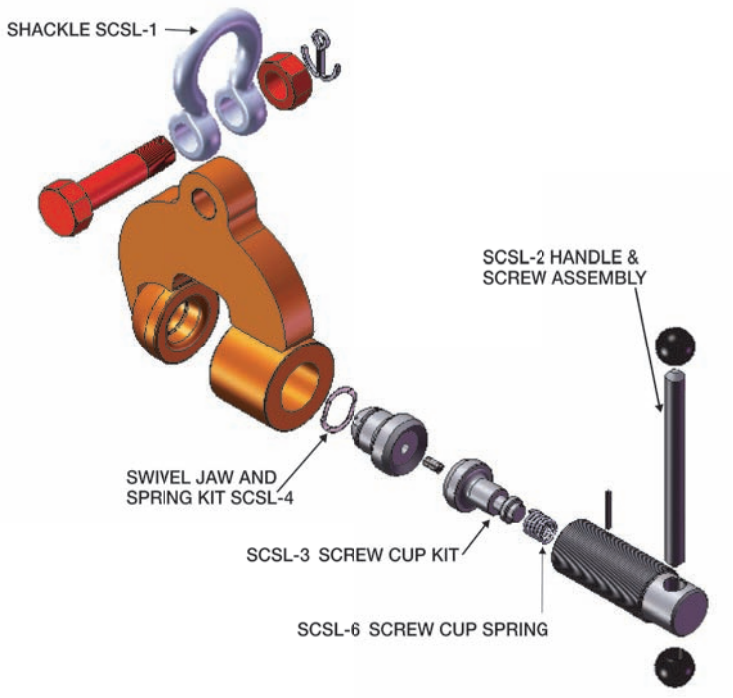
VERTICAL LOCKING and 180 DEGREE TURN - MODEL SCSL

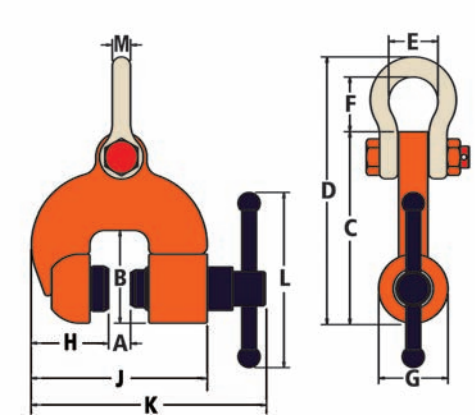
MODEL SCSL IS A LOCKING SCREW CLAMP CAPABLE OF HANDLING A STEEL PLATE FROM A HORIZONTAL THROUGH A 180-DEGREE ARC.

IT IS A LIGHTWEIGHT CLAMP PRIMARILY USED FOR BENCH WORK. SCSL CLAMPS ARE CAPABLE OF HANDLING UP TO A 2,000 POUND LOAD.

MODEL SCSL INCORPORATES A SPRING LOADED SWIVEL JAW AND SCREW CUP. THE SPRING LOADED SCREW CUP SERVES AS AN INDICATOR WHEN THE LOCKING SCREW HAS BEEN PROPERLY TIGHTENED.







MODEL SCSL SPECIFICATIONS (INCHES)

Rated Capacity (Tons)	Jaw Opening A	B	C	D	E	F	G	H	J	Max. K	L	M	Weight (Lbs.)
1	0 - 3/4	3-1/4	6-5/8	9-3/16	1-11/16	1-7/8	2-1/2	2-5/8	6	8-3/8	6	5/8	12

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

⚠ WARNING **See Pages 329-331 for Important Safety, Use and Inspection Information.**

VERTICAL LOCKING +180 DEGREE TURN + SIDE PULL - MODEL JPA

Model JPA is a vertical lifting clamp capable of turning a single plate or member from horizontal to vertical to horizontal through a 180 degree arc. The Model JPA incorporates a push button auxiliary lock and permits side loading of lifting shackle to 90 degrees by derating the clamp's rated capacity. Refer to Figure 1 for derated capacities.

Model JPA incorporates a pivoting shackle that permits side loading of the lifting shackle for:
100 percent of rated capacity from vertical to 30°
75 percent of rated capacity between 30° and 45°
50 percent of rated capacity between 45° and 90°



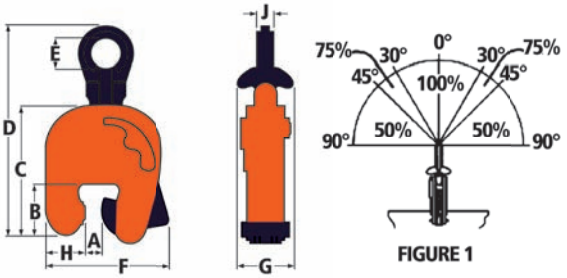
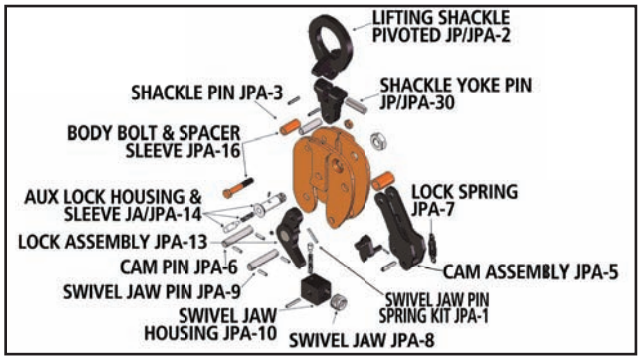


FIGURE 1



MODEL JPA SPECIFICATIONS (INCHES)

Rated Capacity (Tons)	Plate Thickness A	B	C	Max. D	E	Max F	G	H	J	Weight (Lbs.)
1/2	0 - 5/8	2-3/4	6-1/2	12	2-3/8	5-5/8	3-1/4	2-1/4	1/2	12
	1/2 - 1	2-3/4	6-1/2	12	2-3/8	6	3-1/4	2-1/4	1/2	
	3/4 - 1-1/4	2-3/4	6-1/2	12	2-3/8	6-1/4	3-1/4	2-1/4	1/2	
	1-1/4 - 1-3/4	2-3/4	6-1/2	12	2-3/8	6-3/4	3-1/4	2-1/4	1/2	
1	0 - 3/4	3-3/8	7-3/4	13-3/4	2-5/8	7	3-1/2	2-5/8	5/8	20
	1/2 - 1	3-3/8	7-3/4	13-3/4	2-5/8	7-1/4	3-1/2	2-5/8	5/8	
	3/4 - 1-1/4	3-3/8	7-3/4	13-3/4	2-5/8	8	3-1/2	2-5/8	5/8	
	1 - 1-1/2	3-3/8	7-3/4	13-3/4	2-5/8	8-1/4	3-1/2	2-5/8	5/8	
	1-1/2 - 2	3-3/8	7-3/4	13-3/4	2-5/8	8-3/4	3-1/2	2-5/8	5/8	
2	0 - 1	3-5/8	9-1/2	17-3/8	3-1/2	8-3/4	4-1/2	3	3/4	40
	3/4 - 1-1/2	3-5/8	9-1/2	17-3/8	3-1/2	9-1/4	4-1/2	3	3/4	
	1-1/4 - 2	3-5/8	9-1/2	17-3/8	3-1/2	9-3/4	4-1/2	3	3/4	
	2 - 2-3/4	3-5/8	9-1/2	17-3/8	3-1/2	10-1/2	4-1/2	3	3/4	
4	3/16 - 1-1/4	4-3/8	11-1/2	20-1/8	3-1/2	9-1/4	4-1/2	3-1/4	1-1/2	50
	1 - 2	4-3/8	11-1/2	20-1/8	3-1/2	10	4-1/2	3-1/4	1-1/2	
	2 - 3	4-3/8	11-1/2	20-1/8	3-1/2	11	4-1/2	3-1/4	1-1/2	
	3 - 4	4-3/8	11-1/2	20-1/8	3-1/2	12	4-1/2	3-1/4	1-1/2	
6	1/4 - 1-3/8	4-7/8	12-3/8	20-7/8	3-1/2	10-3/4	4-3/4	3-3/4	1-3/4	72
	1 - 2-1/8	4-7/8	12-3/8	20-7/8	3-1/2	11-1/2	4-3/4	3-3/4	1-3/4	
	2 - 3-1/8	4-7/8	12-3/8	20-7/8	3-1/2	12-1/2	4-3/4	3-3/4	1-3/4	
	3 - 4-1/8	4-7/8	12-3/8	20-7/8	3-1/2	13-1/2	4-3/4	3-3/4	1-3/4	
8	3/8 - 1-1/2	5-3/8	12-3/4	22-5/8	3-3/4	12-3/8	5-1/4	4-1/4	2	93
	1 - 2-1/8	5-3/8	12-3/4	22-5/8	3-3/4	13	5-1/4	4-1/4	2	
	2 - 3-1/8	5-3/8	12-3/4	22-5/8	3-3/4	14-5/8	5-1/4	4-1/4	2	
	3 - 4-1/8	5-3/8	12-3/4	22-5/8	3-3/4	15-5/8	5-1/4	4-1/4	2	
12	1/2 - 2-1/2	7-1/4	17-3/8	28-1/8	3-7/8	15-15/16	7-1/16	5-3/8	2	203
	2 - 4	7-1/4	17-3/8	28-1/8	3-7/8	17-7/16	7-1/16	5-3/8	2	212
	4 - 6	7-1/4	17-3/8	28-1/8	3-7/8	19-7/16	7-1/16	5-3/8	2	222
16	1/2 - 2-1/2	8	19-13/16	32-5/16	4-1/2	19-13/16	8-11/16	6-1/4	2-1/4	350
20	1/2 - 3	8-5/8	21-13/16	35-7/8	5	21	11-1/2	6-7/8	2-3/4	456
25	1/2 - 2-1/2	8-5/8	23-5/8	35-7/8	5	19-1/16	9-5/8	6-3/4	3	483
	3 - 5	8-5/8	23-5/8	35 7/8	5	21-9/16	9-5/8	6-3/4	3	495
	4 - 6	8-5/8	23-5/8	35 7/8	5	22-9/16	9-5/8	6-3/4	3	502
30	1/2 - 3	9-9/16	24-1/4	39-7/8	5	22-13/16	14-9/16	7-5/8	3	625
50	3 - 5	10-7/8	30-7/8	46-7/16	5	29-3/16	11-1/8	9-1/4	3-1/2	1306

Consult us for Larger Capacities
Specifications are subject to change without notice.

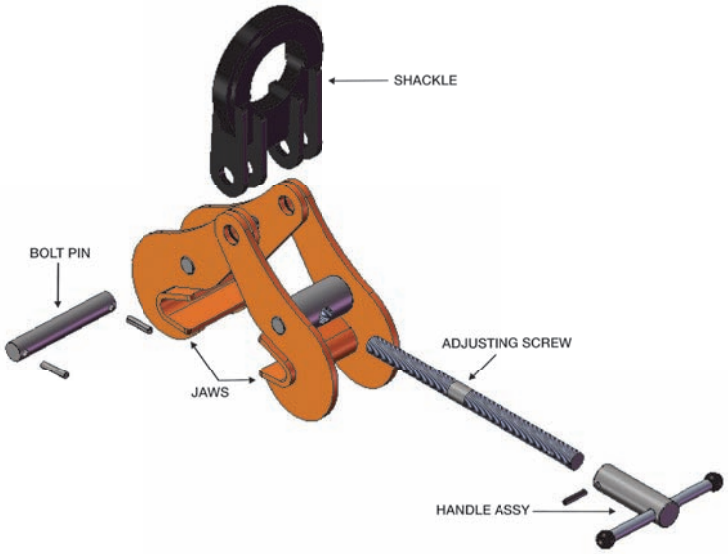
WARNING See Pages 329-331 for Important Safety, Use and Inspection Information.

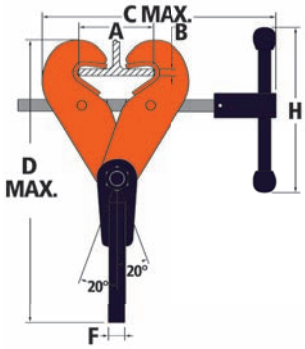
BEAM LOCKING - MODEL BC

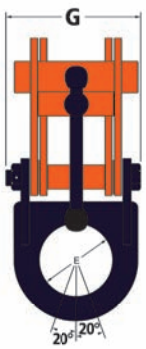
MODEL BC IS A MULTI-PURPOSE BEAM CLAMP SUITABLE FOR LIFTING BEAMS OR PROVIDING SUSPENSION OF HOISTS FROM BEAMS OR GIRDERS, THEREBY ELIMINATING THE NEED FOR NUTS, BOLTS AND SHACKLES.

BEAM LOCKING, MODEL BC IS INTENDED FOR USE ON AMERICAN STANDARD OR WIDE FLANGE BEAMS.









MODEL BC SPECIFICATIONS (INCHES)									
Work Load Limit at 0°-20° (Vertical Tons)	Flange Width A	Flange Thickness B	C	D	E	F	G	H	Weight (Lbs.)
1-1/2	3 - 7-1/2	1/4 - 5/8	11 7/8	11-3/4	3	1/2	5	5-3/4	9.5
3	3 -7-1/2	1/4 - 5/8	11 7/8	12	3	5/8	5-3/16	6-3/4	13
5	6 - 10	1/2 - 7/8	17	14-7/8	3-1/4	3/4	6-5/16	6-3/4	22.5
10	6 - 12	1/2 - 1-1/4	21-1/4	19-1/8	4	1-1/2	7-1/8	9	53
15	8 - 18	7/8 - 2	32	26-1/2	4-1/2	1-3/4	8-3/8	12	120
25	18 - 40	2 - 3	61	40-1/2	5	2	15	15	450

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

WARNING See Pages 329-331 for Important Safety, Use and Inspection Information.

GUIDELINES FOR INSPECTION AND PROPER USE

GENERAL

1) Follow all the requirements of laws, rules and regulations applicable in your country, state or province pertaining to lifting operations, ensuring that all maintenance, testing, inspection and operator training requirements are strictly followed. This is in your interest and can prevent fatal accidents and industrial disasters.
2) Checklist
   - Is any part of the equipment distorted?
   - Are any cracks visible or is extensive corrosion evident?
   - Is any wear evident at: suspension points, wheels, shackles, gears, pivots, pins, bolts, threads, springs or other moving parts?
   - Are locking arrangements functional and safe?
   - Are Work Load Limit, Serial Numbers and other markings legible?
   - Have all inspections or tests been regularly performed and recorded?

SUPERCLAMP EQUIPMENT GUIDELINES

1) Ensure that SUPERCLAMP equipment is suitable for the specific lifting or suspension operation you intend to undertake.
2) Ensure that structures supporting SUPERCLAMP equipment are of adequate design and comply with all legal requirements. Structures designed for lifting operation purposes are usually marked with Work Load Limits which must not be exceeded. Ensure that structures are tested and certified for such use and the appropriate certification is current.
3) Never stand beneath a suspended load.
4) SUPERCLAMP products are primarily designed for in-line use only and the equipment is marked accordingly. Never use SUPERCLAMP products for side loading applications unless this is specifically recommended on the original SUPERCLAMP identification plate affixed to the unit. If the identification plate states that the unit must be used at 0 degrees only, then NO side loading/angle loading is permitted.
5) Never use a single clamp as a lifting point on a beam/girder. Always use two or more clamps to ensure a stable lift. Use a spreader beam when applicable.
6) SUPERCLAMP products must not be attached to defective structures or materials. Ensure that run way beams are fitted with endstops and are free from defects. Should a defect on a runway beam or structural member be observed, remove the SUPERCLAMP unit immediately and report your observations to your supervisor.
7) When selecting SUPERCLAMP products, ensure that the calculated Work Load Limit requirement allows for any additional, suspended equipment weight, together with the original load weight to enable a proper lifting operation to take place.
8) Ensure that all mechanisms on SUPERCLAMP products work freely before use for the intended application.
9) Never replace worn components except with original SUPERCLAMP parts. When products are fitted with replaceable jaws, incorporating teeth showing wear, it is strictly prohibited to recut or resharpen. Cams or jaws incorporating teeth can be easily replaced with original SUPERCLAMP components.
10) Always ensure that repaired products are inspected and tested in accordance with the applicable laws and regulations prior to use and operation.
11) Ensure that all persons using SUPERCLAMP equipment are properly trained in performing lifting operations and the use of this type of equipment.
12) If multipoint lifting operations are undertaken, always ensure that no single SUPERCLAMP unit or single point of lift is at any time required to exceed its maximum Work Load Limit. Do not exceed angle rating at any time as this may prove excessively dangerous.
13) After disassembly or repair, always ensure that parts are reassembled correctly.
14) Never throw or drop any SUPERCLAMP equipment as this may be hazardous and may cause injury to people or property.
15) If in doubt about the suitability of SUPERCLAMP products for your application, contact us or the manufacturer.

GENERAL INFORMATION

Since revisions to the OSHA regulations regarding Personal Fall Arrest Systems were instituted, an urgent need has been created for satisfactory methods of connecting PFAS to a suitable anchor, such as a beam. A brief review of the OSHA regulations and ANSI Z359.1 would indicate that SUPERCLAMP offers a solution to most of these situations.

ANSI Z359.2 section 3.2.5.1 states that the Anchorage Connector "shall be capable of withstanding a 5,000 pound load" and "Anchorage connectors shall meet the strength requirements of the anchorages to which they are coupled as set forth in 7.2.3". This section requires "a strength capable of sustaining static loads, applied in the directions permitted by the PFAS of at least: 3,600 pounds when certification exists".

Please take note that every SUPERCLAMP unit is Proof Load Tested to 200% WLL and certified. Each model has a design factor of 5:1. Tests to destruction ensuring a 5:1 design factor are employed throughout the design, development and manufacturing process, when required.

Specific clamps can be painted a distinctive color or have unique markings added to indicate dedicated use, "For Personnel Use Only", on special request for a nominal charge.

Suppliers are generally required to make available information relating to products supplied to ensure that when used properly, they are safe and without risk.

Experience over many years has not shown any particular problem in connection with SUPERCLAMP products we supply providing:
1. They are used for the purpose which they were designed.
2. They are not loaded beyond their Work Load Limit.
3. They are properly maintained.
4. They are inspected regularly and tested in accordance with the relevant statutory regulations.
5. They are used by competent persons trained in their use.

⚠ WARNING All SUPERCLAMP products are marked with a WORK LOAD LIMIT which MUST NOT be exceeded. The manufacturer does not accept any liability for damage which may result from the product being used in excess of the Work Load Limit. WLL is the maximum load which can be applied to products in service.

Ensure that existing endstops on runway beams will accommodate SUPERCLAMP Trolleys.

All Clamps must be correctly applied to beams by a competent person and fully hand tightened. If in doubt contact us or the manufacturer.

On occasion we supply replacement component parts for SUPERCLAMP models, but we do not accept any responsibility unless they are installed by a person with appropriate knowledge and training and the required tests and inspections are carried out on completion of repair.

Unless we are informed at time of inquiry and order about particular hazardous environmental conditions all equipment is supplied on the assumption that it will be used in normal atmospheric and temperature conditions as applicable within the contiguous United States.

It is of the utmost importance to health and safety to ensure that SUPERCLAMP products are only attached to structures, materials or other lifting components which are authentically and authoritatively approved and recommended to carry or sustain the applied Work Load.

All SUPERCLAMP products exceed the provisions of OSHA 29CFR Parts: 1910, 1918, 1926 and ASME B30 as applicable.

REDUCTION IN WORK LOAD LIMITS WITH SIDELOADS			
Angle from Vertical	0 Deg.	30 Deg.	45 Deg.
Reduction Factor	NIL	17%	34%

SUPERCLAMP SPECIFICATIONS			
Model Number	Work Load Limit (Lbs.)		
S2A, S5A	6,720	5,577	4.435
S3	8,960	7,436	5,913
S3X, S3A, S6A	11,200	9,296	7,392
S4S	13,440	11,155	8,870
S4A, S11	22,400	18,592	14,784
S12, S14	33,601	27,888	22,176
S15, S16	44,800	37,184	29,568
S17, S18	56,000	46,480	36,960
S19, S20	67,200	55,776	44,352

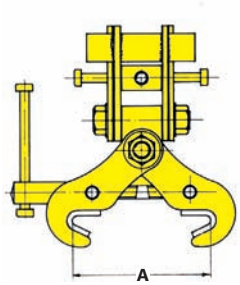
MINIMUM RADIUS - RUNWAY BEAM TROLLEYS	
BA – B – A – GBT-1/2/3 SERIES	4.9 FT
GBT-4/5 SERIES	6.5 FT

SUPERCLAMP HEADROOM CHART*				
MODEL NUMBER	ADJUSTMENT		HEADROOM	
	Min.	Max.	Min.	Max.
S5	3.5	12	11.75	8.75
S5A	3.5	12	12.25	9.25
S6	3.5	12	12.25	9.25
S6A	3.5	12	12.5	9.5
S7	3	7.5	8.5	7.5
S7A	3	7.5	8.5	7.5
S8	6	10	10.5	9.75
S8A	6	10	10.5	9.75
S11	3.5	12	13.5	11.5
S15	8	18	20.5	18.5
S16	16	24	22.5	19.25
S17	8	18	20.25	17
S18	16	24	22.75	19.75
S19	8	18	20.25	17
S20	16	24	22.75	20.25
B1	3	8	11	9.5
B2	4	12	14	12
B3	4	12	15	13

* Measurements in Inches, taken from under side of beam to the load bearing point of the shackle.

CLAMP AND TROLLEY SPECIFICATIONS

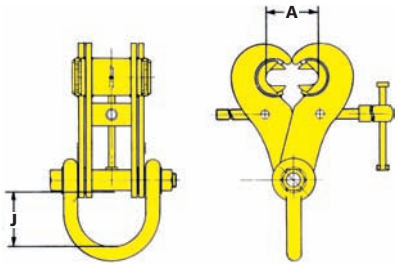
ADJUSTABLE DOUBLE ENDED MONORAIL CLAMP



- Clamp ends are one piece, fully adjustable.
- No tools required.
- Positive grip, left/right threaded adjusting bar.
- "A" Series Models allow for minor height adjustment.
- Ideal for erection of permanent or temporary overhead runways.

Stock Number	WLL at 0°-15° Vertical		Jaw Grip Adjustment Min. - Max.	Jaw Aperature	Max. Height Adjustment	Weight (Lbs.)
	Lbs.	Kgs.	"A"			
S7	6,720	3,048	3" - 7-1/2"	7/8"		17
S7A	6,720	3,048	3" - 7-1/2"	7/8"	1-1/4"	18
S8	8,960	4,064	6" - 10"	7/8"		41
S8A	11,200	5,080	6" - 10"	7/8"	1-1/4"	41

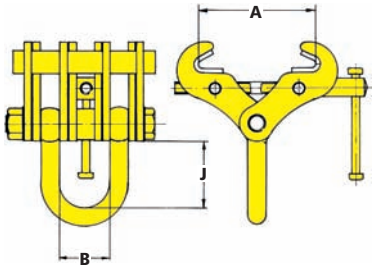
SWIVEL JAW ADJUSTABLE GIRDER CLAMP



- One piece adjustable design.
- Used for lifting or as an anchor point.
- Added benefit of horizontal jaw adjustment.
- Full length/width of swivel jaw anchors on flange.
- Integrated lifting shackle.
- Positive Grip: left/right threaded adjusting bar.
- For use at up to 15° from vertical.
- **Approved for Personnel tie-off use.**

Stock Number	WLL at 0°-15° Vertical		Jaw Grip Adjustment Min. - Max.	Jaw Aperature	Inside Shackle Crown to Spacer (Inches) "J"	Weight (Lbs.)
	Lbs.	Kgs.	"A"			
S5	6,720	3,048	3-1/2" - 12"	1"	3-3/4"	22
S5A	6,720	3,048	3-1/2" - 12"	1"	4-1/2"	31
S6	11,200	5,080	3-1/2" - 12"	1"	4-1/2"	31
S6A	11,200	5,080	3-1/2" - 12"	1"	4-1/2"	34
S11	22,400	10,160	3-1/2" - 12"	1"	5-1/8"	46

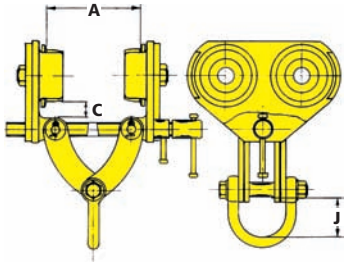
FIXED JAW ADJUSTABLE GIRDER DOG



- One piece adjustable design.
- Used for lifting or as an anchor point.
- Enhanced by balanced distribution of side plates.
- Maximum grip, hold and safety.
- No tools required.
- Positive grip, left/right threaded adjusting bar.
- For use at up to 15° from vertical.
- **Approved for Personnel tie-off use.**

Stock Number	WLL at 0° to 15° Vertical		Jaw Grip Adjustment Min. - Max.	Jaw Aperture	Inside Shackle Crown to Spacer (Inches)	Inside Shackle Width	Weight (Lbs.)
	Lbs.	Kgs.	"A"		"J"	"B"	
S15	44,800	20,320	8" - 18"	2"	8-1/4"	4-1/2"	139
S16	44,800	20,320	16" - 24"	2-1/2"	8-1/4"	4-1/2"	175
S17	56,000	25,400	8" - 18"	2"	8-1/8"	5"	157
S18	56,000	25,400	16" - 24"	2-1/2"	8-1/8"	5"	199
S19	67,200	30,480	8" - 18"	2-1/2"	8-1/8"	5"	208
S20	67,200	30,480	16" - 24"	3"	8-1/8"	5"	239

ADJUSTABLE RUNWAY BEAM TROLLEYS



- One piece adjustable design and no tools are required.
- Hand push, easy to use, ball bearing wheels.
- Adapts to beam width by turning adjusting screw.
- Includes locking collar and wheel guard anti-drop plates for maximum safety.
- Integrated lifting shackle.
- Ideal for temporary and permanent use.
- **Approved for personnel tie-off use.**

Stock Number	WLL at 0° Vertical		Width Adjustment (Inches) Min.-Max.	Accommodates Beam Flange Max. Thickness (Inches)	Inside Shackle Crown to Spacer (Inches)	Weight (Lbs.)
	Lbs.	Kgs.	"A"	"C"	"J"	
B1	6,720	3,048	3"-8"	1-1/8"	4"	50
B2	13,440	6,096	4"-12"	1-1/4"	4"	113
B3	22,400	10,160	4"-12"	1-1/2"	5-1/8"	159

PLATE CLAMPS

⚠ WARNING See Pages 338 and 339 for Important Safety, Use and Inspection Information.

GENERAL PRECAUTIONS

⚠ WARNING Improper use could result in injury or death. Read, understand and follow all instructions in the catalog and owner's manual that accompany the product to ensure proper selection, use, inspection and maintenance of all products. If you do not understand technical words or concepts in any of these materials, DO NOT USE the products. The ultimate responsibility for selecting the correct product lies with the end user, since only the end user has specific knowledge of application and environment in which the product will be used. Crane block and tackle systems should only be rigged by qualified persons as defined by ANSI/ASME B30.

STAY WITHIN THE WORK LOAD LIMITS OF ALL PRODUCTS

Work Load Limits reflect the best engineering assessment possible. They should never be exceeded, regardless of the strength of the wire rope being used. The Work Load Limit (WLL) is based upon loads held uniformly in direct tension. They do not apply to shock loads, which can exceed the static weight, many times over. Likewise, Work Load Limits (WLL) do not account for hook tip loading, side loading or for bending, torsional or other abnormal loading conditions. Work Load Limits also apply only to new products. Age, type of service and environmental conditions can affect these limits. Periodic inspections and tests should be performed to ensure that products perform in accordance with existing regulations and sound operating practices.

DO NOT MISUSE HOOK LATCH ATTACHMENTS

Hook latch kits are designed solely for loose sling retention. Caution must be exercised to prevent a latch from supporting any portion of the load. Ensure that the latch is undamaged and that it is not "Crowded". Make sure the load is properly seated in the lifting fixture, before each lift.

USE CAUTION IN SEVERE VIBRATION OR SHARP BLOW CONDITIONS

Activities like pile driving can have adverse effects upon product life cycle. Standard cheek plates and overhaul balls are not designed as load bearing members and they can break under extreme vibration or sharp blows.

NEVER USE YIELDING POINT AS A "GAUGE" OF ADEQUACY

Relying upon a fitting to bend before it breaks is a dangerous practice and should never be used as a method to judge product adequacy or to exceed Work Load Limits.

LIFT ONLY LOADS FOR WHICH THE PRODUCTS WERE DESIGNED TO LIFT

Do Not Lift Personnel with systems that are not designed to be used as a compliant, personnel hoist system. Federal crane regulations prohibit the transport of personnel on any load or wire rope attachment.

PERSONNEL CONSIDERATIONS

Instruct workers to keep hands and body away from block sheaves, swivels and "Pinch Points", where the rope touches block parts or load. Also instruct workers to be alert and to wear proper protective gear while handling loads.

WATER IMMERSION

Do not immerse standard products in water. Special designs are available for fresh and salt water applications.

MAKE SURE WIRE ROPE IS SUFFICIENTLY RATED

Some products have strengths greater than the wire ropes to which they are applied. Consult necessary charts or reference materials to ensure that the type, application and Work Load Limits are correct for all uses. This verification process is the sole responsibility of the end user. Any system, comprised of components is only as strong as the weakest component.

DO NOT OVERLOAD INDIVIDUAL SHEAVES AND BEARINGS

Bearing life expectancy is based upon the use of all available sheaves under maximum parts of line.

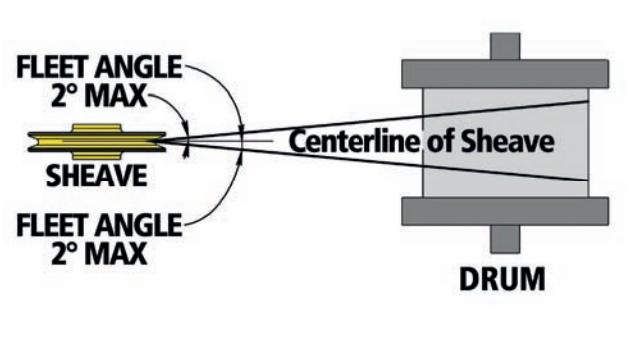
A partially reeved block used at the full Work Load Limit is dangerously overloaded. If a block with three sheaves is rated at 30 tons, each sheave will have a bearing capacity of 10 tons. If only two sheaves are used, the reduced WLL is 20 tons, and if only one sheave is used the reduced WLL is 10 tons.

NEVER "TWO BLOCK" OR ALLOW ANY BLOCK OR BALL TO BE DRAWN INTO ANOTHER UNDER POWER.

GENERAL PRECAUTIONS

SHEAVE USE PRECAUTIONS

Sheave grooves must be covered with grease before being put into service. Sheave lubrication must be maintained during crane operation. This also implies that crane ropes must be lubricated. In order to protect the sheave groove from undue wear, never allow the fleet angle to exceed 2 degrees.



Apply "good", initial tension to crane ropes to avoid axial and radial damage in sheave grooves. The wire rope must be properly fitted to avoid rope sliding, resulting in undue wear to the rope and sheaves at the start and stop of each lifting operation.

Sheaves determined to have excessive wear must be replaced by a competent person.

Horizontally assembled sheaves must have holes placed in the cover assemblies cleaned every 3 months to avoid water collection in the curved, inner surface of these sheaves.

NEVER WELD LOAD BEARING COMPONENTS

Any welding to hooks, shackles or other load bearing fittings adversely affects the fitting material strength.

WEDGE SOCKET PRECAUTIONS

Make sure that a sudden jolt or impact does not dislodge the wedge. When installing wire rope, always pre-load the wedge with the wire rope in place. Check frequently to re-tighten or reposition as necessary. Ensure that the wedge is correct for the wire rope size and for the wedge socket.

Make allowances for the "Crimping Effect" common with all types of wedge sockets. Experience shows that it will reduce Work Load Limits by 20%.

INSPECT EQUIPMENT REGULARLY

If the tag or markings are not legible, do not use any product until it has been properly labeled by a qualified person.

Wear is a fact of life and it will affect fitting cross sections and other critical component dimensions. Worn parts do not have the same WLL as new components and it is the user's responsibility to determine if any component is fit for continued use. Inspection and testing in accordance with federal, state, provincial, employer or jobsite requirements are necessary to determine continued use.

Be sure to lubricate bearings and other moving parts at regular intervals to prevent damage. For general maintenance instructions, please consult the Owner's Manual. Be sure when replacement parts are used that they are genuine, original manufacturer parts. **Do Not Modify** any product.

INSPECT FOR DAMAGE WHICH WILL REQUIRE REPLACEMENT OR REMOVAL OF THE PRODUCT FROM SERVICE:

Wear on pins, axles, rope grooves, side plates, bearings, bushings and fittings.

Deformation in side plates, pins, axle fitting attachment points or component parts.

Deformation or corrosion of hook and nut threads.

Weld corrosion or cracking.

Deformation of hook and signs of wear.

Any hook, fitting or component that is cracked, gouged or distorted.

If you have any doubt as to the strength or continued use of any product, DO NOT USE, until you have consulted a qualified person.

⚠ WARNING

The hook latch must properly operate and fit.

Verify the security of nuts, bolts and other locking devices, especially after reassembly following a repair or inspection.

OVERHAUL BALLS

Johnson Overhaul Balls supply the downfall weight necessary to counter bearing friction and winch-to-boom tip line weight. Because these units meet a wide range of field applications, we offer an equally wide range of sizes. Over 240 models, 35 through 1150 Lbs., 3 through 30 tons WLL. Non-swivel balls are also available.

STANDARD FEATURES

- 3 to 30 Ton WLL
- 4 to 1 Design Factor
- Heavy Duty J-Latch

OPTIONS

Higher capacity, custom designed and engineered models are available.



TOP SWIVEL



SPLIT BALL



NON-SWIVEL



GUNNEBO BK HOOK



BOTTOM SWIVEL

FIXED BAIL RIGGING BLOCKS

Johnson offers many advantages in this product line. With a 100 standard models, you are assured of selections that meet your every need. The lowest strength-to-weight ratios, the quickest rigging and the easiest maintenance are a few additional benefits proving once again that Johnson Blocks are consistent in quality and value.



STANDARD FEATURES

- 10 to 135 Ton Capacities
- 4 to 1 Design Factor
- 1 to 6 Sheaves
- Full Coverage Side Plates and Center Plates
- Top Dead-End Shackle
- Tapered Roller Bearings
- Oval Pattern Side Plates

OPTIONAL FEATURES

- Bronze Bushings
- Diamond Pattern Side Plates
- Fully Galvanized Units for Corrosion Resistance
- Higher capacity, custom designed and engineered models are available



SHORTY "J" CRANE BLOCKS

Shorty "J" represents the broadest line of standard crane blocks in the industry. More than 1500 standard models, not including options are available.

Shorty "J" is one of the most popular crane blocks and for good reason. "J" Blocks can be used with all types of mobile, truck, overhead and hydraulic cranes.



STANDARD FEATURES

- 3 to 350 Ton Capacities
- 4 to 1 Design Factor
- 1 to 8 Sheaves
- 10 to 30 inch Sheave Diameters
- Reeving Guides-Standard
- Bronze Bushed and Roller Bearing Sheaves
- Direct-Channel Sheave Bearing Lubrication through Center Pin
- Flame Hardened Grooves on Sheave Sizes 16 to 30 inch Diameters
- Dual Action (Swing/Swivel) Roller Thrust Bearing Hooks
- Forged Steel Hooks- 3 to 30 Tons
- Total Disassembly Capability

OPTIONAL FEATURES

- Forged Steel Hooks- 35 to 300 Tons
- Cast Alloy Steel Duplex Hooks with Bar Latch 80 to 1,750 Tons
- Cast Alloy Steel Quad Hooks
- Forged Steel Duplex Hooks
- Anti-Rotation Locking Devices - All Models
- Swivel Safety Anchor Shackles - All Models
- Sheave Shrouds - All Models
- Detachable Cast Iron and Steel Cheek Weights - All Models
- Pull Test, Certification, Radiograph, Magnetic Particle and other Non-Destructive Testing to specifications designated by the customer.

QUICK REEVE™ MOBILE CRANE BLOCKS

STANDARD FEATURES

- Quick Release, Zinc Plated, Rope Retention Pin meets OSHA requirements for rope retention. Pin cannot be completely removed from block to avoid pin loss.
- Johnson J-Latch™ heavy duty, steel, lockable, spring loaded latch meets OSHA personnel lifting requirements.
- Johnson J-Latch™ provides a fast hook deformation inspection point.
- Available Capacities - 5 to 300 Tons. Larger capacities are available.
- Quick Reeve™ upright design rests on its own hook for a stable base while reeving.
- No bulky, drop down, trap door to handle or damage.
- Wire rope end fitting will pass through block without removal from wire rope.



⚠ WARNING

NEVER EXCEED WORK LOAD LIMIT.

SNATCH BLOCKS

Johnson produces a wide variety of multipurpose snatch blocks. 235 standard models of single and double sheave snatch blocks are available. Capacities range from 2 to 30 tons with sheave diameters from 3 to 24 inches. Only the finest materials are used for each component.

Johnson Snatch Blocks have a convenient side opening feature. Available even for heavy duty, top dead-end models, it's easy to reeve the block without removing any fittings from the end of the wire rope. Your choice of swivel hook, shackle, eye fitting and tailboard block to get the job done.



DOUBLE SHEAVE SNATCH BLOCK



SNATCH BLOCK WITH HOOK



SNATCH BLOCK WITH SHACKLE

STANDARD FEATURES

- 2 to 30 Ton Capacities
- 4 to 1 Design Factor
- 1 or 2 Sheaves
- 3 to 24 inch Sheave Diameters
- Bronze Bushings

OPTIONAL FEATURES

- Roller Bearings
- Galvanized Finish
- Higher capacity, custom snatch blocks are available



TAILBOARD BLOCK (WITHOUT FITTINGS)



TOP DEAD END WITH HOOK

OILFIELD BLOCKS

Johnson has produced Oilfield Blocks for over 30 years. Because of their expertise in sheaves and blocks and on-site heat treat facility, Johnson has become a respected manufacturer for the petroleum industry.



LAYDOWN BLOCK



MANHANDLER DERRICK BLOCK



TONG LINE BLOCK



HAYFORK PULLEY



GUY LINE BLOCK



MANHANDLER BLOCK

⚠ WARNING

NEVER EXCEED WORK LOAD LIMIT.

SWIVELS

Standard designs are available in a wide variety of styles. Johnson Swivels are engineered for long life at a reasonable cost. Features include: roller thrust bearings, recessed grease fittings and drop forged, steel hooks. All swivels have a 4 to 1 design factor. Higher capacity, custom swivels are available. Heavy duty, J-Latch™ is standard for hook models.



EYE-HOOK | JAW-JAW | JAW-HOOK | EYE - EYE | EYE - JAW

WIRE ROPE SHEAVES

Johnson Wire Rope Sheaves are industry proven and are available in sizes ranging from 3" to 108", in over 250 standard models. Cost efficient, custom designs are available, with no upfront tooling or pattern charges and no premium price for small order quantities. 16" to 108" O.D. Sheaves have flame hardened, precision grooves for slow, even wear and long rope life. The integrity of Johnson's single disc forged steel construction provides sheaves with superior strength.



STANDARD FEATURES

- 3 to 108 inch sheave diameters.
- ¼ to 3 inch wire rope sizes.
- 4 to 1 Design Factor.
- Cast Iron, Ductile Iron, Cast Steel and ForgeFab™ steel types.

OPTIONAL FEATURES

- Custom designs to fit customer shaft, bearing mounting, hub, sheave or wire rope size requirement.
- Electroplate inorganic zinc compound and other corrosion resistant coatings available.
- Hub located grease fittings.
- Modifications for compliance to API or other applicable industry standards.
- Special shafts furnished for any sheave.
- AISE No. 6 Specification compliance.
- Cold weather properties available.

OPEN WEDGE SOCKETS

Johnson Open Wedge Sockets combine positive attachment with optimum versatility. Easy to change, Johnson Wedge Sockets feature a high strength cast alloy steel with a charpy value of 25 Lbs./ft. at -4 degrees (F). Each socket accepts at least two, different ductile iron wedges, allowing the socket to be used for more than one rope size. Together the wedge and body act as a vise which grips the wire rope and locks it into place. The headed attachment pin is standard and has the same charpy value as the socket.

⚠ WARNING

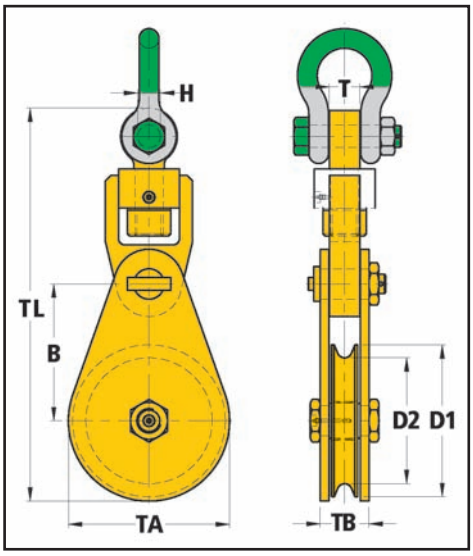
NEVER EXCEED WORK LOAD LIMIT.



SNATCH BLOCKS

STANDARD FEATURES

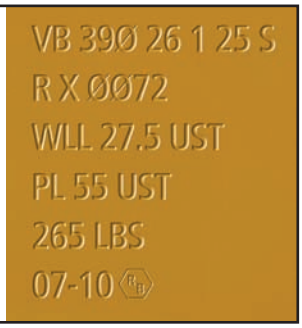
- Made from High Strength Alloy.
- 4 to 1 Design Factor.
- Individually Proof Tested.
- Standard Capacities: 22 to 150 Tons.
- Available up to 350 Ton WLL.
- Single or Double Sheave Models.
- Sheaves run on Lubricated Bronze Bushing.
- Open Swivel with Bronze Thrust Bushing.
- Available with the following fittings:
  Machined Swivel Stud Eye with Shackle
  Standard Machined Oblong Swivel Eye accepts Shackle Pin (standard) or Shackle Ear (upset) for direct connection to the Spreader Bar or Lifting Fixture.





EACH BLOCK IS STAMPED WITH:

- Model Number
- Serial Number
- Work Load Limit
- Proof Load
- Block Weight
- Date of Manufacture



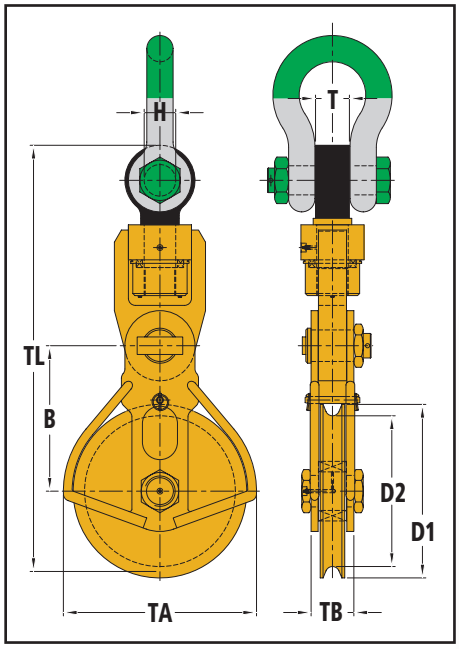
SNATCH BLOCK HL SERIES STUD EYE SPECIFICATIONS

Stock Number	WLL (Tons)	Wire Diameter	Dimensions (Inches)								WEIGHT (Lbs.)
			D1	D2	B	H	T	TA	TB	TL	
VB 240.28.1.20.S	22	1 - 1-1/8	11-3/16	9-7/16	10-1/16	1-7/16	1-7/8	12-3/16	3-5/16	31-7/8	125
VB 240.28.1.25.S	27.5	1 - 1-1/8	11-3/16	9-7/16	10-1/16	1-9/16	2-1/8	12-3/16	3-5/16	32-11/16	125
VB 300.28.1.20.S	22	1 - 1-1/8	14-3/8	11-13/16	11-5/16	1-7/16	1-7/8	14-3/4	3-5/16	34-1/2	135
VB 300.32.1.25.S	28	1-1/8 - 1-1/4	14-3/8	11-13/16	11-5/16	1-9/16	2-1/8	14-3/4	3-5/16	35-1/4	140
VB 345.32.1.32.S	35	1-1/8 - 1-1/4	15-3/4	13-9/16	12-13/16	2-1/16	2-3/4	16-1/8	4-7/16	42-15/16	265
VB 345.36.1.32.S	35	1-1/8 - 1-3/8	15-3/4	13-9/16	12-13/16	2-1/16	2-3/4	16-1/8	4-7/16	43	265
VB 390.26.1.25.S	27.5	7/8 - 1	17-11/16	15-3/8	13-3/4	2-1/16	2-3/4	16-1/8	4-7/16	39-1/2	265
VB 390.32.1.32.S	35	1-1/8 - 1-1/4	17-11/16	15-3/8	13-3/4	2-1/16	2-3/4	18-1/2	4-7/16	45-1/8	310
VB 390.36.1.32.S	35	1-1/4" - 1-3/8"	17-11/16	15-3/8	13-3/4	2-1/16	2-3/4	18-1/2	4-7/16	45-1/8	310
VB 430.32.1.32.S	35	1-1/8 - 1-1/4	19-1/2	16-15/16	14-3/4	2-1/16	2-3/4	20-1/6	4-7/16	46-7/8	330
VB 430.32.1.36,5.S	40	1-1/8 - 1-1/4	19-1/2	16-15/16	15-3/4	2-1/16	2-3/4	20-1/6	4-13/16	48-5/16	440
VB 430.38.1.32.S	35	1-3/8 - 1-1/2	19-1/2	16-15/16	14-3/4	2-1/16	2-3/4	20-1/6	4-7/16	46-7/8	330
VB 430.38.1.36,5.S	40	1-3/8 - 1-1/2	19-1/2	16-15/16	15-3/4	2-1/16	2-3/4	20-1/6	4-13/16	48-5/16	440
VB 520.38.1.55.S	60	1-3/8 - 1-1/2	23-1/2	20-1/2	18-1/8	2-3/8	3-1/8	24	5-9/16	50-3/8	680
VB 520.44.1.55.S	60	1-1/2 - 1-3/4	23-1/2	20-1/2	18-1/8	2-3/8	3-1/8	24	5-9/16	50-3/8	680
VB 520.52.1.55.S	60	1-3/4 - 2	23-1/2	20-1/2	18-1/8	2-3/8	3-1/8	24	5-9/16	50-3/8	680
VB 630.58.1.81.S	90	1-3/4 - 2-1/4	29-1/2	24-13/16	22-7/16	2-7/8	4	30-1/4	7-15/16	71-1/2	1250
VB 710.68.1.100.S	110	2-1/2 - 2-3/4	31-1/2	27-15/16	25-9/16	3-3/8	4-3/4	32-1/4	7-15/16	75-3/16	1650
VB 800.76.1.125.S	132	2-3/4 - 3	35-1/16	31-1/2	25-9/16	3-3/8	4-3/4	36-1/4	7-15/16	84-5/8	2400

TILT UP BLOCKS

STANDARD FEATURES

- Made from High Strength Alloy.
- 4 to 1 Design Factor.
- Individually Proof Tested.
- Standard Capacities: 22 to 150 Tons.
- Available up to 350 Ton WLL.
- Sheaves run on Double Sealed, Maintenance Free, Dynamic Rated Roller Bearing.
- Swivel uses High Efficiency Thrust Bearings for Full Rotation under Load.
- Inner and Outer Sling Guards prevent damage to Wire Rope Slings.
- Quick Removable Line Guard.
- Available with the following fittings:
  Machined Swivel Stud Eye with Shackle
  Standard Machined Oblong Swivel Eye accepts Shackle Pin or Shackle
  Ear (upset) for direct connection to the Spreader Bar or Lifting Fixture.





BLOCKS

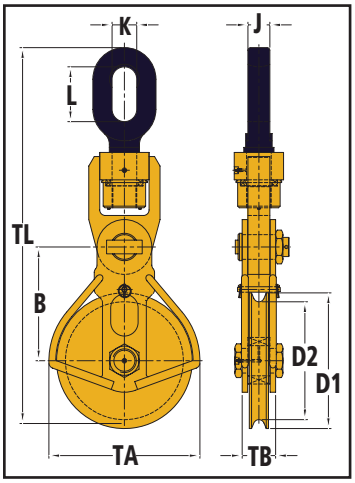
TILT UP BLOCK (Stud Eye) SPECIFICATIONS

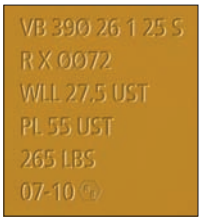
Stock Number	WLL (Tons)	Wire Dia.	Dimensions (Inches)								WEIGHT (Lbs.)
			D1	D2	B	H	T	TA	TB	TL	
HCLW 355.32.1.27S	30	1-1/4	16-9/16	14	14-3/4	1-3/4	2-1/4	18-3/4	4-7/16	39-1/8	265
HCLW 355.36.1.27S	30	1-7/16	16-9/16	14	14-3/4	1-3/4	2-1/4	18-3/4	4-7/16	39-1/8	265
HCLW 355.36.1.32S	35	1-7/16	16-9/16	14	14-3/4	1-3/4	2-1/4	18-3/4	4-7/16	39-1/8	265
HCLW 430.32.1.27S	30	1-1/4	19-1/2	16-15/16	16-15/16	1-3/4	2-1/4	21-11/16	4-13/16	42-1/8	285
HCLW 430.32.1.32S	35	1-1/4	19-1/2	16-15/16	16-15/16	1-3/4	2-1/4	21-11/16	4-13/16	42-1/8	285
HCLW 430.38.1.32S	35	1-1/2	19-1/2	16-15/16	16-15/16	1-3/4	2-1/4	21-11/16	4-13/16	42-1/8	285
HCLW 430.38.1.40S	45	1-1/2	19-1/2	16-15/16	16-15/16	2-1/16	2-3/4	21-11/16	4-13/16	43-5/16	320
HCLW 520.38.1.55S	60	1-1/2	23-7/16	20-1/2	19-1/8	2-13/16	4	25-5/8	5-3/16	51-7/8	420
HCLW 520.44.1.55S	60	1-3/4	23-7/16	20-1/2	19-1/8	2-13/16	4	25-5/8	5-3/16	51-7/8	420
HCLW 520.52.1.55S	60	2-1/16	23-7/16	20-1/2	19-1/8	2-13/16	4	25-5/8	5-3/16	52-1/4	420
HCLW 630.58.1.81S	90	2-5/16	27-15/16	24-13/16	22-5/8	2-13/16	4	30-9/16	6	61-7/16	885
HCLW 760.70.1.100S	110	2-3/4	35-7/16	29-15/16	28-15/16	3-3/8	4-3/4	30-9/16	7-7/8	74-7/16	1325
HCLW 760.76.1.125S	138	3	35-7/16	29-15/16	28-15/16	3-3/8	4-3/4	30-9/16	7-7/8	74-7/16	1325

TILT UP BLOCK (Oblong Eye) SPECIFICATIONS

Stock Number	WLL (Tons)	Dimensions (Inches)				WEIGHT (Lbs.)
		J	K	L	TL	
HCLW 355.32.1.27.O	30	2-3/8	3-1/8	6-7/8	47-1/6	265
HCLW 355.36.1.27.O	30	2-3/8	3-1/8	6-7/8	49	265
HCLW 355.36.1.32.O	35	2-3/8	3-1/8	6-7/8	49	285
HCLW 430.32.1.27.O	30	2-3/8	3-1/8	6-7/8	49	310
HCLW 430.32.1.32.O	35	2-3/8	3-1/8	6-7/8	49	310
HCLW 430.38.1.32.O	35	2-3/8	3-1/8	6-7/8	50-3/8	310
HCLW 430.38.1.40.O	45	2-9/16	3-9/16	7-1/2	51-7/16	340
HCLW 520.38.1.55.O	60	2-9/16	3-9/16	7-1/2	60	340
HCLW 520.44.1.55.O	60	2-3/4	3-15/16	8-11/16	60	440
HCLW 520.52.1.55.O	60	2-3/4	3-15/16	8-11/16	60	440
HCLW 630.58.1.81.O	90	3-9/16	4-15/16	9-13/16	69-3/4	970
HCLW 760.70.1.100.O	110	3-15/16	4-15/16	10-13/16	86-1/4	1435
HCLW 760.76.1.125.O	138	3-15/16	4-15/16	10-13/16	86-1/4	1435

* Please Note: For additional Oblong Eye dimensional information refer to Stud Eye chart.





EACH BLOCK IS STAMPED WITH:

- Model Number
- Serial Number
- Work Load Limit
- Proof Load
- Block Weight
- Date of Manufacture

THE FIELD ID RFID SOLUTION

Do you want to be the digital master of your scheduled inspections and preventative maintenance programs in the field or office? FIELD ID and Lift-It® have the solution.

RFID (Radio Frequency Identification) technology is often referred to as "barcoding on steroids". RFID Inspection Technology will revolutionize the way you do inspections, schedule operations or track equipment as traditional paper based inspections are replaced.

The system consists of passive RFID chips (transponders) scanned by readers (receivers) that synchronize data with a secure, hosted database. The RFID chip is "dumb" like your bank ATM card, but is distinctly identified with a unique Serial Number. The chip, like your bank card provides access to the information held securely by the web based computer system, which is secure, encrypted and backed up.

ADVANTAGES AND FEATURES

No writing, paperwork, faxes or rekeying of data.

Unique Serial Number is read automatically, as information is transferred error free to the online data base.

Step by step electronic forms for inspections or procedures are easily created.



(Model is Chris Shultz, not Brad Pitts)

Comprehensive Auto-Alert notification on overdue inspections or operations.

IMMEDIATE equipment identification with ALL details readily available, on site.

IMMEDIATE access to inspection, maintenance, testing and certification history through a secure, hosted data base.

The Process is Simple, Efficient and Accurate.

Create Records using Reader or Computer. (Initialize the chip).

Upload Sling Info to Computer or Web Based Server.

Use Reader to record Inspection Results.

Upload Inspection Results. Synchronize the Reader to the Web Based Server.

Generate or review Inspection Records.

Eliminate paper and errors. Save Time and Money!



Slings



Motors



Hoses



Vehicles



Equipment



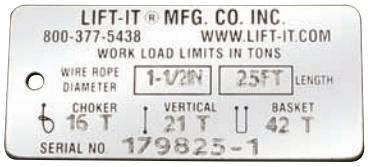
Fall Prevention

RFID – BARCODES – SERIAL NUMBERS

Whether you are identifying a sling, harness or a vehicle, identification is the first step. With Field ID, you can take advantage of advanced electronic identification technologies such as RFID or barcodes. Visual identification of assets is prone to human error. With electronic identification, assets are identified instantly and error free.







RFID: THE MOST EFFICIENT WAY TO IDENTIFY ASSETS

RFID tags do not require a line of sight and are extremely rugged and durable.

- Out of the box compatibility with high frequency (13.56Mhz, ISO 15693) RFID tags.
- Extensive and diverse tagging options are available.
- Easy to use RFID Readers connect via USB or Bluetooth.

BARCODES: LEVERAGE A PROVEN TECHNOLOGY

Field ID is fully compatible with the latest barcode technology. Barcodes have been used for decades to identify assets. Your existing, barcode infrastructure may even adapt to Field ID.

SERIAL NUMBERS STILL WORK!

Still want to use serial numbers? Serial numbers are fully compatible with Field ID. Once input, you save tremendous amounts of time managing them and you can upgrade to electronic identification at any time.

MOBILE FEATURES

All Field ID users get free access to Field ID Mobile. Field ID Mobile allows you to run Field ID on a mobile device. With Field ID Mobile you can run both on or offline (with or without the internet) and all data will be synched to your online account seamlessly.



PDA VERSION



RUGGEDIZED VERSION



PC READERS

POPULAR MOBILE DEVICES

Field ID Mobile runs on a huge array of handheld devices, including: Motorola, Intermec, Nomad and many more. The list continues to grow as more mobile devices enter the market.

ONLINE OR OFFLINE CONNECTIVITY

Even when your device isn't connected to a network, you will still have access to your information. When you reconnect, your data syncs automatically.

ONE CLICK INSPECTIONS

Field ID Mobile allows you to conduct inspections using your mobile device. Inspections are literally conducted with a simple touch of the screen.

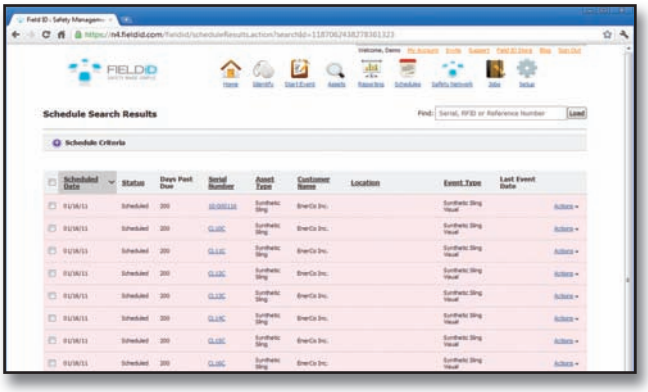
REAL TIME COMPLIANCE CHECK

Whether you are scanning a barcode, RFID tag or entering a serial number, Field ID Mobile will provide the compliance status of your assets.

RFID - Electronic Inspection System

Knowing what needs to be done is a very big and important task and Safety Professionals truly appreciate Field ID's scheduling functionality. Attempting to manage this process using a combination of spreadsheets, reports and outlook just doesn't make the grade. Field ID efficiently manages the entire process, hassle free.

SCHEDULING



EASY SCHEDULE SET UP

It is extremely simple to set up powerful schedules to ensure that you never miss an inspection or deadline. With a few clicks you set up your own inspection schedule that will reoccur and keep you compliant.

CUSTOM SCHEDULING

You can set up custom inspection or preventative maintenance schedules, based on: the asset type, contractor, contractual, rental or regulatory requirements.

REPORTING

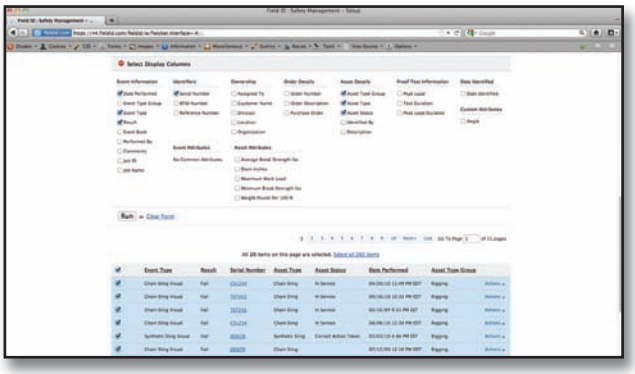
Get real time views of your organization's safety status with Field ID. All properly qualified parties are never more than a few clicks away from the safety insight they need to ensure compliance. Paper based safety management systems do not provide instant and systemic information, reports, documentation and scheduling. With Field ID's reporting functionality, you'll be ready!

24/7/365 ACCESS TO REPORTS

With Field ID you have access to documentation at all times and you will be ready for inspections or audits anytime.

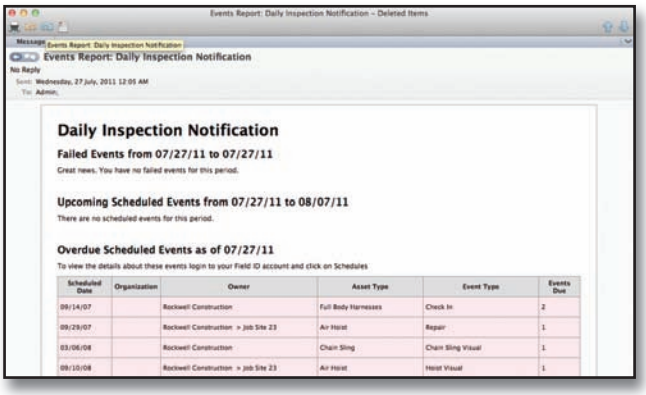
CUSTOMIZED REPORTS

Do you need a special report? With Field ID's selection of report styles, you can quickly select a report style that will work for you. If you don't find what you need, we'll create it for you.



EMAIL NOTIFICATIONS

Email notifications are the easiest and most effective way to remind you that an inspection needs to be done. Have your safety tasks emailed to your inbox whenever you want.



EASY EMAIL SETUP

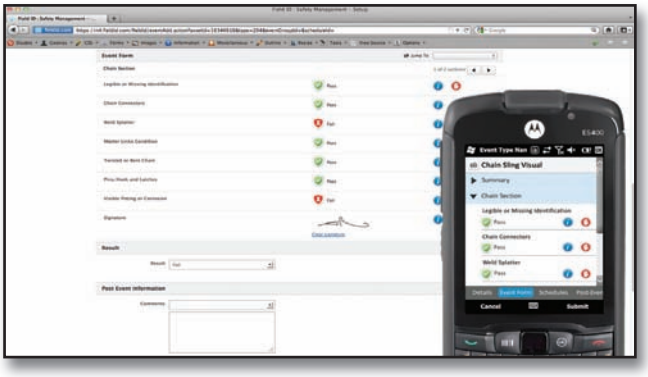
All you have to do is answer a couple of questions to get up and running with our email notification system. Nothing could be easier!

EMAIL DISTRIBUTION

Field ID allows you to set up custom email distribution lists. You can send emails to all qualified partners involved in your inspection and compliance systems.

INSPECTION

Inspections are integral to Field ID. Field ID makes the entire process extremely easy. Conducting inspections with click by click ease, user friendly, checklist templates make conducting and managing safety inspections effortless.



OUT OF THE BOX TEMPLATES

Field ID has an extensive catalogue of predefined checklist templates for items such as harnesses, forklifts, ladders, rigging, cranes, hoses and fire extinguishers. Use or modify the templates or start from scratch, it's your choice!

ONE CLICK INSPECTIONS

Conducting an inspection with Field ID is as easy as touching the screen or clicking a mouse. (Click gently as mice are God's creatures too). Almost everything is template driven to increase speed, accuracy and consistency.

MOBILE OR WEB BASED INSPECTIONS

Conduct inspections either on the web or on a mobile device, the choice is yours. Our goal is to provide you with as many ways possible to record an inspection. Use your laptop, PDA or iPad.

CHECKLIST BUILDER

Field ID allows you to centrally manage, create and deploy checklists for your inspections. Creating a new checklist couldn't be any easier with our Checklist Wizard.

ASSET MANAGEMENT

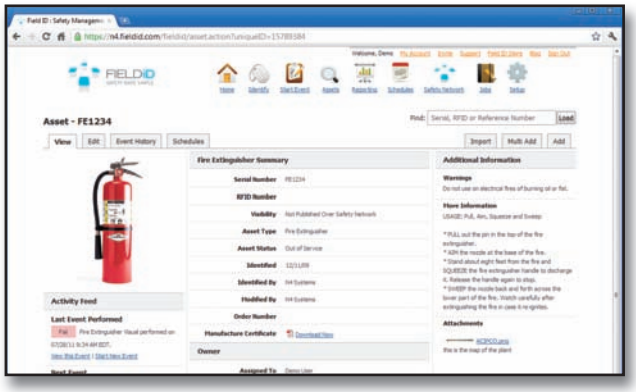
Managing your assets is a huge task. Field ID provides you with a simple way to manage your assets. With Field ID you have the ability to efficiently control inspection, maintenance and scheduling for your assets or rental equiment. One of our clients has saved thousands of dollars by efficiently managing their equipment rentals.

CHECK-IN / CHECK-OUT

Field ID will give you full check-in/check-out functionality from your tool crib or storeroom. You can assign an asset to a location, such as job site as well as to a department or individual. Never lose track of your assets with Field ID.

CUSTOMIZED REPORTS

Do you need a special report? With Field ID's selection of report styles, you can quickly select a report style that will work for you. If you don't find what you need, we'll create it for you.



NETWORKING

The Field ID Network allows you to connect and share information with everyone in your safety ecosystem. If you are safety manager, you might want to connect to your manufacturers and third party inspectors. With Field ID Network you share safety data with your safety partners.



TRACEABILITY

Having safety traceability from cradle to grave is extremely important in ensuring compliance. Field ID Network allows you to have unparalleled traceability, right from the point of manufacture to the point of asset retirement. By connecting to the different parties in the safety ecosystem, you can have true traceability.

MSI-7200 Dyna-Links have become standard tools among test engineers, crane operators and riggers for applications ranging from pull testing in the laboratory to providing on-the-job load indication and overload warning for many types of cranes in virtually every industry, worldwide. Dyna-Links are designed and manufactured under the highest quality assurance levels for ensured safety, performance and reliability.

- Simple to Operate.
- Environmentally Sealed Enclosure.
- Microprocessor Based Electronics.
- Multiple Display Capability.
- Optional Accessories for Versatility.
- Made in the USA.



Dyna-Link is the choice for riggers in construction and utility applications. Safety and reliability are primary concerns for equipment used by personnel in all applications. As a rigger's tool, Dyna-Link provides the necessary reliability, whether used for monitoring or balancing cable line tension or indicating loads for proper rigging practices. The versatility provided by Dyna-Link's many features and an all environment tolerant package, makes it industry's choice tension dynamometer and rigging tool.



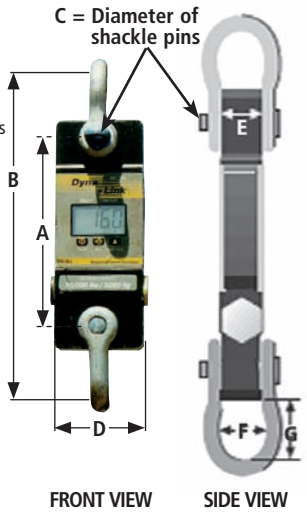
MSI-7200 DYNA-LINK DYNAMOMETERS

STANDARD PRODUCT SPECIFICATIONS

- Accuracy: 0.2% of rated capacity
- Display: Four digit 1 inch/25mm high
- Functions: On/Off, Zero (100%), Peak Hold, Set points (2 selectable)
- Annunciators: Low Battery, Peak Hold, Setpoints I & 2
- Units Displayed: Lbs., Kgs., Tons, Metric Tons, dekaNewtons
- Power: 2 each "C" alkaline batteries
- Operating Time: Minimum 500 hours of continuous use (10 minute auto-shut off with non-use)
- Operating Temperature: -4° to 140°F (-20° to 60°C)
- Enclosure: Corrosion resistant and environmentally sealed
- Overload: 200% Safe - 500% Ultimate

OPTIONS AND ACCESSORIES

- Top and bottom shackles (Crosby or equal)
- Portable carrying case
- Single display remote control (Hard wired)
- Dual display remote control (Hard wired)
- Quick disconnect for remote display options
- Set point relay output control kit
- AC or DC power input (specify power requirements)
- Analog output (available for remote display option only)
- RS232 output (available for remote display option only)
- Dual load sensor input and summing
- Audible set point alarm





Stock No.	Capacity	Resolution	A	B	C	D	E	F	G	Shipping Weight	Optional Shackle
MSI-7200-1/2	500 Lbs.	0.5 Lbs.	9.25 IN	14.77	.75	4.50	.99	1.69	1.87	5 Lbs.	3-1/4 T
	250 Kgs.	0.2 Kgs.	235 MM	375	19	114	25	43	48	2.3 Kgs.	3-1/4 T
MSI-7200-1	1,000 Lbs.	1 Lbs.	9.25 IN	14.77	.75	4.50	.99	1.69	1.87	5 Lbs.	3-1/4 T
	500 Kgs.	0.5 Kgs.	235 MM	375	19	114	25	43	48	2.3 Kgs.	3-1/4 T
MSI-7200-2	2,000 Lbs.	2 Lbs.	9.25 IN	14.77	.75	4.50	.99	1.69	1.87	5 Lbs.	3-1/4 T
	1,000 Kgs.	1 Kgs.	235 MM	375	19	114	25	43	48	2.3 Kgs.	3-1/4 T
MSI-7200-5	5,000 Lbs.	5 Lbs.	9.50 IN	15.02	.75	4.50	.99	1.69	2.00	7 Lbs.	3-1/4 T
	2,500 Kgs.	2 Kgs.	241 MM	382	19	114	25	43	51	3.2 Kgs.	3-1/4 T
MSI-7200-10	10,000 Lbs.	10 Lbs.	9.50 IN	17.12	1.00	4.50	1.37	2.28	2.68	15 Lbs.	6-1/2 T
	5,000 Kgs.	5 Kgs.	241 MM	435	25	114	35	58	68	6.8 Kgs.	6-1/2 T
MSI-7200-25	25,000 Lbs.	20 Lbs.	10.13 IN	23.26	1.63	4.80	2.24	3.88	4.81	30 Lbs.	17 T
	12,500 Kgs.	10 Kgs.	257 MM	591	41	122	57	99	122	13.6 Kgs.	17 T
MSI-7200-50	50,000 Lbs.	50 Lbs.	10.88 IN	26.88	2.00	5.43	2.74	5.00	6.00	50 Lbs.	25 T
	25,000 Kgs.	20 Kgs.	276 MM	683	51	138	70	127	152	22.7 Kgs.	25 T
MSI-7200-100	100,000 Lbs.	100 Lbs.	12.50 IN	30.25	2.25	6.86	3.10	5.75	6.37	85 Lbs.	50 T
	50,000 Kgs.	50 Kgs.	318 MM	768	57	174	79	146	162	38.6 Kgs.	50 T
MSI-7200-160	160,000 Lbs.	200 Lbs.	13.50 IN	37.25	2.75	7.50	3.88	7.25	8.88	150 Lbs.	80 T
	80,000 Kgs.	100 Kgs.	343 MM	946	70	190	99	184	225	68 Kgs.	80 T
MSI-7200-220	220,000 Lbs.	200 Lbs.	14.00 IN	43.25	3.25	7.50	4.74	7.88	11.36	185 Lbs.	110 T
	110,000 Kgs.	100 Kgs.	356 MM	1099	83	190	120	200	288	84 Kgs.	110 T
MSI-7200-350	350,000 Lbs.	500 Lbs.	16.00 IN	49.25	4.25	9.00	5.24	10.00	12.13	285 Lbs.	175 T
	175,000 Kgs.	200 Kgs.	406 MM	1250	108	229	133	254	308	130 Kgs.	175 T
MSI-7200-400	400,000 Lbs.	500 Lbs.	17.50 IN	53.25	4.75	9.50	6.99	11.00	12.88	450 Lbs.	200 T
	200,000 Kgs.	200 Kgs.	445 MM	1353	121	241	178	279	327	204 Kgs.	200 T
MSI-7200-500	500,000 Lbs.	500 Lbs.	19.00 IN	64.00	5.00	10.00	7.99	13.00	17.00	575 Lbs.	250 T
	250,000 Kgs.	200 Kgs.	483 MM	1626	127	254	203	330	432	260 Kgs.	250 T

Larger Capacity Dyna-Links are available. Specifications are subject to change.

⚠WARNING Shackles should be purchased for dedicated use with dynamometers and not used for other applications. Non-dedicated shackles will result in false readings.

MSI proudly introduces the MSI-7300, the all-new generation "Dyna-Link" digital tension dynamometer. Like its predecessor MSI-7200, the MSI-7300 provides a full feature set satisfying nearly all load tension monitoring applications and much more.



Through design incorporation of the MSI "ScaleCore", a highly integrated weight-processing unit with 24-bit A/D conversion, the new generation Dyna-Link provides many new and improved product performance features. MSI-7300 features a large 5 digit, 1.25 inch (32 mm) liquid crystal display extending operator viewing distance along with enhanced resolution settings up to 5,000 divisions with precision accuracy across a wide range of available capacities. Optimum digital processing with low power consumption provides over 300 hours operation from standard flashlight batteries. In addition, ScaleCore features flash memory for easy software updates with ability to save and restore calibration and operational settings.

Enhanced product portability and installation, the MSI-7300 is constructed of high-grade, aircraft quality aluminum achieving optimum strength to weight ratios. Although the new Dyna-Link is lighter than its predecessor, 200% safe and 500% ultimate overload ratings are maintained. An anodized product finish and integrated gaskets ensure an environmentally sound protection equal with NEMA 4 and IP 65 ratings. All Dyna-Link capacities are designed to interface with standard Crosby shackles.

A large cache of available options and accessories ensure Dyna-Link's suitability with nearly all imaginable tension loading and monitoring applications. Both hard-wired and RF telemetry remote displays are available for applications requiring remote control.

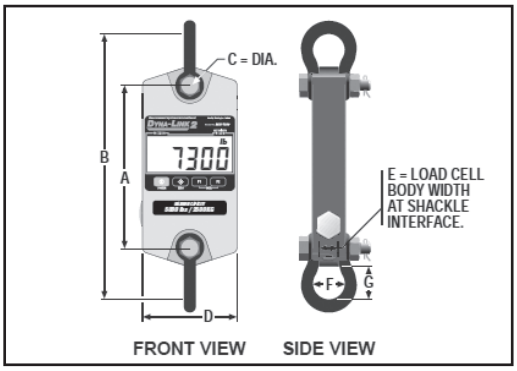
MSI-7300 DYNA-LINK DYNAMOMETERS

STANDARD PRODUCT SPECIFICATIONS

- Accuracy: 0.1% of rated capacity
- Display: Five digit 1.25 inch (32 mm)
- LCD Functions: On/Off, Zero, Hi-Speed Peak Hold, Set Points (2 selectable)
- Total, Tare, Auto-Off, Motion Filter
- LED Annunciators: Function 1, Function 2, Set Points 1 and 2
- LCD Annunciators: Net, Center of Zero, Motion, Battery Test, Peak Hold and Total
- Units Displayed: Lbs., Kgs., Kilonewtons, Tons and Metric Tons
- Operating Time: Up to 200 hours continuous in standard configuration
- Power: 2 each -"C" alkaline batteries for units up to 10,000 Lbs.
  2 each - "D" alkaline batteries for 25,000 - 100,000 Lbs. units
- Operating Temperature: -40° to 158°F (-40° to +70°C)
- Material: 2024 Aircraft Grade Aluminum
- Enclosure: NEMA 4 / IP65, anodized, corrosion resistant finish
- Overload: 200% Safe / 500% Ultimate
- Calibration: Digital

OPTIONS AND ACCESSORIES

- Enhanced Display Resolution (5000 d)
- Audible Set Point Alarm
- Crosby Top and Bottom Shackles (Standard and Oversized)
- Portable Transport Case
- RF or Hardwired Remote Display
- Heavy Capacity Configurations (80 to 250+ tons)



Stock No.	Capacity	Resolution	A	B	C	D	E	F	G	Shipping Weight	Optional Shackle
MSI-7300-1	1,000 Lbs.	.5 Lbs.	8.0 IN	13.53 IN	.75	5 IN	.99	1.69	1.75	4.4 Lbs.	3-1/4 T
	500 Kgs.	.2 Kgs.	203 MM	344 MM	19	127 MM	25	43	44	2.0 Kgs.	3-1/4 T
MSI-7300-2	2,500 Lbs.	1 Lbs.	8.5 IN	14.03 IN	.75	5 IN	.99	1.69	1.75	4.9 Lbs.	3-1/4 T
	1,250 Kgs.	.5 Kgs.	216 MM	356 MM	19	127 MM	25	43	44	2.2 Kgs.	3-1/4 T
MSI-7300-3	5,000 Lbs.	2 Lbs.	8.5 IN	14.03 IN	.75	5 IN	.99	1.69	1.75	4.9 Lbs.	3-1/4 T
	2,500 Kgs.	1 Kgs.	216 MM	356 MM	19	127 MM	25	43	44	2.2 Kgs.	3-1/4 T
MSI-7300-4	10,000 Lbs.	5 Lbs.	8.50 IN	16.14 IN	1	5.5 IN	1.37	2.28	2.34	7.3 Lbs.	6-1/2 T
	5,000 Kgs.	2 Kgs.	216 MM	410 MM	25	140 MM	35	58	59	3.3 Kgs.	6-1/2 T
MSI-7300-5	25,000 Lbs.	10 Lbs.	9.5 IN	22.66 IN	1.63	6.38 IN	2.24	3.88	4.69	13 Lbs.	17 T
	12,500 Kgs.	5 Kgs.	241 MM	576 MM	41	162 MM	57	99	119	5.9 Kgs.	17 T
MSI-7300-6	50,000 Lbs.	20 Lbs.	9.63 IN	25.67 IN	2	7.50 IN	2.74	5	5.75	23 Lbs.	25 T
	25,000 Kgs.	10 Kgs.	245 MM	652 MM	51	191 MM	70	127	146	10 Kgs.	25 T
MSI-7300-7	100,000 Lbs.	50 Lbs.	12 IN	29.75 IN	2.25	8.13 IN	3.1	5.75	4.81	53 Lbs.	2140-55T
	50,000 Kgs.	25 Kgs.	305 MM	756 MM	57	207 MM	79	146	122	24 Kgs.	2140-55T

Dillon EDjunior dynamometers get straight to the point. Apply a load and take a reading. Its Spartan design and development were in direct response to the need for an extremely well built instrument capable of consistently delivering accurate, repeatable measurements. The EDjunior is even more remarkable, when you consider the price. EDjunior accuracy, long service life, safety and price go hand in hand.

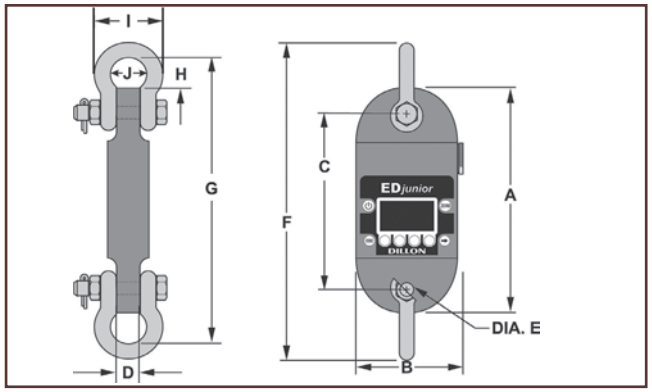
Mechanical Dynamometers, Crane scales and the EDxtreme, a full featured, precision electronic dynamometer with radio communications capabilities are also available.



EDjunior EDxtreme



(Model is not Steve Weaver)



STANDARD PRODUCT SPECIFICATIONS

Accuracy: 0.2% of full scale

Display: Six digit: 1 inch/25mm high

Display Update Rate: 2 Times per Second

Units of Measure: Lbf., Kgf. and Newtons

Functions: On/Off, Peak Detection and Sustained Load

Power: 2 each "C" alkaline batteries

Operating Time: 320 hours typical use

Operating Temperature: -4° to 140°F (-20° to 60°C)

Enclosure: Designed to NEMA4X/IP55.
Suitable for continuous outdoor use.

Overload: 200% safe

EDjunior DYNAMOMETER SPECIFICATIONS

Stock Number	Capacity	A	B	C	D	E	F	G	H	I	J	Ship Weight (Approximate)	Optional Shackle
EDJR-1	2500 Lbs.	8.4 IN	5.0	6.9	.75	.50	11.6	10.8	1.20	2.03	1.16	6 Lbs.	1-1/2 T
	1000 Kgs.	213 MM	127	174	19	13	296	274	30	52	29	3 Kgs..	1-1/2 T
EDJR-2	5,000 Lbs.	10.6 IN	5.0	7.8	1.06	.75	14.8	13.4	1.41	2.94	1.69	10 Lbs.	3-1/4 T
	2000 Kgs.	269 MM	127	198	27	19	375	340	35	75	43	5 Kgs..	3-1/4 T
EDJR-5	10,000 Lbs.	11.4 IN	5.3	8.1	1.38	1.00	17.8	15.8	2.22	4.03	2.28	18 Lbs.	6-1/2 T
	5,000 Kgs.	289 MM	135	2.06	35	25	451	402	56	102	58	8 Kgs..	6-1/2 T
EDJR-10	25,000 Lbs.	11.5 IN	5.3	7.9	1.97	1.38	21.6	18.8	3.67	5.75	3.25	47 Lbs.	12 T
	10,000 Kgs.	291 MM	135	2.01	50	35	548	478	93	146	83	21 Kgs..	12 T

Slingmax® Hydraulic Pad Eye Tester

Pre use testing of hardware, slings and hoists is a common practice. Unfortunately, testing the anchorage points for rigging or fall prevention system is often overlooked. The need for the Hydraulic Pad Eye Tester came about after a conversation with riggers in a shipyard. They had experienced accidents when pad eyes broke from their welds and loads were dropped. Hydraulic Pad Eye Testers attach directly to the pad eye in the ceiling, deck or bulkhead. Verify that pad eyes will hold their intended loads by testing up to 25 tons of force with the 40 lbs. Hydraulic Pad Eye Tester. Remember, gravity always works!





INSTRUCTIONS FOR USE

1. Turn the handle on the threaded rod, counter-clockwise until the jaws and pin are exposed.
2. Remove the pin and slip the jaw over the pad eye.
3. Replace the pin and turn the handle on the threaded rod, clockwise until the jaw retracts and the cylinder is tight against the pad eye base.
4. Tighten the valve on the hydraulic cylinder and pump the handle until the pressure gauge indicates the desired loading. Use the indication on the inside ring of the gauge, which shows values up to 25 tons.
5. After test, release the valve on the hydraulic cylinder, which will release the tension.
6. Turn the handle on the top of the threaded rod, counter-clockwise until the jaws and pin are exposed.
7. Remove the pin and the tester is ready for the next pad eye.

HYDRAULIC PAD EYE TESTER SPECIFICATIONS				
STOCK NUMBER	PET 10	PET 15	PET 20	PET 25
CAPACITY	10 Ton	15 Ton	20 Ton	25 Ton
PUMP	W 3.75″ L 13.25″ Wt. 4.5 Lbs.	W 4.75″ L 21.00″ Wt. 9 Lbs.	W 4.75″ L 13.25″ Wt. 9 Lbs.	W 4.75″ L 13.25″ Wt. 9 Lbs.
CYLINDER	W 2.75″ H 7.25″ Wt. 9.8 Lbs.	W 3.88″ H 6.38″ Wt. 17 Lbs.	W 4.50″ H 7.03″ Wt. 24 Lbs.	W 4.50″ H 7.03″ Wt. 24 Lbs.
HOSE	3/8 NPTF Std. length 6 ft. Avail. to 50 ft.	←	←	←
CLEVIS or JAW	One clevis included to customer's specification.	←	←	←
COLLAR	One collar included to customer's specification.	←	←	←

SUPERCAGE™ Personnel Baskets



Model S-60 Personnel Basket	
Rated Capacity	900 Lbs. - 3 Persons
Outside Dimensions	36" (L) x 60" (W) x 88" (H)
Lifting Lugs	Heavy Duty @ 45 degree
Data Plate	Material-Stainless
Finish	Durable, Safety Yellow Paint
Gate	Inward Locking, Self Closing
Grab Rail	Entire Perimeter
Floor	Non-Slip
Tag Line Pads	Exterior- 2 Each
Load Tested	Yes
Test Weight Optional	1,125 Lbs.
Masterlink	1-1/4" Diameter
Bridle Legs	4 leg-1/2" Diameter
Shackles	Crosby G2130-5/8"
Fork Lift Pockets	Available as an Option
Options	Fixed Crosshead

MODEL S-60



Model SR-7 Personnel Basket	
Rated Capacity	600 Lbs. - 2 Person
Outside Dimensions	36" O.D. x 88" (H)
Lifting Lug	Single Hook Suspension Point
Data Plate	Material-Stainless
Finish	Durable, Safety Yellow Paint
Gate	Inward Locking, Self Closing
Grab Rail	Entire Perimeter
Floor	Non-Slip
Tag Line Pads	Exterior- 2 Each
Load Tested	Yes
Test Weight (Opt.)	750 Lbs.
Masterlink	1-1/4" Diameter
Bridle Legs	4 leg-1/2" Diameter
Shackles	Crosby G2130-5/8"
Fork Lift Pockets	Available as an Option
Options	Safety Sling: Acts as 5th Leg

MODEL SR-7



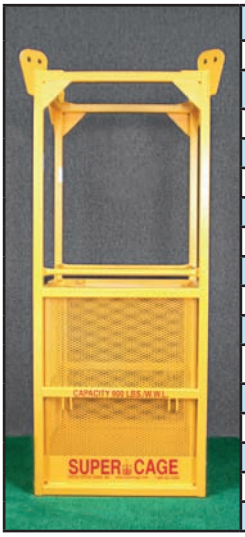
Model S-1000 Personnel Basket	
Rated Capacity	10,000 Lbs. - 20 to 30 Persons
Outside Dimensions	84" (L) x 84" (W) x 88" (H)
Lifting Lugs	Heavy Duty @ 45 degree
Data Plate	Material-Stainless
Finish	Durable, Safety Yellow Paint
Gate	Inward Locking, Self Closing
Grab Rail	Entire Perimeter
Floor	Non-Slip
Tag Line Pads	Exterior- 2 Each
Load Tested	Yes
Test Weight (Opt.)	12,500 Lbs.
Masterlink	1-1/2 Diameter
Bridle	4-Leg Bridle-3/4" Diameter
Shackles	Crosby G2130-3/4"
Fork Lift Pockets	Available as an Option
Options	Fixed Crosshead

MODEL S-1000



Model S-100 Personnel Basket	
Rated Capacity	1,200 Lbs. - 4 Persons
Outside Dimensions	51.5" (L) x 51.5" (W) x 88" (H)
Lifting Lugs	Heavy Duty @ 45 degree
Data Plate	Material-Stainless
Finish	Durable, Safety Yellow Paint
Gate	Inward Locking, Self Closing
Grab Rail	Entire Perimeter
Floor	Non-Slip
Tag Line Pads	Exterior- 2 Each
Load Tested	Yes
Test Weight Optional	1,500 Lbs.
Masterlink	1-1/4" Diameter
Bridle Legs	4 leg-1/2" Diameter
Shackles	Crosby G2130-5/8"
Fork Lift Pockets	Available as an Option
Options	Fixed Crosshead

MODEL S-100
(With Expanded Roof and Test Weight)



Model S-36 Personnel Basket	
Rated Capacity	900 Lbs. - 3 Persons
Outside Dimensions	36" (L) x 36" (W) x 88" (H)
Lifting Lugs	Heavy Duty @ 45 degree
Data Plate	Material-Stainless
Finish	Durable, Safety Yellow Paint
Gate	Inward Locking, Self Closing
Grab Rail	Entire Perimeter
Floor	Non-Slip
Tag Line Pads	Exterior- 2 Each
Load Tested	Yes
Test Weight (Opt.)	1,125 Lbs.
Masterlink	1-1/4" Diameter
Bridle	4 leg-1/2" Diameter
Shackles	Crosby G2130-5/8"
Fork Lift Pockets	Available as an Option
Options	Fixed Crosshead

MODEL S-36

SUPERCAGE™ Personnel Baskets

Supercage™ Personnel Baskets can be custom designed and fabricated to meet your specific applications.

Supercage™ Personnel Baskets are designed, engineered, manufactured and certified to meet or exceed: all existing federal and state codes, ASME B30.23 and Title 29CFR 1926.550(g).

Inspection, load test and certification documents are automatically furnished.

Supercage™ DFA (Direct Fixed Attachment) Personnel Baskets attach directly to the boom of most cranes. DFA models do not require the use of a suspension bridle.

Non-personnel, Medical Evacuation, Welding Equipment and Load Rated Debris Baskets are readily available.

CAUTION: PERSONNEL BASKETS ARE TO BE USED IN COMPLIANCE WITH FEDERAL, STATE AND/OR PROVINCAL RULES AND REGULATIONS.

STANDARD EQUIPMENT FEATURES

All Supercage Personnel Baskets include the following as standard equipment:

- Removable components for easy maintenance and repair.
- High Strength Steel Tubing.
- Door: Inward swing, self-closing, self-latching (with outward stop plate).
- Grab Rail: Entire Inside Perimeter.
- Anchors for Personnel Belts and Harnesses.
- Toe Plate: Entire inside perimeter.
- Expanded Metal from floor deck to top of mid-rail.
- Floor: Non-Slip Material.
- Exterior Pad Eyes for anchoring and tagline use.
- Upper Reinforcing Gussets (8 each) at Bail area for additional strength.
- Permanent ID plate and special Warning Decals.
- Finish: High durability, safety yellow paint.
- Operating Manual and Video.

AVAILABLE OPTIONS

- Easily detachable test weight assembly for load test.
- Top Suspension Bridle.
- Protective Roof: Solid or Expanded Metal.
- Fixed Crosshead with Lifting Eye (for direct attachment to hook).
- Forklift Attachment with restraint.
- Rubber Bumpers on external perimeter.
- Internal Tool/Storage Shelves.
- MSHA Upper Screens.
- Alternate paint colors and finishes.

Contact us for pricing.

PERSONNEL BASKET SPECIFICATIONS

STOCK NUMBER	OUTSIDE DIMENSIONS			RATED CAPACITY (LBS.)	TEST WEIGHT (OPTIONAL)
	L	W	H		
S-30	30″	30″	44/88″	600	750 Lbs.
S-36	36″	36″	44/88″	900	1,125 Lbs.
S-50	36″	48″	44/88″	900	1,125 Lbs.
S-60	36″	60″	44/88″	900	1,125 Lbs.
S-75	51.5″	51.5″	44/88″	900	1,125 Lbs.
S-100	51.5″	51.5″	44/88″	1,200	1,500 Lbs.
S-125	51.5″	58″	44/88″	1,500	1,875 Lbs.
S-150	51.5″	64″	44/88″	1,800	2,250 Lbs.
S-160	51.5″	96″	44/88″	1,800	2,250 Lbs.
S-170	51.5″	108″	44/88″	1,800	2,250 Lbs.
S-200	51.5″	72″	44/88″	2,400	3,000 Lbs.
S-400	72″	144″	44/88″	4,800	6,000 Lbs.
S-1000	84″	84″	44/88″	10,000	12,500 Lbs.
SR-5-24	-	24″ Dia.	88″	300	375 Lbs.
SR-7	-	36″ Dia.	88″	600	750 Lbs.
SNP-60	60″	60″	72″	1,000	N/A
SNP-603	60″	60″	60″	3,000	N/A
FL-50	36″	48″	44/63″	900	N/A
FL-160	36″	96″	44/63″	2,400	N/A

DICA Heavy Duty Outrigger Pads

Outrigger Pads are manufactured using engineered UHMW plastic and come with industry leading features like safety texturing, radius edges and corners and Safety Orange Handles. Outrigger Pads are also corrosion, moisture and chemical resistant, making them easy to clean and maintain.



PRODUCT FEATURES

- ENGINEERED UHMW CONSTRUCTION
- GUARANTEED FOR LIFE
- ONE OR TWO PERSON CARRY
- SINGLE PAD RIGIDITY UP TO 90 TONS
- SAFETY ORANGE HANDLES
- MOISTURE and CHEMICAL RESISTANT

SAFETY TEXTURING

Safety Texturing provides increased traction between: the outrigger foot and pad and the pad and ground surface. Safety Texturing is standard on all DICA Outrigger Pads.

MEMORY AND RECOVERY

Outrigger Pads are engineered to bend, but not break. Depending on ground conditions, weight displacement and pad thickness, Outrigger Pads may conform to the ground, but will return to their original shape once the load is removed.

LIFETIME GUARANTEE

If you break it, we'll replace it, guaranteed. If you crack or break our Outrigger Pad, we'll replace the pad along with free shipping and handling. This is the best Outrigger Pad warranty available anywhere and it provides a lifetime of value.





Our little angel gone to heaven.

LIGHTWEIGHT AND STRONG

Outrigger Pads are incredibly light and strong due to their industry leading design and use of engineered UHMW plastic, providing increased safety and faster set up times.

PAD THICKNESS

Outrigger Pads are available in different thicknesses. Dica Outrigger Pads are Heavy Duty Pads, 2 inches thick. Outrigger Pads can be stacked for increased rigidity and height due to their non-slip Safety Textured surfaces. Other thicknesses are available.

PRODUCT AVAILABILITY

Nearly every model Outrigger Pad is in stock and express shipping options are available upon request.

INFORMATION THAT HELPS US FIT PADS TO YOUR EQUIPMENT:

- Ground Conditions
- Type of Equipment
- Outrigger Foot Size
- Outrigger Configuration

DICA Heavy Duty Outrigger Pads

CONSIDERATIONS

USAGE and PROPER HANDLING

- Outrigger feet must be smooth and have 80 square inches of surface area.
- Muddy or loose soil conditions may require additional blocking, cribbing or stacking of pads.
- Excessive flexing or bending may shorten the usable life of the pad.
- Acceptable operating temperature range is -40 to 180 degrees F.
- Inspect before use.

Any doubts about Outrigger Pad condition? Do Not Use!

PAD LOAD CAPACITY INFORMATION

- Load capacities listed in specification tables were determined using the finite element analysis of an 8" x 10" outrigger foot under two separate conditions:
  - 10,000 lbs. vertically at 90 degrees
  - 10,000 lbs. at a 45 degree angle
- Load capacity for individual Outrigger Pads will increase as the size of outrigger foot increases.
- Maximum Load Capacities are based on ideal ground conditions.
- Operator must use all of the original equipment manufacturer's guidelines for safe and proper operation of equipment.

HANDLE CONFIGURATIONS
(YOU MUST SPECIFY A - G)



OUTRIGGER PAD SPECIFICATIONS

Stock Number	Shape	Load Capacity (Lbs.)		Dimensions (Inches)			Area (Sq. Inches)	Weight (Lbs.)
		90 Deg.	45 Deg.	Width or Dia.	Length	Thickness		
D24242	Square	62,000	40,000	24"	24"	2"	576	37
D30302	Square	85,000	43,000	30"	30"	2"	900	56
D36362	Square	98,000	45,000	36"	36"	2"	1296	82
D48482	Square	140,000	55,000	48"	48"	2"	2304	145
DR362	Round	88,000	43,000	36" Dia.	-	2"	1017	70
DR482	Round	120,000	50,000	48" Dia.	-	2"	1808	116
DR602	Round	150,000	60,000	60" Dia.	-	2"	2826	190

OTHER PRODUCTS


Cleated Pads


Cavity Pads


Dunnage


Cover Mats

PRODUCT DISCLAIMER

Anyone considering the use of these products should thoroughly test them to ensure that they satisfy the specific needs. Manufacturer and/or Distributor cannot guarantee performance of these products because usage or application of buyers cannot be controlled by either the Manufacturer and/or Distributor. Proper Use requires the selection of the proper products for the vehicle and the specific application. Manufacturer and/or distributor expressly disclaim any and all warranties not set forth herein, including any warranty of fitness for a particular purpose and/or any warranty of merchantability which might otherwise be applicable. In the event of a manufacturing defect, buyer's remedy shall be strictly limited to a refund of the purchased price or replacement of the product. Buyers specifically acknowledges waivers of any claim against either manufacturer or any distributor regarding consequential damages to person or property, damages for loss of use, lost time, loss of profit, lost income or other incidental or consequential damage. All prices, designs and/ or specifications are subject to change without notice.

I'll never forget the day I was presenting at the PG&E facility in Eureka, California. My presentation was over and Mr. Al Nunoz asked to speak to the assembled group. He proceeded to compliment me on the job Junior did to save their plant tens of thousands of dollars. Junior had arranged rental on a very large capacity spreader bar for a short period of time instead of selling the unit, as most would do.

In many situations the duration of the lifting or material application can be somewhat short. Equipment Rental can offer many advantages over equipment purchase.

- The burden of statutory obligation and compliance is assigned to others. Records and certification are no longer your headache as this task is delegated to the equipment owner.
- Long term equipment storage space is also no longer required. This is a critical consideration when space is a scarce commodity.
- Accurate project cost control is easily realized through our equipment rental program.
- Capital costs are not a part of rental, so your capital is free to be used for other purposes.
- Equipment rental provides you with up to date equipment and technologies so you don't have to settle for limited or obsolete equipment.
- Rental provides you with the luxury of using specific equipment to get the job done safely and efficiently.



Crane Hand Signals

MOBILE CRANE HAND SIGNALS



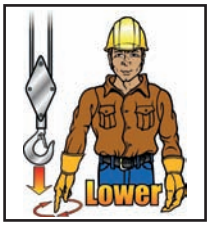
Tap fist on head, then use regular signals.



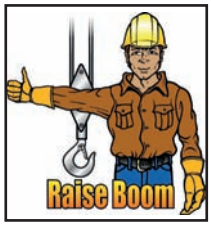
(Auxiliary Hoist) Tap elbow with one hand, then use regular signals.



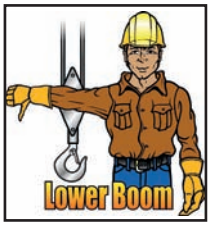
With forearm vertical, forefinger pointing up, move hand in small horizontal circles.



With forearm extended downward,forefinger pointing down, move hand in small horizontal circles.



Arm extended, fingers closed, thumb pointing upward.



Arm extended, fingers closed, thumb pointing downward.



Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal.
(Hoist slowly is shown).



With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.



With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.



Arm extended point with finger in direction of the boom swing.



Both arms extended, palms down, move arms back and forth horizontally.



Arm extended, palm down, move arm back and forth horizontally.



One Hand Signal. One fist in front of chest with thumb tapping chest.



Lock the track on one side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body.



Both fists in front of body with thumbs pointing outward.



Both fists in front of body with thumbs pointing toward each other.



Arm extended forward, hand open and slightly raised, make a pushing motion in the direction of travel.



Clasp hands in front of body.



Both fists in front of body, making a circular motion around each other, indicating direction of travel, forward or backward.



One Hand Signal. One fist in front of chest, thumb pointing outward and heel of the fist, tapping chest.

OVERHEAD CRANE HAND SIGNALS



Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.



Arm extended, palm down, move arm back and forth horizontally.



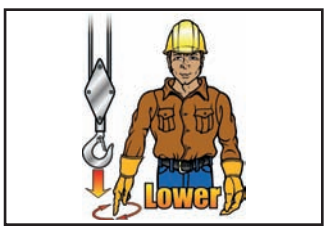
Both arms extended, palms down, move arms back and forth horizontally.



With forearm vertical, forefinger pointing up, move hand in small horizontal circles.



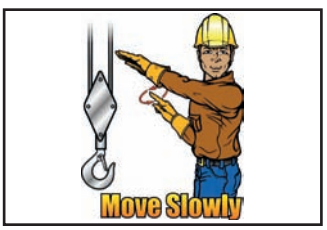
Arm extended forward, hand open and slightly raised, making a pushing motion in the direction of travel.



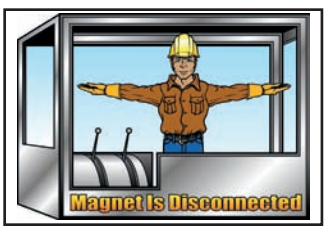
With forearm extended downward,forefinger pointing down, move hand in small horizontal circles.



Hold up one finger for Block "1" and two fingers for Block "2".



Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly is shown).



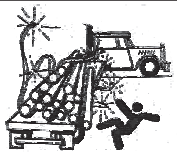
Crane operator spreads both hands apart with palms up.

Information and graphics furnished by Mike Riggs, RiggSafe Solutions, Inc.
See pages 11-13 for Crane Signal Wall Charts and other revolutionary safety products.

SYNTHETIC TIE DOWN SAFETY BULLETIN

Synthetic Tie Down Safety Bulletin

⚠ WARNING



This bulletin contains important safety information about the use of tie downs. However, it **DOES NOT** contain all the information you need to know about handling, manipulating and securing materials and cargo safely. It is your responsibility to use tie downs safely and to consider all risk factors prior to using any tie down system. Failure to do this may result in severe **INJURY** or **DEATH** due to tie down failure and/or loss of cargo.

The following six points briefly summarize some important safety issues:

1. **All users must be trained** in tie down selection, use and inspection, cautions to personnel, environmental effects, all applicable standards, regulations and tie down practices.
2. **Inspect tie down for damage** before each use, if the tie down is damaged, remove it from service.
3. **Protect tie down from damage.** ALWAYS protect tie downs in contact with edges, corners, protrusions, or abrasive surfaces with materials of sufficient strength, thickness and construction to prevent damage.
4. **Do not exceed the working load limit of the tie down;** taking into account the tie down, the load, the vehicle anchor points, tie down configuration and angle, etc.
5. **Be alert when securing cargo.** Users must remain alert to hazards when securing cargo.
6. **Maintain and store tie downs properly**. Tie downs should be protected from mechanical, chemical and environmental damage.

1. All Tie Down Users Must be Trained and Knowledgeable

All tie down users must be trained on the proper use of tie downs, including tie down selection and inspection, cautions to personnel and environmental effects. The Web Sling & Tie Down Association (WSTDA) defines a "qualified person" as one:

> *"who by possession of a recognized degree, certificate of professional standing or by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work." (WSTDA T-1, page 2)*

It is important that all tie down users be knowledgeable about the safe and proper use and application of tie downs and loading practices and be thoroughly familiar with the manufacturer's recommendations and safety materials provided with each product. In addition, all tie down users must be aware of their responsibilities as outlined in all applicable federal, state, provincial and local regulations and industry standards.

If you are unsure whether you are properly trained and knowledgeable, or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training— **DO NOT** use tie downs until you are absolutely sure of what you are doing. Remember, when it comes to using tie downs, lack of skill, knowledge and care can result in severe **INJURY** or **DEATH** to you and others.

2. Tie Downs Must Be Regularly and Properly Inspected

Even seemingly "minor" damage to a tie down can significantly reduce its capacity to hold objects and increases the chance that the tie down will fail during use. Therefore, it is very important that tie downs are regularly and properly inspected. In reality, there simply is no such thing as "minor" damage. If you are not sure whether a tie down is damaged, **DO NOT USE IT** .

2a. How to inspect tie downs

To detect possible damage, you should perform a visual inspection of the entire tie down. You should look for any of the types of conditions listed in Table 1. Table 2 shows examples of some of these types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

2b. What to do if you identify damage in a tie down

If you identify ANY of these types of damage in a tie down, **remove it from service immediately** even if the damage is not as extensive as shown in the pictures in Table 2. Tie downs that are removed from service must be destroyed and rendered completely unusable, as no repairs of tie down webbing, fittings, buckles or stitching/sew patterns shall be permitted. Synthetic web tie downs may be re-webbed using existing hardware if the tie down manufacturer determines the hardware is reusable. All re-webbed tie downs utilizing used hardware shall be proof tested to 150% of the WLL and certified. You should never ignore tie down damage or attempt to perform temporary field repairs of damaged tie downs (e.g., tie knots in the webbing, etc.).

Table 1. Tie down removal from service criteria

The **entire tie down must be inspected** before each use and it shall be **removed from service** if ANY of the following are detected:

- If tie down identification tag is missing or not readable.
- Holes, tears, cuts, snags or embedded materials.
- Broken or worn stitches in the load bearing splices.
- Knots in any part of the webbing.
- Acid or alkali burns.
- Melting, charring or weld spatters on any part of the webbing.
- Excessive abrasive wear or crushed webbing.
- Signs of ultraviolet (UV) light degradation.
- Distortion, excessive pitting, corrosion or other damage to buckles or end fitting(s).
- Any conditions which cause doubt as to the strength of the tie down.

SYNTHETIC TIE DOWN SAFETY BULLETIN

2c. How often to inspect tie downs

A three-stage procedure is recommended to help ensure that tie downs are inspected with appropriate frequency.

Initial Inspection—Whenever a tie down is initially received, it must be inspected by a designated person to help ensure that the correct tie down has been received and is undamaged, and that the tie down meets applicable requirements for its intended use.

Frequent Inspection—Tie downs should be inspected by the person handling/using the tie down before every use.

Periodic Inspection—Every tie down should be inspected "periodically" by a qualified and designated person. The frequency of periodic inspections is based on the tie down's frequency of use, severity of service conditions, and experience gained during the inspection of other tie downs used in similar circumstances.

Tie down users should establish written inspection records to be kept on file.

3. Tie Downs Must be Adequately Protected From Damage

3a. Avoid environmental degradation

Environmental factors such as an exposure to sunlight, dirt or gritty-type matter and cyclical changes in temperature and humidity, can result in an accelerated deterioration of tie downs. The rate of this deterioration will vary with the level of exposure to these conditions and with the thickness of the tie down webbing. Tie downs that are used outdoors regularly should generally be permanently removed from service within a period of 2 to 4 years. All tie downs that are exposed to these conditions should be highly scrutinized during their inspections.

Visible indications of such deterioration can include the following:

- Fading of webbing color.
- Uneven or disoriented surface yarn of the webbing.
- Shortening of the tie down length.
- Reduction in elasticity and strength of the tie down material due to an exposure to sunlight, often evident by an accelerated abrasive damage to the surface yarn of the tie down.
- Breakage or damage to yarn fibers, often evident by a fuzzy appearance of the web.
- Stiffening of the web, which can become particularly evident when tie downs are exposed to outdoor conditions without being used or cyclically tensioned.

3b. Avoid actions that cause damage to tie downs

You should always avoid any action that causes the types of damage identified in the previous section of this Safety Bulletin, including (but not limited to):

- Dragging tie downs on the ground, floor or over abrasive surfaces.
- Pulling tie downs from under cargo when the cargo is resting on the tie down—place blocks under cargo if feasible.
- Shortening or adjusting tie down using methods not approved by the tie down manufacturer or qualified person.
- Twisting, kinking or knotting the tie down.
- Exposing tie downs to damaging acids or alkalis.
- Using tie downs or allowing exposure to temperatures above 194°F (90°C) or below -40°F (-40°C).
- Using the tie down with hardware that has edges or surfaces that could damage the tie down.
- Running/driving over tie downs with a vehicle or other equipment.

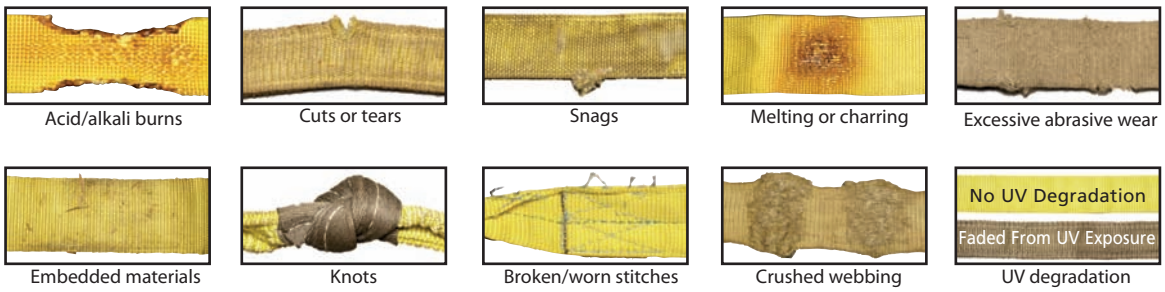
Tie downs are affected by some chemicals ranging from little to total degradation. Time, temperature and concentration factors affect the degradation. For specific applications, consult the manufacturer. In addition, water absorption can decrease a nylon tie down's strength by as much as 10–15% (its strength returns when the tie down dries completely). Consult a tie down manufacturer for specific application loss factors.

3c. Safeguard tie downs using protection

Synthetic tie downs can be damaged, abraded or cut as tension and compression between the tie down, the connection points and the cargo develops. Surfaces in contact with the tie down do not have to be very abrasive or have "razor" sharp edges in order to create the conditions for tie down failure. Therefore, **tie downs must ALWAYS be protected from being cut or damaged by corners, edges, protrusions or abrasive surfaces with protection sufficient for the intended purpose**.

There are a variety of types of ways to protect tie downs from such damage. A qualified person might select and use appropriate engineered protectors/softeners—commercially available products (e.g., sleeves, wear pads, edge wraps, body wraps, corner protectors, etc.) specifically designed to protect tie downs from damage. A qualified person might also design and construct their own methods of protection so long as the tie down is adequately protected from and/or kept off of the damaging edge surface.

Table 2. Types of damage you should look for in tie downs



Acid/alkali burns | Cuts or tears | Snags | Melting or charring | Excessive abrasive wear

Embedded materials | Knots | Broken/worn stitches | Crushed webbing | UV degradation

SYNTHETIC TIE DOWN SAFETY BULLETIN

Regardless of the particular method chosen, the goal is to ensure that the tie down, under tension, maintains its ability to secure a load while avoiding contact with damaging or abrasive surfaces. A qualified person must carefully consider the most appropriate means to accomplish this goal. The protection used should not be makeshift (i.e., selecting and using cardboard, work gloves or other such items based solely on convenience or availability).

Regardless of the approach taken, a qualified person must ensure that the protection method chosen is appropriate for the types of damage to which the tie downs will be exposed. For instance, some protection provides abrasion resistance but offers virtually no protection against cuts. Several "tests", done in a non-consequence setting, may be necessary to determine the suitability of the protection device(s). After each "test", the protection device(s) and tie down(s) need to be inspected for damage and suitability. You should also keep in mind that no protection is "cut proof" and you should always operate within the specified limits of the tie down and its accessories (e.g., fixtures, hardware, protection, etc.).

4. Always Use Tie Downs Properly

When using tie downs to secure cargo, a trained, qualified and knowledgeable user must take into account the factors and issues addressed in this bulletin, as well as considering any other relevant factors that may be appropriate. Among the factors related specifically to tie downs, users must perform several activities, including (but not limited to):

4a. Assess the cargo

Consider the nature, shape, weight of the cargo and the potential dynamic (G) forces that might be exerted on the cargo and the direction cargo may shift (forward, backward and sideways).

4b. Use an appropriate tie down system

Users must determine the number and location of tie downs required and select a suitable tie down (or set of tie downs) for the type of cargo, environment and the vehicle's anchor points. Users must identify the working load limit of the tie down(s) and the vehicle's anchor points. Tie down fittings must be the proper type, size and shape to attach properly to vehicle anchor points.

Consult the manufacturer's tag and/or other materials to determine the reduction in working load limit due to tie down configuration and angle. The effective downward pressure on a load will be reduced when the angle from the horizontal (tie down to trailer) is less than 90° (see Table 3 for the reduction in the effective downward pressure due to tie down angle).

4c. Do not misuse tie downs

Use tie downs for securing cargo only. NEVER use a tie down for towing purposes. NEVER use a tie down for lifting, lowering, or suspending objects.

5. Make Sure All Personnel are Clear of Cargo and Alert to Risks

Even if you account for all of the factors/issues discussed in this Safety Bulletin, things can still go wrong. Therefore, all personnel must be alert to potential risks associated with the use of tie downs.

The cargo must be securely blocked and stabilized before applying tension to or releasing the tie downs. Be especially careful when releasing tie downs, as cargo may have shifted (even slightly) during transport and could move or fall dangerously when tie downs are released—have a plan to be able to get out of the way if this should occur.

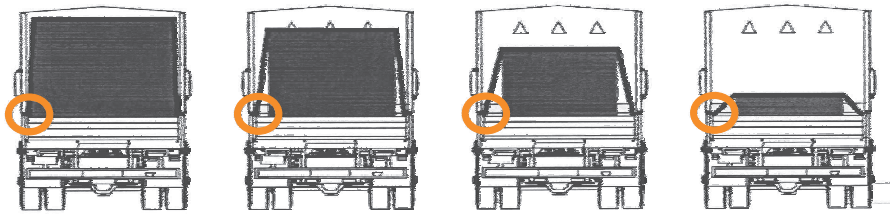
Users must secure their footing before using tie downs to prevent slipping or falling. Also, users must be alert to hazards resulting from tossing assemblies over the cargo.

6. Properly Store and Maintain Tie Downs

In order to prevent damage to tie downs, they should be stored in a cool, dry and dark location. Tie downs should also be stored in an area free from environmental or mechanical sources of damage, such as: weld spatter, splinters from grinding or machining, heat sources, chemical exposure, etc.

Tie downs should be kept clean and free of dirt, grime and foreign materials. Mild soap and water can be used to clean tie downs, but be sure to let the tie down dry completely before placing back in storage or use.

Table 3. Reduction in effective downward pressure as a result of tie down angle

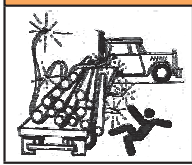


Angle	90°	60°	45°	30°
Effective Downward Pressure	100%	87%	71%	50%

BOLETÍN DE SEGURIDAD DE LOS AMARRES

BOLETÍN DE SEGURIDAD DE LOS AMARRES

⚠ ADVERTENCIA



Este boletín contiene importante información acerca de la seguridad y el uso de los amarres. No obstante, **NO CONTIENE** toda la información que usted necesita para poder manejar, elevar y manipular con seguridad los materiales y cargas. Es la responsabilidad de usted utilizar los amarres de manera segura y considerar todos los factores de riesgo antes de utilizar cualquier sistema de amarre. El no hacer esto podría resultar en **LESIONES** graves o **MUERTE** debido a una falla del amarre o pérdida de la carga.

Los seis puntos a continuación dan un resumen breve de importantes consideraciones de seguridad:

1. **Es necesario capacitar a todos** los usuarios en la selección de amarres, su uso y la manera de inspeccionarlos, así como las precauciones al personal, los efectos ambientales y las normas aplicables, los reglamentos y las prácticas de amarre.
2. **Inspeccionar el amarre** para detectar daños antes de cada uso y si se descubren, retirar el amarre de servicio.
3. **Proteger el amarre contra el daño**. SIEMPRE proteja los amarres en contacto con bordes, esquinas, salientes o superficies abrasivas con materiales dotados de suficiente resistencia y espesor, al igual que una construcción adecuada para prevenir el daño.
4. **No sobrepasar el límite de la carga de trabajo** del amarre; tenga en cuenta el amarre, la carga, los puntos de anclaje al vehículo, la configuración y ángulo de amarre, etc.
5. **Estar alerta al sujetar la carga**. Los usuarios deben estar alerta a los peligros cuando sujeten la carga.
6. **Mantener y almacenar los amarres** correctamente. Se debe proteger los amarres de daños mecánicos, químicos y ambientales.

1. Todos los usuarios de amarres deben ser capacitados y poseer los conocimientos necesarios

Todos los usuarios de amarres deben ser capacitados en el uso apropiado de las mismas, incluso en la selección e inspección, las precauciones al personal y los efectos ambientales. De acuerdo con la definición de la Web Sling & Tie Down Association (WSTDA) una "persona calificada" es:

> "quien, en virtud de poseer un título reconocido o certificado de profesionalismo en un campo aplicable, o quien, por sus amplios conocimientos, capacitación y experiencia, ha demostrado con éxito la capacidad de resolver problemas relacionados con la temática y el trabajo". (WSTDA T-1, página 2)

Es importante que todos los usuarios de amarres tengan conocimientos sobre el uso seguro y correcto, así como la aplicación de los amarres y las prácticas de carga, y que estén totalmente familiarizados con las recomendaciones del fabricante y los materiales de seguridad provistos con cada producto. Además, todos los usuarios de amarres necesitan estar conscientes de sus responsabilidades según su delineación en todas las normas industriales y reglamentos federales, estatales, provinciales y locales.

Si usted no está seguro si está correctamente capacitado o si tiene los conocimientos necesarios, o si no está seguro de lo que le requieren las normas y reglamentos, pídale información y/o capacitación a su empleador— **NO UTILICE** los amarres hasta que esté absolutamente seguro de lo que está haciendo. Recuerde, cuando se trata del uso de los amarres, la falta de habilidad, conocimientos y cuidado puede resultar en **LESIONES** graves o **MUERTE** para usted y otras personas.

2. Se debe inspeccionar los amarres adecuadamente y con regularidad

Hasta los daños aparentemente "menores" o leves sufridos por un amarre pueden reducir significativamente su capacidad de sostener los objetos, y así se aumenta la posibilidad de que el amarre falle durante el uso. Por eso, es muy importante que se inspeccionen los amarres con regularidad y en la forma apropiada. No existen en realidad daños "menores". Si usted no está seguro si un amarre está dañado, **NO LO USE**.

2a. Manera de inspeccionar de los amarres

Haga una inspección visual de todo el amarre a fin de detectar daños posibles. Inspeccione y toque el amarre para detectar la presencia de cualquier tipo de condiciones que figuran en la Tabla 1. La Tabla 2 presenta ejemplos de algunos tipos de daños, pero cabe notar que son ejemplos relativamente extremos que damos únicamente a modo de ilustración.

2b. ¿Qué es lo que se hace si se identifica algún daño en un amarre?

Si descubre CUALQUIERA de estos tipos de daños en un amarre, **retírelo de servicio inmediatamente**, aún si el daño no es tan extensivo como el de las fotografías en la Tabla 2. Los amarres que se retiran del servicio deben destruirse de tal modo que quedan totalmente inutilizables, puesto que no se permitirán reparaciones de la malla de los amarres, los accesorios, hebillas o costura/patrones de costura. La malla sintética de los amarres puede ser reelaborada y se puede seguir usando los accesorios existentes si el fabricante de los amarres determina que aquellos accesorios podrán ser utilizados de nuevo. Todos los amarres de malla reelaborada que utilizan accesorios serán sometidos a pruebas del 150% del límite de la carga de trabajo y luego se certifican. Nunca permita que se pase por alto el daño a un amarre, ni tampoco trate de realizarle reparaciones provisionales en campo (p. ej., hacer nudos en la malla, etc.).

Tabla 1. Criterios para el retiro de servicio de un amarre.

Todo el amarre debe inspeccionarse con regularidad y hay que **retirarlo de servicio** si se descubre CUALQUIERA de los siguientes problemas:

- Si falta el albarán o la etiqueta de identificación del amarre, o si es ilegible.
- Agujeros, roturas, cortes, enganchones o materiales incrustados.
- Costuras rotas o gastadas en los empalmes que sostienen la carga.
- Nudos en cualquier parte de la malla.
- Quemaduras ácidas o alcalinas.
- Derretimiento, carbonización o salpicaduras de la soldadura en cualquier parte de la malla.
- Excesivo desgaste abrasivo o malla aplastada.
- Señales de degradación por luz ultravioleta (UV).
- Deformación, picaduras en exceso, corrosión u otros daños a las hebillas o accesorios de extremos.
- Cualquier condición que haga dudar de la resistencia del amarre.

BOLETÍN DE SEGURIDAD DE LOS AMARRES

2c. Frecuencia de inspección de los amarres

Se recomienda un procedimiento de tres etapas para estar seguro de que se inspeccionan los amarres con la debida frecuencia.

Inspección inicial — A la recepción inicial de un amarre, la persona designada debe inspeccionarlo para poder asegurarse que se ha recibido el amarre correcto y sin daños, y que éste satisface los requisitos aplicables para el uso destinado.

Inspección frecuente — La persona a cargo del manejo y uso de los amarres los debe inspeccionar antes de cada uso.

Inspección periódica — Una persona designada y calificada debe realizar la inspección "periódica" de cada amarre. La frecuencia de las inspecciones periódicas se basa en la frecuencia de uso de los amarres, la intensidad de las condiciones de servicio, y la experiencia obtenida durante la inspección de otros amarres empleados en circunstancias semejantes.

Los usuarios de los amarres deben establecer registros por escrito de las inspecciones que se guardarán en archivo.

3. Se debe proteger los amarres adecuadamente de cualquier daño

3a. Evitar el deterioro ambiental

Los factores ambientales, tales como la exposición al sol, a la suciedad o materia abrasiva y los cambios cíclicos de temperatura y humedad, pueden resultar en una aceleración del deterioro de los amarres. La tasa de este deterioro variará conforme al grado de exposición a estas condiciones y al espesor del material del amarre. Generalmente, los amarres utilizados al aire libre deben retirarse del servicio permanentemente dentro de un plazo de 2 a 4 años. Todos los amarres expuestos a estas condiciones deben examinarse a fondo durante la inspección.

Algunos indicios visibles de dicho deterioro pueden comprender los siguientes:

- Decoloración de la malla.
- Hilo desparejo y desalineado en la superficie de la malla.
- Longitud acortada del amarre.
- Reducción en elasticidad y resistencia del material del amarre por haberse expuesto al sol, a menudo evidente por una aceleración en el daño abrasivo al hilo superficial del amarre.
- Fibras de hilo rotas o dañadas, a menudo evidente por una apariencia vellosa de la malla.
- Rigidez de la malla, la cual puede llegar a ser bastante evidente cuando los amarres se exponen al aire libre sin usarse ni someterse al ciclo de tensionado.

3b. Evitar acciones capaces de dañar los amarres

Se debe evitar siempre acciones que produzcan las clases de daño identificado en la sección anterior de este Boletín de Seguridad, incluyendo (pero sin limitarse a):

- Arrastrar los amarres en el suelo, piso o sobre superficies rugosas.
- Estirar a la fuerza aquellos amarres debajo de una carga, cuando ésta descansa sobre el amarre; de ser factible, se colocan bloques debajo de la carga.
- Acortar o ajustar el amarre, usándose métodos no aprobados por el fabricante del amarre o una persona calificada.
- Torcer, enredar o hacer nudos en el amarre.
- Exponer los amarres a ácidos o álcalis con el daño concomitante.
- Usar los amarres o permitir que se usen cuando la temperatura sube por encima de 194°F (90°C) o baja por debajo de -40°F (-40°C).
- Usar el amarre con accesorios con bordes o superficies que podrían dañar el amarre.
- Conducir o pasar por encima de los amarres con un vehículo u otro equipo.

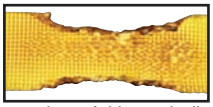
Algunos productos químicos afectan los amarres, desde un leve deterioro hasta una degradación total. Los factores de tiempo, temperatura y grado de concentración afectan el deterioro. Para usos específicos, comuníquese con el fabricante. Además, la absorción de agua puede reducir la resistencia de un amarre de nailon hasta entre el 10 y el 15% (la resistencia se recupera cuando el amarre se seca por completo). Para factores de pérdidas de algún uso en particular, comuníquese con el fabricante de amarres.

3c. Medidas de seguridad para los amarres

Los amarres sintéticos se pueden dañar, desgastar o cortar al desarrollarse la tensión y compresión entre el amarre, los puntos de unión y la carga. Las superficies en contacto con el amarre no necesitan ser muy abrasivas o tener bordes muy filosos para crear las condiciones de falla del amarre. Por lo tanto, **los amarres SIEMPRE se deben proteger contra cortes o daños causados por esquinas, bordes, salientes o superficies abrasivas, así como protegerse suficientemente para el propósito o uso destinado.**

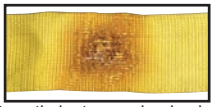
Existe una variedad de maneras para proteger los amarres de los daños mencionados. Una persona calificada podría escoger y utilizar los protectores/suavizadores técnicos apropiados, o sea, productos comercialmente disponibles (p.ej. mangas protectoras, almohadillas contra el desgaste, cantoneras, envolturas del cuerpo, esquineras, etc.), los cuales han sido diseñados específicamente para proteger los amarres contra daños. Asimismo, una persona calificada podría diseñar y construir sus propios métodos de protección siempre y cuando el amarre esté protegido adecuadamente y alejado de la superficie del borde dañado.

Tabla 2. Esté alerta a estos tipos de daños durante una inspección visual y táctil de los amarres.


Quemaduras ácidas o alcalinas


Cortes o roturas

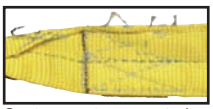

Enganchones


Derretimiento o carbonizado

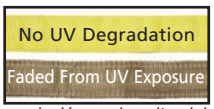

Excesivo desgaste abrasivo


Materiales incrustados


Nudos


Costuras rotas o gastadas


Malla aplastada



Degradación por luz ultravioleta

BOLETÍN DE SEGURIDAD DE LOS AMARRES

Independientemente del método elegido en particular, la meta es la de asegurar que el amarre bajo tensión mantiene la capacidad de sujetar la carga mientras evita el contacto con las superficies dañinas o abrasivas. Una persona calificada debe considerar con cuidado la manera más apropiada de lograr esta meta. La protección utilizada no debe ser precaria, p.ej., la selección y utilización de cartón, guantes industriales u otros artículos afines, únicamente debido a consideraciones de comodidad o disponibilidad.

Independientemente del método elegido, una persona calificada debe asegurar que el método de protección elegido sea apropiado para los tipos de daño a los que estarán expuestos los amarres. Por ejemplo, cierta protección brinda resistencia a la abrasión aunque virtualmente no brinda protección alguna contra cortes. Varias "pruebas" de elevación efectuadas en un entorno sin consecuencias adversas tal vez sean necesarias para determinar la idoneidad del dispositivo(s) de protección. Hace falta inspeccionar el dispositivo(s) de protección y el amarre(s) para detectar daños y determinar el grado de adecuación después de cada "prueba". Se debe tener en cuenta que no existe protección total "a prueba de cortes", por lo que se debe operar siempre dentro de los límites específicos del amarre y sus accesorios (p.ej., dispositivos, piezas y protección, etc.).

4. Siempre usar los amarres correctamente

En las operaciones de afianzar la carga, un usuario calificado y capacitado con los conocimientos necesarios debe tomar en cuenta los temas, problemas y factores tratados en este boletín, al igual que cualesquiera otros factores. Entre los factores especialmente pertinentes a los amarres, los usuarios deben realizar varias actividades, incluyendo (pero sin limitarse a):

4a. Evaluar la carga

Es necesario determinar la naturaleza, configuración, peso de la carga y las fuerzas dinámicas posibles (G) que sean ejercidas sobre la carga y la dirección de posible desplazamiento de la carga (adelante, atrás, y lateralmente).

4b. Usar un sistema de amarre apropiado

Los usuarios deben determinar el número de amarres requerido y su ubicación; luego, habrá que seleccionar un amarre o juego de amarres para el tipo de carga, el ambiente y los puntos de anclaje del vehículo utilizado. Los usuarios deben identificar el límite de la carga de trabajo del amarre(s) y los puntos de anclaje del vehículo. Los accesorios de amarre deben de ser del tipo, configuración y tamaño apropiados para una sujeción correcta a los puntos de anclaje del vehículo.

Consulte la etiqueta del fabricante y/u otros materiales para determinar la reducción en el límite de la carga de trabajo debido a la configuración y el ángulo del amarre. Se reducirá la presión efectiva descendente sobre una carga cuando el ángulo desde la horizontal (amarre al remolque) es menos de 90º (ver la Tabla 3 para la reducción en presión efectiva descendente debido al ángulo de amarre).

4c. No someter el amarre a usos indebidos

Sólo utilice los amarres para afianzar la carga. NUNCA utilice un amarre para el remolque. NUNCA utilice un amarre para levantar, bajar o suspender objetos.

5. Asegurar que todo el personal esté alejado de las cargas y alerta a los riesgos

Aun teniendo en cuenta todos los factores, temas o situaciones que se han tratado en este Boletín de Seguridad, pueden presentarse problemas. Por eso, es necesario todo el personal debe estar alerta a todos los riesgos potenciales asociados con el uso de los amarres.

La carga debe estar fijada de manera segura y estabilizada antes de aplicar tensión a los amarres o soltarlos. Es especialmente necesario tener mucho cuidado al soltar los amarres, puesto que es posible que la carga se haya desplazado (aunque el desplazamiento sea mínimo) durante el transporte y, al soltar los amarres, se podría mover o caer de manera peligrosa—hay que tener un plan previo para salirse de inmediato de ocurrir esto.

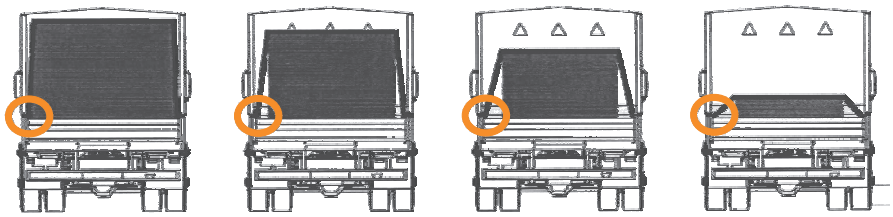
Antes de usar los amarres, los usuarios deben tener los pies en la posición correcta y segura para prevenir resbalamientos o caídas. Asimismo, los usuarios deben estar alerta a los peligros resultantes de tirar cualquier accesorio o montaje sobre la carga.

6. Manera correcta de almacenar y mantener los amarres

Para prevenir el daño a los amarres cuando no se usan, hay que almacenarlos en un lugar fresco, seco y oscuro. Los amarres deben almacenarse en un área libre de fuentes de daño ambiental o mecánico, tales como salpicaduras de soldadura, astillas del esmerilado o fresado, fuentes de calor, una exposición a productos químicos, etc.

Hay que conservar los amarres limpios y libres de suciedad, mugre o materia extraña. Un jabón suave y agua pueden usarse para limpiar los amarres, pero procure que los amarres se sequen completamente antes de almacenarlos o usarlos de nuevo.

Tabla 3. Reducción en presión efectiva descendente como resultado del ángulo de amarre



Angulo	90°	60°	45°	30°
Presión efectiva descendente	100%	87%	71%	50%

Tie Down Selection and Safety Information

The following information is designed to help you choose the right equipment to secure your cargo. If you are unsure about a particular product or application, please contact us. Product manuals and information that accompanies our products provide valuable information about installation, operation and specifications. Always read manuals and product warnings before using products. The most current product manuals and other reference materials are available at our Website www.lift-it.com or by contacting us.

Product Selection

It is the user's responsibility to evaluate the suitability of any cargo securing product for their particular application. Use of cargo control products in an unsuitable manner may result in a failure of your cargo control system or unsecured cargo. **Cargo control system failure can result in cargo damage and injury or death to you, a bystander or another driver.**

All products shown in this catalog are designed and intended to be used only as cargo securing devices. Products are not to be used for lifting.

All tie down products shall be used in accordance with local, state, federal and industry regulations.

Work Load Limit Considerations

Work Load Limit information provided in this catalog is intended to help you make decisions when selecting your cargo control system. Equipment overload can result in cargo control system failure. When considering the Work Load Limit remember:

All Work Load Limits are for products in a new or as new condition.

Age, wear or damage to any tie down system can greatly reduce its strength. To ensure your system is working at capacity, always inspect prior to each use.

Load directions other than straight can result in a significant reduction in Work Load Limit. Unless otherwise specified, all Work Loads are based on a straight tensile pull.

Your cargo control system is only as strong as its weakest link. The ratings shown in this catalog are based on using track, beams, webbing and hardware as a system. Cargo control products must be attached to securing points of equal or greater strength to maintain the established Work Load Limits.

Determining Your Work Load Limit

When designing a cargo control system using component pieces always select components that meet your required Work Load Limits. Your cargo control system is only as strong as its weakest link. For example, if you have: webbing with a Work Load Limit of 4,000 Lbs., a ratchet buckle with a Work Load Limit of 3,670 Lbs. and end fittings with a Work Load Limit of 1,670 Lbs., and these components are sewn together using a sew pattern with a 2,000 Lbs. Work Load Limit, then the Work Load Limit of the system is only 1,670 Lbs. The strength of the sew pattern must support the required Work Load Limit. The only way to determine the strength of a sew pattern is to properly test it. The WSTDA (Web Sling & Tie Down Association) has established recommended practices for proper test methods. Preassembled Lift-It® cargo control systems are always sewn to support the stated Work Load Limit. Never use Lift-It® Tie Down components for lifting applications.

Note: All Work Load Limits shown in this catalog are based on 1/3 the break strength of the component or assembly in a new or as new condition.

Tensioning of Cargo Control Equipment

To avoid over tensioning, always select and use specified equipment to tighten our products. Equipment compatibility is described in this catalog. This equipment has been designed to avoid over tensioning. Use of any unspecified leverage increasing device, such as a cheater bar, can generate enough force to break a piece of cargo control equipment. The release of the energy when a piece of cargo control equipment breaks can cause serious injury or death to you or bystanders. If you are having difficulty securing a load, make sure your cargo control equipment is in working order or readjust and/or reposition your load.

PRODUCT SPECIFIC SAFETY STATEMENTS

Winches and Winch Bars

⚠ WARNING When tightening or loosening winches, always maintain a firm grip on the winch bar. Never release a winch bar without checking the pawl to ensure that it is fully engaged between ratchet teeth. Releasing a winch bar without the pawl being properly engaged can cause serious injury or death to the user or bystanders. Use slip resistant, handled winch bars, specifically designed to tighten or loosen winches. Winch bars shall be used to tension and release tie down assemblies. Use of any unspecified leverage increasing device, such as a cheater bar, can generate enough force to break a piece of cargo control equipment. The release of energy when a piece of cargo control equipment breaks can cause serious injury or death to you or bystanders. User shall stand clear of the winch bar handle during operation of the winch bar in case the winch bar slips. The tip of the winch bar shall be inserted through both holes in the winch end cap to prevent the winch bar from "slipping out" and overloading the tip and/or end cap. Winches shall not be loaded in excess of their Work Load Limit. Winches shall not be used as a pulling or lifting device. A minimum of 12" of webbing shall be inserted through the slot, and a minimum of two (2) wraps shall be on the winch mandrel.

Caution: Excessive wraps of webbing on the mandrel will reduce the Work Load Limit of the winch.

Strap Assemblies

⚠ WARNING Webbing straps must be protected when used on rough or damaging objects. Straps that are cut, worn or damaged shall not be used and shall be replaced immediately. All strap assemblies shall be inspected prior to each use. The use of "Cheater Bars" or other means of increasing leverage on a ratchet buckle handle or winch, other than an approved device, can cause serious injury to the user and/or bystander. Webbing straps are rated for use at temperatures from 194°F/90°C to -40°F/C.

Chain Products

⚠ WARNING Never over tension chain binders. Refer to product descriptions for proper tensioning accessories. Use of any unspecified leverage increasing device, such as a cheater bar, can generate enough force to break a piece of cargo control equipment. The release of energy when a piece of cargo control equipment breaks can cause serious injury or death to you or bystanders. If you are having difficulty securing a load, make sure your cargo control equipment is in working order or readjust and/or reposition your load. Work Load Limits and strength standards for chain products comply with National Association of Chain Manufacturers (NACM) Welded Steel Chain Specifications. Do not exceed Work Load Limits.

Tarp Ties

⚠ WARNING Rubber Ropes and Tarp Ties are not designed to hold a load in place. Failure to properly secure a load can lead to cargo damage, injury or death.

Logistic Straps and Track Fittings

⚠ WARNING Series E, A or F fittings are designed for use with Kinedyne Logistic Track. Load ratings may be reduced when used with other tracks or if the track fitting is not positively engaged. Your cargo control system is only as strong as its weakest link. All ratings for series E and A fittings are based on use with Kinedyne 11 gauge track. Note: Several types of Kinedyne track are not made with 11 gauge steel.

Logistic Track

⚠ WARNING Welding galvanized material will form toxic fumes. Welding shall be done with adequate ventilation.

Tie Down Assemblies

Lift-It® Tie Down Assemblies are easy to use and quickly tighten to the contour of the load. Typical applications include: rail, truck, ship, aerospace and manufacturing.

Lift-It® Tie Down Assemblies are fabricated with high strength nylon or polyester webbing that has been treated for abrasion resistance. Webbing widths of 1", 1-3/4", 2", 3" and 4" are available, resulting in assembly Work Loads ranging from 166 to 8,000 Lbs. Tie Down assemblies with greater capacities are available. Buckles and fittings are fabricated from the finest materials and are treated for corrosion resistance.

TIE DOWN ASSEMBLY OPTIONS

SLEEVES



See pages 51 and 52

BUCKLE PROTECTOR PADS



MATERIAL- Webbing
ORDER CODE - BPP

LOOPS (FLAT)

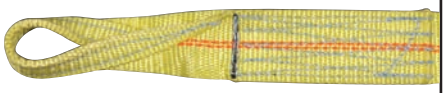


Standard Loop Length- 4 inches
ORDER CODE – FL

IMPORTANT DETAILS TO CONSIDER:

- End fittings face down, unless otherwise specified.
- All Type 3 Assemblies feature an extra 6 inches of Webbing for a pull tab.
- Specified lengths include fittings.
- All dimensions are approximate and are subject to change without notice.

LOOPS (HALF TWIST & TAPERED)



Standard Loop Length- 6 inches
ORDER CODE – HTT

REGULATORY RESOURCES

WHERE TO FIND ADDITIONAL INFORMATION

This Bulletin does not provide you with all the information you need to know in order to be considered trained and knowledgeable about securing cargo and using tie downs, but it does provide important information about the use of tie downs. If you need more information about tie downs or your responsibilities according to regulations and standards, talk to your employer. You and your employer can consult a number of sources of information to help ensure that you are properly knowledgeable and trained when using tie downs, including (but not limited to):

- WSTDA-T-1—Recommended Standard Specification for Synthetic Web Tie Downs.
- WSTDA-T-2—Recommended Operating and Inspection Manual for Synthetic Web Tie Downs.
- Protection Against Shifting and Falling Cargo. 49 CFR 393-100-393.136 U.S. Department of Transportation
- Understanding the Federal Motor Carrier Safety Administration's Cargo Securement Rules. U.S. Department of Transportation Publication No.: MC-P/PSV-04-001. http://fmcsa.dot.gov/documents/cargo/cs-policy.pdf
- FMCSA Final Rule on Cargo Securement. U.S. Department of Transportation http://www.fmcsa.dot.gov/cargosecurement.pdf
- CCMTA National Safety Code Standard 10 Cargo Securement http://www.ccmta.ca/english/pdf/Standard%2010.pdf
- Interpretation Guide for CCMTA NSC 10 http://www.ccmta.ca/english/committees/cra/cargo/pdf/interpretationguide.pdf
- Manufacturer's catalog, manual, website, bulletins, etc.
- Formal Training provided by manufacturers or other outside entities.

DÓNDE ENCONTRAR INFORMACIÓN ADICIONAL

Este boletín no pretende darle toda la información que necesita saber para considerarse capacitado y con los conocimientos necesarios para sujetar la carga y utilizar los amarres, pero sí presenta información importante sobre el uso de los amarres. En caso de necesitar más información sobre los amarres y sus responsabilidades según los reglamentos y normativas, consulte con su empleador. Usted y su empleador pueden consultar una variedad de fuentes informativas para poder asegurar que usted ha sido correctamente capacitado con los conocimientos necesarios para el uso de los amarres, incluyendo (pero sin limitarse a):

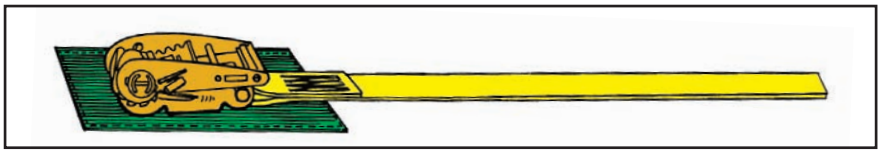
- WSTDA-T-1 — Especificación normalizada recomendada para amarres de malla sintética.
- WSTDA-T-2 —Manual de operación e inspección recomendado para amarres de malla sintética.
- Protección contra la caída o el desplazamiento de la carga. 49 CFR 393.100-393.136 Departamento de Transporte de los EE.UU.
- Manera de entender las reglas sobre la sujeción de las cargas de la Administratión Federal de Seguridad de Vehículos Automotores. Departamento de Transporte de los EE.UU. N° de Publicación: MC-P/PSV-04-001. http://fmcsa.dot.gov/documents/cargo/cs-policy.pdf
- Regla final FMCSA sobre la sujeción de cargas Departamento de Transporte http://www.fmcsa.dot.gov/cargosecurement.pdf
- Código de Seguridad Nacional CCMTA, Normativa 10, Sujeción de Cargas http://www.ccmta.ca/english/pdf/Standard%2010.pdf
- Guía de Interpretación para CCMTA NSC 10 http://www.ccmta.ca/english/committees/cra/cargo/pdf/interpretationguide.pdf
- Catálogo, manual, sitio web, boletines, etc. del fabricante
- Capacitación formal provista por los fabricantes y otras entidades externas.

HOW TO ORDER

To construct a tie down assembly with various combinations of buckles and fittings, select the assembly type and follow the necessary steps to construct the assembly stock number.

TYPE 1

A one piece assembly with a buckle or fitting attached to one end.



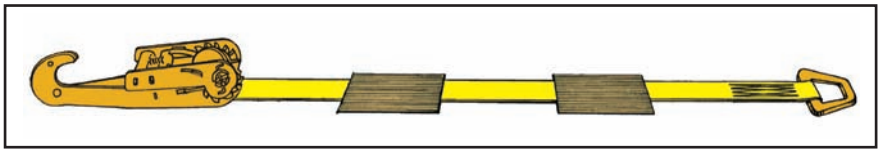
STEPS

A. Specify assembly Type 1.
B. Select buckle or fitting.
C. Specify overall length in feet.
D. Specify options.

STEP A Specify assembly type.		STEP B Select buckle or fitting.		STEP C Specify overall length in feet.		STEP D Specify options (sleeves or buckle protector pad).
1	–	2A	–	12	–	BPP
Assembly Type		Buckle or Fitting		Overall Length (Feet)		Options

TYPE 2

An assembly with a buckle or fitting attached to each end.



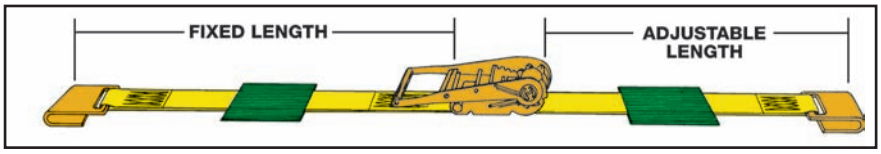
STEPS

A. Specify assembly Type 2.
B. Select buckle or fitting.
C. Specify overall length in feet.
D. Select buckle or fitting for opposite end.
E. Specify options.

STEP A Specify assembly type.		STEP B Select buckle or fitting.		STEP C Specify overall length in feet.		STEP D Select buckle or fitting for opposite end.		STEP E Specify options.
2	–	2B	–	12	–	3F	–	2 EA. CODE LS4 AT 6 IN.
Assembly Type		Buckle or Fitting		Overall Length (Feet)		Buckle or Fitting		Options with lengths specified in inches.

TYPE 3

An assembly consisting of three pieces of hardware, a buckle/tightener located between two fittings.

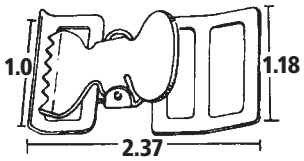


STEPS

A. Specify assembly Type 3.
B. Select fitting for the fixed end.
C. Specify fixed length in inches. (Standard length is 18 inches)
D. Select buckle.
E. Specify adjustable length in feet.
F. Select fitting for the adjustable end.
G. Specify options.

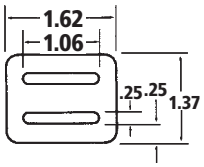
STEP A Specify assembly type.		STEP B Select fitting for fixed end.		STEP C Specify fixed length in inches.		STEP D Select buckle.		STEP E Specify adjustable length in feet.		STEP F Select fitting for adjustable end.		STEP G Specify options.
3	–	3G	–	36	–	3A	–	03	–	3G	–	2 EA. CODE WS4 AT 6 IN.
Assembly Type		Fitting Fixed End		Fixed Length (Inches)		Buckle		Adjustable Length (Feet)		Fitting Adjustable End		Options with lengths specified in inches.

ALLIGATOR SNAP (ORDER CODE 1A)



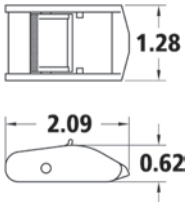
WORK LOAD LIMIT 50 LBS.
UNIT WEIGHT .09 LBS.

ADJUSTER (ORDER CODE 1B)



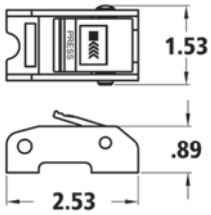
WORK LOAD LIMIT 500 LBS.
UNIT WEIGHT .05 LBS.

CAM BUCKLE (DIE CAST) (ORDER CODE 1C)



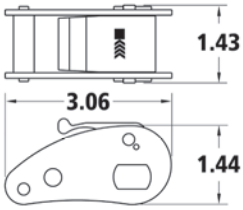
WORK LOAD LIMIT 235 LBS.
UNIT WEIGHT .13 LBS.

CAM BUCKLE (ORDER CODE 1D)



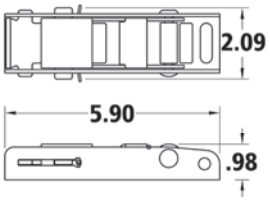
WORK LOAD LIMIT 400 LBS.
UNIT WEIGHT .27 LBS.

CAM BUCKLE (ORDER CODE 1E)



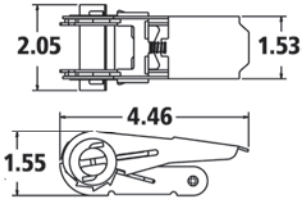
WORK LOAD LIMIT 835 LBS.
UNIT WEIGHT .44 LBS.

OVERCENTER BUCKLE (ORDER CODE 1F)



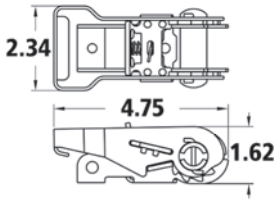
WORK LOAD LIMIT 1000 LBS.
UNIT WEIGHT .70 LBS.

RATCHET BUCKLE (ORDER CODE 1G)



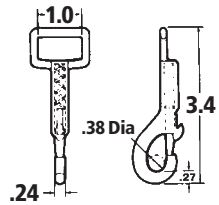
WORK LOAD LIMIT 500 LBS.
UNIT WEIGHT .51 LBS.

RATCHET BUCKLE (ORDER CODE 1H)



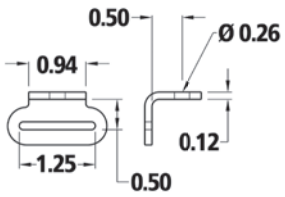
WORK LOAD LIMIT 1100 LBS.
UNIT WEIGHT .74 LBS.

SNAP HOOK (ORDER CODE 1J)



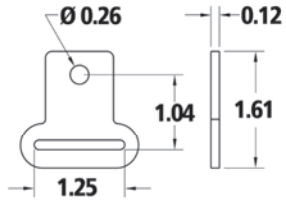
WORK LOAD LIMIT 166 LBS.
UNIT WEIGHT .10 LBS.

STRAP END (BENT) (ORDER CODE 1K)



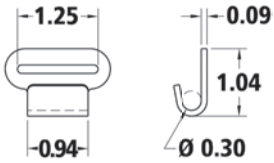
WORK LOAD LIMIT 250 LBS.
UNIT WEIGHT .06 LBS.

STRAP END (ORDER CODE 1L)



WORK LOAD LIMIT 335 LBS.
UNIT WEIGHT .05 LBS.

FLAT HOOK (ORDER CODE 1M)



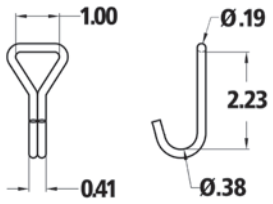
WORK LOAD LIMIT 235 LBS.
UNIT WEIGHT .04 LBS.

"S" HOOK (VINYL COATED) (ORDER CODE 1N)



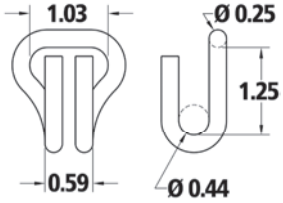
WORK LOAD LIMIT 1000 LBS.
UNIT WEIGHT .39 LBS.

"U" HOOK (ORDER CODE 1P)



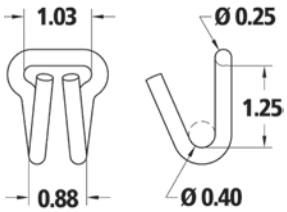
WORK LOAD LIMIT 167 LBS.
UNIT WEIGHT .07 LBS.

NARROW HOOK (ORDER CODE 1Q)



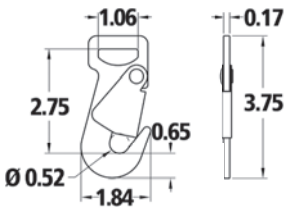
WORK LOAD LIMIT 1000 LBS.
UNIT WEIGHT .10 LBS.

WIDE HOOK (ORDER CODE 1R)



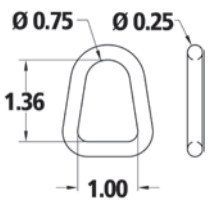
WORK LOAD LIMIT 1000 LBS.
UNIT WEIGHT .10 LBS.

KEEPERED HOOK (ORDER CODE 1S)



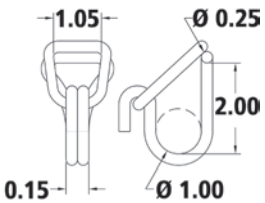
WORK LOAD LIMIT 1835 LBS.
UNIT WEIGHT .22 LBS.

D RING (ORDER CODE 1T)



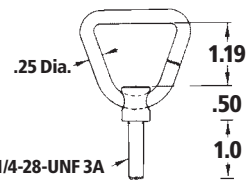
WORK LOAD LIMIT 1670 LBS.
UNIT WEIGHT .08 LBS.

HOOK AND KEEPER (ORDER CODE 1W)



WORK LOAD LIMIT 3000 LBS.
UNIT WEIGHT .30 LBS.

RING AND STUD (ORDER CODE 1X)



WORK LOAD LIMIT 600 LBS.
UNIT WEIGHT .25 LBS.

⚠ WARNING

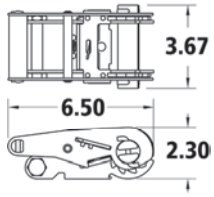


Webbing straps must be protected when used on rough or damaging objects. Straps that are cut, worn or damaged shall not be used and shall be replaced immediately. All Tie Down Assemblies shall be inspected prior to each use.

All Dimensions are expressed in inches and are approximate. Dimensions are subject to change without notice.

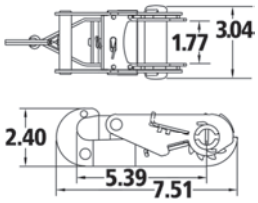
⚠ WARNING **See Pages 363-370 for Important Safety, Use and Inspection Information.**

RATCHET BUCKLE (ORDER CODE 2A)



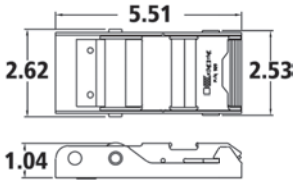
WORK LOAD LIMIT 3,670 LBS.
UNIT WEIGHT 2.25 LBS.

RATCHET HOOK END - 1-3/4" (ORDER CODE 2B)



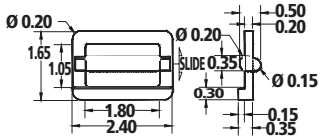
WORK LOAD LIMIT 2,000 LBS.
UNIT WEIGHT 1.80 LBS.

OVERCENTER BUCKLE (ORDER CODE 2C)



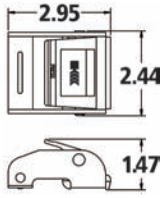
WORK LOAD LIMIT 1,100 LBS.
UNIT WEIGHT .64 LBS.

WEBBING ADAPTER - 1-3/4" (ORDER CODE 2E)



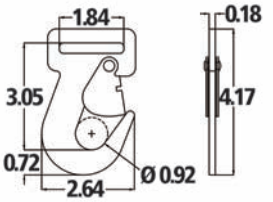
WORK LOAD LIMIT 833 LBS.
UNIT WEIGHT .19 LBS.

CAM BUCKLE (ORDER CODE 2F)



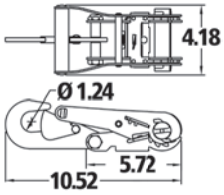
WORK LOAD LIMIT 835 LBS.
UNIT WEIGHT .58 LBS.

KEEPERED HOOK (ORDER CODE 2G)



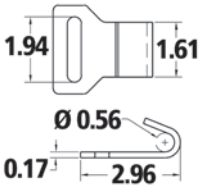
WORK LOAD LIMIT 2,000 LBS.
UNIT WEIGHT .37 LBS.

RATCHET HOOK END - 2" (ORDER CODE 2H)



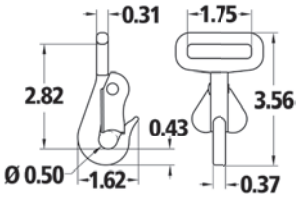
WORK LOAD LIMIT 3,670 LBS.
UNIT WEIGHT 2.41 LBS.

FLAT HOOK (ORDER CODE 2J)



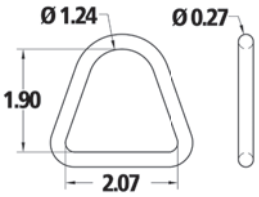
WORK LOAD LIMIT 1,835 LBS.
UNIT WEIGHT .40 LBS.

BUTTERFLY SNAP (ORDER CODE 2K)



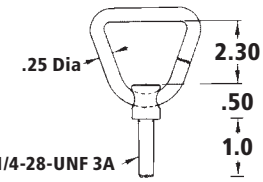
WORK LOAD LIMIT 1,670 LBS.
UNIT WEIGHT .36 LBS.

D RING - WIRE (ORDER CODE 2L)



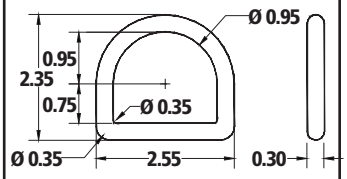
WORK LOAD LIMIT 1,670 LBS.
UNIT WEIGHT .10 LBS.

RING & STUD (ORDER CODE 2M)



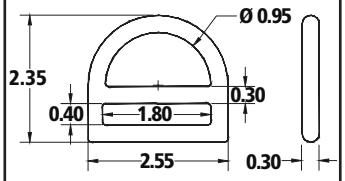
WORK LOAD LIMIT 833 LBS.
UNIT WEIGHT .13 LBS.

D RING - FORGED (ORDER CODE 2N)



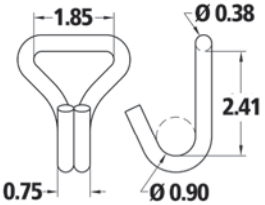
WORK LOAD LIMIT 1,666 LBS.
UNIT WEIGHT .15 LBS.

D RING - FORGED - 1-3/4" (ORDER CODE 2P)



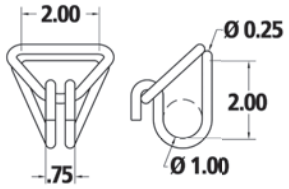
WORK LOAD LIMIT 1,666 LBS.
UNIT WEIGHT .22 LBS.

WIRE HOOK (ORDER CODE 2Q)



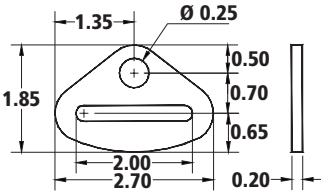
WORK LOAD LIMIT 1,670 LBS.
UNIT WEIGHT .38 LBS.

HOOK & KEEPER (ORDER CODE 2S)



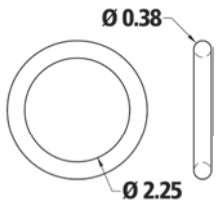
WORK LOAD LIMIT 1,670 LBS.
UNIT WEIGHT .28 LBS.

STRAP END - 1-3/4" (ORDER CODE 2T)



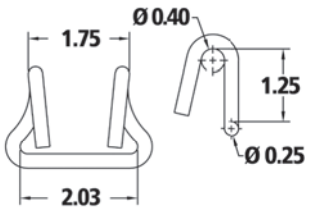
WORK LOAD LIMIT 833 LBS.
UNIT WEIGHT .15 LBS.

WIRE RING (ORDER CODE 2W)



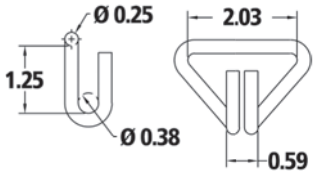
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .26 LBS.

WIDE HOOK (ORDER CODE 2X)



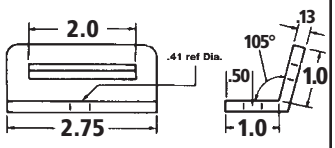
WORK LOAD LIMIT 835 LBS.
UNIT WEIGHT .11 LBS.

NARROW HOOK (ORDER CODE 2Y)



WORK LOAD LIMIT 835 LBS.
UNIT WEIGHT .12 LBS.

STRAP END - BENT (ORDER CODE 2Z)



WORK LOAD LIMIT 433 LBS.
UNIT WEIGHT .16 LBS.

⚠ WARNING

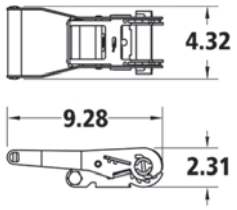


Webbing straps must be protected when used on rough or damaging objects. Straps that are cut, worn or damaged shall not be used and shall be replaced immediately. All Tie Down Assemblies shall be inspected prior to each use.

All Dimensions are expressed in inches and are approximate. Dimensions are subject to change without notice.

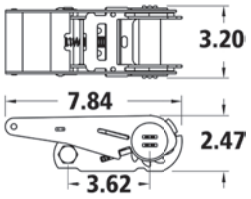
⚠ WARNING **See Pages 363-370 for Important Safety, Use and Inspection Information.**

RATCHET BUCKLE (ORDER CODE 3A) LONG/WIDE HANDLE



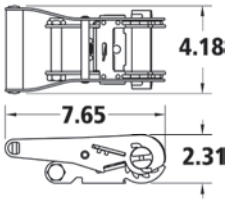
WORK LOAD LIMIT 3,670 LBS.
UNIT WEIGHT 2.44 LBS.

RATCHET BUCKLE (ORDER CODE 3B) LONG/NARROW HANDLE



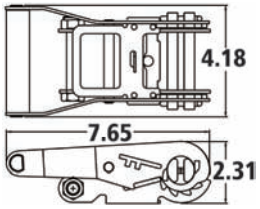
WORK LOAD LIMIT 3,750 LBS.
UNIT WEIGHT 2.57 LBS.

RATCHET BUCKLE (ORDER CODE 3C) STANDARD/WIDE HANDLE



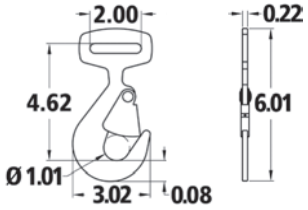
WORK LOAD LIMIT 3,670 LBS.
UNIT WEIGHT 2.41 LBS.

RATCHET BUCKLE (ORDER CODE 3D) STANDARD/WIDE RELEASE



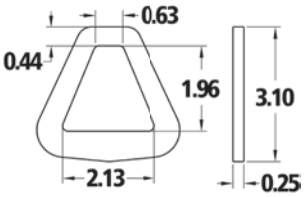
WORK LOAD LIMIT 3,670 LBS.
UNIT WEIGHT 2.41 LBS.

KEEPERED HOOK (ORDER CODE 3E)



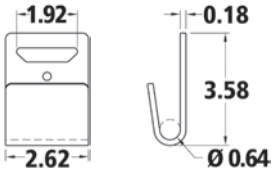
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .69 LBS.

DELTA RING (ORDER CODE 3F)



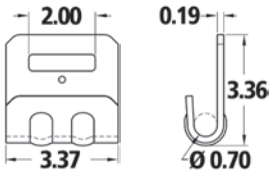
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .32 LBS.

FLAT HOOK (ORDER CODE 3G)



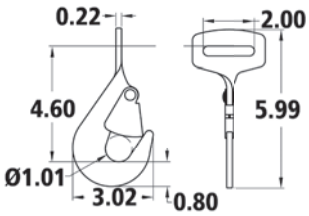
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .68 LBS.

FLAT HOOK - HVY. DUTY (ORDER CODE 3H)



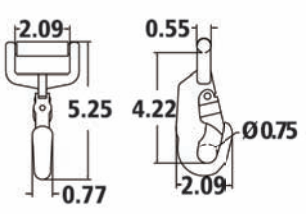
WORK LOAD LIMIT 4,000 LBS.
UNIT WEIGHT .90 LBS.

TWISTED HOOK (ORDER CODE 3J)



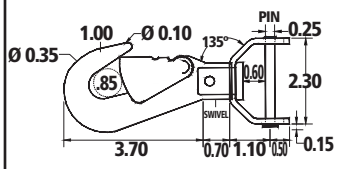
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .70 LBS.

SNAP HOOK - FORGED (ORDER CODE 3K)



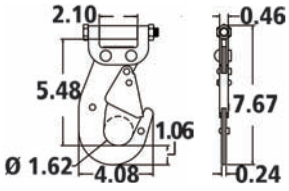
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .93 LBS.

SNAP HOOK - SWIVEL (ORDER CODE 3L)



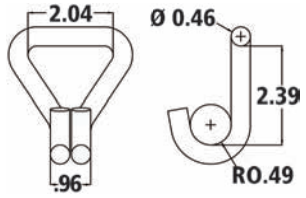
WORK LOAD LIMIT 1,666 LBS.
UNIT WEIGHT .85 LBS.

SNAP HOOK - PIVOT (ORDER CODE 3M)



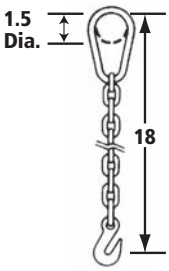
WORK LOAD LIMIT 3,335 LBS.
UNIT WEIGHT .70 LBS.

NARROW HOOK (ORDER CODE 3N)



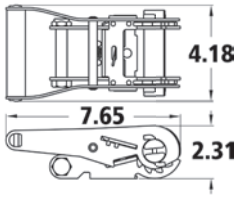
WORK LOAD LIMIT 3,700 LBS.
UNIT WEIGHT .62 LBS.

2" CHAIN ANCHOR (ORDER CODE 3Q)



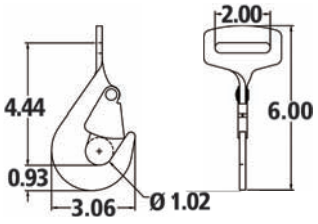
WORK LOAD LIMIT 5,400 LBS.
UNIT WEIGHT 3.30 LBS.

STAINLESS RATCHET (ORDER CODE 3T)



WORK LOAD LIMIT 2,935 LBS.
UNIT WEIGHT 2.91 LBS.

STAINLESS - TWISTED HOOK (ORDER CODE 3W)



WORK LOAD LIMIT 1,670 LBS.
UNIT WEIGHT .70 LBS.

⚠ WARNING



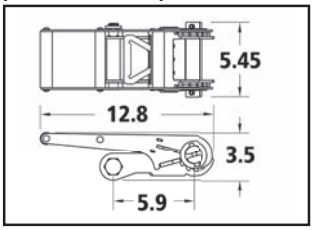
Webbing straps must be protected when used on rough or damaging objects. Straps that are cut, worn or damaged shall not be used and shall be replaced immediately. All Tie Down Assemblies shall be inspected prior to each use.

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⚠ WARNING **See Pages 363-370 for Important Safety, Use and Inspection Information.**

3 IN. RATCHET - LONG HANDLE (ORDER CODE 3S)

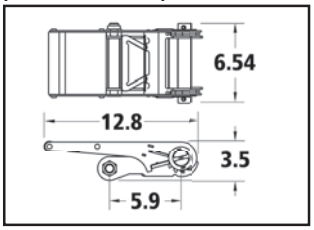




WORK LOAD LIMIT 5,670 LBS.
UNIT WEIGHT 7.09 LBS.

4 IN. RATCHET - LONG HANDLE (ORDER CODE 5R)

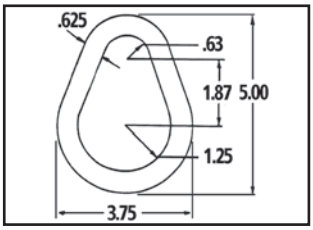




WORK LOAD LIMIT 8,000 LBS.
UNIT WEIGHT 8.17 LBS.

5/8" PEAR LINK (ORDER CODE 5W)

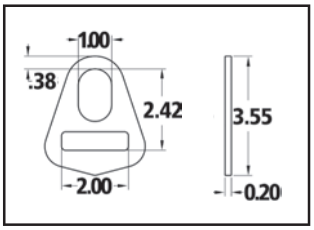




WORK LOAD LIMIT 8,400 LBS.
UNIT WEIGHT 1.10 LBS.

2 IN. FLAT DELTA (ORDER CODE 4X)

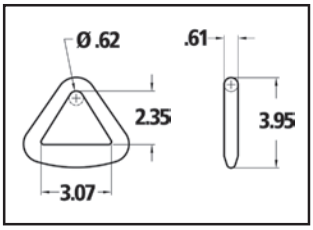




WORK LOAD LIMIT 5,400 LBS.
UNIT WEIGHT .28 LBS.

3" FORGED DELTA (ORDER CODE 3V)

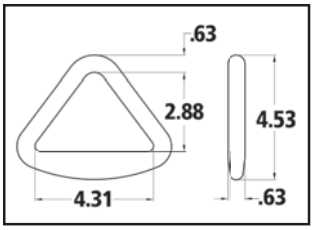




WORK LOAD LIMIT 6,000 LBS.
UNIT WEIGHT .80 LBS.

4" FORGED DELTA (ORDER CODE 4A)

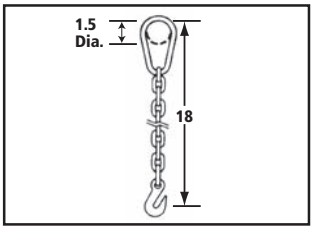




WORK LOAD LIMIT 6,670 LBS.
UNIT WEIGHT 1.25 LBS.

CHAIN ANCHOR (ORDER CODE 3Q)

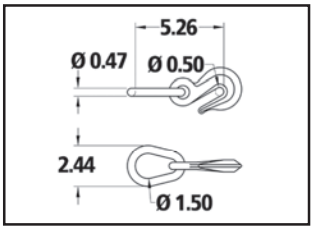




WORK LOAD LIMIT 5,400 LBS.
UNIT WEIGHT 3.76 LBS.

GRAB HOOK (5/16"-3/8") (ORDER CODE 3R)

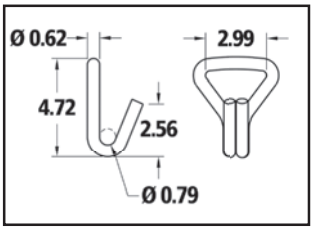




WORK LOAD LIMIT 5,400 LBS.
UNIT WEIGHT 1.40 LBS.

WIRE HOOK (ORDER CODE 3Z)

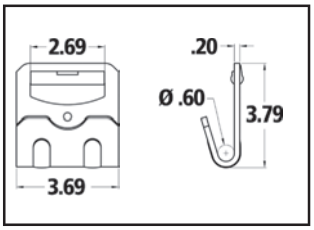




WORK LOAD LIMIT 7,333 LBS.
UNIT WEIGHT 1.40 LBS.

FLAT HOOK (ORDER CODE 3Y)





WORK LOAD LIMIT 5,400 LBS.
UNIT WEIGHT 1.09 LBS.

⚠ WARNING



Webbing straps must be protected when used on rough or damaging objects. Straps that are cut, worn or damaged shall not be used and shall be replaced immediately. All Tie Down Assemblies shall be inspected prior to each use.

All Dimensions are expressed in inches and are approximate. Dimensions are subject to change without notice.

⚠ WARNING **See Pages 363-370 for Important Safety, Use and Inspection Information.**

NAS Strap Assemblies

NAS 1212 and NAS 1213 Strap Assemblies are ordered by the stock number format shown.

NAS 1212 Assemblies do not include a buckle.

NAS 1213 Assemblies include a buckle.

The two, different NAS assemblies may be combined to form a complete assembly as shown below. All nylon webbing is military specification:
MIL-W-4088 or MIL-W-27265.

NAS 1383, 1384 and 1385 Assemblies are also available.

TABLE I - End Code

End Style	NAS Code Letter
	A
	B
	C
	D
	E
	H
	J
	K

TABLE II - Webbing Code

NAS Code	Web Width (Inches)	Work Load Limit (Lbs.)
10	1″	600
15	1-1/2″	700
20	2″	833

TABLE III - Web Color

NAS Code	Color
P	Natural
R	Olive Drab

NAS PART NUMBER EXAMPLES

NAS 1212 STRAPS

1 in. wide, olive drab, nylon strap with delta ring at one end and hook and keeper at opposite end.
48 inch length.



NAS 1212 R 10 AH 48

- 48 — Length (Inches)
- AH — End Style Code (Table I)
- 10 — Web Size Code (Table II)
- R — Web Color Code (Table III)

NAS 1213 STRAPS

2 in. wide, olive drab, nylon strap with a narrow hook one end and a cam buckle opposite end.
22 inch length.



NAS 1213 R 20 D 22

- 22 — Length (Inches)
- D — End Style Code (Table I)
- 20 — Web Size Code (Table II)
- R — Web Color Code (Table III)

COMPLETE ASSEMBLIES

For complete assemblies NAS 1212 portion must have one plain end, code letter J. Add 8 inches to the assembly length for the hand hold.

NAS 1213  NAS 1212

Please Note:

LOOP SIZE

Code Letter K (Loop end) accepts 1″ diameter object.

LENGTH TOLERANCES

Length is measured to the inside of rings and hooks; to the end of plain straps; to the tangent point of the pressure bar on buckles. Tolerance is + 1/4 in. up to 12 in. assembly length and/or + 1/2 in. over 12 in. assembly length.

⚠ WARNING See Pages 363-370 for Important Safety, Use and Inspection Information.

Dimensions are approximate and subject to change without notice.

1 Inch Pre-Assembled Tie Down Assemblies

Lift-It® Manufacturing offers a complete line of pre-assembled ratchet and utility straps. Popular models are featured for your ordering convenience. Standard overall lengths are 12 ft. and 20 ft.

You must specify the overall assembly length.

UTILITY TIE DOWN ASSEMBLIES

Stock No. HP
Work Load Limit-1,000 Lbs.
1H Ratchet
12' and 20' lengths



Stock No. QTH
Work Load Limit-1,000 Lbs.
1H Ratchet
1Q Narrow Hooks and 1T Delta Rings
12' and 20' lengths



Stock No. NH
Work Load Limit-735 Lbs.
1H Ratchet
1N "S" Hooks
12' and 20' lengths



Stock No. NE
Work Load Limit-400 Lbs.
1E Cam Buckle
1N "S" Hooks
12', 16' and 20' lengths



RECREATIONAL VEHICLE TIE DOWNS

Stock No. R15466 6' length
Work Load Limit-835 Lbs.
1E Cam Buckle 1N "S" Hooks
Built-in Soft Loop.





Stock No. R15468 6' length
Work Load Limit-835 Lbs.
1E Cam Buckle 1S Keepered Hook
1N "S" Hook Built-in Soft Loop





Stock No. R15469 6' length
Work Load Limit-1,000 Lbs.
1H Ratchet Buckle
1S Keepered Hook
1N "S" Hook Built-in Soft Loop





⚠ WARNING See Pages 363-370 for Important Safety, Use and Inspection Information.

Dimensions are approximate and subject to change without notice.

Ratchet Tie Down Assemblies

Lift-It® Ratchet Tie Down Assemblies satisfy most transportation tie down requirements and feature a standard 18 inch fixed end. Other fixed end lengths, configurations and strengths are available. Lift-It® Ratchet Tie Down Assemblies are labeled to comply with CVSA guidelines, CHP Standards, North American Cargo Securement Standards, DOT regulations and WSTDA Recommended Standard Specifications.

2" X 30 FT. WORK LOAD LIMIT – 1,666 LBS.

 Stock No. 5-3F-30 Unit Weight-5 lbs.	 Stock No. 5-2G-30 Unit Weight-5 lbs.	 Stock No. 5-LP-30 Unit Weight-5 lbs.
 Stock No. 5-2J-30 Unit Weight-5 lbs.	 Stock No. 5-3J-30 Unit Weight-6 lbs.	 Stock No. 5-2Q-30 Unit Weight-5 lbs.

2" X 30 FT. WORK LOAD LIMIT – 3,333 LBS.

 Stock No. 10-3F-30 Unit Weight-5 lbs.	 Stock No. 10-3E-30 Unit Weight-6 lbs.	 Stock No. 10-LP-30 Unit Weight-5 lbs.
 Stock No. 10-3G-30 Unit Weight-6 lbs.	 Stock No. 10-3J-30 Unit Weight-6 lbs.	 Stock No. 10-3N-30 Unit Weight-6 lbs.

3" X 30 FT. WORK LOAD LIMIT – 5,000 LBS.

 Stock No. 15-3V-30 Unit Weight-12 lbs.	 Stock No. 15-F7-30 Unit Weight-15 lbs.	 Stock No. 15-LP-30 Unit Weight-11 lbs.
 Stock No. 15-3Y-30 Unit Weight-13 lbs.	 Stock No. 15-T7-30 Unit Weight-15 lbs	 Stock No. 15-3Z-30 Unit Weight-14 lbs.

4" X 30 FT. WORK LOAD LIMIT – 6,666 LBS.

 Stock No. 20-4A-30 Unit Weight-16 lbs.	 Stock No. 20-F7-30 Unit Weight-21 lbs.	 Stock No. 20-LP-30 Unit Weight-13 lbs.
 Stock No. 15-3Y/5R-30* Unit Weight-15 lbs. * 5,000 Lbs. WLL	 Stock No. 20-T7-30 Unit Weight-21 lbs.	 Stock No. 20-3Z-30 Unit Weight-16 lbs.

TIE DOWN ASSEMBLIES

WARNING See Pages 363-370 for Important Safety, Use and Inspection Information.

Dimensions are approximate and subject to change without notice.

Truck Tie Down Assemblies

Manufactured from treated, polyester webbing, Lift-It® Truck Tie Down Assemblies are available in 3 inch and 4 inch web widths. Truck Tie Down Assemblies are lighter than chain or cable binders and are much easier to use and store. Polyester webbing is low stretch (approximately 3% at Work Load Limit) and webbing strength is unaffected by moisture. All loose ends are heat seared to prevent fraying. All Lift-It® Truck Tie Down Assemblies meet or exceed federal (DOT), state (CHP) and Commercial Vehicle Safety Alliance (CVSA) regulations and guidelines.

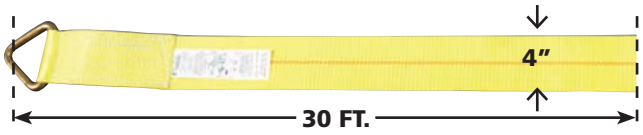
Work Load Limits for Truck Tie Down Assemblies are a function of web and fitting strength and sewing efficiencies. Generally, 3 Inch Truck Tie Down Assemblies are assigned a 4,000 Lbs. Work Load Limit. 4 Inch Truck Tie Down Assemblies are generally rated at 5,000 Lbs. Work Load Limit.

⚠ WARNING The CVSA regulations and guidelines allow permissible levels of damage to Tie Down Assemblies. Lift-It® and other responsible manufacturers stipulate ZERO TOLERANCE for damage. If Tie Down Assemblies of any width, used in any application exhibit damage as described on page 364, the Tie Down must not be used for any purpose.

HOW TO ORDER

1) Select fitting or end termination.
2) Specify webbing type. (A = 3 inch B = 4 inch).
3) Specify overall assembly length, expressed in feet.

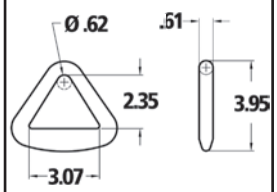
FITTING ORDER CODE	–	WEB TYPE	–	ASSEMBLY LENGTH (FT.)
4A	–	B	–	30





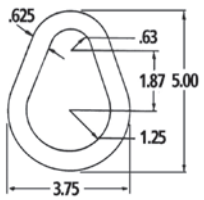
FITTING AND ACCESSORY INFORMATION

FORGED DELTA (ORDER CODE 3V) (3 INCH WEBBING)



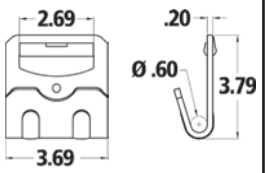
WORK LOAD LIMIT 6,000 Lbs.
UNIT WEIGHT .80 Lbs.

5/8" PEAR LINK (ORDER CODE 5W)



WORK LOAD LIMIT 8,400 Lbs.
UNIT WEIGHT 1.10 Lbs.

FLAT HOOK (ORDER CODE 3Y) (WITH KEEPER - 3YSP)



WORK LOAD LIMIT 5,400 Lbs.
UNIT WEIGHT 1.09 Lbs.

WEB WINDER (ORDER CODE 4C)

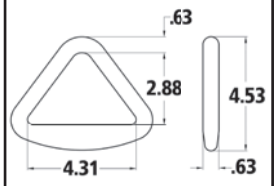


FOR 2", 3" & 4" WEB
UNIT WEIGHT 3.23

FABRIC LOOP (ORDER CODE 4B)

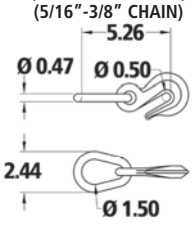


FORGED DELTA (ORDER CODE 4A)



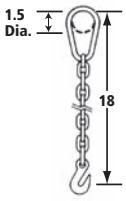
WORK LOAD LIMIT 6,670 Lbs.
UNIT WEIGHT 1.25 Lbs.

GRAB HOOK (ORDER CODE 3R) (5/16"-3/8" CHAIN)



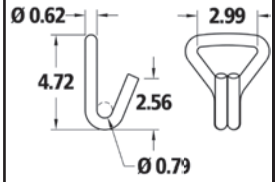
WORK LOAD LIMIT 5,400 Lbs.
UNIT WEIGHT 1.40 Lbs.

CHAIN ANCHOR (ORDER CODE 3Q)



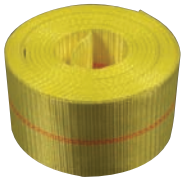
WUNIT WEIGHT 3.76 Lbs.

WIRE HOOK (ORDER CODE 3Z)



WORK LOAD LIMIT 7,333 Lbs.
UNIT WEIGHT 1.40 Lbs.

PLAIN ENDS (ORDER CODE P-B-30) (4 In. x 30 Ft.)



WORK LOAD LIMIT 5,000 Lbs.
UNIT WEIGHT 1.40 Lbs.

⚠ WARNING See Pages 363-370 for Important Safety, Use and Inspection Information.

Dimensions are approximate and subject to change without notice.

Cargo Winches

Lift-It® Cargo Winches feature high strength-to-weight ratios in adopting the lightweight design trends now incorporated in the surface transportation industry.

Lift-It® Cargo Winches are designed and manufactured using materials and techniques which provide the utmost in quality. Mandrels are cast, ratchets and pawls are flame cut from high strength steel and pawls are secured with alloy steel rivets. Lift-It® Cargo Winches comply with Federal (DOT), state (CHP) and Commercial Vehicle Safety Alliance (CVSA) guidelines and are subject to stringent quality control requirements. All Winches are produced as right-hand models; left-hand models are available. Some of the more popular models are available with galvanized finish. Unless otherwise stated the Work Load Limit for all winches is 5500 Lbs. Please note the orientation of the depicted Winches is done for illustration purposes and does not represent recommended installation.

STANDARD
STOCK NO. - 4G
The standard winch is for use with 4 inch webbing.



LOW PROFILE
STOCK NO. - 4K
Low Profile Winches, (Side-Mount) minimize trailer width.



COMBINATION
STOCK NO. - 4H
Combination Winches accept cable or web Tie Down Assemblies.



STANDARD – PORTABLE
STOCK NO. - 4J
Used when additional tie downs are needed.



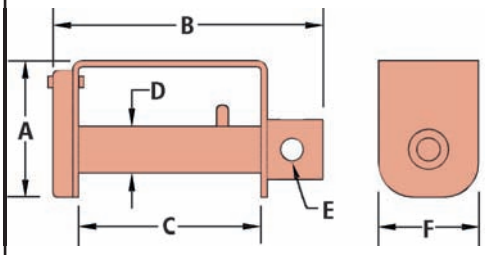
LOW PROFILE – PORTABLE
STOCK NO. - 4L
Portable, yet minimizes trailer width.



COMBINATION – PORTABLE
STOCK NO. - 4HP
Portable and accepts cable or web tie downs.



⚠WARNING **Remove and store Portable Winches when not in use. Portable Winches can fall off the vehicle during travel resulting in injury or death to other drivers or bystanders.**



CARGO WINCH DIMENSIONAL DATA (Inches)										
ORDER CODE	A	B	C	D	E	F	UNIT WEIGHT (Lbs.)		POST	SLOT
							STD.	PORT.		
4G / 4J	5.51	7.66	4.9	1.9	.94	3.54	8	9.4		XX
4K / 4L	4.33	7.68	4.9	1.9	.94	3.94	8.1	9.2		XX
4H / 4HP	5.71	9.50	6.5	1.9	.94	3.54	10.7	11.5	XX	XX

⚠WARNING When tightening or loosening winches, always maintain a firm grip on the winch bar. Never release a winch bar without checking the pawl to ensure that it is fully engaged between ratchet teeth. Releasing a winch bar without the pawl being properly engaged can cause serious injury or death to the user or bystanders. The use of slip resistant handle winch bar, specifically designed to tighten or loosen winches, is recommended. Winch bars shall be used to tension and release tie down assemblies. Use of any unspecified leverage increasing device, such as a cheater bar, can generate enough force to break a piece of cargo control equipment. The release of energy when a piece of cargo control equipment breaks can cause serious injury or death to you or bystanders. User shall stand clear of the winch bar handle during operation of the winch bar in case the winch bar slips. The tip of the winch bar shall be inserted through both holes in the winch end cap to prevent the winch bar from "slipping out" and overloading the tip and/or end cap. Winches shall not be loaded in excess of their Work Load Limit. Winches shall not be used as a pulling or lifting device. A minimum of 12" of webbing shall be inserted through the slot, and a minimum of two (2) wraps shall be on the winch mandrel.

Caution: Excessive wraps of webbing on the mandrel will reduce the Work Load Limit of the winch.

⚠WARNING SEE PAGES 363-370 FOR IMPORTANT SAFETY, USE AND INSPECTION INFORMATION.

ALL DIMENSIONS ARE APPROXIMATE AND SUBJECT TO CHANGE, WITHOUT NOTICE.



CHROME KNURLED WINCH BAR
Stock No. WB-1

One end tapered and angled for truck winch application. Knurled handle provides a positive grip.
Approximate Length – 32 inches.



CHROME COMBINATION BAR
Stock No. WB-2

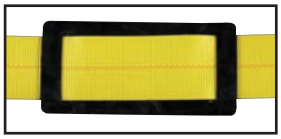
One end is tapered and angled for truck winch application. Opposite end features a special end fitting for chain binder application.
Approximate Length – 32 inches

⚠WARNING When tightening or loosening winches, always maintain a firm grip on the winch bar. Never release a winch bar without checking the pawl to ensure that it is fully engaged between ratchet teeth. Releasing a winch bar without the pawl being properly engaged can cause serious injury or death to the user or bystanders. Use slip resistant, handled winch bars, specifically designed to tighten or loosen winches. Winch bars shall be used to tension and release tie down assemblies. Use of any unspecified leverage increasing device, such as a cheater bar, can generate enough force to break a piece of cargo control equipment. The release of energy when a piece of cargo control equipment breaks can cause serious injury or death to you or bystanders. User shall stand clear of the winch bar handle during operation of the winch bar in case the winch bar slips. The tip of the winch bar shall be inserted through both holes in the winch end cap to prevent the winch bar from "slipping out" and overloading the tip and/or end cap. Flying Winch Bars are deadly projectiles that can cause injury, death and/or property damage.

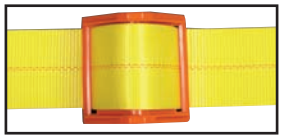
CORNER PROTECTORS

Corner protectors provide protection for webbing and cargo. Not for use with Slings. Order Codes 4D and 4E are for tie down applications only.
See pages 43-52 for additional protection devices.

STOCK NO. 4D
Web widths up to 4 inches.
Reinforced rubber sheet
Material thickness .18
Standard length - 12 inches.



STOCK NO. 4E
Web widths up to 4 inches.
Copolymer corner guard.

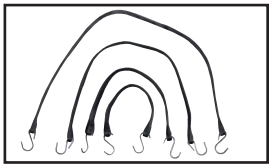


TARP STRAPS

- All natural rubber with negligible amounts of filler
- Exceptional UV resistance & cold weather working abilities
- Hooks are attached
- Superior tensile strength
- Packaged 50 pieces per pack

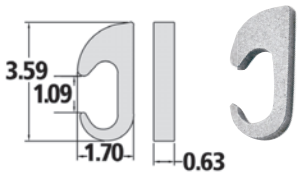
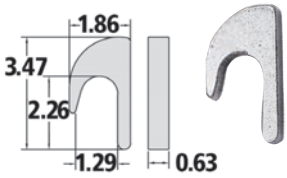
⚠WARNING
Use extreme caution when using tarp straps.
Snap back can cause severe injury or death.

STOCK NUMBER	STRAP LENGTH	LENGTH W/HOOKS	SPAN RANGE
RT9	9"	13"	15" - 20"
RT15	15"	19"	20" - 30"
RT21	21"	25"	30" - 40"
RT31	31"	35"	40" - 55"
RT41	41"	45"	50" - 60"



C & J HOOKS

Flame cut, 5/8" Steel.
Work Load Limit- 6,670 Lbs.
Note: Minimum welding requirements are 1/4" fillet weld, around entire contact surface and 1/8" penetration.

C HOOK ORDER CODE- C10002	J HOOK ORDER CODE C10003
	

RUBBER ROPE

High quality, solid core rubber rope is available in either 7/16 in. or 3/8 in. diameters. Packaged in 150 ft. rolls.

ORDER CODE RR3S-3/8" DIA.
ORDER CODE RR7S-7/16" DIA.



RUBBER ROPE HOOK ORDER CODE – RRSJ (100 per Carton)



⚠WARNING Rubber Rope and Tarp Straps are not designed to hold a load in place.
Failure to properly secure a load can lead to cargo damage, injury or death.
See Pages 363-370 for Important Safety, Use and Inspection Information.

Interior Van Strap Assemblies

Interior Van Strap Assemblies feature special purpose fittings for the restraint of cargo in trailers and vans equipped with logistic track.

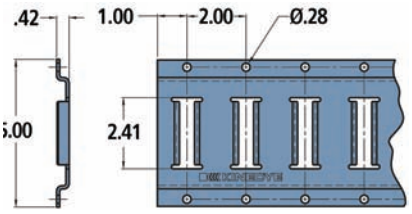
Series E and A Track are made from high strength (minimum yield 50,000 psi.), steel and is offered in standard 10 Ft. lengths. Galvanized or Power Coated Track must be specified. Track can be attached by screws, rivets or welding. Specific fastener size and/or mounting method should be determined by the vehicle manufacturer or qualified installer. Care should be taken to ensure that installation environments and materials do not create a potential for corrosion.

⚠WARNING Welding galvanized materials will form harmful toxic fumes. Welding must be done with adequate ventilation.

Interior Van Strap Assemblies have a standard 48 inch fixed length.
Standard assembly lengths are 12 ft., 16 ft. and 20 ft.
See page 371, How to Order to develop Interior Van Strap Assembly stock number.

TRACK

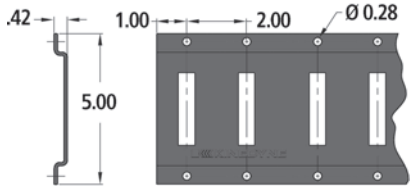
E TRACK HORIZONTAL
ORDER CODE 4MP-Power Coated
ORDER CODE 4MG- Galvanized





LENGTH – 10 Ft. Weight- 16.2 Lbs.
MATERIAL – 11 GAUGE

A TRACK HORIZONTAL
ORDER CODE 4PP-Power Coated
ORDER CODE 4PG- Galvanized



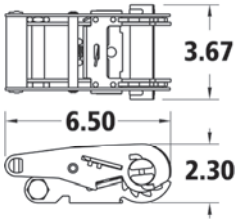


LENGTH – 10 Ft. Weight- 15.5 Lbs.
MATERIAL – 12 GAUGE

PLEASE NOTE: TRACK IS DISPLAYED VERTICALLY FOR ILLUSTRATION PURPOSES ONLY AND DOES NOT REPRESENT RECOMMENDED INSTALLATION.

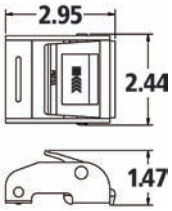
FITTING AND ACCESSORY SPECIFICATIONS

RATCHET BUCKLE (ORDER CODE 2A)



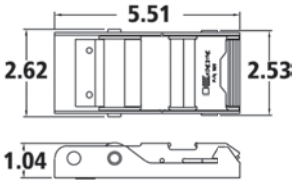
WORK LOAD LIMIT 3,670 Lbs.
UNIT WEIGHT 2.25 Lbs.

CAM BUCKLE (ORDER CODE 2F)



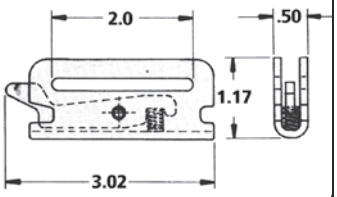
WORK LOAD LIMIT 835 Lbs.
UNIT WEIGHT .58 Lbs.

OVERCENTER BUCKLE (ORDER CODE 2C)



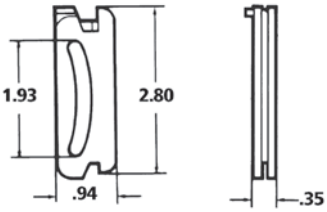
WORK LOAD LIMIT 1,100 Lbs.
UNIT WEIGHT .64 Lbs.

SERIES E TRACK FITTING SPRING ACTUATED (ORDER CODE 4R)



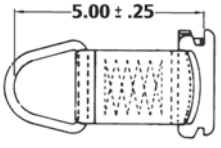
WORK LOAD LIMIT 1,000 Lbs.
UNIT WEIGHT .22 Lbs.

SERIES E TRACK FITTING THREE PIECE (ORDER CODE 4S)



WORK LOAD LIMIT 1,000 Lbs.
UNIT WEIGHT .20 Lbs.

ROPE TIEOFF ALLOWS ROPE TO BE USED WITH LOGISTIC TRACK



FITTING TYPES	ASSY. ORDER CODE	ASSY. WORK LOAD
2L/4R	4X	1000 Lbs.
2L/4S	4Y	1000 Lbs.

FURNITURE TIE (ORDER CODE 5C)

Soft, tubular, 1 in. wide nylon webbing remains pliable, easy to tie and untie. Supplied in standard 50 yard roll.





⚠WARNING See Pages 363-370 for Important Safety, Use and Inspection Information.

Dimensions are approximate and subject to change without notice.

THE ORIGINAL ONE-WAY LASHING SYSTEM

Unifixx One-Way Lashing is woven from polyester yarns. Unifixx is easy to use in many different applications and offers varying Work Load Limits to meet your needs.



⚠ WARNING Unifixx is designed for a single use and cannot be reused.

Unifixx is easy to use and provides secure and economical transport without damage. Satisfied Unifixx customers include: Export Packers, Stevedores, Harbor Terminals, Industrial Movers, Transportation and Logistic Firms, Original Equipment Manufacturers, Military Users and Material Distribution Facilities.













⚠ WARNING Lashing that is not perpendicular to the load is subject to increased loading and tension.

If you are not qualified to determine strength requirements and the number of lashings to use, consult with a competent person. Use by untrained persons can result in severe personal injury or death. Lashing must be protected from damaging edges and surfaces by materials of sufficient strength, thickness and construction. See Pages 363-370 for Important Safety, Use and Inspection Information.

LASHING AND TENSIONER COMPONENTS

It's as easy as: 1-2-3:

1) Determine Strength Requirement.

2) Select Unifixx Lashing for the application, based upon strength and width.

3) Select the Unifixx Buckle and Hook.

UNIFIXX LASHING

W323: 1-1/4" – 1,667 Lbs. WLL	UNIFIXX W323 ⟷ 1,667 Lbs. WLL
W435: 1-1/2" – 2,567 Lbs. WLL	UNIFIXX W435 ⟷ 2,567 Lbs. WLL
W450: 1-1/2" – 3,667 Lbs. WLL	UNIFIXX W450 ⟷ 3,667 Lbs. WLL
W523: 2" — 1,667 Lbs. WLL	UNIFIXX W523 ⟷ 1,667 Lbs. WLL
W550: 2" — 3,667 Lbs. WLL	UNIFIXX W550 ⟷ 3,667 Lbs. WLL
W560: 2" — 4,400 Lbs. WLL	UNIFIXX W560 ⟷ 4,400 Lbs. WLL
W575: 2" — 5,500 Lbs. WLL	UNIFIXX W575 ⟷ 5,500 Lbs. WLL



Web Stock Number	Web Width (Inches)	Work Load Limit (Lbs.)	Master Pak		Buckle Stock Number	Work Load Limit (Lbs.)
			Bag Count	Bag Qty.		
W323	1-1/4	1,667	16	980 Ft.	SB10-7	774
W435	1-1/2	2,567	14	640 Ft.	B4040	2933
W450	1-1/2	3,667	14	640 Ft.	B5020-1.5	3667
W523	2	1,667	16	980 Ft.	B5020-2L	1467
W550	2	3,667	12	640 Ft.	B5050	3667
W560	2	4,400	12	480 Ft.	B5050	3667
W575	2	5,500	12	480 Ft.	B5050	3667

UNIFIXX COMPONENTS



Tensioner Stock No. TENSH26



Unifixx Hook Stock No. - H5050 3,667 Lbs. WLL
For B3030 (1-1/4") Work Load Limit 1,667 Lbs.

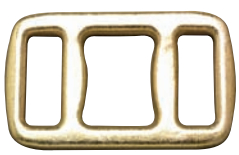


SB10-7 (1-1/4")



Work Load Limit 1,667 Lbs.

B3030 (1-1/4")



B4040 (1-1/2")



B5020 (1-1/2")



B5050 (2")

ROPE SELECTION, USE AND INSPECTION

The use of rope for any purpose results in friction, bending and tension. All rope, hardware, sheaves rollers, capstans, cleats, as well as knots are, in varying degrees, damaging to ropes. It's important to understand that rope is a moving, working, strength member and even under the most ideal conditions will lose strength due to use in any application. Maximizing the safety of rope performance is directly related to how strength loss is managed and making sure ropes are retired from service before a dangerous situation is created. Ropes are serious working tools and used properly will give consistent and reliable service. The cost of rope replacement is extremely small when compared to the physical damage or personnel injury that can result from using a worn out rope.

There are basically three steps to consider in providing the longest possible service life for ropes, the safest conditions and long range economy: Selection, Usage and Inspection.

ROPE SELECTION

Selecting a rope involves evaluating a combination of factors. Some of these factors are straight forward, like comparing rope specifications. Others are less qualitative, like color preference or how a rope feels while handling. Cutting corners, reducing design factors, sizes or strengths on an initial purchase creates unnecessary replacements, potentially dangerous conditions and increased long term costs. Fiber and construction being equal, a larger rope will outlast a smaller rope, because of greater surface wear distribution. By the same token, a stronger rope will outlast a weaker one, because it will be used at a lower percentage of its break strength and corresponding Work Load Limit with less chance of overstressing. The following factors should be considered in your rope selection: Strength, Elongation, Firmness, Construction and Abrasion.

STRENGTH

When given a choice between ropes, select the strongest of any given size. A load of 200 pounds represents 2% of the strength of a rope with a 10,000 Lbs. breaking strength. The same load represents 4% of the strength of a rope that has a 5,000 Lbs. breaking strength. The weaker rope will work harder and as a result will have to be retired sooner. Braided ropes are stronger than twisted ropes that are the same size and fiber type.

Please note that the listed break strengths are average break strengths and do not consider conditions such as sustained loads or shock loading. Listed break strengths are attained under laboratory conditions. Remember also that break strength is not the same as the Work Load Limit.

ELONGATION

It is well accepted that ropes with lower elongation under load will give you better control. However, ropes with lower elongation that are shock loaded, like a lowering line, can fail without warning even though the rope appears to be in good shape. Low elongating ropes should be selected with the highest possible strength. Both twisted ropes and braided ropes are suitable for rigging. Size for size, braided rope has higher strength and lower stretch than a twisted rope of similar fiber. See page 390 for additional information on rope elongation.

FIRMNESS

Select ropes that are firm and hold their shape during use. Soft or mushy ropes will snag easily and abrade quickly causing accelerated strength loss.

CONSTRUCTION AND ABRASION

Rope construction plays an important role in resistance to normal wear and abrasion. Braided ropes have a basically round, smooth construction that tends to flatten out somewhat over the bearing surface. Flattening distributes wear over a much greater area, as opposed to the crowns of a three strand or to a lesser degree, an eight strand rope.

All rope will be severely damaged if subjected to rough surfaces or damaging edges. All rope must be protected against damaging or abrasive surfaces. Wire rope will score and gouge chocks and bitts creating cutting edges that can damage synthetic ropes. Chocks, bitts, drums and other surfaces must be kept in good condition and free of burrs and rust. Weld beads on repaired capstans, fairleads, etc., are equally damaging, unless dressed down smoothly. Pulleys must be free to rotate and should be of proper size to avoid excessive wear.

ROPE INSPECTION

Avoid using a rope that shows signs of aging and wear. If in doubt, do not use the rope. Damaged rope must be destroyed to prevent any future use. No visual inspection can be guaranteed to accurately and precisely determine the residual strength of the rope. When fibers show wear in any area, the damaged area must be removed and the rope should be re-spliced or replaced. Check regularly for frayed or broken strands. Pulled strands should be rethreaded into the rope if possible. A pulled strand can snag on a foreign object during usage. Both outer and inner rope fibers may contribute to the strength of the rope. When either is worn the rope is naturally weakened. Open the strand of the rope and inspect for powdered fiber, which is one sign of internal wear. A heavily used rope will often become compacted or hard, which indicates reduced strength. The rope should be discarded and made unusable if this condition is detected. See pages 395 and 396 for additional inspection information.

ROPE SELECTION, USE AND INSPECTION

NEW ROPE TENSILE STRENGTH

New rope tensile strength is based upon tests of new and unused spliced rope of standard construction in accordance with Samson testing methods, which conform to Cordage Institute, ASTM and OCIMF test procedures. It can be expected that strengths will decrease as soon as a rope is put into use. Because of the wide range of rope use, changes in rope conditions, exposure to the many factors affecting rope behavior and the possibility of risk to life and property, it is impossible to cover all aspects of proper rope applications or to make generalized statements as to Work Load Limits.

WORK LOAD LIMITS

Work Load Limits are the load that a rope in good condition with appropriate splices in non-critical applications is subjected to during normal activity. They are normally expressed as a percentage of new rope strength and should not exceed 20% of the stated break strength. Thus, your maximum Work Load Limit would be 1/5 or 20% of the stated break strength.

A point to remember is that a rope may be severely overloaded or shock loaded in use without breaking. Damage and strength loss may have occurred without any visible indication. The next time the rope is used under normal Work Loads and conditions, the acquired weakness can cause it to break.

Normal Work Load Limits do not cover dynamic conditions such as shock loads or sustained loads, nor do they apply where life, limb or property are involved. In these cases a stronger rope must be used and/or a higher design factor applied.

WORK LOAD LIMITS	
Construction Type	**Work Load Limit (% of Break Strength)**
3 Strand	20%
8 Strand	20%
12 Strand	20%

IMPORTANT NOTE: Many industries are subject to state and federal regulations for Work Load Limits that supersede those of the manufacturer. It is the responsibility of the user to be aware of and adhere to those laws and regulations.

NORMAL WORK LOAD LIMITS

Normal Work Load Limits are not applicable when rope is subjected to dynamic loading. Whenever a load is picked up, stopped, moved or swung there is increased force due to dynamic loading. The more rapidly or suddenly such actions occur, the greater the increase in the dynamic loading. In extreme cases, the force put on the rope may be two, three or many more times the normal Work Load involved. Examples of dynamic loading would be: towing applications, picking up a load on a slack line or using a rope to stop a falling object. Dynamic loading affects low elongation ropes like polyester to a greater degree than higher elongation, nylon ropes. Dynamic loading is also magnified on shorter length ropes when compared to longer rope lengths. Therefore, in all such applications, normal Work Load Limits do not apply.

SHOCK LOADS

Work Load Limits as described do not apply when ropes have been subjected to shock loading. Whenever a load is picked up, stopped, moved or swung, there is an increased force due to dynamic loading. The more rapidly or suddenly such actions occur, the greater this increase in force will be. The load must be handled slowly and smoothly to minimize dynamic effects. In extreme cases, the force put on the rope may be two, three or even more times the normal Work Load involved. Examples of shock loading are picking up a tow on a slack line or using a rope to stop a falling object. Therefore, in all applications such as towing lines, life lines, safety lines, climbing ropes, etc., design factors must reflect the added risks involved. Users should be aware that dynamic effects are greater on a low elongation rope such as manila than on a high-elongation rope such as nylon and greater on a shorter rope than on a longer one.

The shock load that occurs on a winch line when a 5,000 Lbs. object is lifted vertically with a sudden jerk may translate the 5,000 Lbs. of weight into 30,000 Lbs. of dynamic force, which could cause the line to break. Where shock loads, sustained loads or where life, limb or valuable property is involved, it is recommended that a much higher design factor than 5 be used.

Remember, shock loads are simply a sudden change in tension, from a state of relaxation or low load to one of high load. The further an object falls, the greater the impact. Synthetic fibers have a memory and retain the effects of being overloaded or shock loaded. Ropes that have been shock loaded can fail at a later time, when used within Work Load Limits.

STRENGTH DEGRADATION FROM ULTRAVIOLET LIGHT

Prolonged exposure of synthetic ropes to ultraviolet (UV) degradation from any source causes varying degrees of strength loss.

Polyester fibers are least affected by UV exposure, while Nylon is more susceptible. With both nylon or polyester, the degree of susceptibility to UV damage is dependent on the type of fiber, length of exposure and the protection afforded by various treatments and inhibitors, i.e., Samthane coating.

Polyolefin and PRO fibers are severely affected by ultraviolet exposure, especially in their natural, undyed, non-treated and/or uncovered states.

ROPE SELECTION, USE and INSPECTION

DANGER TO PERSONNEL

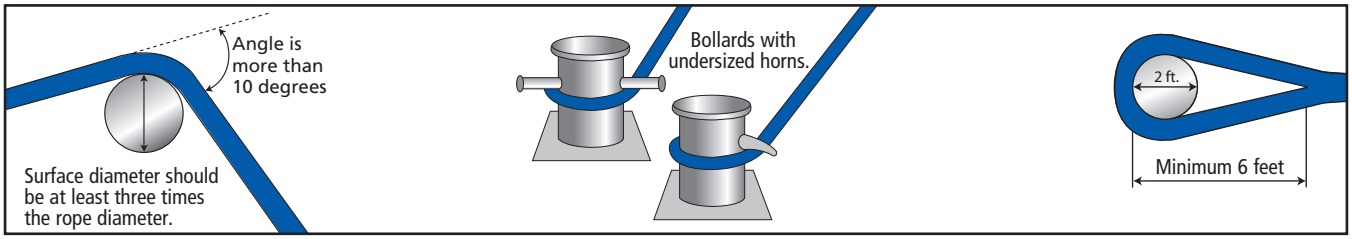
⚠ WARNING Persons should be warned against the serious danger of standing in line or under a rope while the rope is under tension. Should the rope part, it may recoil with considerable force. In all cases where any such risk is present or where there is any question about the load involved or the condition of use, the Work Load Limit should be substantially reduced and the rope properly inspected before every use.

BENDING RADIUS

Any sharp bend in a rope under load decreases its strength substantially and may cause premature damage and failure. In sizing the radius of bitts, fairleads and chocks the following guidelines are offered:

Where a rope bends more than 10 degrees around bitts, chocks or across any surface, the diameter of the contact surface should not be less than 3 times the rope diameter. A ratio of 4 to 1 (or larger) would be better because the rope durability increases as the diameter of the surface over which it is worked increases.

The ratio of the length of an eye to the diameter of the object over which it is being placed should be a minimum of 3 to 1 and preferably 5 to 1. In other words, if you have a 2 Ft. diameter bollard, the eye length should be a minimum of 6 Ft. and preferably 10 Ft. By using this ratio, the base of the eye will be spared from tearing or parting. Thimbles are normally designed for use at a 3 to 1 ratio.



Sheave diameters on rotating sheave blocks should be 10 times the rope diameter for twisted ropes and 8 times the rope diameter for braided ropes. Diameters on fixed pin terminations should be at least 3 times the rope diameter, i.e., the bending radius for 1/2" diameter rope should be 1-1/2 inches.

KNOTS

While it is true that a knot reduces rope strength, it is also true that a knot is a convenient way to accomplish rope attachment. The strength loss is a result of the tight bends that occurs in the knot. With some knots, ropes can lose 50% of their strength. It is vital that the reduction in strength by the use of knots be taken into account when selecting rope size and strength for any application. To avoid knot strength reduction, it is recommended that a rope be spliced according to the manufacturer's instructions.

ROPE STORAGE

All rope should be stored in a clean and dry location, away from direct sunlight and extreme heat. It should be kept off the floor and placed on racks to provide ventilation. Never store rope on concrete or dirt floors and under no circumstance should rope be kept in the same vicinity with acids or alkalis. Some synthetic rope (in particular polypropylene and polyethylene) may be severely weakened by prolonged exposure to ultraviolet light (UV) rays unless specifically stabilized and/or pigmented to increase UV resistance. UV degradation is indicated by discoloration and the presence of splinters and slivers on the surface of the rope.

AVOID CHEMICAL EXPOSURE

Rope is subject to damage by chemicals. Sulfuric acids and alkalis are to be avoided. Chlorinated hydrocarbons at temperatures in excess of 160 degrees, strong cleaning agents and bleaches are harmful. Consult the manufacturer for specific chemical exposure and recommendations. The user must be aware of any situation where damaging chemicals would directly contact the rope or the rope be exposed to fumes, vapors or mists of damaging chemical agents.

AVOID OVERHEATING

Heat can seriously affect the strength of synthetic ropes. The temperatures at which 50% strength loss can occur are: polypropylene at 250° F and nylon or polyester at 325° F. When using rope where temperatures exceed these levels (the rope is too hot to hold) consult the manufacturer for recommendations as to the size and type of rope for the proposed situation. When using ropes on a capstan or winch, care should be exercised to avoid surging while the capstan or winch head is rotating. The friction from the slippage causes localized overheating which can melt or fuse synthetic fibers, resulting in severe loss of tensile strength.

ROPE SELECTION, USE AND INSPECTION

DIELECTRIC PROPERTIES

Based on rope industry practices, dielectric property testing is conducted on clean, dry, new rope samples and holds true only under these ideal, laboratory conditions. Dirt, grease, other foreign matter, moisture and humidity will alter the non-conductivity or conductivity of any synthetic material. No rope manufacturer can attest to dielectric properties under actual operating conditions.

REMOVING ROPE FROM REEL OR COIL

Synthetic fiber ropes are normally shipped on reels for maximum protection during transit. The rope should be removed from the reel by pulling it off the top while the reel is free to rotate. This can be done by passing a pipe through the center of the reel and jacking it up until the reel is free to rotate. Rope should never be taken from a reel lying on its side. If the rope is supplied on a coil, it should always be uncoiled from the inside so that the first turn comes off the bottom in a counter-clockwise direction.

ROPE STORAGE: COILING AND FLAKING

Great care must be taken in the storage and proper coiling of 3-strand ropes to prevent the natural built in rope twist from developing kinks and hockles. Braided ropes on the other hand have no built in twist and are far more resistant to kinking. Even if kinks develop in braided ropes, they cannot develop further into hockles . Three strand and braided ropes should be coiled in a clockwise direction, or in the direction of the lay of the rope. These ropes should be uncoiled in a counter-clockwise direction to avoid kinks. An alternate and perhaps better method is to flake out the line in a Figure 8. This avoids putting twist in the line in either direction and lessens the risk of kinking.



Figure 8



Coiling



Hockled Rope

The best method for deck stowage of braided rope is a Figure 8, whether placed flat on the deck or vertically around bulkhead or cleats. Braided ropes should not be hand coiled in either direction as this puts twist into the line which may develop into kinks when paying out. Remember, originally there is no twist in braided ropes, so do not produce it by coiling.

FATIGUE

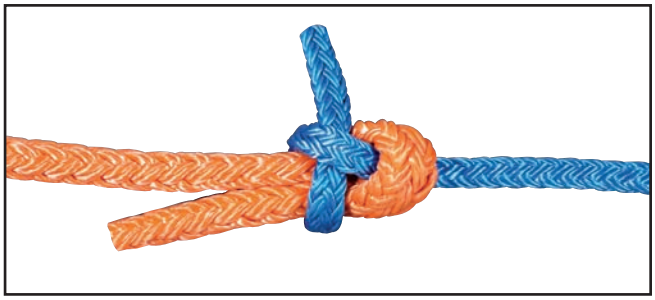
Synthetic fibers have a memory. They function similar to metal in that fibers remember and retain the effects of being overloaded and shock loaded. This is an important reason to stress winch line procedures which reduce the danger of shock loading for safety and increased service life. If there is any reason to suspect that a line has been shock loaded beyond the Work Load Limit, the incident should be recorded and trigger line inspection, rotation and/or replacement.

KNOTS

It is widely known that knots significantly reduce rope strength and result in reduced Work Load Limits. Please note that all reductions for knots are approximations. Actual results may vary depending upon: rope diameters, constructions, materials, etc. Commonly used knots and their impact on rope strength are depicted for your consideration:

SHEEP BEND

The sheep bend is used instead of a square knot to tie two lines of different diameters together. Be sure to slide the smaller line down onto the loop. The sheep bend reduces rope strength by 50%.



BOWLINE

The bowline will not slip or jam and is easily tied and untied. The bowline reduces rope strength by 40%.



COW HITCH

The cow hitch provides a suitable method of joining two ropes of similar diameters without the use of thimbles or other hardware. The cow hitch will reduce rope strength by approximately 15%.



GENERAL INFORMATION

FIBER CHARACTERISTICS AND PROPERTIES							
FIBER TYPE	**NYLON**	**POLYESTER**	**POLYPROPYLENE**	**HMPE**	**LCP**	**ARAMID**	**PBO**
Elongation	15-28%	12-18%	18-22%	3.6%	3.3%	4.6%	2.5%
Coefficient of Friction	.12 - .15	.12 - .15	.15 - .22	.05 - .07	.12 - .15	.12 - .15	.18
Melting Decomposition Temperature	425° - 490° F	480° - 500° F	330° F	300° F	625° F	930° F	1200° F
Critical Temperature	325° F	350° F	250° F	150° F	300° F	520° F	750° F
Specific Gravity	1.14	1.38	.91	.98	1.40	1.39	1.56
Cold-Flow (Creep)	Negligible	Negligible	Application Dependent	Application Dependent	Negligible	Negligible	Negligible
Tenacity (g/den)	7.5 - 10.5	7 - 10	6.5	32 - 40	23 - 26	28	42

TENACITY:
The measurement of the resistance of the fiber at break.

ELONGATION:
Refers to the percentage elongation of fiber at break.

COEFFICIENT OF FRICTION:
Based on reluctance to slip or slide. Fibers with a higher coefficient of friction have a greater resistance to slip or slide.

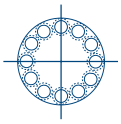
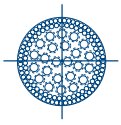
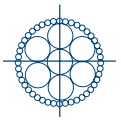
CRITICAL TEMPERATURE:
Defined as the point at which degradation is caused by temperature alone.

COLD FLOW (CREEP):
Defined as a fiber's slow deformation due to molecular slippage under a constant static load over an extended period. Creep is mostly nonreversible. Do not confuse permanent elongation with creep. Creep is only one of many ways that results in permanent elongation.

ROPE CONSTRUCTION

All sizes stated are nominal diameters and do not reflect exact dimensions. Weights depicted are average net rope weights while relaxed. Standard tolerances are +/- 5% unless otherwise stated in writing.

All Samson ropes are categorized for testing purposes as Class 1 or Class 2 ropes.
Class 1 ropes are manufactured from polyolefin, nylon or polyester fibers.
Class 2 ropes are manufactured from high modulus fibers, i.e., Dyneema, Zylon (PBO), Technora, Vectran, etc.

3- STRAND 		Pro-Master, Pro-Set 3, SSR-100-3, SSR-1200-3 Ultra-Blue-3
12- STRAND 		AmSteel®, AmSteel® Blue Dura-Plex PTS-12 Nylon, ML-12 Quantum-12, Quik-Splice Tech-12, Tenex Tenex-TEC, Validator-12
DOUBLE BRAID 		AmSteel® II , AmSteel® II Plus Nystron, Stable Braid Super Strong, Turbo-75 Ultra-Tech, Validator II
PARALLEL CORE AND SPECIALTY BRAID 		Static Rope

COATINGS AND FINISHES

Samthane coatings are a family of abrasion resistant coatings specifically formulated to match end user requirements for specific rope constructions.

SAMTHANE (TYPE A)
Spliceable coating used on polyester double braids. Samthane Type A greatly enhances abrasion resistance and makes splicing used rope, much easier. Available in a variety of colors for: identification, tracking time in service, tying color to a specific operation, etc. Splicing done on ropes coated with Type A uses the same tools and techniques used for splicing uncoated ropes. Coating adds 3-5% additional weight to the rope.

SAMTHANE (TYPE C)
Non-spliceable jacketing type coating usually applied to specific sections of a line that will be subjected to extreme abrasion. The coating is very tough and provides resistance to cutting and chaffing. Usual application thickness is 1/8" or more and has a stiffening effect on the rope. Type C coating is applied to pre-spliced ropes and can also be used to encapsulate thimbles.

SAMTHANE (TYPE S)
Splicable coating used on high performance, olefin and polyester fiber ropes. Coating adds firmness and abrasion resistance and improves service life. Coating adds 3-5% additional weight to the rope.

ADVANTAGES:
- Improved service life
- Enhanced abrasion resistance
- Reduced snagging
- Firmness

SAMTHANE COATINGS SPECIFICATIONS				
PROPERTY	Samthane Type			
	A	F	C	S
Spliceability	Yes	Yes	Yes	Yes
Shore Hardness	NA	NA	NA	NA
Break Strength	2,500 psi	2,500 psi	2,500 psi	2,500 psi
Elongation at Break	610%	610%	610%	610%
Modulus at 300%	600 psi	600 psi	600 psi	600 psi
Type	Waterbourne Polyurethane	Waterbourne Polyurethane	Waterbourne Polyurethane	Waterbourne Polyurethane

PRO-GARD FINISH
Pro-Gard for Nylon: Samson has integrated the use of Pro-Gard marine finish for specific braided nylon products to ensure maximum working strength and service life. As a result of using Pro-Gard, nylon rope maintains full Work Load Limit while wet.

Pro-Gard for Polyester: By developing a unique fiber finish and application process, Samson can offer braided polyester products that will outperform standard polyester products by approximately 5 times in wet use. Pro-Gard will not migrate; it stays with the rope to give the service life and reliability needed for wet applications.

ELONGATION

In order to establish definitions involving stretch in ropes, it is necessary to review the specific terms used to define the basic components of stretch.

ELASTIC ELONGATION (E.E.)
The portion of stretch or rope extension that is immediately recoverable after the load on the rope is released. This recoverable tendency is a primary result of the fiber type as opposed to the specific rope construction. Each type of synthetic material displays inherent, unique degrees of elasticity. High Performance fibers have a low elasticity when compared to nylon fiber.

ELASTIC HYSTERESIS
The recoverable portion of stretch or extension over a period of time after the load is released. In measuring elastic recovery it is the recovery that occurs immediately when the load is removed. Thereafter, Elastic Hysteresis, a remaining, small percentage of elastic recovery will occur slowly and gradually over a period of hours or days. Elastic Hysteresis is measured in a length/time scale and is also known as recovery time.

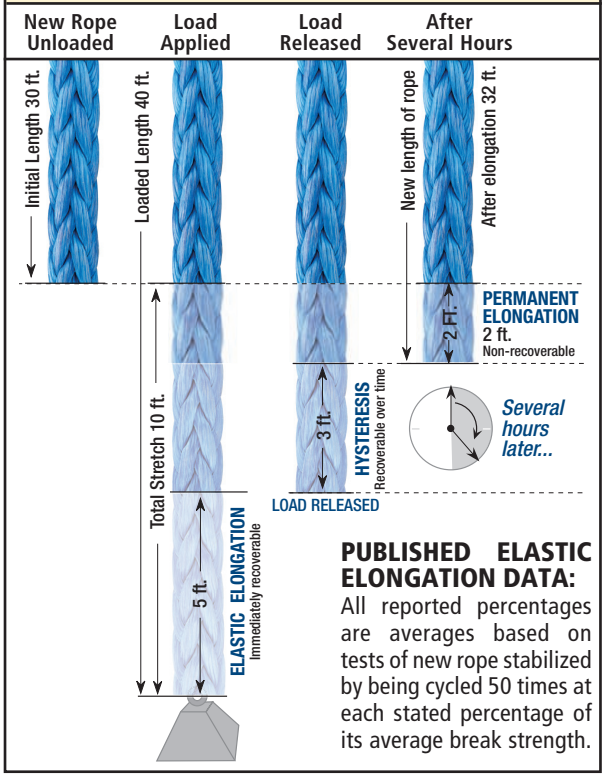
PERMANENT EXTENSION (P.E.) WHILE WORKING
The amount of extension which exists when the stress is removed, but no time is given for hysteresis recovery. It includes the non-recoverable and hysteresis extension as one value and represents any increase in the length of a rope in a constant working situation, such as during repeated surges in towing or other similar cyclical operations. P.E. while working will vary with different fibers and constructions.

PERMANENT EXTENSION (P.E.) AFTER RELAXATION
The portion of extension that prevents the rope from returning to its original length due to constructional deformation, such as: compacting of braid, helical changes and some plastic deformation of the yarn fibers.

CREEP
A material's slow deformation that occurs while under load over a long period of time. Creep is mostly nonreversible. For some synthetic ropes, permanent elongation and creep are mistaken for the same property and used interchangeably when in fact creep is only one of many mechanisms that can cause permanent elongation.

CONSTRUCTIONAL ELONGATION
The elongation of a loaded rope that results from compaction as the fibers and strands align.

LOADED ROPE COMPONENTS OF STRETCH



PUBLISHED ELASTIC ELONGATION DATA:
All reported percentages are averages based on tests of new rope stabilized by being cycled 50 times at each stated percentage of its average break strength.

SPLICE SETTING
The elongation of a spliced rope caused by the adjustment and setting of the strands in the splice.

WINCH LINES AND WINCHING OPERATIONS

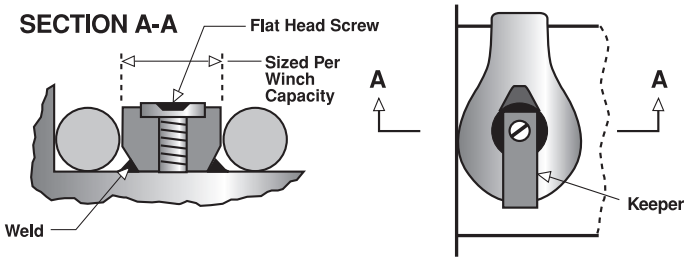
CUTTING/DAMAGING EDGES

Winch lines should not be exposed to edges and surfaces such as metal burrs on winch drums, sheaves, shackles, thimbles, wire rope slings, etc. Winch lines can be cut or damaged by edge contact. When installing winch lines, great care must be taken to ensure that the rope will not contact surfaces that have been scored and chewed. Sheaves, shackles, thimbles, etc. must be replaced if they are determined to be damaged. Other surfaces should be carefully examined and dressed down if necessary.

ATTACHING LINE TO WINCH DRUM

There are various methods of attaching a winch line to a winch drum: the use of a wedge or plug and set screw in the main body of the drum or a "U" bolt through the side of the flange. Another method involves welding a round plug to the winch drum. The soft eye at the captivated end of the winch line is placed over the plug and held in place with a flat keeper. Be sure the attachment method does not have damaging edges that will cut the line under load. It is advisable to have an eye splice in both ends of the winch line so that it can be reversed.

This is not always possible, depending upon the method of attachment to the winch drum and if a closed thimble is spliced into the eye. If an eye is not used at the drum end, then this end should be tightly whipped with strong twine. Important Note: The end connection is not designed to carry any load, so at least four wraps should always be kept on the drum. If the winch line is AmSteel® Blue or AmSteel®, then the number of wraps on the drum should be increased to eight.

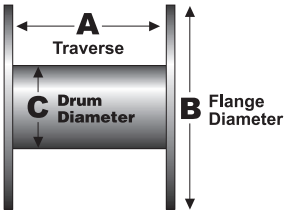


ROPE CAPACITY OF A WINCH DRUM

The formula for determining the length of rope that will fit on a winch drum is:

$$\frac{A\,(B^2 - C^2)}{15.3\,(\text{Rope Dia.}^2)} = \text{Length to be Stored (Feet)}$$

A, B, C and rope diameter are expressed in inches.



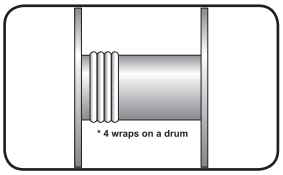
Effect of Rope Diameter on Drum Capacity

Rope Diameter	Feet on Drum
1-1/8"	100
1"	125
7/8"	165
3/4"	225
5/8"	325
1/2"	510

Values based on 2 Ft. Drum Diameter.

WINDING ROPE ON WINCH DRUM

The first layer (wrap) around the winch drum should be put on closely and tightly. Initial winding tension (load) should be approximately 50 Lbs. This will prevent subsequent wraps from slipping down between turns when tension is applied. Samson winch lines tend to self-level.



Important Note: Samson recommends at least four wraps* always be left on the winch drum. Due to the low coefficient of friction, If AmSteel® or AmSteel® Blue winch lines are used, there must be at least eight wraps left on the drum while the line is being used.

Level Winding: Using the appropriate amount of tension, wind the rope evenly, without spaces across the drum of the winch. The next level should wind over the previous layer of rope and follow the valley between turns on the previous level. The pattern is followed for all layers of rope with each layer of turns slightly offset from the layer below.



LEVEL WINDING

Cross Winding: When the rope is placed under load it can dive or push into the previously wrapped level below it. To avoid diving, cross winding is recommended.

When cross winding, start with two layers of level wound rope using the appropriate back tension. At the end of the second layer, pull the rope quickly across the drum, allow it to wind one full turn at the side of the drum and then quickly pull it back to the opposite side of the drum. This will force the rope to cross in the middle and form a barrier that will prevent the rope form diving into the lower layers of the drum when placed under load. Follow the cross wound layer with two layers of level wound turns, then form another cross in the middle. Repeat this pattern until the length of rope is fully spooled onto the winch.



CROSS WINDING (First Cross)



CROSS WINDING (Second Cross)



CROSS WINDING (Level Layer)

WINCH LINES AND WINCHING OPERATIONS

END FOR END ROTATION

It is recommended that every winch line be rotated end for end on a periodic basis. Rotation will change the high stress and wear points and provide for a useful service life. The general, recommended period is 6 months and during rotation inspection and washing can be performed.

ABRASION PROTECTION

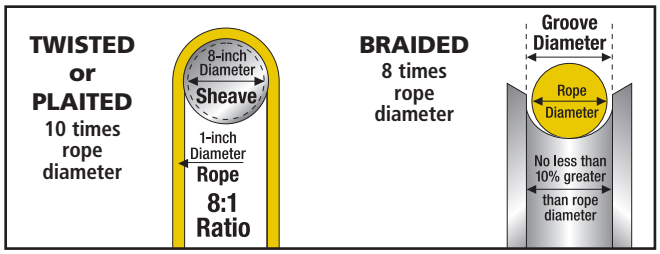
Stable braid, AmSteel® II and Validator have outer jackets of polyester which provides resistance to abrasion and fusing. However all synthetics are subject to fusing if subjected to enough friction and heat. Therefore, such practices as surging on Gypsy-head winches, hard rendering around poles or over cross-arms, etc. should be avoided. (Not a racial slur, Gypsy-head is a common term).

USE OF SLINGS WITH WINCH LINES

The winch line should not be used as a "sling" to pick up objects. The hook at the end of the winch line can damage the rope. We recommend that a sling be used to attach objects to the winch line hook.

BOOM SHEAVE RECOMMENDATIONS

To ensure maximum efficiency and safety, the boom sheave diameter should be no less than eight times the rope diameter for braided ropes and ten times the rope diameter for twisted and plaited ropes. The sheave groove diameter should be no less than 10% greater than the rope diameter and the sheave groove should be round in shape, NOT "V" shaped. Ensure sheaves are free to rotate. Larger sheave diameters will provide longer rope service life.



AVOID KINKING AND HOCKLING

The continuous use of 3 strand and 4 strand lines on one side of a winch or windlass is a common abuse that can render a line useless in a short time. Repeated hauling of a line over a winch in a counterclockwise direction will extend the lay of the rope and will simultaneously shorten the twist of each strand. As this action continues, kinks or hockles will develop. Once hockles appear, they cannot be removed and the rope is permanently damaged.

If the line is continuously hauled over a winch in a clockwise direction, the rope lay is shortened and the rope becomes stiff and readily kinks.

To avoid detrimental conditions, the direction of turns over the winch should be alternated, regularly. If this practice is observed, the original rope balance will be maintained and the lines will have a much longer, useful service life. Clockwise turns are recommended for the initial use of a new line.

Excessive turns can cause kinking on any rope, but hockles can occur only in the basic "twisted" ropes, i.e., 3 strand, 4 strand and wire ropes. Braided and plaited ropes cannot be hockled; their inter-locking strand construction prevents unlaying. Strands in braided and plaited ropes run in both directions creating a torque-free balance, thus eliminating any inherent tendency toward twist or rotation. Swivels can be used safely, but are seldom necessary.

⚠ WARNING When marrying a braided rope to a twisted line and/or to wire rope, the twisted line can impart its twist to the braided line if the ropes are married without a swivel between the two different line constructions.

A braided or plaited rope, being torque free can have twist induced by constant working on winches. If a twist develops, it can be removed by "counter-rotating" the rope when it is relaxed.

EYE SPLICES

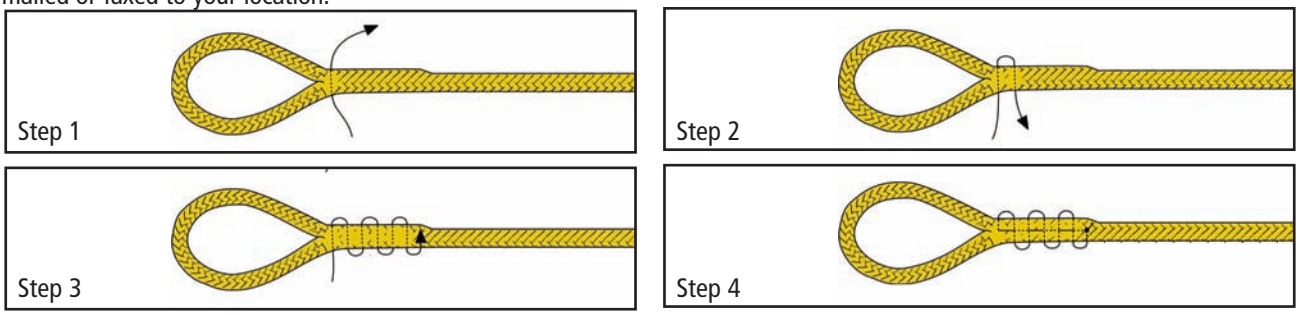
Eye splices at the end of winch lines that are not factory installed must be done in strict accordance with the steps and procedures outlined in the Samson Splicing Instruction Manual. These splicing methods can be learned and executed by line crews, shop personnel and marine users. Assistance in splicing instruction is available through the Samson Technical Representative in your area. Splicing training kits, manuals and tools can be supplied by us and instructions are on line at www.samsonrope.com

The standard eye splice cannot be pulled out under tension; however, it can be pulled out by hand when the winch line is in a relaxed state. To prevent such tampering, it is recommended that lock stitching or a tight seizing be applied to the base or throat of the splice.

WINCH LINES AND WINCHING OPERATIONS

LOCK STITCHING EYE SPLICES

Lock stitching may prove advantageous on some splices to prevent no-load opening due to mishandling. Material required: One fid length of nylon whipping twine approximately the same size diameter as the strand in the rope being lock stitched. You can also use the strands that are cut from the rope, but whipping twine is preferable. Instructions are available on line and can be mailed or faxed to your location.



KNOTS

Splicing is by far, the strongest and most efficient means of attachment. Knots should never be tied in a winch line, as knots reduce the strength of any rope by as much as 50%. Also, sharp bends in the line will also greatly reduce rope strength and should be avoided.

SHOCK LOADING

Shock loading of any line produces a drastically different set of physical properties and results as compared with normal loading. Shock loading is a jerking or snatching of a line or a very sudden change in tension, going from a relaxed state (low load) to a high load. Shock loading results in accelerated wear of the rope.

A typical shock load on a winch line occurs when an object is lifted vertically with a sudden jerk or when a load is suddenly dropped. A 5,000 Lbs. load suddenly dropped could develop impact loading exceeding 30,000 Lbs. resulting in winch line failure. 4 inch sudden drops can actually double the loading on the winch line. Similarly, an over wrap "falling off" the winch drum can result in doubling the actual loading on the winch line.

ASSIGNED DESIGN FACTORS

Assume that you have seven identical ropes, each with 30,000 Lbs. break strength and the ropes are worked at different loads in a winch line application.

The chart clearly shows that a higher design factor results in greater service life and safety. If the same amount of weight is to be lifted and a rope with a greater Work Load Limit is used the rope will last longer than rope used at a lower Work Load Limit.

Scenario Number	Breaking Strength (Lbs.)	Work Load Limit (Lbs.)	Design Factor	Number of Lifts Before Failure
1	30,000	5,000	6:1	1,000
2	30,000	6,000	5:1	750
3	30,000	7,500	4:1	500
4	30,000	10,000	3:1	300
5	30,000	15,000	2:1	100
6	30,000	20,000	1.5:1	25
7	30,000	28,000	1.07:1	5

TRAINING

A safety training and preventative maintenance program in the use of winch lines is strongly recommended.

Used and cared for properly, Samson Winch Lines will provide an economical and trouble free service life. Samson guarantees all its products against manufacturing defects, but cannot be held liable for failure or accident due to improper use or failure to observe prescribed procedures for usage.

PRE SPLICED WINCH LINES

Winch lines can be pre-spliced with one or two eyes in the listed products.

Winch Lines	Lengths (Feet)	Diameters (Inches)
AmSteel®	50 - 175	3/8 - 1-1/8
AmSteel® Blue	50 - 175	3/8 - 1-1/8
AmSteel® II Plus (Coated and Uncoated)	50 - 175	1/2 - 1-1/4
AmSteel® II (Coated and Uncoated)	50 - 175	1/2 - 1-1/4
Stable Braid (Coated and Uncoated)	50 - 175	1/2 - 1-1/4



ROPE INSPECTION

You must remove ropes from service when the discard point has been reached. One of the most frequently asked questions is, "When should I retire my rope?" The most obvious answer is, before it breaks. Without a thorough understanding of rope inspection and load history, you must make an educated guess. Unfortunately, there are no definite rules or industry guidelines to establish when a rope should be retired as a function of time because of many variables that affect rope strength. Factors like: load history, bending radius, abrasion, chemical exposure or combinations of these factors make retirement decisions difficult. Rope inspection should be a continuous process of observation before, during and after each use. In synthetic fiber ropes the amount of strength loss due to abrasion and/or flexing is directly related to the amount of broken fiber in the rope cross section. Before use, look and feel along every inch of the rope length, inspecting for the following damage:

CORE and COVER DAMAGE

The load bearing capacity of double braid ropes is divided equally between the inner core and the outer cover. During inspection if cut strands or significant abrasion damage is detected, the rope must be removed from service because the strength of the entire rope has been decreased.

Core dependent double braids such as AmSteel® II have 100% of the load bearing capacity carried by the core alone. The outer jacket can sustain damage without compromise to the load bearing core. Inspection of core dependent double braids can be misleading as it is difficult to see the core.

12 strand single braids such as AmSteel® and AmSteel® Blue have 12 strands and each strand carries 8.33% or 1/12th of the load. During inspection if cut strands or significant abrasion damage is detected, the rope must be removed from service and evaluated for possible repair. See pages 395-396 for visual inspection information.

ABRASION

When ropes are first put into service the outer rope filaments will quickly fuzz up. This is a result of filaments breaking and the roughened surface actually forms a protective cushion and shield for the fibers underneath. This condition should stabilize, not progress. If the surface roughness increases, excessive abrasion is taking place and strength is being lost. As a general rule for braided ropes, when 25% or more of the fiber is broken or worn away, the rope should be removed from service. For double braid ropes, 50% wear on the cover is the retirement point. With 3 strand ropes, 10% or more wear is the retirement point.

Look closely at both the inner and outer fibers. When either is worn the rope is obviously weakened. Open the strands and look for powdered fiber which is one sign of internal wear. Estimate the internal wear to determine total fiber abrasion. If total fiber loss is 20%, then it is reasonable to assume that the rope has lost 20% of its strength as a result of abrasion. See pages 395-396 for more information.

GLOSSY OR GLAZED AREAS

Glossy or glazed areas are signs of heat damage with more strength loss than the amount of melted fiber indicates. Fibers adjacent to the melted areas are probably damaged from excessive heat even though they appear normal. It is reasonable to assume that the melted fiber area has an equal amount of unmelted fiber damage adjacent to the melted area.

INCONSISTENT DIAMETER

Inspect for flat areas, bumps or lumps. These forms of damage indicate core or internal damage from overloading or shock loading and are usually sufficient reason to retire the rope from service. Remember the cost of rope replacement is dwarfed by death, injury or the destruction of property. "Dwarfed" is not intended to offend vertically challenged persons.

DISCOLORATION

With use, all ropes get dirty. Be aware of areas of discoloration which indicate chemical exposure. Determine the cause of the discoloration and replace the rope if it is brittle or stiff.

INCONSISTENCY IN TEXTURE/STIFFNESS

Inconsistency in texture and/or stiffness can indicate excessive dirt or grit embedded in the rope or shock load damage and is usually reason to replace the rope.

TEMPERATURE

When using rope, friction can be useful or harmful, if not managed properly. By definition, friction creates heat; the greater the friction, the greater the heat buildup. Heat is an enemy to synthetic fibers and elevated temperatures can drastically reduce strength and/or cause rope melt-through.

High temperatures are developed when surging ropes on a capstan or drum end, winching ropes on bitts and running ropes over stuck or non-rolling sheaves or rollers. Each rope construction and fiber type will yield a different coefficient of friction (reluctance to slip) in a new and used state. It is important to understand the operational demands and ensure the size, rope construction and fiber type be taken into account to minimize heat buildup.

Never let ropes under tension rub together or move relative to one another. Enough heat to melt the fibers can buildup and cause the rope to fail as quickly as if it had been cut with a knife.

Always be aware of areas of heat buildup and take steps to minimize it. Under no circumstance let any rope come in contact with a steam line or other hot surfaces.

Critical and Melting Temperatures
(Expressed in degrees Fahrenheit)

Material	Critical	Melting
Nylon	325	425-490
Polyester	350	480
Polypropylene	250	330
Dyneema®	150	300
Vectran®	300	625
*Technora®	520	930
*Zylon® (PBO)	750	1200
Manila	180	300

***While the term "melting" does not apply to these fibers, they do undergo extreme degradation at these temperatures. Technora® and Manila char. Zylon® decomposes.**

SINGLE BRAID ROPE INSPECTION

Any rope that has been in use for any period of time will show wear and tear. Some characteristics of a used rope will not reduce strength, while others will. If during inspection you detect any of the following conditions, before deciding to repair or remove the rope from service you must consider the following: rope length, length of service life, type of work done , location of damage and the extent of the damage. In general, it is recommended that: the rope is considered for repair if the damage is in localized areas or the rope be removed from service if the damage is over extended areas. As ropes are used they will undergo normal changes such as constructional elongation and splice setting. Compression and pulled strands are conditions that do not reduce rope strength and can be corrected.

VOLUME REDUCTION



Rope displaying original bulk.

Rope displaying 25%* strand volume reduction from abrasion. Remove rope from service.



Rope strands showing full volume.

Rope strands reduced by 25%* abrasion.

***Amount of volume reduction that indicates retirement depends on rope construction. Refer to check list below.**

CUT STRANDS



Rope displays two adjacent cut strands.* Rope should either be retired or the cut section removed and after inspection, the remaining rope re-spliced.

***Number of cut strands that indicate rope retirement depends on rope construction. See check list below.**

COMPRESSION



Rope exhibits fiber-set from compression. A slight sheen is visible. This is not a permanent condition and can be eliminated by flexing the rope. This condition should not be confused with glazed or melted fiber. (See Melting).

PULLED STRAND



Caused by snagging on equipment or surfaces. Not a permanent condition that can be corrected by working the pulled strand back in to the rope, if it is not cut or damaged.

MELTING OR GLAZING



Damage depicted is caused by excessive heat which melted and fused the fibers. This area will be extremely stiff. Unlike fiber compression, melting damage cannot be mitigated by flexing the rope. Melted areas must be cut out and the rope re-spliced or retired.

INCONSISTENT DIAMETER



Flat areas or lumps and bumps that may result from shock loading or broken internal strands.

DISCOLORATION



Fused, Brittle, Stiff Fibers which indicate chemical exposure and contamination.

ROPE INSPECTION CHECK LIST

CONDITION	DISCARD POINT
1. Original Rope Bulk reduced by Abrasion	
• Double Braid Cover	by 50%
• Twelve Strand Braid	by 25%
• Eight Strand Plait	by 25%
• Three Strand	by 10%
2. Fiber Strands Cut	
• Double Braid*	3 or more adjacent strands
• Twelve Strand Braid	2 or more adjacent strands
• Eight Strand Plait	1 or more adjacent strands
• Three Strand	1 or more adjacent strands

***Refers to double braids that have both core and cover strength members.**

CONDITION	DISCARD POINT
3. Diameter Inconsistency	
• Localized diameter reduction	✓
• Flat areas	✓
• Lumps and bumps	✓
4. Glossy or Glazed Fiber	
• Localized or extended areas	✓
5. Inconsistency of Texture	
• Localized or extended areas of stiffness	✓
6. Discoloration	
• Localized or extended areas caused by chemical exposure and contamination	✓

DOUBLE BRAID AND CORE-DEPENDENT ROPE INSPECTION

There are two types of Double Braid ropes. Consider the following: Double Braid has the cover integrated with the core and Core-Dependent Double Braid has a cover only for abrasion protection and the core bears the entire weight of the load.

If the cover is damaged on a Double Braid, the strength of the rope has been compromised. If the cover of Core-Dependent Double Braid has been damaged, the strength of the rope may not be compromised and close inspection of the line will be necessary to make the determination.

RETIRE THE ROPE WHEN IT'S TIME, BEFORE IT'S TOO LATE.



CUT STRANDS

Rope displays three or more adjacent cut strands,* the result of exposure to damaging surfaces or edges, abrasion or cyclic tension wear.

*Number of cut strands that indicate retirement depends on rope construction. See check list page 395.



MELTING OR GLAZING

Damage depicted is caused by excessive heat which melted and fused the fibers. Damage is manifested by visibly charred and melted fibers, yarns and/or strands. This area will be extremely stiff. Unlike fiber compression, melting damage cannot be mitigated by flexing the rope.



DISCOLORATION

Fused, brittle, stiff fibers which indicate chemical exposure and contamination.



INCONSISTENT DIAMETER

Flat areas, lumps and/or bumps that may result from shock loading or broken internal strands.



VOLUME REDUCTION

Rope displaying 50% volume reduction from abrasion, exposure to damaging surfaces and/or cyclic tension wear.

Regular inspection will help determine when the rope will need to be retired.

Internal abrasion can be determined by pulling one strand away from the others and looking for powdered or broken filaments. (Figures 1 and 2).

To determine the extent of outer fiber damage from abrasion, a single yarn in all abraded areas should be examined. The diameter of the abraded yarn should then be compared to a portion of the same yarn or an adjacent yarn of the same type that has been protected by strand cross over and is free from abrasion damage. (Figure 3).



Fig. 1 Inspect for Internal Abrasion.

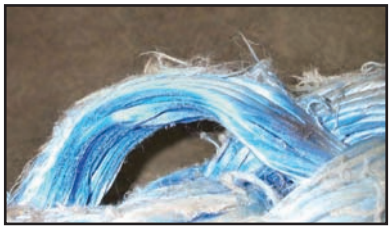


Fig. 2 Inspect for Internal Abrasion.



Fig. 3 Compare Surface Yarns with Internal Yarns

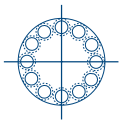
RESIDUAL STRENGTH TESTING

The strength of a used rope can be determined by testing. Samson offers our customers residual strength testing of their ropes, which is critical in determining retirement criteria. Periodic testing of samples taken from ropes currently in service ensures that retirement criteria reflect the actual conditions of use.

The ability to determine the retirement point before failure in service without strength testing is essential and is based on a combination of education in rope use and construction along with good judgment and experience. Remember, if you have any doubt about the condition of a rope; do not use it, until you consult with a qualified person.

TENEX-TEC (12 STRAND)

Tenex-TEC is a high-strength, low-stretch, polyester rope specifically designed with two ends per carrier to allow higher production splicing for standard and adjustable slings. This construction also provides more rope surface conformance to objects being lifted than standard, single braid constructions. Tenex-Tec is Samthane coated to enhance service life. A viable alternative to double braids when easy field splicing and economy are major considerations.



Characteristics

- Standard Colors
- Easy to splice
  Class 1- 12 Strand for:
  Eye and End for End Splices
- Firm, round construction
- Excellent snag and abrasion resistance
- Easy to inspect for potential internal wear
- Higher diameter strength than double braid
- Good gripping characteristics



Applications:

- Slings
- Winch, Pulling and Stringing Lines
- Gillnet Lead
- Purse Seine and Cork Lines
- Mooring Line Stoppers

Technical Specifications:

Specific Gravity - 1.38

Elastic Elongation % Break Strength		
10%	20%	30%
1.4%	2.3%	3%

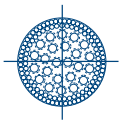
TENEX-TEC SPECIFICATIONS			
Rope Diameter (Inches)	Rope Circumference (Inches)	Weight Per 100 Feet (Lbs.)	Minimum Break Strength* (Lbs.)
1/4	3/4	2.1	2,900
5/16	1	3.2	4,200
3/8	1-1/8	4.2	5,200
7/16	1-1/4	6.3	8,100
1/2	1-1/2	8.5	10,600
5/8	2	13.1	15,400
3/4	2-1/4	17.2	20,200
7/8	2-3/4	25.8	29,300
1	3	34.5	38,400
1-1/4	3-3/4	52.2	51,500

*Properly Spliced Strength

STABLE BRAID-DOUBLE BRAID (COATED)

Stable Braid-Double Braid (Coated) is a firm, polyester double braided rope with low stretch, high strength-to-weight ratio and torque-free construction. It is durable with excellent abrasion and UV resistance.

Characteristics:



- Polyester cover and core
- Torque-free construction
- Durable
- Abrasion resistant
- UV resistant
- Splicing:
  Class 1 - Double Braid splice for:
  Eye and End to End splices
- Low elongation
- High strength-to-weight ratio
- Firm and flexible
- Flex-fatigue resistance



Applications:

- Winch Worklines
- Pulling and Stringing Lines
- Trawl and Bridle Lines
- Gillnet Lead and Cork Lines
- Secondary Mooring Lines
- Non-HMPE Tug Lines
- Stage Rigging
- Utility and General Rigging

Technical Specifications:

Specific Gravity - 1.38

Elastic Elongation At Break Strength		
10%	20%	30%
1.1%	1.7%	2.7%

STABLE BRAID COATED SPECIFICATIONS			
Rope Diameter (Inches)	Rope Circumference (Inches)	Weight Per 100 Feet (Lbs.)	Minimum Break Strength* (Lbs.)
1/4	3/4	2.1	2,000
5/16	1	3.2	3,100
3/8	1-1/8	4.5	4,800
7/16	1-1/4	6.1	6,500
1/2	1-1/2	8.2	8,800
9/16	1-3/4	11	11,300
5/8	2	14	13,900
3/4	2-1/4	18	17,300
7/8	2-3/4	27.1	25,400
1	3	34	33,300
1-1/8	3-1/2	45.3	41,000
1-1/4	3-3/4	53.9	48,700
1-5/16	4	60.8	55,000
1-1/2	4-1/2	73.3	63,800

*Properly Spliced Strength

PRO-SET-3 NYLON

Pro-Set-3 Nylon is a premium, 3-strand, high tenacity Nylon Rope that provides shock mitigation and full performance flexibility. It is manufactured to minimize shrinkage, snagging and hockling, while maximizing strength, durability and flexibility.





Characteristics:

- Four Stage construction
- Excellent energy absorption
- Low shrinkage
- Tough and durable
- Improved splicing:
  Class 1 – 3 Strand splice for:
  Eye and End for End Splices

Applications:

- Hand Lines
- Block Lines
- Vertical Lifelines

Technical Information:

Specific Gravity – 1.14

Elastic Elongation At % Break Strength		
10%	20%	30%
5.5%	10%	12.1%

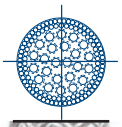
PRO-SET 3 NYLON SPECIFICATIONS

Rope Diameter (Inches)	Rope Circumference (Inches)	Weight Per 100 Feet (Lbs.)	Minimum Break Strength* (Lbs.)
3/16	9/16	1	1,100
1/4	3/4	1.5	1,400
5/16	1	2.5	2.300
3/8	1-1/8	3.5	3,200
7/16	1-1/4	5	4,300
1/2	1-1/2	6.5	5,700
9/16	1-3/4	8.1	7,100
5/8	2	10.5	9,000
3/4	2-1/4	14.5	12,200
13/16	2-1/2	17	13,800
7/8	2-3/4	20	17,100
1	3	26	22,500
1-1/16	3-1/4	29	24,500
1-1/8	3-1/2	34	28,800
1-1/4	3-3/4	40	33,800
1-5/16	4	45	37,400
1-1/2	4-1/2	55	46,800

*Properly Spliced Strength

SUPER STRONG HIGH TENACITY NYLON

Super Strong is a premium, double braid, high tenacity Nylon Rope that provides shock mitigation and full performance flexibility. It is manufactured to provide durability and flexibility and is treated with Pro-Gard finish to provide for maximum strength while wet and wear resistance for a useful service life.





Characteristics:

- High tenacity nylon fiber
- Excellent energy absorption
- Low shrinkage
- Tough and durable
- Improved splicing:
  Class 1 – Double Braid splice for:
  Eye and End for End Splices

Applications:

- Slings
- Winch Lines
- Utility Rigging

Technical Information:

Specific Gravity – 1.14

Elastic Elongation At % Break Strength		
10%	20%	30%
3.0%	5.3%	6.7%

SUPER STRONG HIGH TENACITY NYLON SPECIFICATIONS

Rope Diameter (Inches)	Rope Circumference (Inches)	Weight Per 100 Feet (Lbs.)	Minimum Break Strength* (Lbs.)
1/4	3/4	1.6	2,000
5/16	1	2.6	2,900
3/8	1-1/8	3.7	4,200
7/16	1-1/4	5.1	5,600
1/2	1-1/2	6.6	7,300
9/16	1-3/4	9.3	10,100
5/8	2	12	12,900
3/4	2-1/4	15	16,000
7/8	2-3/4	22	24,700
1	3	26	30,600
1-1/16	3-1/4	31	34,600
1-1/8	3-1/2	36	38,300
1-1/4	3-3/4	41	44,200
1-5/16	4	43.5	50,400
1-1/2	4-1/2	60	64,300

*Properly Spliced Strength

AMSTEEL® II PLUS

AmSteel® II Plus is a double braid rope that derives its strength from a braided Dyneema® core. The polyester, outer cover results in firmness and provides abrasion resistance. AmSteel® II Plus provides the maximum in strength-to-weight ratio and size for size, is the same strength as steel. AmSteel® II Plus is an excellent wire rope replacement. It has extremely low stretch and superior flex fatigue and wear resistance. Samthane coating is available and enhances abrasion resistance, while providing for a longer service life.



Characteristics:

- Double-braid construction
- 100% Dyneema® braided core
- Polyester cover
- Samthane coating available
- Wire replacement
- Low elongation
- Class 2 – Double Braid splice for:
  Eye and End for End Splices

Applications:

- Pulling Lines
- Winch Lines
- Slings
- Entertainment Rigging
- Camera Guy Lines

Technical Information:

Specific Gravity – 1.20

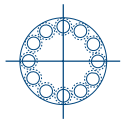
Elastic Elongation At % Break Strength		
10%	20%	30%
.50%	.67%	.96%

AMSTEEL® II PLUS SPECIFICATIONS			
Rope Diameter (Inches)	Rope Circumference (Inches)	Weight Per 100 Feet (Lbs.)	Minimum Break Strength* (Lbs.)
1/4	3/4	2.2	4,800
5/16	1	3.5	7,900
3/8	1-1/8	4.1	10,400
7/16	1-1/4	6.1	12,400
1/2	1-1/2	8.6	16,500
9/16	1-3/4	10	23,400
5/8	2	12.6	28,700
3/4	2-1/4	16	37,200
13/16	2-1/2	20.3	42,500
7/8	2-3/4	24.8	53,100
1	3	29.7	60,600
1-1/16	3-1/4	31.7	62,900
1-1/8	3-1/2	37	76,500
1-1/4	3-3/4	42.6	85,900

*Properly Spliced Strength

AMSTEEL® BLUE

AmSteel® Blue is a torque-free 12 strand single braid rope made from Dyneema® fibers. AmSteel® Blue yields the maximum in strength-to-weight ratio and size for size, is the same strength as steel, yet it floats. AmSteel® Blue is an excellent wire rope replacement. It has extremely low stretch and superior flex fatigue and wear resistance. Samthane coating enhances abrasion resistance and provides for a longer service life.





Characteristics:

- 12-Strand single braid construction
- 100% Dyneema® SK-75 fiber
- Samthane coating
- Wire replacement
- Same elongation as wire rope
- 1/7th the weight of wire rope
- Torque free – Non-Rotational
- Highly flex-fatigue resistant
- Highly abrasion resistant
- Easily spliced
- Class 2 – 12 Strand splice for:
  Eye, Tuck-Bury and End for End splices
- Floats
- UV stabilized
- Easily inspected

Applications:

- Pulling and Stringing Lines
- Winch and Drag Lines
- Slings
- Entertainment Rigging
- Trawl, Tow, Tug and Bridle Lines
- Climbing and Recreational
- Low Stretch Support Lines
- Horizontal Lifelines

Technical Specifications:

Specific Gravity: .98 (Floats)

Elastic Elongation At % Break Strength		
10%	20%	30%
.46%	.70%	.96%

AM-STEEL® BLUE SPECIFICATIONS			
Rope Diameter (Inches)	Rope Circumference (Inches)	Weight Per 100 Feet (Lbs.)	Minimum Break Strength* (Lbs.)
7/64	5/16	.30	1,400
1/8	3/8	.50	2,300
5/32	15/32	.75	3,600
1/4	3/4	1.6	7,700
5/16	1	2.7	12,300
3/8	1-1/8	3.6	17,600
7/16	1-1/4	4.2	21,500
1/2	1-1/2	6.4	30,600
9/16	1-3/4	7.9	36,500
5/8	2	10.2	47,500
3/4	2-1/4	13.3	58,000
7/8	2-3/4	19.6	81,700
1	3	21.8	98,100
1-1/16	3-1/4	27.5	118,000
1-1/8	3-1/2	31.9	133,000
1-1/4	3-3/4	36.2	149,000
1-5/16	4	41.8	166,000
1-3/8	4-1/8	45	185,000
1-1/2	4-1/2	51.7	205,000

*Properly Spliced Strength

CHAFFING GEAR

DC GARD



- Made with Dyneema® fiber
- Light and flexible
- Cut and abrasion resistant
- Superior durability
- Fully repairable in the field
- DC GARD must be removed for inspection and provides maximum protection
- Dynalene allows inspection without removal and provides added protection

DC Gard Size	For Ropes (Inches Dia.)	For Ropes (Inches Circ.)
Size C	1 - 1-1/4	3 - 3-1/2
Size D	1-5/16 - 1-3/4	3-3/4 - 5-1/2
Size E	1-7/8 - 2-1/2	5-3/4 - 6-1/2
Size F	2-5/8 - 3-1/8	7 - 8-3/4

*Contact Customer Service to calculate DC GARD sizing for installation over splice.

Dynalene Size	For Ropes (Inches Dia.)	For Ropes (Inches Circ.)
Small	7/8 - 1-1/4	2-3/4 - 3-3/4
Medium	1-5/16 - 1-5/8	4 - 5
Large	1-3/4 - 3	5-1/2 - 9

DYNALENE













Photos provided by Samson Rope Technologies, Inc.

NYLITE CONNECTOR ASSEMBLIES

Nylite connector assemblies are easily installed or removed from premade soft eyes. Nylite spools are only one-seventh the weight of steel spools. Nylite connectors will not deform or rupture from repeated loading.



⚠ WARNING Work Load Limits are based on the pin-bore relationship provided by Nylite shackles. When using other pins, Work Load Limits DO NOT APPLY.

Work Load Limits are based on a 4:1 design factor.

HP aluminum spools available for Sizes 1 through 5.

Aluminum spools not recommended for continuous use in submerged marine environments.

Assembly ratings are based on the use of designated spools and shackles. Spools used in conjunction with other hardware are not rated by Samson.

NYLITE SHIELDS

Designed for use with specific rope, spool and shackle sizes.



NYLITE GALVANIZED SHACKLES

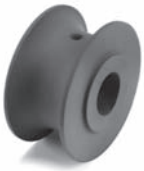


Nylite Shackles (sizes 6-9) are hot-dip galvanized per ASTM A123.

Assembly rating is based on use of designated spool and shackle. Spools used in conjunction with other hardware are not rated by Samson.

NYLITE SPOOLS

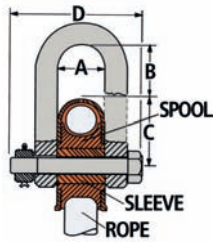
Available in standard and high-performance (HP) options. Standard spools are lighter than steel and recommended for use with Class I ropes. HP aluminum spools allow size-for-size use with Class II high-performance ropes.

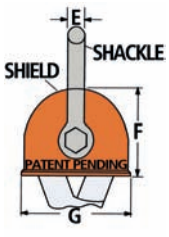


HP Aluminum Spool
(Sizes 1 – 5)



Nylite Spool
(Sizes 1 – 9)





NYLITE CONNECTOR ASSEMBLY SPECIFICATIONS

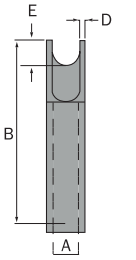
Size	Work Load Tons	Spool Inside Dia. (In.)	Spool Outside Dia. (In.)	Pin* Dia. (In.)	A (In.)	B (In.)	C (In.)	D (In.)	E (In.)	F (In.)	G (In.)	Color
1	2.7	.46	1.50	.44	.88	1.08	1.11	2.41	.38	1.99	2.34	Blue
2	4.8	.58	1.75	.56	1.13	1.21	1.38	3.11	.50	2.38	2.88	Red
3	5.8	.64	2.25	.63	1.38	1.61	1.77	3.54	.56	3.02	3.70	Green
4	11.8	.89	3.00	.88	1.75	1.90	2.29	4.70	.75	3.79	4.71	Orange
5	16.1	1.02	3.75	1.00	2.13	2.15	2.85	5.55	.88	4.85	5.95	Black
6	30	1.54	5.00	1.50	2.63	3.14	3.80	7.75	1.37	6.30	7.85	Yellow
7	45	1.75	6.25	1.63	3.25	3.75	4.80	8.90	1.50	7.93	9.89	Black
8	53	2.00	7.25	1.75	3.75	4.13	5.61	10.13	1.75	9.24	11.47	Black
9	65	2.25	9.00	2.00	4.63	5.06	6.95	12.15	2.00	11.45	14.28	Black

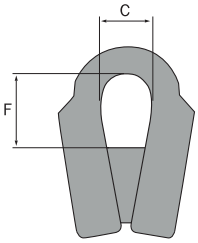
*Sizes 1 to 5 are supplied with jam nuts and cotter pins. Larger sizes have cotter pins and standard nuts.

SYNTHETIC ROPE THIMBLES

BLUE LINE THIMBLE







Blue Line Thimbles are compatible with Samson's high-performance, high-modulus, synthetic fiber ropes. The tubular gusseted design creates a high-strength thimble that protects the rope and maintains the proper bending radius when connected to hardware.



Size Range Diameter (Inches)	Size Range Circumference (Inches)	Thimble Weight (Lbs.)	Dimensions (Inches)					
			A	B	C	D	E	F
3/8 - 7/16	1-1/8 - 1-1/4	.80	.50	3.3	.90	.20	.30	.90
1/2*	1-1/2	1.1	.60	3.7	1.1	.20	.40	1.2
9/16	1-3/4	1.2	.70	3.9	1.1	.20	.40	1.5
5/8*	2	1.4	.80	4.4	1.3	.20	.50	1.8
3/4	2-1/4	2.0	.90	4.9	1.4	.20	.60	1.9
13/16 - 7/8*	2-1/2 - 2-3/4	2.8	1.0	5.9	1.8	.30	.60	2.4
1*	3	3.6	1.1	6.2	1.8	.30	.60	2.2
1-1/16*	3-1/4	4.5	1.2	6.7	1.9	.30	.70	2.7
1-1/8 - 1-5/16	3-1/2 - 4	5.8	1.4	7.5	2.4	.30	.90	2.9
1-3/8 - 1-1/2*	4-1/8 - 4-1/2	7.5	1.8	9.0	2.8	.30	1.1	3.7
1-5/8 - 1-11/16	5 - 5-1/4	10.3	2.0	10.0	3.0	.30	1.4	3.8
1-3/4 - 2*	5-1/2 - 6	10.8	2.2	10.6	3.2	.30	1.2	3.9

*Available in Stainless Steel.

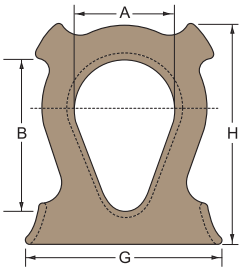
BRONZE THIMBLE

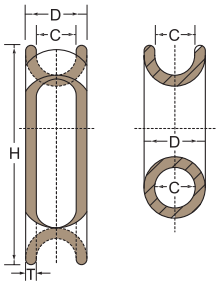
Bronze Rope Thimbles are made from a high strength, non-corrosive, non-sparking, nickel-aluminum bronze alloy. Bronze Rope Thimbles were developed primarily for use with nylon, manila and polypropylene ropes. Four keepers secure the rope to the thimble. Eighteen sizes are available for rope diameters ranging from 3/8" to 4-3/4".

Rope Diameter (Inches)	Rope Circumference (Inches)	Dimensions (Inches)							Shackle Size (In.)	Estimated Weight (Lbs.)
		A	B	C	D	G	H	T		
3/8 - 7/16	1-1/8 - 1-1/4	7/8	1-1/2	9/16	3/4	2-1/16	2-7/16	3/32	3/8	.20
1/2 - 9/16	1-1/2 - 1-3/4	1	1-5/8	11/16	29/32	2-3/8	2-13/16	7/64	3/8	.40
5/8 - 3/4	2 - 2-1/4	1-1/8	2	7/8	1-1/8	3-1/8	3-1/2	1/8	1/2	.60
13/16 - 15/16	2-1/2 - 2-3/4	1-1/4	2-5/16	1-1/16	1-3/8	3-3/4	4-3/16	5/32	5/8	.90
1	3	1-5/8	2-3/4	1-3/16	1-9/16	4-1/4	4-11/16	3/16	3/4	1.6
1-1/8 - 1-1/4	3-1/2 - 3-3/4	1-7/8	3-1/16	1-7/16	1-27/32	5-1/16	5-3/16	13/64	7/8	2.1
1-5/16	4	2-1/8	3-5/8	1-1/2	1-15/16	5-1/2	5-13/16	7/32	7/8	2.6
1-1/2	4-1/2	2-3/8	4-1/16	1-11/16	2-5/32	6-1/4	6-1/2	15/64	1	3.7
1-5/8	5	2-5/8	4-1/2	1-13/16	2-5/16	6-3/4	7-1/16	1/4	1-1/8	4.8
1-3/4	5-1/2	2-7/8	4-15/16	2	2-17/32	7-3/8	7-3/4	17/64	1-1/4	6.8
2	6	3-1/8	5-3/8	2-1/4	2-13/16	8-3/8	8-5/8	9/32	1-1/4	7.7
2-1/8	6-1/2	3-1/2	5-13/16	2-3/8	2-31/32	9	9-1/8	19/64	1-3/8	9.5
2-1/4	7	3-7/8	6-1/4	2-1/2	3-1/8	9-3/8	9-5/8	5/16	1-1/2	11.0
2-5/8	8	4-3/8	7	2-7/8	3-5/8	10-5/8	10-3/4	3/8	1-5/8	16.5
3	9	4-7/8	8	3-1/4	4-1/8	11-3/4	12-1/8	7/16	2	25.0
3-1/4	10	5-3/8	9-1/4	3-1/2	4-1/2	13-1/8	13-7/8	1/2	2	38.0
3-3/4	12	8	10	4	5-3/8	14-5/8	15-1/2	11/16	-	60.0
4-3/4	15 - 16	9	12-1/2	6-3/8	8-3/8	22-7/8	21-1/2	1	-	225.0

Dimensions are approximate and subject to change.







INDEX OF ENGINEERING

SELECTION

Selecting a Rope: Always consult the manufacturer before using rope when personal safety or possible damage to property is involved. Make sure the rope is adequate for the job. Do not use rope that is too small or the wrong type.

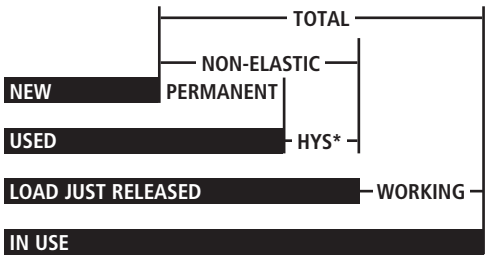
FIBER COMPARISON INFORMATION

ROPE	Strength	Elastic Elongation at WLL	Weight	Working Energy Absorption Capacity Ft. Lbs./Lb. of Rope	Maximum Energy Absorption Capacity Ft. Lbs./Lb. of Rope	Specific Gravity	Firmness (1 = Firm)	Splicability (5 = Very Easy)	Dielectric Strength** MA Leakage @ 90 KV DC
PoBOn	5.0	.80	1.6	185	4,444	1.56	2	2	-
Crystalyne	3.2	.60	1.5	187	3,403	1.40	2	2	100
Ultrex	5.6	.50	1.0	317	8,300	.98	3	5	75
Maxibraid	3.6	.70	1.0	226	6,342	.98	3	5	75
Double Esterlon	1.8	2.2	1.4	291	7,711	1.38	2	3	100
Polydyne	1.9	5.3	1.2	576	11,187	1.24	3	3	500
Yalon	1.5	7.1	1.1	796	11,871	1.38	2	3	100
Kernmaster	1.7	5.0	1.2	622	9,775	1.23	2	N/A	500
Aramid Ropes	3.5	.80	1.5	*	*	1.40	2	1 to 5	N/A
Yalex	1.9	3.0	1.4	409	10,700	1.38	5	5	100
Vectrus	4.6	.80	1.4	232	4,446	1.40	5	5	100
PolyPlus	1.1	3.6	1.0	395	8,228	1.25	5	5	100
PE-12	1.9	3.0	1.4	406	8,738	1.38	4	4	100

* See specific product pages for information

** We recommend you consider all ropes as conductive when in use.

COMPONENTS OF ELONGATION



*HYS = HYSTERESIS

Hysteresis: Recoverable portion of stretch over a period of time, after the load is released.

FIBER COMPARISON INFORMATION

FIBER TYPE	Strength	Weight	Elastic Elongation	Specific Gravity	Water Absorption % @ 65% RH	Melt Point °F	Cost Ratio
Nylon	1.00	1.00	1.00	1.14	4.0	460	1
Polyester	.9-1.1	1.20	.60	1.38	.40	480	1+
Polypropylene	.55	.80	.90	.91	Neg	330	.80
UHMPE***	3.30	.90	.10	.98	Neg	297	12
Aramid	2.7	1.30	.10	1.39	7.5	800*	8
Vectran	3.8	1.30	.10	1.44	Neg	620	22
Zylon PBO	5.4	1.40	<.10	1.56	.60	1200**	60
Manila	.30	1.10	.50	1.38	High	275*	.9

*Chars

**Decomposition temperature

***Ultra High Molecular Polyethelyne

YALE COATINGS

Yale Maxijacket is a spliceable urethane coating, which is applied after the rope is braided. Maxijacket firms the rope, increases snag resistance, improves abrasion resistance and helps keep contaminants from entering the rope. Unlimited lengths may be processed at the mill through automatic coaters, which apply and control the polymer penetration, curing the coating at precisely controlled temperatures. Maxijacket maintains rope splicing characteristics and is available in a range of colors. The colors are useful to track time in service, to color code for load rating, for phase identification or to make the rope more visible. Maxijacket coating is also available in clear or white.

INDEX OF ENGINEERING

USAGE

Handling: Never stand in line with a rope under tension. If a rope fails it can recoil with lethal force. Synthetic rope has higher recoil tendencies than natural fiber rope. Reverse rope ends regularly, which permits even wearing and ensures a longer, useful life. When using tackle or slings, apply a steady, even pull, to get full rope strength.

⚠ WARNING

OVERLOADING AND USE OF WORK LOAD LIMITS

Because of the wide range of uses for rope, exposure to factors affecting rope behavior and the degree of risk to life and property involved, it is impossible to make blanket recommendations about Work Load Limits. However, to provide guidelines, Work Load Limits are calculated for rope in good condition with appropriate splices, in non-critical applications and under normal service conditions.

A higher Work Load Limit may be selected only with expert knowledge of conditions and professional estimate of risk; if the rope has not been subjected to dynamic loading or other excessive use; if the rope has been inspected and found to be in good condition and is to be used in the recommended manner; and if the application does not involve elevated dynamic loading (see explanation below) such as sudden drops, snubs, or pickups. For all such applications and for applications involving more serious exposure conditions or for recommendations on special applications, consult the manufacturer. Many uses of rope involve serious risk of injury to persons or damage to valuable property. Workers should never be under a suspended load. An equally dangerous situation occurs if persons are in line with a rope under tension; should the rope fail, it may recoil with lethal force. Persons should be warned against the serious danger of standing in line with any rope under tension.

In all cases where such risks are present, or there is any question about the loads involved or the conditions of use, the Work Load Limit should be substantially reduced and the rope properly inspected.

Minimum Break Strength is based upon test data of new, unused rope and is a value not greater than two standard deviations below the mean.

DYNAMIC LOADING VOIDS WORK LOAD LIMITS

Normal Work Load Limits are not applicable when rope is subject to significant dynamic loading. Instantaneous changes in load up or down, in excess of 10% of the line's rated Work Load Limit constitutes hazardous shock load and would void normal Work Load Limits. Whenever a load is picked up, stopped or swung, there is an increased force due to such dynamic loading. The more rapidly action occurs, the greater the increase will be. In extreme cases, the force put on the rope may be two, three or even more times the normal Work Load involved and may result in the rope breaking. Examples could be picking up a tow on the slack line or using a rope to stop a falling object. Therefore, in all such applications: towing lines, lifelines, safety lines, climbing ropes, etc. Work Load Limits as given DO NOT APPLY.

COMPUTING ENERGY ABSORPTION REQUIREMENTS

Users should be aware that dynamic forces are greater on a low-elongation, high modulus, aramid rope and less on a higher elongation nylon rope. Dynamic forces are greater on a shorter rope than on a longer one. Work Load limits contain provision for very modest dynamic loading. This means, however, that when the Work Load Limit has been used to select a rope, the load must be handled slowly and smoothly to minimize effect and avoid exceeding provision for them.

Example: A load of 3,500 Lbs. is being lowered using 5/8 in. diameter, Double Esterlon, which has a maximum recommended Work Load Limit of 3,060 Lbs. With 15 feet of line in tension, the line accidentally slips, dropping the load one foot before arresting the fall.

Questions: How much energy did the rope have to absorb?
What was the maximum load on the rope?
Has the rope been overloaded or damaged?

Data:

Work done (Ft. Lbs.) – (Weight)(Length of Fall) = 3,500 Ft. Lbs.

$$\frac{\text{Weight of the Rope in Use} \times \text{Working Energy Absorption Capacity for the Rope Type Used}}{\text{Rated Maximum Working Energy Absorption Capacity}}$$

Assuming Double Esterlon has a working energy absorption capacity of 291 ft. Lbs. per pound of rope and a weight of 13.7 Lbs. per 100 ft., or .137 Lbs./ft.

Rated Maximum Working Energy Absorption Capacity of:
16 ft. of 5/8" Double Esterlon =
(16 ft.)(.137 Lbs./Ft.)(291 Ft. Lbs./Lbs.) = 638 Ft. Lbs.

In this example:
2.19 Lbs. of rope (16 ft. x .137 Lbs./ft.) in use must absorb:
3,500 Ft. Lbs. or 3,500 ÷ 2.19 Lbs. =1,596 Ft. Lbs./Lbs. of rope.

In this example the maximum working energy absorption capacity has been exceeded by nearly six (6) times. The effect is to drive the maximum load the rope encounters until it arrests the load or breaks.

Ultimate energy absorption of 5/8" x 16 Ft. Double Esterlon =
(16 Ft.)(.137Lbs./Ft.)(7,711 Ft. Lbs./Lb.)=16,902 Lbs.

Any dynamic load beyond this would break the line. There is a linear relationship between the weight of the rope in tension versus rope energy absorption capability. In the above example, some degree of the rope integrity has been compromised and prudent safety practices would dictate for discarding the line.

A short film on this subject may be viewed at
www.yalecordage.com/videos

COMPUTING WEIGHT IN SEAWATER:

$$\text{Wt. in Seawater} = \text{Wt. in Air} - \frac{(\text{Wt. In Air})\ (1.03)}{(\text{Specific Gravity of Rope})}$$

Wt. = Weight

INDEX OF ENGINEERING

SLING INSPECTION AND STORAGE

ABRASION
Avoid all abrasive conditions for rope. All rope will be damaged severely if subjected to rough or damaging surfaces or edges. Chocks, bits, winches, drums and other surfaces must be kept in good condition and free of burrs and rust. Pulleys must be free to rotate and should be of proper size to avoid excessive wear. Clamps and similar devices will damage and weaken the rope and should be used with extreme caution. Do not drag rope over the ground. Dirt and grit picked up by rope can work into the strands cutting the inside fibers. Cut fibers reduce rope strength.

CHEMICALS
Avoid exposing rope to chemicals. Rope is subject to damage by chemicals. Consult the manufacturer for recommendations when a rope will be used where chemical exposure (either fumes or actual contact) can occur.

TEMPERATURE
Temperature has an effect on tensile strength. The Tensile Strength Charts apply to ropes tested at normal room temperature (70°F). Ropes have lower tensile strength at higher temperatures; tensile strength loss is 30% or greater at the boiling point of water (212°F) and tensile strength continues lowering down to zero strength as temperature increases. Continued exposure at elevated temperatures can melt and part synthetic ropes or cause permanent damage.

DIELECTRIC STRENGTH
Dielectric strengths are shown on page 403 as a guideline to assist you in comparing different fibers and constructions. We recommend that you consider all ropes, regardless of their initial, new rated dielectric strength as conductive when in use. A short video is available for viewing at www.yalecordage.com

SPLICING
Join rope by splicing. Use Yale's recommended splices for maximum efficiency. The strengths shown are for spliced assemblies. Other terminations can be used, but the actual strength loss for particular ropes and constructions should be determined and never assumed.

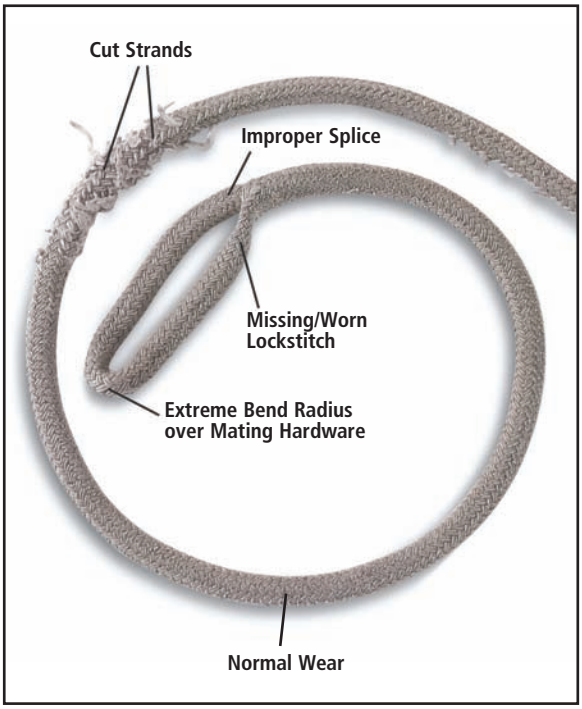
KNOTS
Knots and abrupt bends significantly decrease rope strength, lowering Work Load Limits.

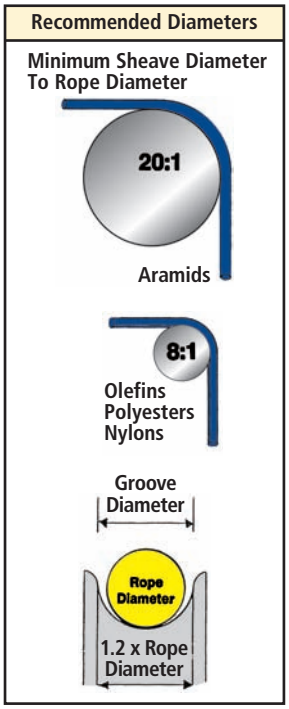
STORAGE AND CARE
All rope should be stored clean, dry, out of direct sunlight and away from extreme heat. Some synthetic rope (particularly polypropylene, polyethylene, and aramid) may be weakened severely by prolonged exposure to ultraviolet (UV) rays unless specifically stabilized and/or pigmented to increase their UV resistance. UV degradation is indicated by discoloration and the presence of splinters and slivers on the surface of the rope.

INSPECTION
Avoid using rope that shows signs of aging and wear. If in doubt, destroy the used rope. No type of visual inspection can accurately determine actual residual strength. When fibers show wear in any given area, the rope should be re-spliced to eliminate the damaged area, downgraded or replaced.

Check the line regularly for frayed strands and broken yarns. Pulled strands should be rethreaded into the rope if possible. A pulled strand can snag during a rope usage.

Both the outer and inner rope fibers contribute to the strength of rope. When either is worn, the rope is compacted or hard, rope strength is reduced. The dielectric strength of rope in this condition also is reduced.





INDEX OF ENGINEERING

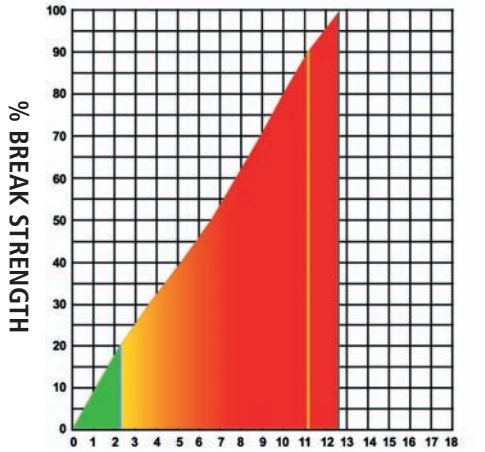
ENERGY ABSORPTION

The colorized graphs represent the ability of ropes to absorb energy. Values are expressed in foot-pounds per pound of rope in tension. Green represents rope Work Load Limits.

DOUBLE ESTERLON™

291 Ft. Lbs./Lb. of Rope

7,771 Ft. Lbs./Lb. of Rope



MAX. WORK LOAD LIMIT

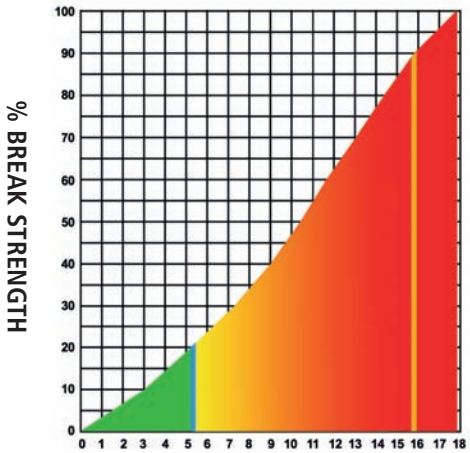
MINIMUM BREAK STRENGTH

SPECIFIC GRAVITY – 1.38

POLYDYNE™

576 Ft. Lbs./Lb. of Rope

11,187 Ft. Lbs./Lb. of Rope



MAX. WORK LOAD LIMIT

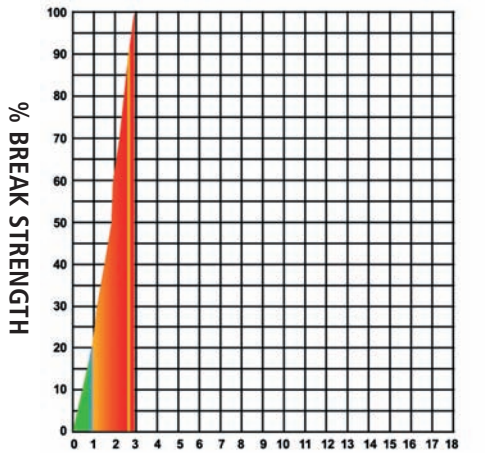
MINIMUM BREAK STRENGTH

SPECIFIC GRAVITY – 1.24

VECTRUS™

232 Ft. Lbs./Lb. of Rope

4,446 Ft. Lbs./Lb. of Rope



MAX. WORK LOAD LIMIT

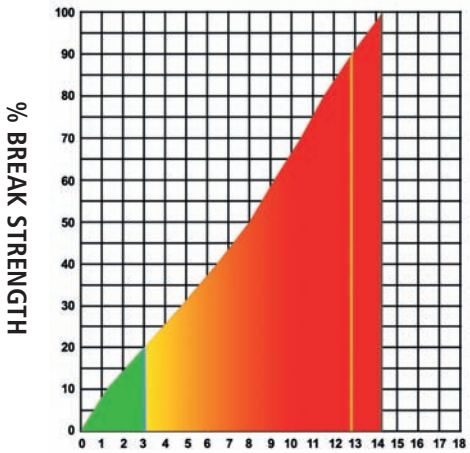
MINIMUM BREAK STRENGTH

SPECIFIC GRAVITY – 1.40

YALEX™

409 Ft. Lbs./Lb. of Rope

10,700 Ft. Lbs./Lb. of Rope



MAX. WORK LOAD LIMIT

MINIMUM BREAK STRENGTH

SPECIFIC GRAVITY – 1.38

Work Load Limits are based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of line's Work Load Limit constitutes hazardous shock loading and would void normal Work Load Limit recommendations. See the engineering information found on page 404 and consult Yale Cordage for guidelines regarding Work Load Limits and safe use of rope. Knots and abrupt bends significantly reduce rope strength and lower Work Load Limits.

DOUBLE BRAID ROPE

DOUBLE ESTERLON™



Double Esterlon™ is a double-braided rope made from unique, high tenacity, cordage-finish, polyester yarn. Yale's exceptionally high strengths come from: selecting this specific yarn (minimum 9.2 gpd), careful attention to machine setup and the extraordinary lubricity of the yarn. Double Esterlon™ offers low stretch, high strength, excellent wear life and dielectric strength.

Double Esterlon™ is identified by two adjacent green strands braided into the cover structure and is available with Maxijacket Coating to enhance wear resistance.

Specific Gravity: 1.38

DIELECTRIC STRENGTH

The maximum allowable leakage for new, dry, clean Double Esterlon™ is 100 micro amperes when tested at 90KV per ASTM 1701-05, "Routine Production Test".

CAUTION Absorbed and entrained impurities will increase rope conductivity, DRAMATICALLY.

DOUBLE ESTERLON™ SPECIFICATIONS			
Diameter Inches	Minimum Break Strength (Lbs.)	Work Load Limit 5 To 1 (Lbs.)	Weight Per 100 Ft. (Lbs.)
1/4	2,430	486	2.3
5/16	3,600	720	3.2
3/8	5,040	1008	4.2
7/16	7,020	1404	5.5
1/2	9,720	1944	8.1
9/16	12,330	2466	9.6
5/8	15,300	3060	13.7
3/4	18,720	3744	16.3
7/8	27,900	5580	23.7
1	39,600	7920	35.2
1-1/16	42,300	8460	39.5
1-1/8	45,000	9000	43.3
1-1/4	52,020	10404	53.5
1-5/16	57,420	11484	58
1-1/2	68,580	13716	69.3
1-5/8	80,325	16065	85
1-3/4	95,940	19188	104
2	114,390	22878	124

POLYDYNE™



Polydyne™ is a high strength double-braided rope incorporating a polyester sleeve over a nylon core.

Despite the dissimilar stretch characteristics of these fibers, Polydyne™ maximizes load sharing between core and sleeve, yielding extremely high strength and high working energy absorption capacity. Available with Maxijacket Coating.

Specific Gravity: 1.24

DIELECTRIC STRENGTH

The maximum allowable leakage for new, dry, clean Polydyne™ is 500 Micro Amperes when tested at 90KV per ASTM 1701-05, "Routine Production Test".

CAUTION Absorbed and entrained impurities will increase rope conductivity, DRAMATICALLY.

POLYDYNE™ SPECIFICATIONS			
Diameter Inches	Minimum Break Strength (Lbs.)	Work Load Limit 5 To 1 (Lbs.)	Weight Per 100 Ft. (Lbs.)
1/4	2,250	450	1.9
5/16	3,420	684	2.8
3/8	4,500	900	4.4
7/16	6,750	1,350	5.8
1/2	9,900	1,980	7.6
9/16	13,500	2,700	9.7
5/8	17,010	3,402	13.3
3/4	23,400	4,680	16.8
7/8	30,240	6,048	23.5
1	37,800	7,560	32.7
1-1/8	46,800	9,360	41.5
1-1/4	58,500	11,700	50.8
1-5/16	69,300	13,860	55
1-1/2	81,000	16,200	66

Work Load Limits are based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of line's Work Load Limit constitutes hazardous shock loading and would void normal Work Load Limit recommendations. See the engineering information found on page 404 and consult Yale Cordage for guidelines regarding Work Load Limits and safe use of rope. Knots and abrupt bends significantly reduce rope strength and lower Work Load Limits.

Double Esterlon™ is made to Yale Cordage Specification #YCI-DE-022. Polydyne™ is made to Yale Cordage Specification #YCI-PD-012. Splice Double Esterlon™ or Polydyne™ using Yale's splicing document No. 10017200.

SINGLE BRAID ROPE

VECTRUS™



Vectrus™ is a single-braid rope of 100% Vectran™ (LCP-Liquid Crystal Polymer) with Maxijacket coating to enhance fiber abrasion resistance and UV stability. LCP is more tolerant of tighter bending radii in terminations than other high-modulus fibers. Vectran™ LCP has no tendency to creep, making it the perfect solution for critical applications where little or no dimensional variation is acceptable.

Specific Gravity: 1.44

DIELECTRIC STRENGTH

The maximum allowable leakage for new, dry, clean Vectrus™ is 100 Micro Amperes when tested at 90KV per ASTM 1701-05, "Routine Production Test".

CAUTION Absorbed and entrained impurities will increase rope conductivity, DRAMATICALLY.

VECTRUS™ ROPE SPECIFICATIONS			
Diameter Inches	Minimum Break Strength (Lbs.)	Work Load Limit 5 to 1 (Lbs.)	Weight Per 100 Ft. (Lbs.)
1/8	1,800	360	.50
5/32	2,880	576	.96
3/16	4,050	810	1.2
1/4	7,200	1,440	2.1
5/16	10,350	2,070	3
3/8	14,400	2,880	4.4
7/16	19,350	3,870	6.3
1/2	23,400	4,680	8
9/16	31,500	6,300	10.3
5/8	43,650	8,730	14.6
3/4	56,250	11,250	22.9
7/8	76,500	15,300	26.2
1	98,100	19,620	32.1

YALEX™



Yalex™ is a single-braid, 12-strand rope constructed of lubricated, type 1W81, high-tenacity polyester. Yalex™ construction with two ends per carrier creates a larger void in the middle of the rope, making rope splicing easier. Yalex™ is finished with Maxijacket coating to optimize the service life of the rope by reducing snagging and increasing abrasion resistance.

Specific Gravity: 1.38

DIELECTRIC STRENGTH

The maximum allowable leakage for new, dry, clean Yalex™ is 100 Micro Amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test".

CAUTION Absorbed and entrained impurities will increase rope conductivity, DRAMATICALLY.

YALEX™ ROPE SPECIFICATIONS			
Diameter Inches	Minimum Break Strength (Lbs.)	Work Load Limit 5 to 1 (Lbs.)	Weight Per 100 Ft. (Lbs.)
1/4	2,250	450	2.2
5/16	3,600	720	2.8
3/8	5,400	1,080	4
7/16	8,100	1,620	7.1
1/2	11,250	2,250	9
9/16	14,850	2,970	11.2
5/8	16,380	3,276	12.7
3/4	21,600	4,320	17
7/8	31,950	6,390	25.6
1	38,700	7,740	32.3
1-1/8	50,400	10,080	34.9
1-1/4	58,950	11,790	39.3
1-5/16	67,275	13,455	46.6
1-1/2	84,150	16,830	60
1-5/8	101,250	20,250	83
1-3/4	108,000	21,600	94
2	119,800	23,960	117

Work Load Limits are based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of line's Work Load Limit constitutes hazardous shock loading and would void normal Work Load limit recommendations. See the engineering information found on page 404 and consult Yale Cordage for guidelines regarding Work Load Limits and safe use of rope. Knots and abrupt bends significantly reduce rope strength and lower Work Load Limits.

Vectrus™ is made to Yale Cordage Specification #YCI-VSB-009. Splice using Yale splicing technique document 10015109 for all sizes or technical document video 100118009.

More information on Vectran® fiber is available at www.vectran.net

Yalex™ is made to Yale Cordage Specification #YCI-XX-002. Splice using Yale splicing technique document 10015101 for all sizes.

There are two types of fibers used in the construction of ropes and twines, natural and synthetic. The most common natural fibers used are: Manila, Sisal, Jute and Cotton. Synthetic fibers such as: Polypropylene, Polyethylene, Nylon and Polyester have become the most popular fibers in today's market.

MANILA rope was once the preferred choice in ropes before synthetic fibers were developed. Manila ropes still maintain some advantages over synthetic fibers. Manila rope has good resistance to the UV (Ultraviolet) rays.



SISAL fibers come from the Agave and Sisalana plants grown in tropical countries. Sisal has many of the characteristics of manila, but offers only 80% of its strength. It is more economical than manila and makes a good choice as a general purpose rope. Sisal is commonly used as a tying twine.



JUTE is mainly used as a tying twine. It knots very well. Due to its short fibers, Jute does not have much strength.



COTTON is a natural fiber, typically white in color. It is a soft fiber, which makes it nice to handle. Cotton also knots very well.



POLYPROPYLENE & POLYETHYLENE make a flexible and lightweight rope. They are rot proof and resist degradation from exposure to: oil, water, gasoline and many chemicals. Polypropylene and Polyethylene are the only rope fibers that float. Available in twisted or braided constructions, they are a perfect economical choice as a general purpose rope.



POLYESTER is very strong and provides excellent abrasion resistance. Polyester stretches less than nylon and does not have the elasticity or shock absorbing qualities of nylon. Polyester has good resistance to UV rays and resists rot and degradation from exposure to: oil, gasoline and many chemicals. Polyester is very popular as a marine or industrial rope where stretch is not desired.



NYLON is known for its elasticity and shock absorbing qualities. Nylon has good abrasion resistance and is rot proof. Nylon fiber resists degradation from exposure to: oil, gasoline and many chemicals. Nylon has good resistance to UV rays. Nylon will last 4-5 times longer than natural fibers.



ROPE SELECTION GUIDE						
FIBER TYPE	**NYLON**	**POLYESTER**	**POLYPROPYLENE**	**POLYETHYLENE**	**MANILA**	**COTTON**
STRENGTH	1*	2*	3*	4*	5*	6*
WET STRENGTH VS. DRY STRENGTH	85%	100%	100%	100%	115%	115%
SHOCK LOAD ABILITY	1*	3*	2*	4*	5*	6*
FLOATS OR SINKS IN WATER	SINKS	SINKS	FLOATS	FLOATS	SINKS	SINKS
ELONGATION AT BREAK	20-34%	15%-20%	15%-20%	10%-15%	10%-15%	5%-10%
WATER ABSORPTION	6%	ZERO	ZERO	ZERO	100%	100%
MELTING POINT	480° F	500° F	330° F	275° F	DOES NOT MELT CHARS AT 350° F	DOES NOT MELT CHARS AT 350° F
ABRASION RESISTANCE	2*	1*	4*	5*	3*	3*
DEGRADATION: RESISTANCE TO SUNLIGHT	GOOD	EXCELLENT	POOR	FAIR	GOOD	GOOD
DEGRADATION: RESISTANCE TO ROT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	POOR	POOR
DEGRADATION: RESISTANCE TO ACIDS	POOR	GOOD	GOOD	GOOD	POOR	POOR
DEGRADATION: RESISTANCE TO ALKALIS	GOOD	POOR	GOOD	GOOD	POOR	POOR
DEGRADATION: RESISTANCE TO OIL AND GAS	GOOD	GOOD	GOOD	GOOD	POOR	POOR
ELECTRICAL CONDUCTIVITY RESISTANCE**	POOR	GOOD	GOOD	GOOD	POOR	POOR
FLEXING ENDURANCE	1*	2*	3*	6*	4*	5*
SPECIFIC GRAVITY	1.14	1.38	.90	.95	1.38	1.54
STORAGE REQUIREMENTS	WET OR DRY	WET OR DRY	WET OR DRY	WET OR DRY	DRY ONLY	DRY ONLY

* Rating Scale: 1 = BEST. **All rope should be considered as conductive when in use.

SPECIFICATIONS

DIAMETER AND SIZE NUMERICAL VALUES

Size is determined by linear density. Diameter is given as a minimal value and may vary slightly. If a specific diameter value is specified, linear density and minimum breaking strength values may be different from those given in tables.

WORK LOAD LIMITS

Minimum breaking strength is based on data from a number of manufacturers and represents a value of 2 standard deviations below the mean, as established by regression analysis. The Work Load Limits of a rope shall be determined by dividing the minimum breaking strength by the design factor. Design factors range from 5 to 12. Because of the wide range of rope use, rope conditions, exposure to the several factors affecting rope behavior, and the degree of risk to life and property involved, it is not realistic to make standard recommendations as to design factors or Work Load Limits. Work Load Limits are based upon rope in good condition with appropriate splices used in non-critical applications and under normal service conditions. Normal service is generally considered to be: use under static or very modest dynamic load conditions. Design factors at the low end of the suggested range should only be selected with expert knowledge of conditions and professional estimate of risk, based on the critical conditions of use listed below.

SPECIAL SAFETY NOTE

A dangerous situation occurs if personnel are in line with a rope under excessive tension. Should the rope fail, it may recoil with considerable force and injury or death may result. Persons must be warned against standing in line with the rope.

DYNAMIC LOADING

Whenever a load is picked up, stopped, moved or swung, there is an increased force due to dynamic loading. The more rapidly or suddenly such actions occur, the greater the increased force will be. In extreme cases, the force put on the rope may be two, three or even more times the normal load involved. Dynamic Loading occurs when picking up a tow on a slack line or using a rope to stop a falling object. Therefore, in applications such as: towing lines, life lines, safety lines, climbing ropes, etc., design factors must reflect the added risks involved. Users should be aware that dynamic effects are greater on a low elongation rope such as manila than on a high-elongation rope such as nylon and greater on a shorter rope than on a longer one. The range of design factors contains provision for very modest dynamic loads. This means that the load must be handled slowly and smoothly to minimize dynamic effects.

CRITICAL CONDITIONS OF USE

LARGER DESIGN FACTORS SHALL BE USED WHEN:

1) Loads are not accurately known. (Always know load weight).
2 Operators are not trained. (Do not use unless you are trained).
3) Operation and use procedures are not well defined and/or controlled.
4) Inspection is infrequent. (Inspect before use).
5) Abrasion, cutting and dirt are present. (Use adequate protection).
6) Shock loads or extreme dynamic loadings are likely.
7) High temperatures are present. (Avoid heat damage).
8) Chemicals are present. (Avoid harmful chemicals).
9) Ropes are kept in service indefinitely.
10) Rope tension is maintained continuously for long periods.
11) Rope subjected to sharp bends if used over pulleys or surfaces with too small a radius.
12) If knots are used, strength is reduced by up to 50%.

⚠ WARNING

Death, injury or loss of valuable property may result from failure to properly use and inspect ropes.

SPECIAL APPLICATIONS

Design factor ranges are not necessarily intended to apply in those applications where a thorough engineering analysis of all conditions of use has been made by qualified professionals. In such cases: breaking strength, elongation, energy absorption, behavior under long-term or cyclic loading and other pertinent properties and operating procedures may be evaluated to allow the selection of a design factor best suited for the specific requirements.

ROPE GUIDELINES

NOTE: Because of the wide range of rope use, rope condition, exposure to the several factors affecting rope behavior and the degree of risk to life and property involved, it is impossible to cover all rope applications. In all cases where risk is involved, or there is a question about the condition of use, consult the manufacturer. Consult the manufacturer for specific applications relative to rescue rope information.



CHOOSING A ROPE

Always consult the manufacturer before using rope when personal safety or possible damage to property is involved. Make sure the rope is adequate for the job. Do not use too small a rope or the wrong type. Specifications are readily available, which gives the strength for various sizes and constructions of natural fiber and synthetic ropes.



REMOVING ROPE FROM COILS & REELS

Remove rope properly from coils or reels to prevent kinking. If the rope is in a coil, it should always be uncoiled from the inside. If on a reel, the rope should be removed by pulling it off the top while the reel is free to rotate. This can be accomplished by passing a pipe through the center of the reel and jacking both ends up in a horizontal position until the reel is free from the surface. To proceed in any other manner may cause kinks or hockles (strand distortion).



HANDLING ROPE

Never stand in line with rope under tension. If a rope or attachment fails, it can recoil with deadly force causing serious injury or death. Synthetic rope has higher recoil/snapback tendencies than natural fiber rope. Reverse rope ends regularly, particularly when used in tackle. This permits even wearing and ensures longer, useful life. When using tackle or slings, apply a steady, even pull to get full strength from the rope. For maximum safety and economy, always use slings employing an angle of about 45° or less.



OVERLOADING

Do not overload rope. Sudden strains and shock loading can cause failure.
Avoid sudden strains and shock loads as they can exceed rope breaking strength. Shock loading can cause failure of a rope normally strong enough to handle the load. Work Load Limits are not applicable when the rope is subject to significant dynamic loading. Whenever a load is picked up, stopped, moved or swung, there is an increased force due to dynamic loading. The more rapidly or suddenly such actions occur, the greater this increase will be.

In extreme cases, the force put on the rope may be two, three or even more times the normal load involved. Examples could be picking up a tow on a slack line or using a rope to stop a falling object. Work Load Limits as given do not apply in applications such as: towing lines, life lines, safety lines or climbing ropes. Users should be aware that dynamic effects are greater on a low elongation rope like manila than on a high elongation rope like nylon and greater on a shorter rope than on a longer one. Excessive dynamic loading of a high elongation rope is equally dangerous, because of stored energy which will cause the rope to recoil dangerously if it breaks. When a Work Load Limit has been used to select a rope, the load must be handled slowly and smoothly to minimize dynamic effect and avoid exceeding the provision for them.



WINCHING LINES

Proper procedures will prevent kinks and hockles in three strand twisted rope. Repeated hauling of a line over a winch in a counterclockwise direction will extend the lay of twisted rope and simultaneously change the twist of each strand. As this action continues, strand hockles or back turning may develop. Once these hockles appear they cannot be removed and the rope is permanently damaged at the point of hockling. If the line is continuously hauled over a winch in a clockwise direction, the rope lay is shortened and the rope becomes stiff and will readily kink.



CHECKING ROPE FOR WEAR

Avoid using rope that shows signs of aging and wear. If in doubt, destroy the used rope.
No type of visual inspection can accurately determine actual residual strength. When fibers show wear in any given area, the rope should be re-spliced or replaced. Check the line regularly for frayed strands and broken yarns. Pulled strands should be rethreaded into the rope if possible. A pulled strand can snag on a foreign object during rope operation. Both outer and inner rope fibers contribute to the strength of the rope. When either is worn, the rope is weakened.

Open the strands of rope (either three strand or braided) slightly and look for powdered fiber, which is one sign of internal wear. A heavily used rope will often become compacted or hard which indicates reduced strength. The rope should be discarded if this condition exists.

ROPE GUIDELINES



SPLICING

Join Rope Ends by Splicing.

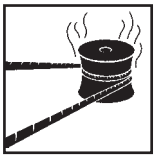
Knots can decrease rope strength by as much as 60%. Use the manufacturers' recommended splices for maximum efficiency. Other terminations can be used, but their strength loss with a particular type of rope construction should be determined and not assumed.



CHEMICALS

Avoid Damaging Chemical Exposure.

Rope is subject to damage by chemicals. Consult the manufacturer for specific chemical exposure such as solvents, acids and alkalis. This is particularly true for natural fiber rope. Consult the manufacturer for recommendations when a rope will be used where chemical exposure (either fumes or actual contact) can occur.



HEAT

Avoid Overheating.

Heat can seriously affect the strength of rope. When using rope where temperatures exceed 140˚F (or if it is too hot to hold), consult the manufacturer for recommendations as to the size and type of rope for the proposed, continuous, heat exposure condition. When using ropes on a capstan or winch, care should be exercised to avoid surging while the capstan or winch head is rotating. The friction from this slippage causes localized overheating which can melt or fuse synthetic fibers or burn natural fibers, resulting in severe loss of tensile strength.

Synthetic fiber ropes will show a reduction in strength when used at elevated temperatures. Because of this property, caution should be taken when using synthetic rope at elevated temperatures; rope will fail under loads well below the published breaking strength. In addition, even though synthetic rope is being used at 75˚F, if it has been stored at elevated temperatures over a long period of time it can fail under loads below published break strength. If the user has any doubts concerning the strength of the rope contact the manufacturer.

CAUTION

Heat can seriously affect the strength of synthetic ropes. The temperature at which 50% strength loss can occur in new and unused rope is: Polypropylene at 150°F, Nylon or Polyester at 350°F.



ABRASION

Avoid all abrasive conditions.

All rope will be severely damaged if subject to rough or damaging surfaces and/or edges. Chocks, bitts, winches, drums and other surfaces must be kept in good condition and free of burrs and rust. Pulleys must be free to rotate and should be of proper size to avoid excessive wear. Restraining clamps and similar devices will damage and weaken the rope and should be used with extreme caution.



STORAGE AND CARE OF ROPE

All rope should be stored clean, dry, out of direct sunlight and away from extreme heat. Rope should be stored in a cool, dry and well ventilated location. It should be kept off the floor and on racks to provide ventilation underneath. Never store rope on a concrete or dirt floor and under no circumstances should rope and acid or alkalis be kept in the same location. Natural fiber rope mildews and decays if stored wet. Do not store rope in direct sunlight. Some synthetic rope (particularly polypropylene and polyethylene) may be severely weakened by prolonged exposure to ultraviolet (UV) rays unless specifically stabilized and/or pigmented to increase UV resistance. UV degradation is indicated by discoloration and the presence of splinters and slivers on the surface of the rope.

⚠ WARNING All synthetic rope under load will recoil if a fitting such as a chain, hook, cleat, bolt, pin or ball-hitch, etc., should fail. The snapback action can propel the fitting and the rope causing serious injury to persons or property anywhere in the vicinity. This danger can exist from failure of the fitting within the rope's Work Load Limit. Before using, check all fittings, bolts, shackles, connectors, pins, mountings, splices, etc.

The Cordage Institute publishes standards for strengths, weights and testing procedures. Contact us for a copy of the publications list.

MANILA ROPE



Manila rope is a natural fiber made from abaca, with low stretch and good abrasion resistance. Manila rope has poor chemical resistance and is subject to rot. Available with blue tracer. Furnished on wooden reels. Meets Federal Specification No. TR605, Type M.

MANILA ROPE SPECIFICATIONS				
Stock Number	Diameter (Inches)	Length (Ft.)	Min. Break (Lbs.)*	Weight (Approximate)
201003	1/4"	600'	540	11 lbs
201005	1/4"	1,200'	540	22 lbs
201007	5/16"	600'	900	16 lbs
201010	5/16"	850'	900	22 lbs
201015	3/8"	600'	1,215	25 lbs
201020	7/16"	600'	1,575	29 lbs
201025	1/2"	600'	2,385	42 lbs
201030	5/8"	600'	3,960	76 lbs
201035	3/4"	600'	4,860	95 lbs

* New rope minimum break strength is based on data from a group of manufacturers and represents a value of 2 Standard Deviations below the mean, established by regression analysis.

POLYPLUS™ AND POLY/DAC™ BLENDED ROPE



PolyPlus™ is a blended rope combining polyester, polypropylene and polyethylene. Polyester forms the surface yarns for strength and abrasion resistance, while polyethylene and polypropylene are used as core yarns to reduce weight.

Poly/Dac™ is a blend of polypropylene and polyester. Polypropylene provides a high strength, light weight core, while the polyester cover yarns provide excellent resistance to abrasion and UV degradation, extending rope service life. Poly/Dac™ ropes are not subject to deterioration by petroleum products and most chemicals. Poly/Dac™ will not rot or mildew and 2"diameter and larger ropes will float.

POLYPLUS™ and POLY/DAC™ BLENDED ROPE SPECIFICATIONS					
Poly/Dac™ Stock No.	PolyPlus™ Stock No.	Diameter (Inches)	Length (Ft.)	Min. Break (Lbs.)*	Weight (Approximate)
325005	755005	1/4 "	600'	1,200	10 lbs
325015	755015	5/16 "	600'	1,870	15 lbs
325025	755026	3/8 "	600'	2,700	22 lbs
325040	755035	7/16 "	600'	3,500	29 lbs
325045	755045	1/2 "	600'	4,400	37 lbs
325060		9/16 "	600'	5,200	47 lbs
325065	755065	5/8 "	600'	6,100	57 lbs
325100	755100	3/4 "	600'	8,400	81 lbs
325110	755110	7/8 "	600'	11,125	108 lbs
325120	755120	1 "	600'	13,175	130 lbs
325130	755130	1-1/8 "	600'	16,325	163 lbs
325140	755140	1-1/4 "	600'	19,900	200 lbs
325147	755150	1-1/2 "	600'	28,250	282 lbs
	755160	1-5/8 "	600'	32,950	330 lbs
325167	755165	1-3/4 "	600'	36,850	372 lbs
325173	755200	2 "	600'	48,050	486 lbs
325182	755205	2-1/4 "	600'	59,950	606 lbs
325187	755210	2-1/2 "	600'	73,550	744 lbs
325191		2-5/8 "	600'	80,650	840 lbs
325197		3 "	600'	102,900	1,074 lbs

* New rope minimum break strength is based on data from a group of manufacturers and represents a value of 2 Standard Deviations below the mean, established by regression analysis.

Poly/Dac™ and PolyPlus™ are available in 1200 Ft. Lengths.

⚠WARNING **See Pages 411 and 412 for Important Safety, Use and Inspection Information.**

NYLON ROPE – 3 STRAND

Nylon, 3 strand rope offers high elongation and strength. Nylon rope provides good energy absorption and abrasion resistance, while providing good resistance to UV, rot, mildew and degradation from exposure to many chemicals. Standard color is white, but other colors are available.





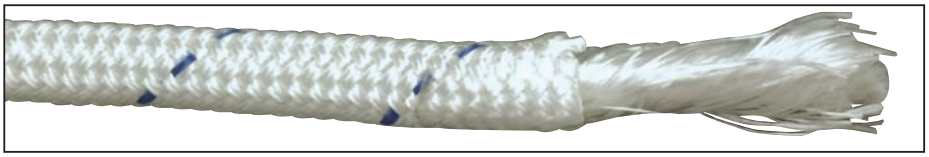
NYLON ROPE - 3 STRAND SPECIFICATIONS						
Standard Stock No.	Gulf Spec* Stock No.	Black Nylon Stock No.	Diameter (Inches)	Length (Ft.)	Minimum Break (Lbs.)**	Weight (Approximate)
315005	409005		3/16 "	600'	880	7 Lbs..
315010	409010		3/16 "	1,200'	880	14 Lbs.
315015	409015	316203	1/4 "	600'	1,485	10 Lbs.
315020	409020	316430	1/4 "	1,200'	1,485	20 Lbs.
315025	409025	316204	5/16 "	600'	2,295	16 Lbs.
315030	409030		5/16 "	1,200'	2,295	32 Lbs.
315035	409035	316205	3/8 "	600'	3,240	22 Lbs.
315040	409040		3/8 "	1,200'	3,240	44 Lbs.
315045	409045		7/16 "	600'	4,320	31 Lbs.
315055	409050	316215	1/2 "	600'	5,670	40 Lbs.
315060	409055		1/2 "	1,200'	5,670	80 Lbs.
315100		316300	9/16 "	600'	7,200	50 Lbs.
315110	409060	316230	5/8 "	600'	8,910	62 Lbs.
315115	409065		5/8 "	1,200'	8,910	124 Lbs.
315120	409070	316235	3/4 "	600'	12,780	90 Lbs.
315125	409071		3/4 "	1,200'	12,780	180 Lbs.
315130	409080		7/8 "	600'	17,280	122 Lbs.
315140	409085	316250	1 "	600'	22,230	160 Lbs.
315145	409090		1 "	1,200'	22,230	320 Lbs.
315150	409095		1-1/8 "	600'	28,260	202 Lbs.
315160	409100		1-1/4 "	600'	34,830	249 Lbs.
315200	409105		1-1/2 "	600'	48,600	358 Lbs.
315217			1-3/4 "	600'	66,150	486 Lbs.
315220	409110		2 "	600'	84,600	636 Lbs.
315230	409109		2-1/4 "	600'	107,100	804 Lbs.
315235	409113		2-1/2 "	600'	131,400	990 Lbs.

*Gulf Spec products may have different weights.
**New rope minimum break strength is based on data from a group of manufacturers and represents a value of 2 Standard Deviations below the mean, established by regression analysis.

WARNING See Pages 411 and 412 for Important Safety, Use and Inspection Information.

NYLON DOUBLE BRAID

Nylon Double Braid rope provides: torque free, high strength, stretch, excellent shock absorption and good resistance to: abrasion, ultraviolet rays and common chemicals. Due to its rate of elongation, nylon is almost always used in applications involving unintentional shock loading such as anchor lines and mooring lines.





NYLON DOUBLE BRAID ROPE SPECIFICATIONS					
Stock Number	**Diameter (Inches)**	**Length (Ft.)**	**Color**	**Minimum Break (Lbs.)***	**Weight per 600 Ft. (Approximate) Lbs.**
345015	1/4 "	600'	White	1,900 Lbs.	11 Lbs.
345014	1/4 "	600'	Gold/White	1,900 Lbs.	11 Lbs.
345099	1/4 "	600'	Black	1,900 Lbs.	11 Lbs.
345025	5/16 "	600'	White	2,900 Lbs.	16 Lbs.
345035	3/8 "	600'	White	4,200 Lbs.	22 Lbs.
345012	3/8 "	600'	Gold/White	4,200 Lbs.	22 Lbs.
345110	3/8 "	600'	Black	4,200 Lbs.	22 Lbs.
345045	7/16 "	600'	White	5,700 Lbs.	31 Lbs.
345050	1/2 "	600'	White	7,400 Lbs.	40 Lbs.
345013	1/2 "	600'	Gold/White	7,400 Lbs.	40 Lbs.
345120	1/2 "	600'	Black	7,400 Lbs.	40 Lbs.
345060	5/8 "	600'	White	14,800 Lbs.	70 Lbs.
345011	5/8 "	600'	Gold/White	14,800 Lbs.	70 Lbs.
345115	5/8 "	600'	Black	14,800 Lbs.	70 Lbs.
346070	3/4 "	600'	White	19,000 Lbs.	88 Lbs.
346107	7/8 "	600'	White	28,300 Lbs.	131 Lbs.
346110	1 "	600'	White	33,500 Lbs.	156 Lbs.
346125	1-1/8 "	600'	White	44,900 Lbs.	213 Lbs.
346127	1-1/4 "	600'	White	52,300 Lbs.	244 Lbs.
346130	1-1/2 "	600'	White	74,000 Lbs.	350 Lbs.
346135	1-5/8 "	600'	White	92,400 Lbs.	434 Lbs.
346137	1-3/4 "	600'	White	110,900 Lbs.	525 Lbs.
346140	2 "	600'	White	131,500 Lbs.	623 Lbs.

*New rope minimum break strength is based on data from a group of manufacturers and represents a value of 2 Standard Deviations below the mean, established by regression analysis. Larger sizes and colors are available.

⚠WARNING **See Pages 411 and 412 for Important Safety, Use and Inspection Information.**

PLASMA® 12 STRAND

Plasma® 12 Strand rope is one of the highest strength, synthetic ropes available. Plasma® 12 Strand comes with a standard polyurethane finish and is easily spliced using a lockstitch type splice, 4-3-2 or 5-4-3 tuck splice. Plasma® 12 Strand rope has low stretch, low creep and soft hand. Plasma® 12 Strand is torque free and floats.

PLASMA® 12 STRAND SPECIFICATIONS				
Stock Number	**Diameter (Inches)**	**Length (Ft.)**	**Minimum Tensile (Lbs.)***	**Weight / Reel (Lbs.) (Approximate)**
353501	3/16 "	600'	5,500	6.80
353500	5/16 "	600'	11,700	15.00
353505	7/16 "	600'	21,000	25.20
***	1/2"	600'	31,300	38.40
***	5/8"	600'	51,400	63.60
***	3/4"	600'	68,500	79.80
***	1"	600'	110,000	140.40
***	1-1/2"	600'	221,000	310.20
***	2"	600'	355,000	548.40
***	2-1/2"	600'	530,000	888

*New rope minimum break strength is based on data from a group of manufacturers and represents a value of 2 Standard Deviations below the mean, established by regression analysis.

Other sizes are available.

WARNING See Pages 411 and 412 for Important Safety, Use and Inspection Information.





It must be genetic.
Aubrey Kay Gelskey, Junior's daughter is in training to "man" the phones in a few years. Hope she will be half as good as her father.

SPECTRA® 12 STRAND

Spectra® 12 Strand is a high strength, synthetic rope with excellent abrasion resistant in a single braid construction. Spectra® 12 Strand comes with a standard polyurethane finish and is easily spliced using a lockstitch type splice, 4-3-2 or 5-4-3 tuck splice. Spectra® 12 Strand rope has low stretch, low creep and soft hand. Spectra® 12 Strand is torque free and floats.

SPECTRA 12 STRAND SPECIFICATIONS				
Stock No.	**Diameter (Inches)**	**Length (Ft.)**	**Minimum Tensile (Lbs.)***	**Weight / Reel (Lbs.) (Approximate)**
353344	1/8 "	600'	1,800 lbs	3.2
353343	3/16 "	600'	3,600 lbs	6
353346	1/4 "	600'	6,000 lbs	9.6
353345	5/16 "	600'	9,000 lbs	15.6
353349	3/8 "	600'	13,900 lbs	22.2
353348	3/8 "	1,200'	13,900 lbs	44.4
353352	7/16 "	600'	14,800 lbs	25.2
353350	1/2 "	600'	22,500 lbs	38.4
353351	1/2 "	1,200'	22,500 lbs	76.8
353355	5/8 "	600'	36,600 lbs	63.6
353358	3/4 "	600'	43,200 lbs	79.8



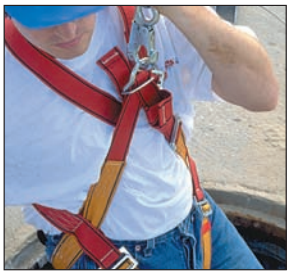
Other sizes are available.

WARNING See Pages 411 and 412 for Important Safety, Use and Inspection Information.

Fall Prevention Equipment

Lift-It® Manufacturing stocks and distributes the finest fall protection equipment from the recognized, industry leader, Capital Safety, manufacturer of the two leading brands DBI-SALA and PROTECTA. DBI-SALA offers the ultimate in fall protection for any environment, supported by a commitment to excellence and innovation. PROTECTA offers fundamental fall protection at an exceptional value, back up by a commitment to quality, reliability and economy. The combination of the two brands gives access to the broadest range of products and value available. ISO certification drives superior products, manufactured and engineered to meet or exceed OSHA and ANSI standards. Most items are in stock at competitive prices.

BODY HARNESSES



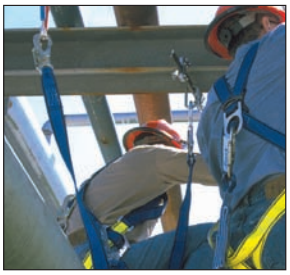
CONFINED SPACE



RETRACTABLE LIFELINES



ANCHORAGE DEVICES



LANYARDS



ESCAPE DEVICES



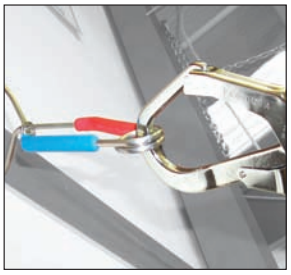
POSITIONING DEVICES



ROPE GRABS



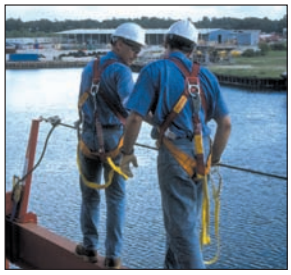
CONNECTING DEVICES



COMPLIANCE IN A CAN



HORIZONTAL LIFELINES



VERTICAL LIFELINES



THE ABC'S OF FALL PREVENTION

DBI-SALA and PROTECTA offer a complete array of passive and active Fall Arrest Systems. The basics of every personal Fall Arrest System can be described as the ABC's of Fall Arrest.

ANCHORAGE
Anchorage is a secure point of attachment (structure) for the fall arrest system. Types of Anchorage vary by industry, the job being performed, the type of installation and the available structure. The anchorage connector provides a means of attaching the system to the Anchorage (structure).



BODY SUPPORT
Full Body harnesses provide a connection point on the user for the personal fall arrest system. Depending on the application, Harnesses can be used as part of a protection system and/or to limit the extent of injury.



CONNECTORS
Connectors are devices used to connect the user's harness to the anchorage system. Connectors include: Lanyards, Snap Hooks, Carabiners, Deceleration Devices, Self-Retracting Lifelines, Ladder Climbing Systems, Vertical Lifelines and Rope Grabs.



DESCENT/RESCUE
Rescue and retrieval of a fallen person is a required component of any Fall Prevention Program.



EQUIPMENT INSPECTION

Conscientious inspection of Fall Protection Equipment is essential to ensure proper product performance and the safety of the user.

INSPECTION FREQUENCY	INSPECTION GUIDELINES - REMOVAL FROM SERVICE
1) Equipment should be inspected by the user before each use. 2) A formal inspection should be performed annually by a competent person. 3) After fall arrest, equipment shall not be used again, until inspected and determined by a competent person to be undamaged and suitable for reuse. Some items require factory verification. 4) **RECORDKEEPING**: Inspections should be recorded in a centralized logbook and should include: date of purchase, date of inspection, serial number, any service or maintenance performed and the signature of the inspector.	**HARDWARE:** Check all hardware components for damage such as: Distortion, Corrosion, Burrs, Cracks and Worn Parts. Moving parts should move freely. **WEBBING:** Inspect webbing for: Frays, Cuts, Broken Fibers, Tears, Abrasion, Mold, Burns, UV Degradation, Heavy Soiling and Discoloration. Inspect all Stitching for Snags, Cut or Broken Stitches. **WIRE AND SYNTHETIC ROPE:** Inspect for: Cuts, Kinks, Broken Strands, Abrasions, Corrosion or Chemical Contact. **ACCESSORIES:** All Pads and Keepers should be in place and free of Cuts or Cracks. Inspect Impact Indicators if present. **LABELS:** All Labels must be present and legible.

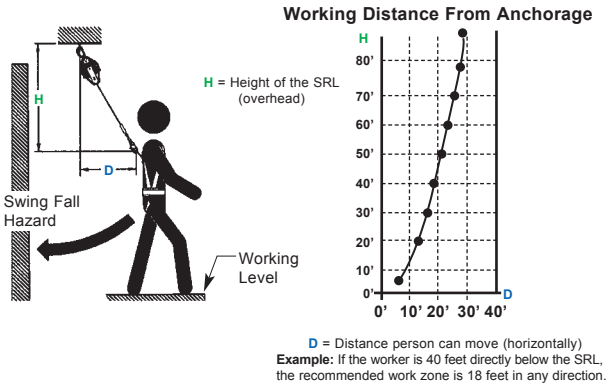
If inspection or operation reveals damage, remove the product immediately from service, destroy it or send it to an authorized service center for evaluation.

MAINTENANCE AND STORAGE

Most webbing and hardware can be washed with mild soap and detergent, using water and a rag to remove excess grease, dirt or grime. The equipment should be allowed to air dry, out of direct sunlight. ⚠ WARNING Do not machine wash to clean Fall Protection Equipment. Some hardware may require lubrication; however any hardware that comes into contact with webbing should be free from grease or solvents. Service and maintenance should only be performed by Factory Authorized Service Centers.

Equipment should be stored in a cool, dry, dark location that is free from environmental and mechanical damage. Protective bags should be used for storage.

SWING FALL HAZARD AND FALL CLEARANCE



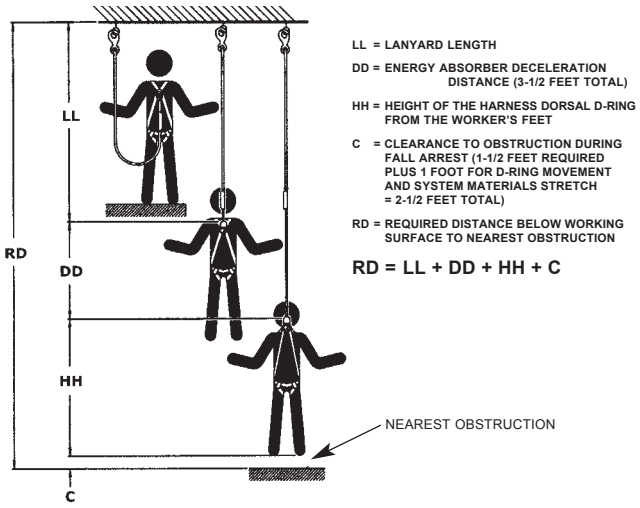
D = Distance person can move (horizontally)
Example: If the worker is 40 feet directly below the SRL, the recommended work zone is 18 feet in any direction.

Swing Falls occur when the anchorage point is not directly above where the fall occurs.

Self Retracting Lifelines provide greater mobility than lanyards, but also increase the opportunity for swing falls. Minimize Swing Falls by working as close as practical, below the anchorage point. Please refer to the chart.

⚠ WARNING The force of striking an object, as a result of this "pendulum" effect may cause serious injury or death. Objects striking lifelines may result in serious injury or death.

⚠ WARNING Read and understand the information in our catalog and instructions supplied with all equipment.



When setting up and using a Personal Fall Arrest System, clearance and swing fall hazards are critical issues. There must be sufficient clearance below to prevent the user from striking the ground or other objects. This determination must be made by the user. Please refer to the chart.

⚠ WARNING Lack of planning or understanding can lead to serious personal injury or death.

DBI-SALA Training and Consulting



We recognize that our commitment to the serious field of fall protection means that every product we sell must meet or exceed the toughest standards. We and the users of our products must also know that even the best equipment must be used correctly. This is why we recommend our training division which devotes critical care and attention to your safety.

The key to effective fall protection training is practical, hands-on experience. We offer a full range of fall protection and industrial rescue courses on-site or at one of the four state-of-the-art training centers located in North America.

On-site courses apply professional training to your specific daily work activities. Courses at the training centers provide controlled environments uniquely designed to offer practical experience with: scaffolding, fixed ladders, towers, sloped roofs, rebar and climbing walls, elevated catwalks, I-beams and confined spaces.

DBI-SALA COMPREHENSIVE TRAINING PROGRAMS

Course	Length	Class Population	Learning Objectives	Open Enrollment	Site Specific
Authorized Person	4 hours	Users that work at heights are trained on specific products supplied by the employers.	Complies with OSHA and ANSI regulations for an authorized person.		✓
Confined Space Access/Egress	2 days	Workers who use a single, pre-engineered and pre-installed fall protection system.	Provides the skills and theory necessary for that single system.	✓	✓
Competent Rescuer	4 hours	Users who will/may be involved in the rescue of a co-worker from within a confined space.	Provides the skills necessary for both team development and establishment of peer rescue programs. Competent Person training is a required prerequisite.	✓	✓
Competent Person	2.5 days	Supervisors of authorized users who implement and monitor a managed fall protection program.	Development of the necessary skills and knowledge to meet the requirements for a competent person as defined by OSHA and ANSI.	✓	✓
Competent Person Refresher	1 day	Pre-requisite is Competent Person. For those who need refresher training under ANSI.	Meets requirements of ANSI for refresher training as a competent person.	✓	✓
Competent Climber/Rescuer	2 days	Users who are required to climb and work on towers or specific sites and individuals responsible for rescue methods.	Skills to properly protect oneself when working on towers and while performing a rescue on the tower or specific site.	✓	✓
Program Administrator	4 days	Persons responsible for the development and assignment of duties and responsibilities of individuals qualified to meet the needs of their program.	Learn the skills necessary to implement and develop a comprehensive managed fall protection program.	✓	
Qualified Person	5 days	Engineers charged with the design and setup of engineered fall protection systems.	Details the technical requirements to design engineered systems.	✓	
Competent Person Trainer	5 days	Persons responsible for the training of all authorized users and competent persons at a specific site or location.	Advanced training in fall protection regulations, standards, equipment and systems.	✓	✓
Competent Rescuer Trainer	4 days	Individuals interested in training competent rescuers. Shall have the ability to evaluate the rescue and fall protection knowledge of a competent rescuer.	Advanced training in fall protection rescue standards, equipment and techniques.	✓	

DBI-SALA Training and Consulting

Custom Courses

If standard courses don't fit your needs, DBI-SALA will customize courses for your organization and your site specific requirements.



Specialty Courses

In addition to the basic courses, our fall protection experts have developed specialty courses designed for a particular trade or industry work requirements. These include: Confined Space Entry and Retrieval, Oilfield Rig Workers Awareness, Rig Rescue, Tower Climbing/Rescue and more.

DBI-SALA Demonstration Vehicles Bring Vital Training to Your Workforce



DBI-SALA helps protect your workers by bringing its expertise and training right to your site. Workers, worldwide enjoy the experience of our hands-on demonstrations of DBI-SALA and PROTECTA fall arrest, restraint and rescue equipment. Our Mobile Vehicle demonstrations show drop tests, featuring force measuring instruments to demonstrate arresting forces users would experience during a fall. The presentation provides an excellent introduction to fall protection.

Expert Consulting to Minimize Risk and Maximize Protection

When preparing for a new project site or an existing one, DBI-SALA Consulting Services provide early identification of fall protection hazards and provide solutions to minimize the risks and programs to implement training and inspection.

DBI-SALA Expert Consulting Services include:

• Site Surveys • Manual and Training Development • Equipment Inspection • Fall Protection Program Development

TRAINING TOOLS PROVIDE FALL PROTECTION BASICS

As part of the ongoing DBI-SALA commitment to improving on-the-job safety, our experts have developed a booklet and media presentation giving a fall protection overview that serves as the foundation of an effective fall protection program. Available in English or Spanish.

THINKING ABOUT FALL PROTECTION

The 20-page booklet,
Thinking about Fall Protection includes:

- Fall Protection Terminology
- Fall Prevention Types
- Fall Arrest Systems
- Calculating Fall Clearance
- Swing Fall Hazards
- Equipment Inspection and Maintenance
- 8-Step Fall Protection Plan
- Understanding Fall Protection Applications
- Harness Sizing and Donning
- Compatibility of Connectors
- Training, Regulations and Standards



ON VIDEO OR DVD

The 20-minute presentation includes many of the same topics as the booklet, "Thinking about Fall Prevention" and also has an in-depth review of the ABC's of fall protection.

- **Booklet – English (Stock No. 9700041)**
- **Booklet – Spanish (Stock No. 9700068)**
- **Video – VHS (Stock No. 9700070)**
- **Video – DVD (Stock No. 9700071)**

- **Training from the top professionals and technicians in the industry.**
- **Backed by decades of company experience.**
- **State-of-the-art training facilities.**
- **Sample and experience the broadest fall protection equipment line in the industry.**
- **Easy-to-understand training manuals.**
- **Bilingual or all-Spanish Instruction is available.**

For additional details on DBI-SALA training programs, customized site specific training and specialty courses, please contact us!

DBI-SALA Full Body Harnesses

DBI-SALA's reputation for quality provides peace of mind in selecting a full body harness. Quality in a harness means maximum comfort, freedom of movement and ease of use. Industry innovations such as the Spring-Loaded, Stand-Up Back D-Ring and the No-Tangle Delta™ Pad demonstrate DBI-SALA engineering and ingenuity.

A full body harness is designed to distribute fall arrest forces over the upper thighs, pelvis, chest and shoulders. This moves the impact of a fall from the internal organs to the major bone and muscle groups around the pelvis. The full body harness includes a means for attaching to the other components of a fall arrest system. Harnesses must meet OSHA, ANSI and CSA standards that include 5,000 Lbs. (22kN) of minimum breaking strength at all attachment points and load bearing straps.

WHAT TO LOOK FOR IN A HARNESS



BACK D-RING: The fall arrest point must be located on the back, positioned between the shoulder blades. No matter what additional anchor points are included on a harness, it must always include the dorsal attachment.

WEBBING: Webbing is an important factor in the durability and safety of the harness. Webbing must be strong enough to endure rough use and exposure to sunlight and other elements without tearing or fraying, yet at the same time stay soft and be comfortable. Kevlar® and Nomex® webbing is used for specialty applications such as welding that requires fire, heat and flame resistance.

ADJUSTING POINTS: Whether you wear a harness for two or fourteen hours, it needs to fit right for safety and comfort. Harnesses with adjusting points on the legs, waist, chest and shoulders allow for a proper fit.

LEG STRAPS: Depending on worker preference, leg strap fasteners may be available in different styles, including:

- Tongue buckle
- Pass thru buckle
- Parachute buckle
- Quick connect buckle

PELVIC SUPPORT: An added sub-pelvic strap provides additional support, security and comfort for the user. Properly positioned, it better distributes forces during a fall.

LABELS: DBI-SALA harnesses feature labels that put product and inspection information at the workers' fingertips. Information may include: sizing, operating instructions, inspection log, warning labels and compliance information. The DBI-SALA labels and information contained, promote inspection, compliance and safety.

STITCHING: Double box stitching provides maximum strength and durability. Sewn-in quality you can trust.

OTHER CONSIDERATIONS



NO-TANGLE DESIGN: Donning a harness incorrectly can mean the equipment may not work properly. The patented Delta™ Pad and Exofit™ exclusive Wrap-Around X-Design make these harnesses easy to don and comfortable to wear with a wide spread over the shoulders to prevent irritating abrasion.

COLOR CODED SIZING: Color coded sizing allows users to quickly and easily choose the harness that will work best for their size.

ARC FLASH STANDARD: Arc flash harnesses are made from a material such as 7,000 lb. (31kN) nylon or Nomex®/Kevlar® to meet the requirements of utility work applications that require protection against static build-up. Options include non-conductive, non-sparking PVC Coated Hardware, Rescue Loops and Back Web Loops. Leather Insulators behind metal hardware reduce static energy transfer. DBI "Specialty" Harnesses are designed to comply with the ASTM F887-05 40 cal/cm2 arc flash standard.

EXOFIT NEX™

ExoFit NEX™ harnesses are the most advanced harnesses available. They're the culmination of years of experience with ExoFit™ and ExoFit™ XP, ongoing research and the incorporation of new materials and innovative features. When you purchase an ExoFit NEX™ harness, you can be certain that you're purchasing the finest harness available.

COMFORT: True to our mission, ExoFit NEX™ harnesses utilize materials that won't add unnecessary weight.

FUNCTION: When speed and efficiency are requirements, ExoFit NEX™ will provide the freedom and confidence to function at your maximum potential.

DURABILITY: ExoFit NEX ™ harnesses are designed using materials that last.

PROTECTIVE SHOULDER CAPS
Provide protection and comfort when carrying heavy materials.

HYBRID COMFORT PADDING
Lightweight, moisture wicking and breathable padding won't move or slip, always keeping you comfortable.

REVOLVER™ VERTICAL TORSO ADJUSTERS
Simple and fast adjustments that eliminate loose ends and lock into place, preventing slippage.

TECH-LITE™ ALUMINUM D-RINGS
Extremely lightweight alloy used in military and aerospace applications offers a higher level of security and comfort.

INTEGRATED TRAUMA STRAPS
Provide an adjustable, continuous loop, minimizing suspension trauma.

DUO-LOK™ QUICK CONNECT BUCKLES
Lightweight, one-hand use with memory-fit web-lock ensures fast, non-slipping connections.



ULTRA-SOFT EDGING
Moves with you. Doesn't rub or chafe.

MOLDED LANYARD KEEPERS
Easy holstered snap hooks break away to avoid trip hazard.

REFLECTIVE MATERIAL
For greater visibility in dark, dangerous environments, reflective material is integrated on legs, chest, shoulders and back.

BUILT-IN CARRYING POCKET
Conveniently holds and protects a cell phone, camera or other items.

REPEL TECHNOLOGY WEBBING
Water repellent to reduce attraction of mold and dirt and is five times more abrasion resistant.





STAND-UP DORSAL D-RING
Patented spring-loaded design automatically stands-up, ensuring fast, easy and safe connections to your fall arrest system.

SUPERIOR X-DESIGN
A single piece of "X" shaped material wraps around the user for the ultimate in comfort, security and no-tangle donning.

EXOFIT NEX™ VEST STYLE

Vest-style harnesses are the most universal, with multiple configurations and connection point options. Used in a wide variety of industries.

EXOFIT NEX™ VEST-STYLE HARNESS
Aluminum back D-Ring locking, quick connect buckles.

1113001	Small
1113004	Medium
1113007	Large
1113010	X Large





EXOFIT NEX™ VEST-STYLE HARNESS
Aluminum back and side D-Rings, locking, quick connect buckles.

1113046	Small
1113049	Medium
1113052	Large
1113055	X Large



EXOFIT NEX™ VEST-STYLE HARNESS
Aluminum back and shoulder D-Rings, locking, quick connect buckles.

1113061	Small
1113064	Medium
1113067	Large
1113070	X Large

EXOFIT NEX™ VEST-STYLE HARNESS
Aluminum front and back D-Rings, locking, quick connect buckles.

1113031	Small
1113034	Medium
1113037	Large
1113040	X Large





EXOFIT NEX™ VEST-STYLE HARNESS
Aluminum front, back and side D-Rings, locking, quick connect buckles.

1113076	Small
1113079	Medium
1113082	Large
1113085	X Large

EXOFIT NEX™ CROSS-OVER STYLE

A front-mounted D-Ring makes the cross-over style ideal as a rescue harness and for ladder climbing applications.

EXOFIT NEX™ CROSS-OVER STYLE HARNESS
Aluminum front and back D-Rings, locking, quick connect buckles.

1113091	Small
1113094	Medium
1113097	Large
1113100	X large





EXOFIT NEX™ CROSS-OVER STYLE HARNESS
Aluminum front, back and side D-Rings, locking, quick connect buckles.

1113106	Small
1113109	Medium
1113112	Large
1113115	X large

EXOFIT NEX™ TOWER CLIMBING

Tower Climbing Harnesses are built to keep the user comfortable during long hours of use. Tool Loops are ideal for carrying equipment.

EXOFIT NEX™ TOWER CLIMBING HARNESS

Aluminum front, back and side D-Rings, locking, quick connect buckles with sewn in hip pad and belt, removable seat sling with positioning D-Rings.

1113190	Small
1113191	Medium
1113192	Large
1113193	X Large



A removable seat sling adds even more comfort for our all day users!

EXOFIT NEX™ CONSTRUCTION STYLE

Made for general construction users, EXOFIT™ Construction Harnesses have excellent tool carrying capability, sewn in hip pad and removable body belt.

EXOFIT NEX™ CONSTRUCTION STYLE HARNESS

Aluminum back and side D-Rings, locking, quick connect buckles with sewn in hip pad and removable belt.

1113121	Small
1113124	Medium
1113127	Large
1113130	X Large



EXOFIT NEX™ CONSTRUCTION STYLE HARNESS

Aluminum front, back and side D-Rings, locking, quick connect buckles with sewn in hip pad and removable belt.

1113151	Small
1113154	Medium
1113157	Large
1113160	X Large





Protective hip padding loops prevent equipment pouches from sagging and reduce abrasion in vulnerable areas.



Easily adjusted, tongue buckle. body belt.

EXOFIT NEX™ WIND ENERGY

Our Wind Energy Harnesses meet global compliance standards: ANSI, OSHA, CSA and CE.



EXOFIT NEX™ WIND ENERGY HARNESS
Aluminum front, back and side D-Rings, locking, quick connect buckles and sewn in hip pad with belt and lumbar protection.

1113215	Small
1113216	Medium
1113217	Large
1113218	X Large



REPLACEABLE LUMBAR PROTECTOR
The lumbar protector is easily replaced when worn or damaged.



RADIO HOLSTER
Conveniently holds and protects a radio, cell phone or other items.





EXOFIT NEX™ WIND ENERGY HARNESS
Aluminum front, back and side D-Rings, locking, quick connect buckles.

1113210	Small
1113211	Medium
1113212	Large
1113213	X Large

EXOFIT NEX™ MINER

Our Miner Harnesses are made with belts constructed specifically to hold equipment carried by miners.

EXOFIT NEX™ MINER HARNESS
Aluminum back D-ring, locking, quick connect buckles, integrated hip padding with belt and miner equipment straps.

1113195	Small
1113196	Medium
1113197	Large
1113199	X Large

We know the boys at Lift-It will get us rigging quick to get the rubber on the road.





EXOFIT NEX™ ARC FLASH

ExoFit NEX™ Arc Flash harnesses incorporate Nomex®/Kevlar® materials with flame resistant and non-conductive properties, making them perfect for use in industries where high voltage electricity or hot-work such as welding is a concern.

All DBI-SALA™ arc flash equipment is tested to perform in accordance with the stringent ASTM F887-05 arc flash standard specification for personal climbing equipment, as well as ANSI Z359 and CSA requirements.



EXOFIT NEX™ ARC FLASH HARNESS
Nomex®/Kevlar® web, PVC coated, aluminum, back D-ring, locking quick connect buckles, comfort padding.

1103085	Small
1103086	Medium
1103087	Large
1103088	X Large

EXOFIT™ DESIGN FEATURES



PADDING
Cushioned shoulder, leg and hip pads keep the pressure off, providing extra worker comfort for long hours of wear. In a fall, padding absorbs shock and helps distribute your weight. They may be built-in to prevent slipping or made removable. Washable, removable padding promotes product longevity.

LINING
Exofit™ and Exofit™ XP harnesses feature breathable lining that wicks moisture away from your body so you're always dry and comfortable. First designed for sport, recreation and work shoe linings, breathable 3-D Mesh Lining is rugged and resistant to odor and mildew.

IMPACT INDICATOR
Some harnesses include impact indicators to give immediate notice that the harness has been in a fall. Impact Indicators promote safety and inspection.

STAND-UP BACK D-RING
The patented DBI-SALA Spring-Loaded, D-Ring makes lanyard connection easy and provides for increased worker comfort.

INTEGRAL LANYARD KEEPER
Lanyard Keepers provide a place to hook up excess line when not in use. Prevents tripping and entanglement for enhanced productivity and safety.

QUICK CONNECT BUCKLE
The patented DBI-SALA Quick Connect Buckle is color-coded and provides one-hand operation for fast and easy donning.

SEAT SLING
An optional, removable seat sling provides job versatility and added comfort for long hours of use.

I-SAFE™
Every DBI-SALA harness now comes with i-Safe™, incorporating RFID, web based communications technologies. RFID technology provides you with the ability to track inspections, control inventory and efficiently manage critical safety information.

FULL BODY HARNESS MODELS

DBI-SALA harnesses are available in many models with various options depending on their intended use.



DESCENT CONTROL:
Has frontal attachment points for use with descent control devices.



CONFINED ENTRY/ RETRIEVAL:
Has an attachment point located on each shoulder strap to facilitate upright retrieval from confined spaces or frontal attachment.



LADDER CLIMBING:
Has frontal attachment point for connection to permanent ladder safety systems.



WORK POSITIONING:
Positioning D-rings are located on the hips for use with pole straps or work positioning lanyards to provide for hands-free operation. (Integral waist belts may be attached to the harness.)



MULTI-PURPOSE:
Extra attachment points may be included to allow work in a variety of situations. The dorsal D-ring must always be used for fall arrest. The pad and belt provide additional back support. Other features may include: positioning rings or tool carrying options.

EXOFIT™ XP HARNESS FEATURES

Quick Connect Buckles



Stand-Up Back D-Ring



Removable Padding



Impact Indicator



Lanyard Keeper



DBI-SALA Full Body Harnesses

HARNESS SELECTION GUIDE

Harness Type	Harness Description	Usage and Application	Webbing Information	Padding and Lining	Quick Connect Buckle	No Tangle Design	Back (Dorsal) D-Ring	Hardware Information	Labels and Warnings	Integral Lanyard keeper	Impact Indicator
ExoFit™ XP	ExoFit™ XP and ExoFit™ are the premier harnesses in the industry, surpassing all other models in comfort and durability.	• Utility • Maintenance • Tower Climbing • Construction • Oil & Gas	100% Polyester (Arc Flash available in Nylon, Nomex® and/or Kevlar®)	✓ Removable 3-D mesh breathable shoulder, back & leg padding	✓ (Also available with Tongue Buckle for leg adjustment)	Wrap Around X-design	Adjustable Patented Spring Loaded Stand-up D-Ring	Plated, Forged, Alloy Steel	✓	✓	✓
ExoFit™	Premium harness for long hours of comfort and durability.	• Construction • Utility • Maintenance • Oil & Gas	100% Polyester	✓ Sewn-in padding	✓ (Also available with Tongue Buckle legs)	Wrap Around X-design	Fixed Back D-ring	Plated, Forged, Alloy Steel	✓		
Delta™	The most popular harness in the industry featuring the patented Delta™ No-Tangle design for optimum comfort and productivity.	• Oil & Gas • Construction • Commercial roofing • Residential roofing • Ladder climbing • Rescue & descent • Warehousing • Order picker	100% Polyester	Optional back and shoulder padding Available as part #9501207	Optional	Delta™ No Tangle Pad	Adjustable Patented Spring Loaded Stand-up D-Ring	Plated, Forged, Alloy Steel	✓		

HARNESS HYDRATION SYSTEM

- Incorporates a simple clip-on design that attaches to any harness.
- 50 oz. capacity provides convenient hydration for safety and productivity.
- Zip-up nylon carrier protects the system and provides easy access filling.
- Compact design keeps water source close to the body without getting in the way.
- Anti-microbial, taste free tubing and reservoir-dual hose ports provide over shoulder access.
- Drink tube clip and quick release hose prevent entanglements.
- No-leak bite valve delivers liquid easily; hands free and the bite valve cover keeps dirt away.
- 50oz (1.5L) capacity, 38" drink tube, 0.75 Lbs. when empty.

Stock No. 1150174



SUSPENSION TRAUMA STRAP



Suspension Trauma Straps allow a suspended worker to stand up in their harness to relieve pressure. Continuous loop design allows for either one or two foot suspension relief without pinching. Can be quickly attached to most harness brands right in the field – just choke off to the strap and it's ready to go.

If you have a harness, you need a Suspension Trauma Strap.

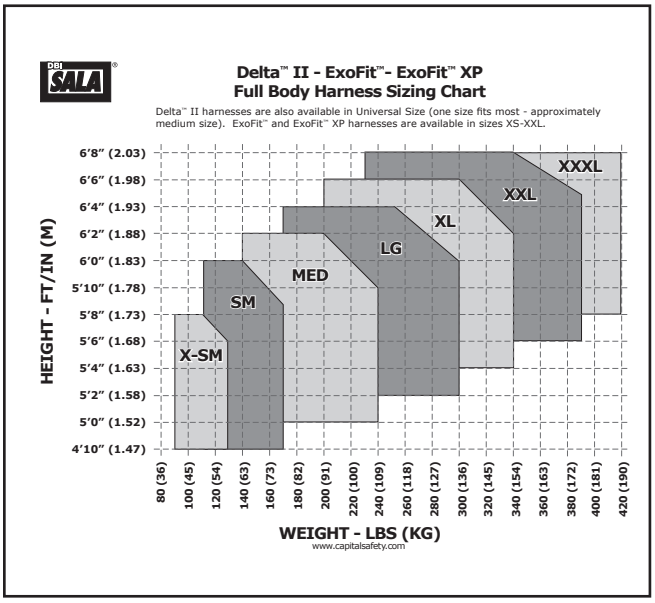
Know how to deploy and adjust your Strap, BEFORE you need to use it!

Extremely compact and lightweight design stays out of the way.

Easy deployment and operation – unzip and hook straps together.

Stock No. 9501403

FULL BODY HARNESS SIZING CHART



EXOFIT™ XP HARNESS

The ExoFit™ XP is the most comfortable, user-friendly harness available.

Removable shoulder, back and leg padding with breathable 3-D Mesh Lining makes this harness the ultimate in comfort and safety. The padding is constructed in the shape of an "X" that wraps around for No-Tangle donning. Stand-Up Back D-ring enables connections to be made without straining.

- Industry's first truly washable harness with removable padding.
- Breathable 3-D Mesh Lining with soft edging for comfort.
- Patented, Spring-Loaded, Stand-Up Back D-ring with Impact Indicator.
- Integral Lanyard Keeper to prevent trip-fall hazards.
- **i-Safe™** Every DBI-SALA harness now comes with i-Safe™, incorporating RFID, web-based communications technologies. RFID technology gives you the ability to track inspections, control inventory and efficiently manage critical safety information.



The ExoFit™ Full Body Harness features a wrap around, No-Tangle design that slips on like a vest, making it quicker and easier to put on while providing ventilation, comfort, padding and security.

The materials are soft and lightweight, yet extremely durable. The shoulder, hip and leg padding is built-in so it can't slip. The breathable lining guarantees you'll stay dry and comfortable. Quick-Release Buckles are fast, efficient and totally secure!

- Incorporates a breathable lining that immediately draws moisture away from the body keeping the user dry and comfortable.
- Ergonomic design incorporates built-in shoulder, hip and leg padding that stay in place enhancing comfort.
- Soft edging moves with you preventing uncomfortable rubbing or chafing and enhances comfort and mobility.
- i-Safe™ RFID enabled.

EXOFIT™ XP HARNESSES



EXOFIT™ XP CONSTRUCTION HARNESS
Hip pad and belt for use with tool pouches and side D-rings for positioning.
Stock No. 1110150



EXOFIT™ XP STANDARD HARNESS
Ideal harness for all general purpose applications.
Stock No. 1110100



EXOFIT™ XP CROSS-OVER HARNESS
Cross-over style with front D-ring; also ideal for female workers.
Stock No. 1109800

EXOFIT™ XP HARNESS SPECIFICATIONS

Model & Size Small M L XL	Style	D-Rings	Buckle Type	Hip Pad/ Belt	Belt Loops
11101(00) (01) (02) (03)	Vest	Back	Quick Connect		✓
11101(25) (26) (27) (28)	Vest	Back	Tongue Buckle		✓
11102(25) (26) (27) (28)	Vest	Back, Side	Quick Connect		✓
11101(50) (51) (52) (53)	Construction	Back, Side	Quick Connect	✓	✓
11101(75) (76) (77) (78)	Construction	Back, Side	Tongue Buckle	✓	✓
11098(00) (01) (02) (03)	Cross-Over	Back, Front	Quick Connect		✓
11113(00) (01) (02) (03)	Nomex®/ Kevlar® Construction	PVC Coated Dorsal D	Quick Connect	Nomex®/ Kevlar® pad, Pass Thru Kevlar belt	✓

EXOFIT™ HARNESSES



EXOFIT™ CONSTRUCTION HARNESS
Hip pad and belt for use with tool pouches; side D-rings for positioning.
Stock No. 1108500



EXOFIT™ STANDARD HARNESS
Ideal harness for general purpose applications.
Stock No. 1107975



EXOFIT™ IRON WORKER HARNESS
Reinforced leg and seat area for greater durability.
Stock No. 1100530

EXOFIT™ XP HARNESS SPECIFICATIONS

Model & Size Small M L XL	Style	D-Rings	Buckle Type	Hip Pad/ Belt	Belt Loops
11079(75) (76) (77) (81)	Vest	Back	Quick Connect		✓
11093(56) (55) (57) (58)	Vest	Back	Tongue Buckle		✓
11085(75) (76) (77) (81)	Vest	Back, Side	Quick Connect		✓
11085(00) (01) (02) (07)	Construction	Back, Side	Quick Connect	✓	✓
11104(75) (76) (77) (78)	Construction	Back, Side	Tongue Buckle	✓	✓
11005(30) (31) (32) (33)	Iron Worker	Back, Side	Tongue Buckle	✓	✓

DELTA™ HARNESS

Delta™ harnesses feature the patented, Delta™ No-Tangle Pad, providing extra comfort throughout the neck, shoulders and back.

The Delta™ No-Tangle Pad design holds the shape of the harness, making it easier to put on. The added comfort and ease of donning has greatly improved worker acceptance and reduced the probability of improper usage. The patented, spring-loaded "Stand-Up" Back D-Ring ensures quick and easy connection to your fall arrest device. A wide variety of models and options lets you find just the right harness for most work applications.

- Patented , spring-loaded, Stand-Up Back D-Ring for quick and easy connection.
- Book-style labels keep information and inspection logs readily available.
- Forged, alloy steel hardware for maximum strength and durability
- **i-Safe™** Every DBI-SALA harness now comes with i-Safe™, incorporating RFID, web-based communications technologies. RFID technology gives you the ability to track inspections, control inventory and efficiently manage critical safety information.



Patented, Spring-Loaded, Stand-Up, Back D-Ring for quick and easy connection.



DELTA™ FULL BODY HARNESSES



DELTA™ CONSTRUCTION HARNESS
Hip pad and belt for use with tool pouches and side D-rings for positioning.

Stock No. 1101655



DELTA™ STANDARD HARNESS
Ideal harness for most, general purpose applications.

Stock No. 1102000



DELTA™ IRON WORKER HARNESS
Reinforced leg and seat area for greater durability, lanyard keepers and hip pad/belt support.

Stock No. 1106450



DELTA™ POSITIONING HARNESS
Side D-rings for positioning and belt loops for separate belt attachment.

Stock No. 1103512



DELTA™ RETRIEVAL HARNESS
Shoulder D-rings for retrieval and rescue.

Stock No. 1101254



DELTA™ CROSS-OVER HARNESS
Cross-over style with front D-ring; also ideal for female workers.

Stock No. 1103270



DELTA™ NOMEX® /KEVLAR® HARNESS
Flame resistant Nomex®/ Kevlar® webbing and non-conductive non-sparking PVC coated hardware.

Stock No. 1105475



DELTA™ HI-VIS WORK VEST HARNESS
Sleeveless, waist length vest with harness built in for high visibility.

Stock No. 1111580

DBI-SALA Full Body Harnesses

DELTA™ HARNESS SPECIFICATIONS						
Stock No. & Size	**Style**	**D-Rings**	**Buckle Type**	**Hip Pad/Belt**	**Belt Loops**	**Additional Info**
1102000 (U)	Vest	Back	Tongue Buckle			
1103321 (U)	Vest	Back	Pass Thru			
1110600 (U)	Vest	Back	Quick Connect			
1102008 (U)	Positioning Vest	Back, Side	Tongue Buckle			
1103875 (U)	Positioning Vest	Back, Side	Pass Thru			
1102526 (U)	Vest	Back	Tongue Buckle		✓	
1103513 (U)	Vest	Back	Pass Thru		✓	
1105475 (L)	Nomex®/Kevlar® Vest	Back	Pass Thru		✓	Nomex®/Kevlar® Web PVC Coated Hardware
1102025 (U)	Positioning Vest	Back, Side	Tongue Buckle		✓	
1103512 (U)	Positioning Vest	Back/Side	Pass Thru		✓	
1107404 (U)	Hi-Vis WorkVest	Back	Tongue Buckle			Hi-Vis Reflective Orange Workvest
1111580 (U)	Hi-Vis WorkVest	Back	Quick Connect			Hi-Vis Reflective Orange Workvest
1101254 (U)	Retrieval Vest	Back, Shoulder	Tongue Buckle			
1102950 (U)	Cross-Over	Back, Front	Tongue Buckle			
1102010 (U)	Cross-Over	Back/ Front	Pass Thru			
1103375 (U)	Cross-Over	Back, Front, Side	Tongue Buckle			
1103270 (U)	Cross-Over	Back, Front, Side	Pass Thru			
1101655 (L)	Construction	Back, Side	Tongue Buckle	✓	✓	Shoulder Pads
1110577 (L)	Construction	Back, Side	Quick Connect	✓	✓	Shoulder Pads
1106405 (L)	Iron Worker	Back, Side	Tongue Buckle	✓	✓	Reinforced Seat Straps

(U) = Universal Size: One Size fits most in the Medium and Large Ranges

DELTA™ HARNESS ACCESSORIES













DELTA® II HARNESS ACCESSORIES		
Item No.	**Stock No.**	**Description**
1	9501207	Delta™ Comfort Back Pad
2	1231117	18" D-Ring Extension
3	9502006	Foam Shoulder Pad
4	9504374	Lanyard Keeper
5	9504066 9504072	11 Pocket Tool Bag 15 Pocket Tool Bag
6	9511597	Harness & Lanyard Bag 7-1/2" x 6-1/2" x 15-1/2"

BODY BELT with SIDE D-RINGS



Stock No. 1000024

- Side D-Rings for connection to restraint lanyard
- 3" Body Pad for added comfort
- Tongue Buckle belt adjustment for fast and easy donning
- Sturdy polyester webbing for added durability
- Size Large

BODY BELT (BASIC)



Stock No. 1000054

- Basic belt with NO D-Ring or Body Pad
- Tongue Buckle Belt adjustment for fast and easy donning
- Sturdy polyester webbing for added durability
- Size Large

DBI SALA Shock Absorbing Lanyards

DBI-SALA can design and build the products you need for all your fall protection challenges.

The patented, DBI-SALA Snap Hook with easy one-hand operation is the most popular in the Industry. The innovative, DBI-SALA Snap Hook is just one of many lanyard features that have enhanced worker productivity and safety. Available with over 20 different Connectors to fit the application, DBI-SALA Lanyards promote safety and enhance productivity.

Lanyards are flexible lines with a connector at each end used to connect the anchorage to the body support component of a fall protection system. Lanyards must be connected to the back D-Ring for fall arrest, located between the shoulder blades and ideally should be anchored above the worker to minimize fall distance. The worker should not walk too far from the overhead anchorage or a swing fall may occur. **See Page 418.**

SHOCK ABSORBING LANYARDS

SHOCK ABSORBING LANYARDS

Lanyards used for fall protection must include a shock absorber to dissipate the energy of the fall, limiting the forces on the body of the falling user.



SHOCK ABSORBING STRETCH LANYARDS

For added flexibility and safety, the DBI-SALA ShockWave™ and EZ-Stop® Retrax™ Lanyards incorporate an expansion and contraction feature that allows the lanyard to be extended when length is needed and contracted with the movement of the worker to avoid trips, falls and snags.



POSITIONING LANYARDS

Rope or web lanyards without shock absorbers may be used for applications that require positioning, restraint of a worker or if the fall possibility is less than 2 Ft.



DOUBLE LEG LANYARDS OR 100% TIE-OFF LANYARDS

This style lanyard (two lanyards that are connected at one end) is used to provide 100% tie-off. It allows you to stay connected and protected while you move from one location to another.



SPECIALTY SHOCK ABSORBING LANYARDS



LANYARDS FOR TYING OFF AT THE FEET

The DBI-SALA Force2™ Shock Absorbing Lanyard allows for a 12' free fall and keeps the forces below the 1,800 Lbs. OSHA limit.



TIE-BACK LANYARDS

When a qualified anchorage connector is not available, a tie-back lanyard acts as both a connector and an anchorage connector. There are two styles: one incorporates a movable D-ring on the lanyard for attaching the snap hook and the other is designed for the hook to go around the webbing itself. This requires a specialty hook with a gate strength capacity of 5,000 Lbs.



KEVLAR® LANYARDS

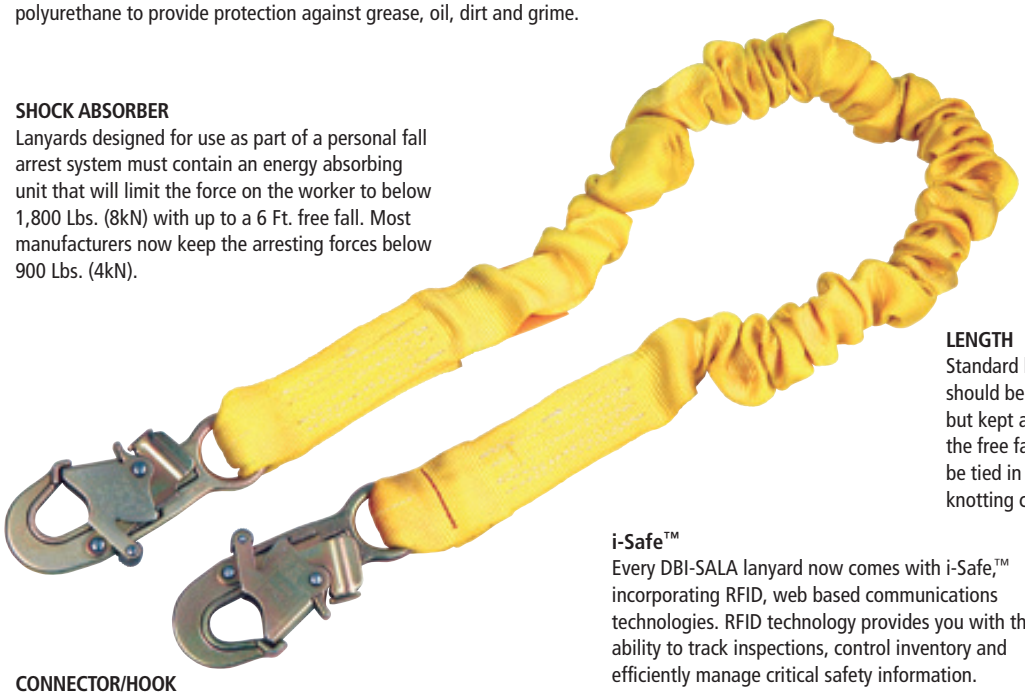
Kevlar® is a special material for high temperature environments. Also available is a Nomex®/Kevlar® Shock Pack Cover option for extra durability.

WHAT TO LOOK FOR IN A SHOCK ABSORBING LANYARD

WEBBING
Webbing is an important factor in the durability and safety of the lanyard. The webbing must be strong enough to endure rough use and exposure to sunlight and other elements without tearing or fraying. Nomex®/Kevlar® webbing is used for specialty applications such as welding that require fire resistance or when extra protection is needed against arc flash hazards. Webbing may also be coated with polyurethane to provide protection against grease, oil, dirt and grime.

CABLE
Some lanyards are made of vinyl-covered cable for extra durability or when working in high heat environments.

SHOCK ABSORBER
Lanyards designed for use as part of a personal fall arrest system must contain an energy absorbing unit that will limit the force on the worker to below 1,800 Lbs. (8kN) with up to a 6 Ft. free fall. Most manufacturers now keep the arresting forces below 900 Lbs. (4kN).



IMPACT INDICATOR
If the lanyard has been used to arrest a fall or if the energy absorber has been deployed, the lanyard must be retired immediately. An Impact Indicator gives easy visual reference of a shock load.

LENGTH
Standard lanyard length is 6 Ft. Lanyards should be long enough to be user-friendly, but kept as short as possible to minimize the free fall distance. Knots should never be tied in lanyards to reduce their length as knotting can reduce strength by 50%.

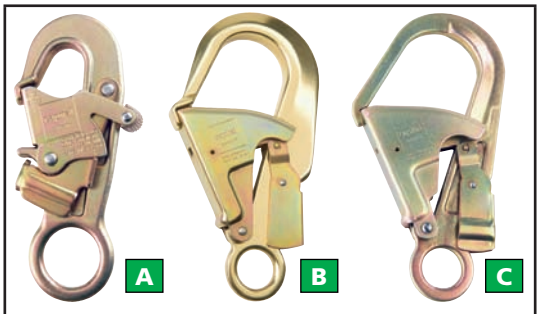
i-Safe™
Every DBI-SALA lanyard now comes with i-Safe,™ incorporating RFID, web based communications technologies. RFID technology provides you with the ability to track inspections, control inventory and efficiently manage critical safety information.

CONNECTOR/HOOK
Most lanyards are available with traditional auto-locking snap hooks. The popular, patented DBI-SALA Snap Hook allows one-hand use with no pinching of thumbs or fingers. Lanyards can also be fitted with larger snap hooks or carabiners for connection to larger anchorages.

LANYARD SNAP HOOKS

DBI-SALA patented snap hooks are preferred in the industry!

Every DBI-SALA Lanyard combines strength and ease of use. All hardware is proof tested to industry standards and our patented, user-friendly, self-locking hooks are standard on all DBI-SALA lanyards. Self-Locking Snap Hooks allow you to open and close the hook even with gloves on, without getting your fingers in the way. All lanyards exceed industry standards, including OSHA and ANSI Z359.1. CSA and CE approved models are also available.



Shock absorbing lanyards are available in multiple configurations with a variety of anchorage hooks:

- A Standard DBI-SALA patented Snap Hook with 3/4" gate opening.
- B Aluminum Rebar Hook with 2-1/4" gate opening.
- C Flat Steel Rebar Hook with 2-1/2" gate opening.

One-hand, easy connection, even with your gloves on!
Open and close without getting your fingers in the way.



NEW REGULATORY REQUIREMENTS – ANSI Z359 STANDARD
The current standard stipulates that snap hook and carabiner gates must withstand a 3,600 Lbs. load. DBI-SALA and PROTECTA products are available to meet the new requirement. We've made ordering the 3,600 Lbs. hook gate option easy; 120 series lanyards will change to 123 and 122 series lanyards will change to 124. Example: Stock No. 1224306 with 3,600 Lbs. gate hooks, WOULD NOW BE Stock No. 1244306

DBI SALA Shock Absorbing Lanyards



Every DBI-SALA Lanyard features Quality in Design, Materials and Manufacturing.

DBI-SALA LANYARD SELECTION GUIDE

Product	Description	Use and Applications	Line Description	Patented DBI-SALA Snap Hook	Tie Back	Retraction and Expansion	Rated for Tie-Off at Feet
Shock Wave 2™	Stretches to provide freedom of movement. Shock Wave 2™ has a unique inner core that limits arresting forces to no more than 900 Lbs.	• Construction • Oil & Gas • Utility • Maintenance • Tower climbing	1 Inch Polyester Webbing	✓		✓	
EZ STOP® II	Designed for versatility. Available in many variations for optimum safety.	• Construction • Oil & Gas • Utility • Maintenance	1" Polyester or Polyurethane Coated Webbing 1-3/4 Kevlar® Webbing or 7/32" Cable	✓	Available		
EZ STOP® Retrax™	The first shock absorbing lanyard that retracts automatically to fit the working area.	• Bucket Truck • Aerial Lift • Bridge Construction	1 Inch Polyester Webbing	✓		✓	
WrapBax™ 2	Unique hook provides 360° , 5,000 Lbs. protection in any direction for safe tie-back.	• Construction • Steel Tie-Back	Heavy Duty 13,000 Lbs. Webbing	✓	✓ 5,000 Lbs. Hook Capacity		
Force 2™	Only shock absorbing lanyard rated for 12 Ft. free fall.	• When no overhead anchorage is available • Use as a standard lanyard for increased capacity for 311 - 420 Lbs.	1 Inch Polyester Webbing	✓	Force2™, WrapBax™ 2 Available		✓
EZ STOP® III	Designed for versatility and available in many variations for optimum safety.	• Construction • Utility • Maintenance	1-3/8 Inch Tubular Webbing	✓			
Positioning	Durable, high quality lanyards for non-fall arrest applications.	• Construction	Nylon or polyester rope, 1" Polyester Webbing, Rebar:Twist Link Chain	✓			

EZ STOP® SHOCK ABSORBING LANYARDS

EZ Stop® Shock Absorbing Lanyards are manufactured with the highest quality to ensure safety and comply with the strictest standards. EZ Stop® II lanyards utilize a controlled tearing action when subjected to fall arrest forces and limits arresting forces to 900 Lbs. or less.

- **DBI-SALA patented, Double Locking Snap Hooks.**
- **Soft Cover Shock Absorber for comfort.**
- **Many lengths and hook options available to fit your specific needs.**

EZ STOP® II SHOCK ABSORBING LANYARDS

Heavy duty, 1"polyester webbing and box stitching for durability and longevity.

Single Leg
Stock No. 1240006



Double Leg
100% Tie-Off
Stock No. 1240406



Double Leg
100% Tie-Off
Tie-Back
Stock No. 1241206



Single Leg Tie-Back
Stock No. 1241106



EZ STOP® RETRAX™ SHOCK ABSORBING LANYARDS

EZ Stop® Retrax™ is the first shock absorbing lanyard that retracts automatically to fit the working area.

- Innovative spring technology retracts and expands from 2.5 Ft. to 6 Ft.
- Smooth retraction without irritating lock-ups.
- Adjustable retraction length, allowing the user to limit retraction.
- A unique alternative to elasticized lanyards.

Single Leg
Stock No. 1241460



Retrax™ Double Leg
Stock No. 1241480



DBI-SALA LANYARD SELECTION GUIDE

Stock Number	Type	Single Leg	Double Leg	Tie-Back	Length	Connectors	Additional Information
1240006	EZ Stop® II	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	
1240068	EZ Stop® II	✓			6 Ft.	Choker Web Loop, Std. Hook, 3600 Lbs. Gates	
1240256	EZ Stop® II	✓			6 Ft. Adj.	Std. Hooks, 3600 Lbs. Gates	Adjustable
1240706	EZ Stop® II	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	7/32" Vinyl Coated Cable
1240558	EZ Stop® II	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	Kevlar® Webbing
1240406	EZ Stop® II		✓		6 Ft.	Std. Hooks, 3600 Lbs. Gates	
1240416	EZ Stop® II		✓		6 Ft.	1 Std. Hook/2 Alum. Rebar, 3600 Lbs. Gates	
1241106	EZ Stop® II	✓		✓ D-Ring	6 Ft.	Std. Hooks, 3600 Lbs. Gates	Abrasion Resistant Tubular Wear Jacket
1241206	EZ Stop® II		✓	✓ D-Ring	6 Ft.	Std. Hooks, 3600 Lbs. Gates	Abrasion Resistant Tubular Wear Jacket
1240860	EZ Stop® II Arc Flash	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	Coated Web, Nomex®/Kevlar® Shock Pack, ASTM F887-05
1241219	EZ Stop® II		✓	✓ D-Ring	6 Ft.	1 Std. Hook/2 Alum. Rebar, 3600 Lbs. Gates	Abrasion Resistant Tubular Wear Jacket
1241220	EZ Stop® II		✓	✓ D-Ring	6 Ft.	2 Std. Hooks/2 Steel Rebar, 3600 Lbs. Gates	Abrasion Resistant Tubular Wear Jacket
1241460	EZ Stop® Retrax™	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	Retracts automatically
1241480	EZ Stop® Retrax™		✓		6 Ft.	3 Std. Hooks, 3600 Lbs. Gates	Retracts automatically
1240850	EZ Stop® II Resist	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	Resist Model with Coated Web
1240526	EZ Stop® II Resist		✓		6 Ft.	Std. Hooks, 3600 Lbs. Gates	Resist Model with Coated Web
1244006	EZ Stop® III	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates	

SHOCKWAVE2™ SHOCK ABSORBING LANYARDS

Designed to expand and contract with use in reaction to the user's movements. ShockWave2™ lanyards stay out of the way when not in use, avoiding trips and snags. ShockWave2™ Lanyards Impact Indicators provide easy visual evidence if shock loading has occurred through a fall or improper use. ShockWave2™ Shock Absorbing Lanyards limit arresting forces to 900 Lbs. or less.

- Expands to 6 Ft. and contracts to 4.5 Ft.
- Unique inner core that immediately extends and absorbs energy during a fall.
- Impact Indicator allows user to visually inspect unit.
- Available in Double Leg, 100% Tie-Off style.
- Standard web is polyester. Flame resistant/arc flash models incorporate Nomex®/Kevlar® web with a 800ºF char temperature and arc tested to 40 cal/cm2 to meet the specifications of the ASTM F887-05 standard.

Single Leg
Standard Hooks
Stock No. 1244306



Double Leg
100% Tie-Off
Steel Rebar Hooks
Stock No. 1244412



Arc Flash, Double Leg
Standard Hooks
Stock No. 1244630



Single Leg Tie-Back
Standard and
Tie-Back Hook
Stock No. 1244650



SHOCKWAVE2™ LANYARD SPECIFICATIONS

Stock Number	Single Leg	Double Leg	Nomex®/ Kevlar® Web	Length	Connectors
1244306	✓			6 Ft.	Std. Hooks, 3600 Lbs. Gates
1244311	✓			6 Ft.	1 Std. Hook 1 Aluminum Rebar Hook, 3600 Lbs. Gates
1244321	✓			6 Ft..	1 Std. Hook Flat Steel Rebar Hook, 3600 Lbs. Gates
1244406		✓		6 Ft.	3 Std. Hooks, 3600 Lbs. Gates
1244413		✓		6 Ft.	Choker Web Loop, Std. Hooks, 3600 Lbs. Gates
1244409		✓		6 Ft.	1 Std. Hook 2 ea. Aluminum Rebar Hooks, 3600 Lbs. Gates
1244412		✓		6 Ft.	1 Std. Hook 2 Flat Steel Rebar Hooks, 3600 Lbs. Gates
1244456		✓		6 Ft.	1 Std. Hook 2 Flat Steel Rebar Hooks, 3600 Lbs. Gates / Plus D Ring
1244610	✓		✓	6 Ft.	Std. Hooks, 3600 Lbs. Gates
1244630		✓	✓	6 Ft.	Std. Hooks, 3600 Lbs. Gates
1244650	✓			6 Ft.	1 Std. Hook, 3600 Lbs. Gate 1 Tie-Back Carabiner 5000 Lbs. Gate
1244675		✓		6 Ft.	1 Std. Hook, 3600 Lbs. Gate 1 Tie-Back Carabiner 5000 Lbs. Gates

***Stock No. 1244657 also incorporates a tie-back feature.**

WRAPBAX™2 TIE-BACK SHOCK ABSORBING LANYARDS

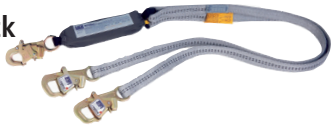
Eliminates the need for a separate anchorage connector, thereby reducing inventory and cost, simplifying inspections, training and improving compliance. The WrapBax™2 Tie-Back Hook has a unique look to easily differentiate it from standard hooks and provides 5,000 Lbs. strength, even on the gate. WrapBax™ 2 Shock Absorbing Lanyards limit arresting forces to 900 Lbs. or less. Force2™ style limits forces to 1,800 Lbs. or less.

- 5,000 Lbs. hook capacity from every direction, including the gate.
- Heavy duty webbing provides five times more abrasion resistance, making it ideal for tying off on rough surfaces.
- Industry preferred easy-to-use, one-hand operation with DBI-SALA patented snap hooks.
- Unique hook design makes it easily differentiated from standard snap hooks to eliminate confusion on the jobsite.

WrapBax™2 Tie-Back
Single Leg
Stock No. 1241906



WrapBax™2 Tie-Back
Double Leg
Stock No. 1242003



WrapBax™2 LANYARD SPECIFICATIONS

Stock Number	Single Leg	Double Leg	Tie-Back	Length	Connectors
1241906	✓		✓	6 Ft.	WrapBax™2 Hook
1242003		✓	✓	6 Ft.	WrapBax™2 Hook
1242102	✓		✓	6 Ft.	Force2™, WrapBax™2 Hook
1242128		✓	✓	6 Ft.	Force2™, WrapBax™2 Hook

FORCE2™ SHOCK ABSORBING LANYARDS



Force2™ Shock Absorbing Lanyards are used when there is no overhead anchorage and your only option is to tie-off at your feet, a situation often faced by iron workers. Force2™ Shock Absorbing Lanyards can be used for a 6 to 12 Ft. free fall and limits the arresting forces below the mandated OSHA requirements. Force2™ Shock Absorbing Lanyards can also be used as a standard lanyard for workers that require a capacity of 311 Lbs. to 420 Lbs.

- OSHA approved for tying off at the feet
- Soft Shock Absorber Cover for comfort
- Dual Capacity Rating
  - Up to 310 Lbs. for a 12 Ft. free fall.
  - From 311 Lbs. to 420 Lbs. for a 6 Ft. free fall.
- Limits arresting forces to 1,800 Lbs. or less.



FORCE2™ SPECIFICATIONS					
Stock Number	Single Leg	Double Leg	Tie-Off at Feet	Length	Connectors
1245006	✓		✓	6 Ft.	Standard Hooks, 3600 Lbs. Gates
1245176		✓	✓	6 Ft.	3 Standard Hooks, 3600 Lbs. Gates

POSITIONING & RESTRAINT LANYARDS

Positioning and Restraint lanyards provide the ultimate in durability and safety for non-fall arrest applications.

Rope Lanyards
- Nylon or polyester rope with five-tuck splice and exclusive seizing method to hold the connection and prevent unweaving.
- Various lengths available.

Web Lanyards
- Built-in Wear Indicator in the webbing alerts when there is excess abrasion.
- Various lengths available.

Rebar Hook Assemblies
- Twist link chain for strength and durability. A variety of hooks provide safe and compatible connections to many types of structures. Web option is also available.

Wall-Form Assembly
- Twist link chain or 1 In. polyester web, fits most wedge bolt slots or holes on wall-forms.

POSITIONING & RESTRAINT LANYARD SPECIFICATIONS					
Stock Number	Type	Single Leg	Double Leg	Length	Connectors
1231106	Positioning Web	✓		6 Ft.	Standard Hook, 3600 Lbs. Gates
1231016	Positioning Web	✓		6 Ft. Adjustable	Standard Hook, 3600 Lbs. Gates
1232354	Positioning 1/2" Nylon Rope	✓		6 Ft.	Standard Hook, 3600 Lbs. Gates
1232209	Positioning 1/2" Nylon Rope	✓		6 Ft. Adjustable	Standard Hook, 3600 Lbs. Gates
5920050	Chain Rebar Assembly		✓	20.5 In.	2 Std. Hooks, 1 Flat Steel Rebar Hook, 3600 Lbs. Gates
1231380	Web Rebar Assembly		✓	18 In.	2 Std. Hooks, 1 Aluminum Rebar Hook, 3600 Lbs. Gates

Chain Rebar Assembly
Flat Steel Rebar Hook at center.
Stock No. 5920050



Web Rebar Assembly
1 In. Polyester Web
Stock No. 1231380



Rope Lanyard
1/2 In. Nylon Rope
Stock No. 1232354



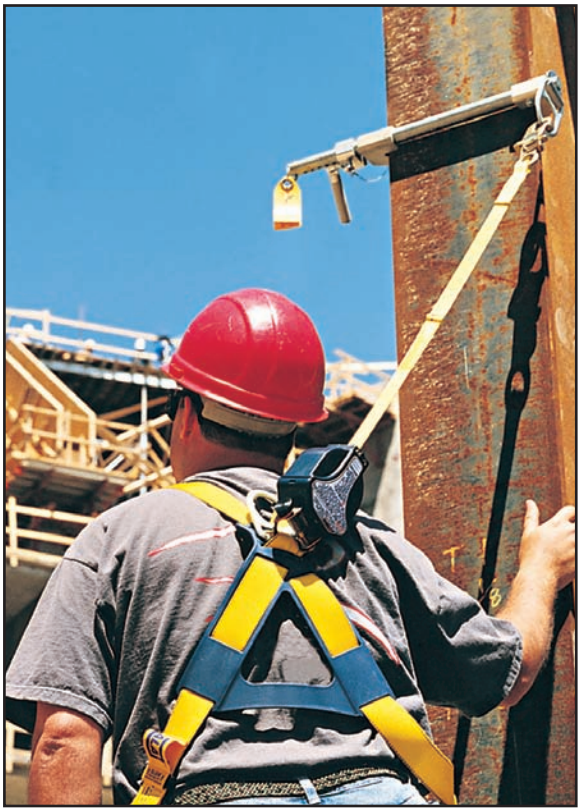
Web Lanyard
1 In. Polyester Web
Stock No. 1231106



ANCHORAGES & ANCHORAGE CONNECTORS

SECURITY TO MATCH THE TASK

Anchorage connectors are selected to suit the specific requirements of the user, based upon: the type of attachment, the environment and the connecting system. DBI-SALA offers the most complete line of anchorage connectors available, rigorously tested to ensure the strength you need.



ANCHORAGES

An anchorage is a secure point of attachment for the fall arrest system. The anchorage must be capable of supporting a load of 5,000 Lbs. per worker attached to the anchorage or shall be designed, installed and used as part of a complete personal fall arrest system which maintains a minimum design factor of 2.

Anchorages may be certified, designed or engineered on site for fall protection. Certified anchorages should be identified with paint or special markings and kept on a site location list.

Non-certified Anchorages are beams, trusses or other suitably strong structures.

ANCHORAGE CONNECTORS

Anchorage connectors provide a means of attaching the fall arrest system to the anchorage. Anchorage Connectors vary widely depending on application. Some of the more popular anchorage connectors are Anchor Slings, Roof Anchors, Beam Clamps, Rail Sliders, Trolleys, Eyebolts and Shepherd Hooks.

ANCHORAGE CONNECTORS



ANCHORAGE CONNECTORS FOR CONCRETE

Concrete Anchors are secured to concrete decks and columns. They provide the worker safety and mobility when performing leading edge work.



ANCHORAGE CONNECTORS FOR ROOFS

Roof Anchors are available in a variety of designs to match the roof being worked on. Roof Anchors must include specialized components to keep the worker safe without causing damage to the structure.



ANCHORAGE CONNECTORS FOR STEEL

Steel anchors can be mounted on flanges horizontally or vertically. Steel Anchors can be permanently attached or temporarily clamped, offering both a fixed and mobile Anchorage Connector.



TIE-OFF ADAPTORS SCAFFOLD CHOKERS

Tie-off Adaptors and Scaffold Chokers are alternative Anchorage Connectors for fall arrest systems. Tie-off Adaptors and Scaffold Chokers may be made of different materials, including cable, web and chain. Kevlar® tie-off adaptors should be used when working with high temperatures.

WHAT TO LOOK FOR IN A CONNECTOR

ANCHORAGE CONNECTOR SELECTION IS BASED ON:

- What they connect to: steel, concrete or roofs.
- Whether they are fixed or mobile.
- Whether they are permanent or portable.

Experienced DBI-SALA technicians can provide guidance for the Anchorage Connector that will best fit your applications.

TESTING

Anchorage Connectors are a critical part of a fall protection system. Anchorage Connectors must be tested to ensure strength to withstand the tremendous forces that can be generated by a fall. DBI-SALA Anchorage Connectors are rigorously tested both in-house and by SEI, an independent, non-profit testing and certification company accredited by ANSI and the Standards Council of Canada (SCC).

VACUUM ANCHORS

Vacuum Anchor Systems allow users to anchor to virtually any smooth, non-porous surface simply by flipping a switch and waiting for the green light.



If work on a tank, vessel or steel structure is required, users are able to quickly and easily put themselves where they need to be, without putting themselves in danger.



WHAT TO LOOK FOR IN SNAP HOOKS AND CARABINERS



SELF-LOCKING DESIGN

Snap Hooks and Carabiners used in fall protection or rescue operations must be self-locking. Non-locking hooks must not be used for fall protection because of the danger of rollout, the accidental disengagement of a connector from the attachment point. The unique DBI-SALA Snap Hook is an industry favorite.

ONE-HAND OPERATION

Snap hooks should be simple to operate, even when wearing gloves in order to ensure proper use.

CONSTRUCTIONAL MATERIALS

DBI-SALA Snap Hooks and Carabiners are made of high tensile, alloy steel or aluminum.

STANDARDS AND REGULATORY COMPLIANCE

Snap Hooks and Carabiners used for fall protection must be capable of withstanding a 5,000 Lbs. (22kN) load and be proof-tested to at least 3,600 Lbs. (16kN). Many imported connectors will not meet these requirements.

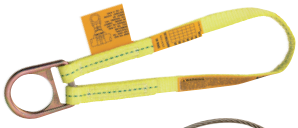
Features	Benefits	Saflok® Carabiners	Patented Snap Hooks
Maximum Strength	Safety	✓	✓
One Hand Operation	Ease of Use	✓	✓
Range of Gate Openings	Versatility	✓	
Self-Locking and Closing	Safety	✓	✓
Corrosion Resistant	Durability	✓	✓

DBI-SALA Anchorages & Connectors

DBI-SALA offers the widest range of Anchorage Connectors which combine ease of use, lightweight materials and a 5,000 Lbs. minimum tensile tensile strength to meet or exceed OSHA and ANSI Z359.1 requirements. CE and CSA compliant models are also available.















(Door Jamb Anchor)



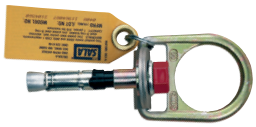
ANCHORAGE CONNECTORS SPECIFICATIONS

Product	Description	Stock Number	Additional Information
Tie-Off Adaptor	Pass thru design provides a safe and easy way to anchor a fall protection device to an overhead location and beyond normal reach. 1-3/4" polyester strap, 3" wear guard, zinc plated, steel hardware.	1003000	3 Ft. length
		1002103	3 Ft. length (Adjustable)
		1003006	6 Ft. length
		1002106	6 Ft. length (Adjustable)
Scaffold Choker	1" polyester webbing, 17" length fits 3" maximum diameter structure, zinc plated, steel hardware.	1201390	17 in. length
Cable Choker	Pass thru design, (7x19) 3/8" stainless steel cable, dual O-ring pass through, zinc plated, steel hardware.	5900550	4 Ft. length
		5900551	6 Ft. length
D Ring and Anchorage Plate	Bolted or weld on, two 1/2" attachment holes, 1/4"x 2"x 4-1/4"	2101630	Stainless Steel Plate, D-Ring, zinc plated
		2101634	Raw steel
		2101632	Painted
		2101636	All Stainless Steel
First-Man-Up™ System	Provides a complete system to mount a tie-off adapter to an overhead anchorage.	2104519	6 Ft. to 12 Ft. Adjustable Pole
		2104520	8 Ft. to 16 Ft. Adjustable Pole
		2104527	6 Ft. to 12 Ft, 3600 Lbs. Hook
		2104528	8 Ft. to 16 Ft., 3600 Lbs. Hook
		2104530	6 Ft. to 12 Ft., 3600 Lbs. and Original Hook
		2104531	8 Ft. to 16 Ft., 3600 Lbs. and Original Hook
		2104522	Snap Hook Connector Tool, Original Hook
		2104529	Snap Hook Connector Tool, 3,600 Lbs.
Door Jamb Anchor	Non-penetrating anchor designed to install against door or window jambs. Fits opening sizes 21.5" to 51.5", weighs 14 lbs.	2100080	Fits openings from 21.5" to 51.5"
Perimeter Limiter	Provides a non-penetrating anchor or tie-off point for personnel performing work on concrete decking operations or similar type applications.	2100090	Overhead Anchorages for 2 users - Reduces the fall distance and minimizes swing falls.



BEAM ANCHOR SPECIFICATIONS

Product	Stock Number	Description
Fixed Beam Anchor	2108406	Works horizontally or vertically. Fits 1-1/2" thick flange, 2-1/2" to 12" wide. Larger models are available.
Glyder2™ Sliding Beam Anchor	2104700	For complete horizontal mobility. Designed for use with the Force2™ Shock Absorbing Lanyard at user's feet. Integrated ratcheting adjustment system provides quick and easy installation and removal. NO MORE PINS AND CHAINS! Extremely lightweight at only 3.7 Lbs., with a user capacity of 420 Lbs. Fits flange 3-1/2" to 14" wide, up to 1-1/4" thickness.
Glyder™ Sliding Beam Anchor	2110941	For complete horizontal mobility. Designed for use with the Force2™ Shock Absorbing Lanyard at the user's feet. Easily installed and/or removed and taken to a new site. Fits flange 6" to 18" wide, up to 2-1/2" thickness.
Personnel Rated I Beam Trolley	2103143	Designed for use on I-Beam Flanges ranging from 3" to 8" wide, up to 11/16" thickness. The Personal Rated I Beam Trolley, Anchorage Connector rolls along an I-Beam providing horizontal mobility







CONCRETE ANCHOR SPECIFICATIONS

Product	Description	Stock Number	Additional Information
Concrete D-Ring Anchor	Reusable D-Ring assembly. Drill hole in concrete, insert and torque anchor. (For temporary or permanent applications.) Fits 11/16" or 3/4" holes. Connection swivels 360°.	2104560	Standard model
		2104561	D-Ring assembly with 5 additional bolts
		2104562	D-Ring assembly with 11 additional bolts
		2100066	Bolt kit, 10 pack
Leading Edge Concrete Anchor	Developed for work on pre-cast concrete. Use with Leading Edge Ultra-Lok®; can also be used as an end anchor for temporary horizontal lifeline. Material: zinc plated, steel.	2105500	Use with 3504500 Ultra-Lok® Leading Edge Self-Retracting Lifeline.
Concrete Anchor Strap	Provides temporary anchorage on concrete forms. Loop slips over rebar, concrete is poured on top of loop and wear pad. Once concrete sets, serves as 5,000 Lbs. Anchorage Point. When no longer needed, simply cut strap and discard. Durable 1-3/4" polyester webbing with full length outer wear pad; Steel, D-ring is zinc plated.	2100050	3-1/2 Ft. length
		2100053	4 Ft. length
		2100061	3-1/2 Ft. web length. D-Ring adds to assembly length.



2000112 2000114 2000113 2000200 2000300 2000301

CARABINER SPECIFICATIONS

Product	Description	Stock Number	Additional Information
Saflok® Carabiners	Self-closing/self-locking gate for increased safety and security. Steel construction, user friendly even with gloves. Compatible with most connecting rings.	2000113	1-3/16" gate opening, 3,600 Lbs. rated gate
		2000114	2-3/16" gate opening, 3,600 Lbs. rated gate
		2000112	11/16" gate opening, 3,600 Lbs. rated gate
		2000200	11/16" gate opening, stainless steel
		2000300	2" gate opening
		2000301	2" gate opening, stainless steel



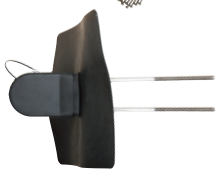
If you have a question, I'll find the answer, even if I'm enjoying a 3 plane ride day. Dana Morgan and Craig Brewer at the Hanford DOE Site will tell you that's one of the many reasons they prefer a value added relationship with Lift-It®.

ROOF ANCHORS

When you are on the roof of a residential or commercial structure, flat or sloped, your fall protection system needs specialized components to keep you safe and secure without causing damage to the roof. DBI-SALA's easy to use, economical roof anchorages provide the exact solution for reliable safety that meets the latest OSHA and ANSI standards.

















ROOF ANCHOR SPECIFICATIONS

Product	Stock Number	Fastener Type	Roof Type	Description
Reusable Roof Anchor	2103676	Nails	Flat or sloped wood	Nail into the sheathing and joist, rafter, etc. Includes twenty 16D nails for one time use.
Reusable Roof Anchor	2103673	Nails or lag screws	Flat or sloped wood	Removable and reusable after inspection. Nail (twelve 16D) or bolt (six 1/4" x 2-1/2" or longer lag screws) into roof member. The anchor can be used in conjunction with Synthetic Horizontal Lifeline System. Stock No. 7000506
Permanent Roof Anchor	2103670	Built-in clamp	Flat or sloped wood	Clamps onto roof member; complete with flashing to prevent leakage. Fits up to 2" x 8" roof truss, joist or rafter.
	2103671			Fits 2"x10" and 2"x12" roof truss, joist or rafter.
Roof Top Anchor for: metal, wood or concrete.	2100075	Lag screws, rivets, metal screws or concrete anchors	Flat wood, metal, or concrete	Designed to mount to corrugated steel or wood sheathing structures or concrete. Fasteners not included.
Roof Top Anchor for: metal, membrane or built-up.	2100076	5.5" Toggle bolts	Membrane or built-up	Designed to mount to membrane or built-up roofing structures. Fasteners are included.
	2100077	10.5" Toggle bolts		
Reusable Swiveling Roof Anchor	2105683	Wood or metal screws	Flat or Sloped Wood or Metal	Portable and reusable on sloped or flat wood and metal decking, providing 360° mobility. No special tools required for installation. Fits 30' or 50' Ultra-Lok® SRL (not included); Provides an additional D-Ring anchor point, which is fall arrest rated.
Standing Seam Roof Anchor	2103675	Built in clamp	Flat, standing seam or metal	360° swivel; portable & reusable on minimally sloped or flat standing seam roofs. No special tools required for installation. Fits 30' or 50' Ultra-Lok® SRL (not included). Telescoping adjustment legs fits: 24", 30", 32" and 36" seam spacing.
Reusable Roof Anchor Kit	2104169	Nails	Flat or sloped wood	2103676 Anchor 1224005 Rope Adjuster/Lanyard 1103513 Harness 1202794 Lifeline x 50 Ft. 5901583 Counterweight 9511597 Bag
Reusable Roof Anchor Kit	2104168	Nails or lag screws	Flat or sloped wood	2103673 Anchor 1224005 Rope Adjuster/Lanyard 1103513 Harness 1202794 Lifeline x 50 Ft. 5901583 Counterweight 9511597 Bag
Freestanding Counterweight Anchor	7255000	Weights	Variety of flat roof surfaces up to 5% grade or slope	Non penetrating design does not attach to working surface, reducing the possibility of damage. Built-in Shock Absorbing Post provides added safety for user and to structure. Fall arrest and restraint rated for one worker.

VERTICAL SYSTEMS

ROPE LIFELINE ASSEMBLIES

DBI-SALA's Lifeline Assemblies offer additional abrasion and UV resistance for increased durability, longevity and safety. Our patented, Snap Hook allows for one-hand, easy connections even with your gloves on! Rope Life Line Assemblies are available in various styles and lengths to suit any need.



ROPE LIFELINE SPECIFICATIONS			
Stock Number	**Length**	**Rope Type**	**Connectors**
1202753	30 Ft.	5/8" blended polyester/polypropylene	Snap Hooks at both ends.
1202754	30 Ft.	5/8" blended polyester/polypropylene	Snap Hook at one end, taped at other end.
1202790	50 Ft.	5/8" blended polyester/polypropylene	Snap Hooks at both ends.
1202794	50 Ft.	5/8" blended polyester/polypropylene	Snap hooks at one end, taped at other end.
1202823	75 Ft.	5/8" blended polyester/polypropylene	Snap Hooks at both ends.
1202821	75 Ft.	5/8" blended polyester/polypropylene	Snap Hook at one end, taped at other end.
1202842	100 Ft.	5/8" blended polyester/polypropylene	Snap Hooks at both ends.
1202844	100 Ft.	5/8" blended polyester/polypropylene	Snap Hook at one end, taped at other end.

LADDER SAFETY SYSTEMS

LAD-SAF® FLEXIBLE CABLE LADDER SAFETY SYSTEM

The Lad-Saf® shock absorbing design uses an elastomeric impact attenuator to reduce the forces imposed on the ladder structure. The swiveling Lad-Saf® sleeve prevents falls by locking onto the cable. It is easily attached or removed along the cable and automatically follows as you climb or descend.

Easily install the Lad-Saf® System with standard tools. The unique built-in Tension Indicator tells you precisely when the system is at the proper tension.

Lad-Saf® Systems are galvanized for a maintenance free life. For harsh environments, use stainless steel system. Nonmetallic Cable Guides reduce cable wear, permitting you to ascend or descend unhindered.

Cable Guides also protect both the Lad-Saf® system and the climbing structure.



Rope Grab
Stock No.
5000335



Lad-Saf® Sleeve
Stock No.
6116540



Lad-Saf®
Static Wire
Rope Grab
Stock No.
5000338



Rope Adjuster Lanyard
Stock No. 1224005

ROPE GRAB SPECIFICATIONS				
Type	**Stock No.**	**Lifeline**	**Lanyard**	**Description**
Static Rope Adjuster Lanyard	1224005	5/8" Rope	Attached	Rope Adjuster with permanently attached EZ Stop® II (3 Ft.) Shock Absorbing Lanyard for sloped roof work or leading edge fall restraint. Grab stays locked in place, once positioned.
Static Wire Rope Grab	5000338	3/8" Diameter 7x19 Galvanized or Stainless Steel Cable	Use 4 ft. maximum length Shock Absorbing Lanyard	Wire Rope Grab with patented wedging action that grips and locks onto cable lifeline. Attach or detach anywhere along the lifeline. Stainless steel construction.
Mobile Rope Grab	5000335	5/8" Rope	Use 3 ft. maximum length Shock Absorbing Lanyard	Mobile design with hands-free operation automatically follows the user providing maximum freedom of movement. The Mobile Rope Grab utilizes both inertia and cam locking systems for added safety and to prevent "panic-grab"situations. The energy absorbing design reduces the forces generated upon a user in the event of a fall. For added flexibility, the Mobile Rope Grab can be attached or removed anywhere along the lifeline. It is constructed from durable, lightweight stainless steel and thermoplastic covered to provide for a useful service life.

SELF RETRACTING LIFELINES

DBI-SALA has been the industry leader in the development of reliable, versatile Self Retracting Lifelines (SRL's). DBI-SALA's innovations include the patented, Sealed Self Retracting Lifeline and the SRL Impact Indicator, an important safety innovation which has now been widely adopted by the competition.

Self Retracting Lifelines are flexible lifelines attached to a mechanism that allows it to extend and retract under slight tension when the user moves away from and toward the device. This enables a user to work safely while moving within a recommended area at normal speeds.

Self Retracting Lifelines can be used in a variety of situations, but are primarily used to provide movement and protection of users in a vertical work area. The SRL should be anchored to a location directly above the user. Self Retracting Lifelines can also be used with a horizontal lifeline to improve the overall mobility of the fall prevention system.



WHAT TO LOOK FOR IN AN SRL



HOUSING
The housing protects the inner parts of the Self Retracting Lifeline and holds the excess line when not in use. Durable, impact resistant housings offer longer wear and greater protection of the brakes and retraction springs. DBI-SALA developed the industry's only fully Sealed Self Retracting Lifeline that isolates the critical working components, protecting them from the dirt, oil or grease drawn in by the retracted cable.

i-Safe™
Every DBI-SALA Self Retracting Lifeline now comes with i-Safe™, incorporating RFID, web based communications technologies. RFID technology provides you with the ability to track inspections, control inventory and efficiently manage critical safety information.

LINE
Self Retracting Lifelines can be made from cable, webbing or synthetic rope. Cable is advised for rugged, outdoor applications or where the line may contact damaging objects. Web is a more lightweight, compact choice, often preferred indoors for warehousing operations. Stainless steel offers the ultimate in corrosion resistance, reliability and longevity.

IMPACT INDICATOR
Self Retracting Lifelines should be inspected before each use and monthly by the user's designated, competent person. Inspections are made easier with an impact indicator that immediately shows an orange or red band if the Self Retracting Lifeline has been loaded or has arrested a fall. All retractable lifelines should be removed from service following the arrest of a fall and if the impact indicator is visible. In most cases the unit will have to be returned to an authorized service center for service or replacement.

SNAP HOOK
The Snap Hook affects the ease and speed of connection. A swivel snap hook provides versatility to allow the Self Retracting Lifeline to be easily connected to a wide variety of anchorages, making it adaptable to different structures. The patented DBI-SALA Self-Locking Snap Hook opens and connects without fingers getting in the way.

RESERVE LIFELINE
Some Self Retracting Lifelines have an emergency Reserve Lifeline feature. If a user has nearly all the line extended and experiences a fall, the Reserve Lifeline will still be capable of absorbing energy and keeping the arresting forces to a minimum.

3-WAY RETRIEVAL OPTION
Some Self Retracting Lifelines incorporate a built in winch retrieval mechanism. These units not only provide fall protection as a user enters a confined space, but also allow activation of a retrieval mechanism for fast, convenient rescue.

QUICK ACTIVATING BRAKING SYSTEM
Many Self Retracting Lifelines use a seat-belt type extension and retraction mechanism which can malfunction and lock-up. DBI-SALA Self Retracting Lifelines feature an anti-ratcheting, twin disc brake mechanism that provides smooth operation and locks only when you are ready. Once the mechanism engages, it stays locked, ensuring that the worker is not ratcheted down to the ground. The system limits arresting forces to 900 Lbs. or less. Because fall arrest begins within 2 Feet, the required clearance distance is reduced when using DBI-SALA Self Retracting Lifelines.

DBI-SALA Self Retracting Lifelines

Innovations made by DBI-SALA include: first retractable lifeline, sealed SRL, RSQ dual-mode SRL, 3-way SRL with built-in retrieval and the impact indicator. All are extremely important safety innovations, which have now been widely adopted. When there is nothing between you and the ground, it doesn't make sense to choose another brand. Our Self Retracting Lifelines meet OSHA and ANSI standards.



HOW TO CHOOSE THE RIGHT SRL?

- **HOUSING CONSTRUCTION:**
  Thermoplastic: When weight is important.
  Aluminum: When ultimate durability is required.
- **LIFELINE MATERIAL:**
  Cable or synthetic options for varying environments.
- **SEALED DESIGN:**
  For harsh and corrosive environments.
- **RETRIEVAL:**
  Ideal for confined space rescue and retrieval applications.
- **RSQ:**
  Built-in rescue allows user to be lowered after a fall either automatically or manually.
- **FAST-LINE™:**
  Allows user to replace lifeline assembly.
- **HARNESS MOUNT:**
  Direct connection takes the hassle out of fall protection.
- **ARC FLASH RATED:**
  Built to withstand the demands of electrical and utility work.
- **LEADING EDGE:**
  Specialized lifeline and external shock for leading edge applications.

FEATURES	SEALED-BLOK™	ULTRA-LOK™	TALON™
Lifeline Lengths	15 Ft. - 175 Ft.	10 Ft. - 85 Ft.	6 Ft. - 16 Ft.
Housing Construction	Aluminum	Thermoplastic	Thermoplastic
Lifeline Material	Cable/Synthetic	Cable/Synthetic/Web	Web
Sealed Design for Corrosive Environment	•		
Retrieval Option	•		
RSQ™	•	•	
FAST-Line™	•		
Tie-Back Option			•
Direct Harness Mount			•
Arc Flash Rated		•	
Leading Edge		•	

SEALED–BLOK™

Sealed-Blok™ Self Retracting Lifelines incorporate a patented concept that separates all dynamic components, including the motor spring and brake, from foreign elements such as grease, moisture and dirt. You can always trust your Sealed-Blok™ SRL to work at peak efficiency without worrying about the environment you're working in.

TRUSTED: Our sealed SRLs are backed by decades or proven field service for absolute confidence.

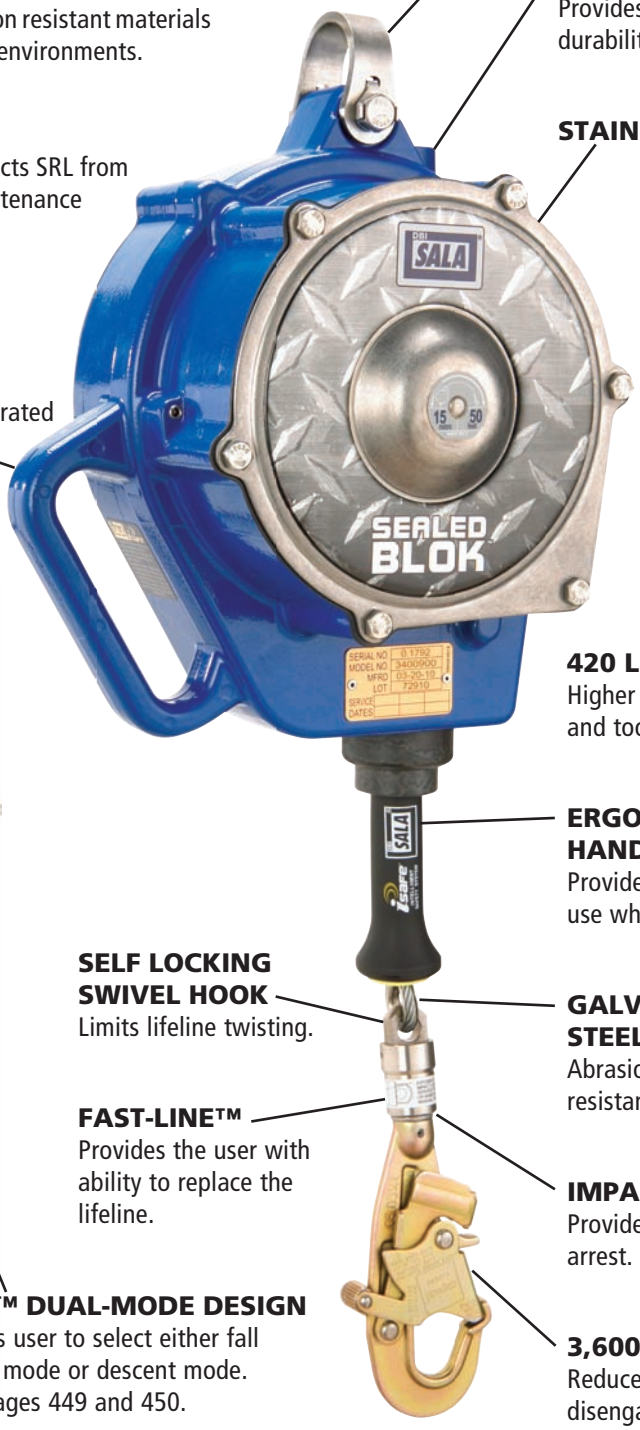
DURABLE: Heavy-duty, corrosion resistant materials stand-up to even the harshest of environments.

RELIABLE: Sealed design protects SRL from foreign elements, extending maintenance intervals and longevity

CARRYING HANDLE
Built-in design for easy transport. Certified as secondary fall arrest, rated anchorage point..



RSQ™ DUAL-MODE DESIGN
Allows user to select either fall arrest mode or descent mode.
See pages 449 and 450.



PIVOTING ANCHORAGE LOOP
Centers the load.

ALUMINUM HOUSING
Provides exceptional strength, durability and corrosion resistance.

STAINLESS STEEL END-PLATE

SEALED DESIGN
Ensures efficient, safe operation for most working conditions.The only SRL to meet IP68 sealed rating.

ANTI-RATCHETING DESIGN
Stays locked on rigid and non-rigid (horizontal lifeline) anchors.

420 LBS. WEIGHT CAPACITY
Higher capacity option for operator and tools.

ERGONOMIC CABLE HANDLE
Provides added comfort and ease-of-use when making connections.

SELF LOCKING SWIVEL HOOK
Limits lifeline twisting.

GALVANIZED & STAINLESS STEEL CABLE
Abrasion resistant and corrosion resistant lifeline options.

FAST-LINE™
Provides the user with ability to replace the lifeline.

IMPACT INDICATOR
Provides visual indication of fall arrest.

3,600 LBS. GATE
Reduces chances of accidental disengagement ("roll-out").

SEALED –BLOK™

Sealed-Blok™ Self Retracting Lifelines extend and retract enabling the user to move about within a recommended working area at normal speeds. Should fall occur, a speed-sensing brake system (4.5 Ft./Sec.) will activate, stopping the fall and reducing the forces imposed on the user to 900 Lbs. or less.



3-way models with built-in emergency retrieval and mounting brackets are ideal for confined space rescue. Available with and without mounting brackets. See the confined space section for additional options.



FAST-Line™ allows the user to replace the lifeline assembly.

50 Ft. FAST-Line™ Galvanized, replacement cable assembly.
Stock No. 3900105

50 Ft. FAST-Line™ Stainless steel, replacement cable assembly.
Stock No. 3900106

50 Ft. FAST-Line™ Stainless steel, replacement cable assembly and hook.
Stock No. 3900107

Other models available.

LIFELINE MATERIAL	HOOK MATERIAL	INCLUDES MOUNTING BRACKET	RETRIEVAL CAPABILITY	RSQ CAPABILITY	310 LBS. WEIGHT CAPACITY	420 LBS. WEIGHT CAPACITY	15 Ft.	30 Ft.	50 Ft.	85 Ft.	130 Ft.	175 Ft.
GALVANIZED CABLE	STEEL				•		3400825	3400800		3403500	3403600	3400610
						•			3400900			
			•		•			3400850		3403502	3403602	3400620
			•			•			3400920			
			•	•	•				3400940			
				•	•				3400930			
		•	•		•			3400853		3400311	3400509	
		•	•			•			3400923			
STEEL CABLE	STAINLESS STEEL				•		3400827	3400802		3400205	3400407	3400612
						•			3400902			
				•	•				3400932			
			•		•			3400852		3400308	3400507	
			•			•			3400922			
			•	•	•				3400942			
	STEEL				•		3400826	3400801		3403501	3403601	3400611
						•			3400901			
				•	•				3400931			
			•		•			3400851		3403503	3403603	3400621
			•			•			3400921			
			•	•	•				3400941			
		•	•		•			3400857		3400309	3400508	
		•	•			•			3400924			
WEIGHT							12 lbs.	18 Lbs.	29 Lbs.	44 Lbs.	60 Lbs.	100 Lbs.
SEALED DESIGN							Sealed	Sealed	Sealed	Sealed	Sealed	Non-Sealed
FAST-LINE™									Standard			
APPROXIMATE LENGTH							10.2"	11.5"	13.3"	16"	18.7"	18.7"
APPROXIMATE WIDTH							7.6"	9.4"	10.4"	9.9"	11.7"	11.7"
APPROXIMATE HEIGHT							4.3"	5.4"	6.9"	6.7"	7.2"	10.9"

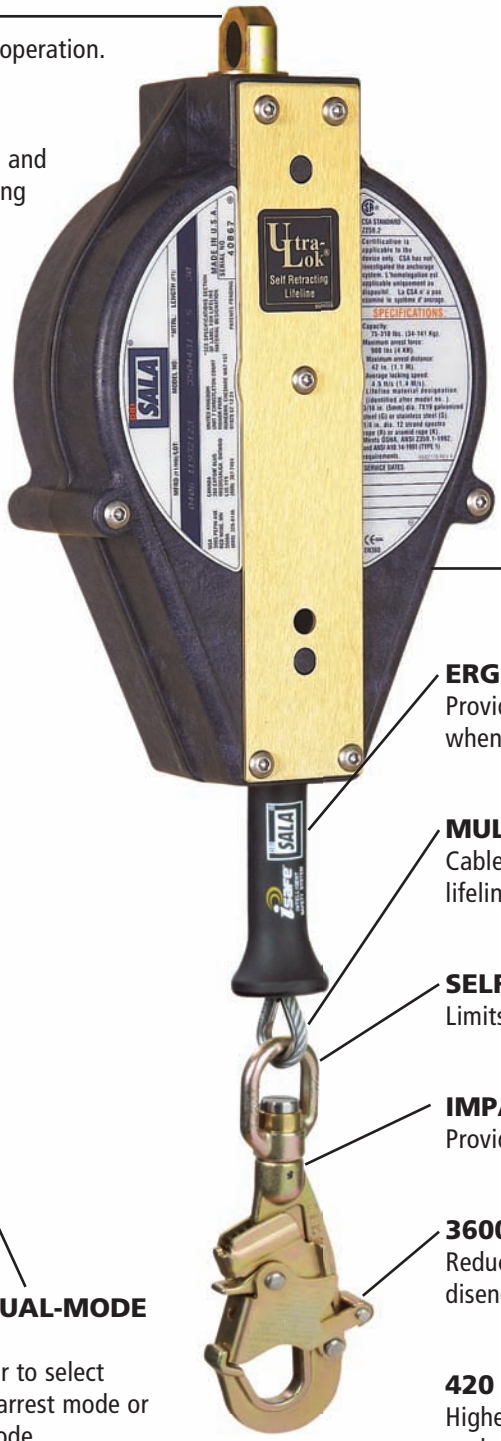
ULTRA-LOK™

Ultra-Lok™ Self Retracting Lifelines are rugged, yet extremely lightweight and superbly engineered. You can count on them for safety, efficiency and comfort. Stainless steel components, an anti-ratcheting brake system and a semi-sealed design provide the user with a system built to last.

TOP SWIVEL
Limits lifeline twisting for smoother operation.

CONSTANT MOVING PAWLS
Helps prevent corrosion or freeze-up and provides audio indicator of functioning brake system.

SEMI-SEALED DESIGN
Gasket between housing halves helps prevent contaminants from entering, extending life of device.



ANTI-RATCHETING DESIGN
Stays locked on rigid and non-rigid (horizontal lifeline) anchors.

RESERVE LIFELINE
Allows brake to function properly when entire lifeline is extended.

STAINLESS STEEL COMPONENTS
Motor spring, fasteners, locking pawls, shaft, springs and ratchet plate are stainless steel to extend service life.

THERMOPLASTIC HOUSING
Lightweight, compact and durable.

ERGONOMIC CABLE HANDLE
Provides added comfort and ease-of-use when making connections.

MULTIPLE LIEFELINE OPTIONS
Cable, Web, Vectran™ and Spectra™ rope lifeline options for ultimate jobsite flexibility.

SELF LOCKING SWIVEL HOOK
Limits lifeline twisting.

IMPACT INDICATOR
Provides visual indication of fall arrest.

3600 LBS. GATE
Reduces chances of accidental disengagement ("roll-out").

420 LBS. WEIGHT CAPACITY
Higher capacity option for operator and tools.



RSQ™ DUAL-MODE DESIGN
Allows user to select either fall arrest mode or descent mode.
See pages 449 and 450.

ULTRA-LOK™

Ultra-Lok™ lifelines extend and retract, enabling the user to move about within a recommended working area at normal speeds. Should a fall occur, a speed sensing brake system (4.5 Ft./Sec.) will activate, stopping the fall and reducing the forces imposed on the user to 900 Lbs. or less.

WEB SRL
Stock No. 3103108
Nylon web lifeline models are lighter weight for added comfort and are less abrasive to objects around system.



ARC FLASH SRL
Stock No. 3103175
Kevlar™/Nomex® lifelines offer the ultimate in spark, fire resistance and electrical conductivity for utility, welding, cutting and torching applications.



LEADING EDGE SRL
Stock No. 3504500
Unique design incorporates larger diameter 7/32" cable and an in-line shock absorber for the demands of leading edge applications.



LIFELINE MATERIAL	HOOK STYLE	HOOK THROAT SIZE (INCHES)	RATED GATE CAPACITY (LBS.)	SWIVEL HOOK	ORDER PICKER MOUNTING	LEADING EDGE	RSQ	SRL WEIGHT CAPACITY (LBS.)	11 Ft.	20 Ft.	30 Ft.	50 Ft.	55 Ft.	85 Ft.
GALVANIZED CABLE	STEEL CARABINER	5/8	3,600	•				310		3504445	3504446	3504463		
	STEEL HOOK	5/8	3,600	•		•		310			3504500		3504600	
		3/4	3,600	•			•	310				3504550		
				•				310		3504433	3504430	3504450		3504485
STAINLESS STEEL CABLE	STEEL HOOK	3/4	3,600	•			•	310				3504551		
				•				310		3504434	3504431	3504451		3504486
	STAINLESS STEEL HOOK	3/4	3,600	•			•	310				3504552		
				•				310		3504437	3504432	3504452		3504487
VECTRAN ROPE	STEEL HOOK	3/4	3,600	•				310		3504438		3504480		
NYLON WEB	STEEL CARABINER	11/16	3,600					310		3103209				
			3,600		•			420	3103119					
	STAINLESS STEEL CARABINER	11/16	3,600					310		3103214				
	ALUMINUM REBAR HOOK	2-1/4	3,600		•			420	3103110					
	STEEL HOOK	5/8	3,600	•	•			420	3103108					
				•				310		3103208				
					•			420	3103107					
								310		3103207				
	STAINLESS STEEL HOOK	3/4	3,600	•	•			420	3103136					
				•				310		3103212				
KEVLAR®/ NOMEX® WEB	STEEL HOOK	5/8	3,600	•	•			420	3103175					
				•				310		3103275				
	WEB LOOP (CHOKER)	N/A	N/A		•			420	3103176					
APPROXIMATE WEB SRL WEIGHT									3.9 Lbs.	5.5 Lbs.	-	-	-	-
APPROXIMATE CABLE (GALVANIZED) SRL WEIGHT									8 Lbs.	9 Lbs.	11 Lbs.	15 Lbs.	30 Lbs.	33 Lbs.
APPROXIMATE DEPTH									2"	2"	3.3"	3.3"	3.3"	3.3"
APPROXIMATE WIDTH									5.2"	6.4"	6"	6"	6"	6"
APPROXIMATE HEIGHT									7.6"	8.9"	11.5"	11.5"	11.5"	11.5"

RSQ™ DUAL-MODE (BUILT IN RESCUE OPERATION)

No other Self Retracting Lifeline has the exclusive DBI-SALA™ RSQ™ Dual-Mode descent operation. The RSQ™ feature allows the user, prior to connection, choose the mode of operation. The Dual-Mode operation lowers the cost of ownership by reducing the need for separate rescue equipment.

- **STANDARD FALL ARREST MODE.**
- **AUTOMATIC DESCENT MODE.**
- **REMOTE/ASSISTED DESCENT ACTIVATION OPTIONS.**



(Model is not Cody P. Nuss.)



CHOOSE YOUR MODE

FALL ARREST MODE

(Assisted Rescue)



A speed-sensing brake stops the fall, reducing forces imposed on the user to safe levels of 900 Lbs. or less and allows for assisted rescue to take place.



AUTOMATIC DESCENT MODE

(Self Rescue/Descent)



A Speed-sensing brake stops the fall just like in fall arrest mode, then instantly a centrifugal brake activates, lowering the user at a controlled speed to the next level or to the ground.



RSQ™ DUAL-MODE (BUILT IN RESCUE OPERATION)



FALL ARREST MODE

Assisted Rescue by Pole





FALL ARREST MODE

Assisted Rescue by Hand





AUTOMATIC DESCENT MODE

Self Rescue/Descent



THESE ASSISTED RESCUE OPTIONS "ENGAGE" THE DESCENT MODE.
Traditional assisted rescue operations may also be conducted.



SEALED-BLOCK™ RSQ ASSISTED RESCUE ACCESSORIES
3500201 FIRST-MAN-UP™ Pole 6-12 Ft. with Assisted Rescue Tool
3500202 FIRST-MAN-UP™ Pole 8-16 Ft. with Assisted Rescue Tool
3500200 Assisted Rescue Tool Only (If you already have a FIRST-MAN-UP™ Pole).

ULTRA-LOK™ RSQ ASSISTED RESCUE ACCESSORIES
3500101 FIRST-MAN-UP™ Pole 6-12 Ft. with Assisted Rescue Tool
3500102 FIRST-MAN-UP™ Pole 8-16 Ft. with Assisted Rescue Tool
3500100 Assted Rescue Tool Only (If you already have a FIRST-MAN-UP™ Pole).

TALON

Talon™ is an extremely compact Self Retracting Lifeline with an all metal anti-ratcheting braking system that limits arresting forces to 900 Lbs. Because of the unique brake system, users can maintain a normal work pace and not be interrupted with constant lock ups. Talon™ Self Retracting Lifelines are lighter, stronger and safer.

- EXTREMELY LIGHTWEIGHT DESIGN – UNDER 3 LBS.
- BUILT-IN CONNECTOR FOR DIRECT ATTACHMENT TO HARNESS.
- GREATER FREEDOM OF MOVEMENT WITHOUT COMPROMISING SAFETY.
- COMPACT SIZE AND WEIGHT FOR COMFORT AND CONVENIENCE.

TALON™
QUICK CONNECT SELF RETRACTING LIFELINE
Stock No. 3101001
Web SRL with quick connector and swiveling hook. 8 Ft. length.



TALON™
ORDER PICKER SELF RETRACTING LIFELINE
Stock No. 3101009
Web SRL with order picker connector and swiveling hook.
8 Ft. length.



HOOK STYLE	HOOK THROAT SIZE (IN.)	RATED GATE CAPACITY (LBS.)	SWIVEL HOOK	HOUSING SWIVEL	ORDER PICKER MOUNTING	TIE-BACK	SRL WEIGHT CAPACITY (LBS.)	7 Ft.	8 Ft.	9 Ft.- 6 In.	16 Ft.
ALUMINUM REBAR HOOK	2-1/4	3,600					310		3101007		
STEEL REBAR HOOK	2-1/2	3,600					310		3101006		
STEEL SNAP HOOK	5/8	3,600	•	•			310				3101051
			•		•		310		3101009		
			•				310		3101001		
				•			310				3101050
					•		310		3101008		
							310		3101000		
		5,000				•	310			3101300	
APPROXIMATE WEB SRL WEIGHT								2.7 Lbs.	2.7 Lbs.	3.4 Lbs.	4.7 Lbs.
APPROXIMATE DEPTH								2.2"	2.2"	2.2"	2.4"
APPROXIMATE WIDTH								3.9"	3.9"	3.9"	5.9"
APPROXIMATE HEIGHT								8.9"	6.7"	6.7"	7.9"

DBI-SALA Horizontal Lifeline Systems

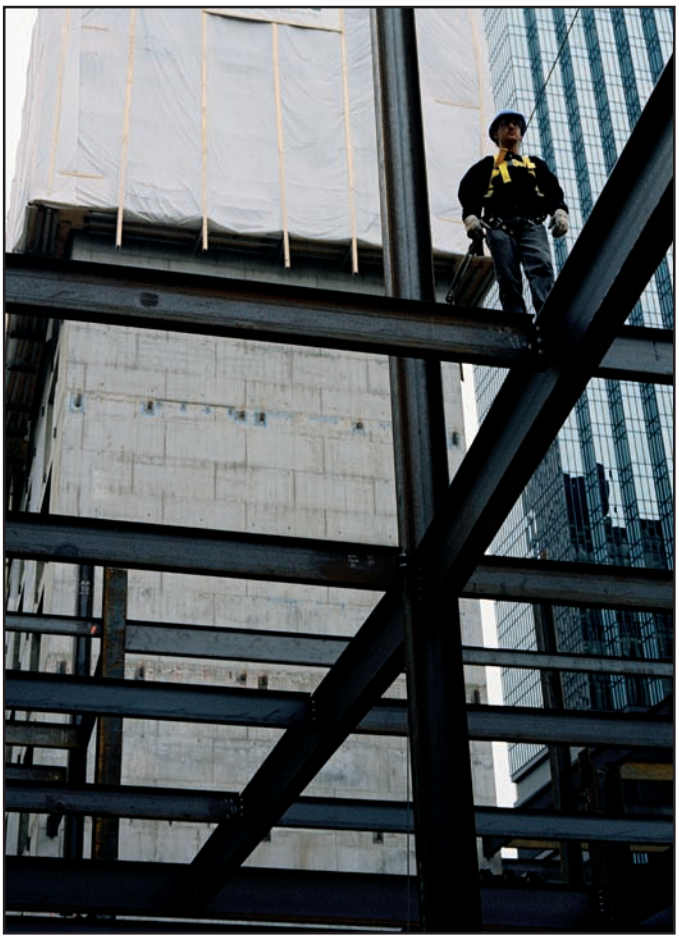
For years, safety engineers and site directors have put their trust in the DBI-SALA Horizontal Lifeline Systems for superior engineering, technology and service.

With the largest range of systems to fit a variety of applications, DBI-SALA Horizontal Lifelines offer significant benefits to enhance safety and productivity.

A horizontal lifeline is a complex system comprised of a flexible line with connectors at both ends for securing it horizontally between two anchorages or anchorage connectors.

Horizontal Lifeline Systems are used to protect users operating in the horizontal plane who may not have continuous access to suitable anchorage points.

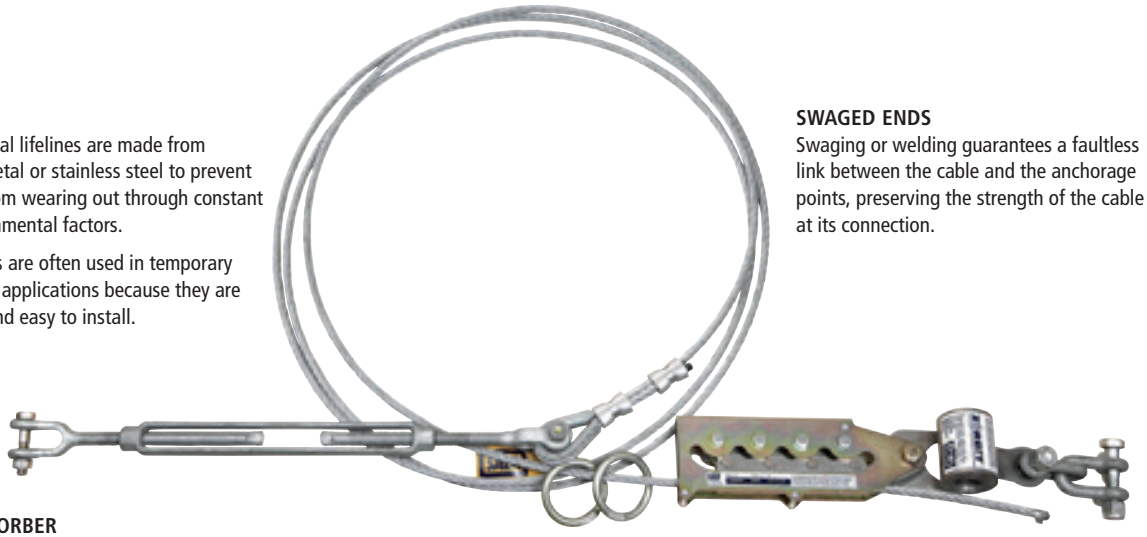
Horizontal Lifeline Systems include the lifeline component, connectors, anchorages and may include an energy absorbing component.



WHAT TO LOOK FOR IN A HORIZONTAL LIFELINE ENERGY ABSORBER

LINES
Most horizontal lifelines are made from galvanized metal or stainless steel to prevent the system from wearing out through constant use or environmental factors.

Synthetic lines are often used in temporary and/or indoor applications because they are lightweight and easy to install.



SWAGED ENDS
Swaging or welding guarantees a faultless link between the cable and the anchorage points, preserving the strength of the cable at its connection.

ENERGY ABSORBER
Some systems have in-line energy absorbers to reduce the overall forces on the system. The DBI-SALA Zorbit™ Energy Absorber begins to pay out at a higher force than other industry models. This means in case of a fall, there will be less slack on the line for less fall distance.

One energy absorber is used for units under 60 Ft.
If over 60 Ft., a unit is used at each end.

ADJUSTABLE TERMINATION
Construction and maintenance activity are fast moving and your equipment needs to be as well. The wedge grip termination allows the user to easily adjust and install cable type Horizontal Lifeline Systems.

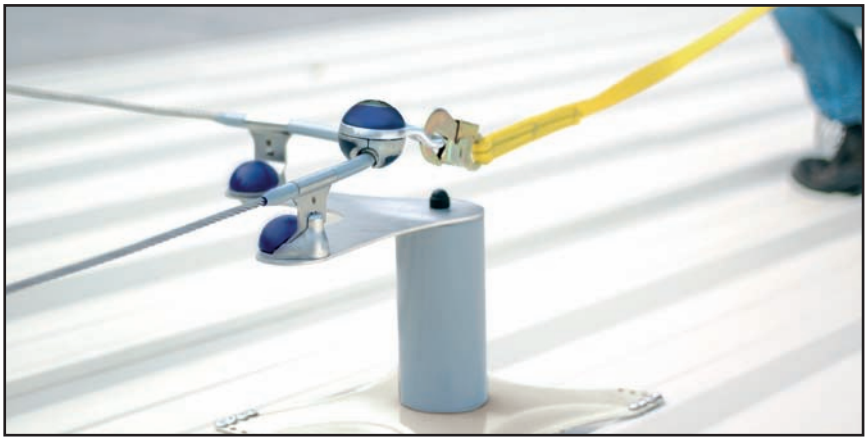
DBI-SALA Horizontal Lifeline Systems

Horizontal Lifeline Systems may appear to be a simple line strung between two anchors. It is not! Proper engineering is critical to ensure a safe lifeline. Typical failures result from: improper calculation of clearance, no account for sag in the lifeline, misunderstanding of anchorage strength and location. When a fall is experienced, the load is magnified back to the anchorage point generating tremendous force on the Horizontal Lifeline. The amount of sag amplifies the forces on the end anchors. Other factors include the number of workers using the system, overall length and the material used. Precision engineered systems that have endured rigorous testing and meet OSHA and ANSI requirements take the guesswork out of putting together a Horizontal Lifeline System.



EVOLUTION™ PERMANENT HORIZONTAL LIFELINE SYSTEMS

Evolution™ Permanent Horizontal Lifeline Systems are permanently installed Horizontal Lifeline Systems that are customized to fit your application. Straight or curved systems with unlimited lengths are available. Evolution™ Permanent Horizontal Lifeline Systems offer multiple users the ability to be fully protected, working hands-free, bypassing intermediate bracket points without unhooking from the lifeline.



PERMANENT VS. PORTABLE

Horizontal Lifelines Systems are classified as permanent or portable. Portable systems must be easy to install and remove. DBI-SALA Portable Lifeline Systems are affordable and lightweight for quick installation and versatile use. Evolution™ Permanent Horizontal Lifeline Systems are particularly adaptable for companies seeking a permanent solution. Evolution™ Permanent Horizontal Lifeline Systems provide protection in the workplace without any damage to the building or the structure to which the lifeline is attached to.

STANCHIONS

Stanchions are usually included as part of a complete and portable Horizontal Lifeline System. The type of stanchion selected affects the distance of the span, the weight and portability of the system and the anchorage point of the Horizontal Lifeline System.



SUPERIOR TECHNOLOGY FOR MORE CONFIDENCE IN YOUR HORIZONTAL FALL PROTECTION.

HORIZONTAL LIFELINE SYSTEMS SELECTION GUIDE

Product	Description	Recommended For:	Installation	Energy Absorber	Cable	Number of Users:
 **SecuraSpan®**	**Temporary** Extremely lightweight and affordable engineered system.	• Construction • Steel Erection • Bridges • Pipe Racks	Single Clamp Anchor on Stanchion Base.	Zorbit™	7x19 3/8" Galvanized	6 Maximum 2 per Span
SecuraSpan® Pour-In-Place	**Temporary** Simple, versatile system mounts into sleeve that is cast into the concrete during the initial pour.	• Parking Decks • Construction	Stanchion slides into sleeve cast into concrete, during initial pour.	Zorbit™	7x19 3/8" Galvanized	6 Maximum 2 per Span
 **Iron Wing™**	**Temporary** Strong, versatile system that can accommodate a larger system.	• Construction • Bridge Work • Pipe Racks	Easy to install. Instructional video provided.	In-Line Energy Absorber	7x19 3/8" Galvanized	6 Maximum 2 per Span
 **Concrete Iron Wing™**	**Temporary** Simple, versatile system designed for multiple applications: prestressed concrete beams, shear connector studs or steel I-beams.	• Construction • Bridges	Easily installed with standard torque wrench.	Zorbit™	7x19 3/8" Galvanized	6 Maximum 2 per Span
 **Sayfline™ Horizontal Lifeline System (Synthetic)**	**Temporary** The lightest synthetic portable horizontal lifeline available.	• Maintenance • Bridge Work • Construction • Manufacturing	Easy to install with no special tools or equipment required.	In-Line Energy Absorber	Kernmantle Rope	2 Users
 **Sayfline™ Horizontal Lifeline System (Cable)**	**Temporary** The lightest cable portable horizontal lifeline available.	• Maintenance • Bridge Work • Construction • Manufacturing	Easy to install with no special tools or equipment required.	Zorbit™	7x19 3/8" Galvanized	2 Users
 **Portable Guard Rail™ System**	**Portable** Free-standing, portable fall prevention system that requires no surface attachments.	• Rooftops • Leading Edges • Holes or openings on roofs or floors	Easy to set up as no tools are required.	None required	N/A	N/A
 **FlexiGuard™ Portable Guard Rail® System**	**Temporary** Free-standing, portable fall prevention system that clamps to wood or concrete.	• Rooftops • Leading Edges • Holes or openings on roofs or floors • Bridge Work • Construction	Easy to install with no special tools or equipment required.	None required	N/A	N/A
 **EZ-Line™ Horizontal Lifeline System (Cable)**	**Temporary** The easiest horizontal lifeline to install.	• Plant/Facility Maintenance • Pipe Racks	Easy to install with no special tools or equipment required.	Internal Friction Brake	7x19 3/8" Galvanized	2 Users

DBI-SALA Horizontal Lifeline Systems







FLEXIGUARD™ PORTABLE CONSTRUCTION GUARD RAIL SYSTEM

Traditional fall protection is accomplished by a worker using a Personal Fall Arrest System: a full body harness connected to an anchor point with a lanyard. Personal Fall Arrest Systems (PFAS) are actually one of the later choices in a comprehensive fall protection program. The first step should be an attempt to eliminate fall hazards altogether. This may be accomplished with a modification to the job, work process and/or work area to eliminate the need to work at height. The next step is to use a fall prevention system such as DBI-SALA's FlexiGuard™ Portable Construction Guardrail System. The FlexiGuard™ Portable Construction Guardrail System acts as a barrier that prevents personnel from falling to lower levels, thus eliminating the fall hazard. Used properly systems like this protect the greatest number of employees with little or no training, no special maintenance and/or gear.

- Mounts in both parapet and edge grab configurations.
- Clamp expands from 6 in. to 24 in.
- Works with both wood or concrete structures.
- Durable zinc plated finish.
- Supports both top and mid-rail guardrails.
- Designed to be used with standard wood 2x4's.

Stock No. 7901000 FlexiGuard™ Portable Construction Guardrail Stanchion



PORTABLE GUARD RAIL™ SYSTEM

Portable Guard Rail™ System is a totally free-standing, portable fall protection prevention system that requires no surface attachments. Versatile and affordable, it meets OSHA and ANSI requirements.

- Skid resistant bases are light enough for one worker to move.
- Base incorporates built-in directional changes for rail, providing continuous protection.
- Easy installation : Insert railing into base fitting and tighten.
- UV resistant finish.

Portable Guardrail™ Components and Systems	
7900005	Splice Kit (Powder Coated)
7900061	6ft Guardrail
7900062	8ft Guardrail
7900063	10ft Guardrail
7900060	Base Assembly



POUR-IN-PLACE SECURASPAN® SYSTEM

Pour-In-Place SecuraSpan® is a horizontal system that installs to column tops providing workers an overhead tie-off point and fall protection during the decking process. The stanchion (aluminum pole) simply slides into the embedded pour-in-place sleeve and does not require "tie-back" for fast installation. Single span or multi-span configurations are available for complete worksite flexibility. The system can be configured to run indefinitely and handle a maximum of 6 workers (2 workers per span maximum). Span between intermediates can be as great as 60 Ft., depending upon your clearance requirements.

SecuraSpan® Systems	
7400220	20 ft. Complete System
7400230	30 ft. Complete System
7400240	40 ft. Complete System
7400250	50 ft. Complete System
7400260	60 ft. Complete System

Customize Your System	
7400203	Stanchion, 7 ft. - 6 in. Tall
7400201	Pour-in-Place Sleeve
7400200	Intermediate Bracket

SECURASPAN® CLEARANCE SPECIFICATIONS

(Required above lower level or obstruction)

Span Ft.	Clearance Ft.
0-10 Ft.	6 ft.-11 in.
10-20 Ft.	8 ft.
20-30 Ft.	9 ft.-1 in.
30-40 Ft.	10 ft.-2 in.
40-50 Ft.	11 ft.-4 in.
50-60 Ft.	12 ft.-5 in.



SECURASPAN® HORIZONTAL LIFELINE SYSTEM

The extremely lightweight stanchions in the Securaspan® Horizontal Lifeline Systems can be configured into a complete engineered fall protection system for steel erectors. With optional "bypass" bracket, the Horizontal Lifeline System can be configured to run indefinitely for ultimate jobsite flexibility. Spans between intermediates can be as great as 60' depending on your clearance requirements.

- Temporary system: can be moved from one location to another.
- Fast installation with a simple, clamp anchor.
- Unlimited system length provides 100% protection and flexibility.
- Zorbit™ Energy Absorber with turnbuckle.
- Standard size fits flanges up to 12" wide and 2-1/4" thick. Optional base clamps to fit: 18", 24" or 36" beams, up to 3-3/8" thick.
- Custom lengths available in 10' increments.

SecuraSpan® Systems	
7400420	20 ft. Complete System
7400430	30 ft. Complete System
7400440	40 ft. Complete System
7400450	50 ft. Complete System
7400460	60 ft. Complete System

Customize Your System	
7400001	Stanchion, fits flange up to 12 in. wide and 2-1/4 in. thick
7400035	Stanchion, fits flange up 18 in. wide and 2-1/4 in. thick
7400031	Stanchion, fits flange up 24 in. wide and 2-1/4 in. thick
7400036	Stanchion, fits flange up 36 in. wide and 2-1/4 in. thick
7400015	Stanchion, fits flange up to 12 in. wide and 3-3/8 in. thick
7400032	Stanchion, fits flange up 18 in. wide and 3-3/8 in. thick
7400033	Stanchion, fits flange up 24 in. wide and 3-3/8 in. thick
7400034	Stanchion, fits flange up 36 in. wide and 3-3/8 in. thick
7400008	Intermediate Bypass Bracket Kit
7403020	20 ft. Cable Assembly with Turnbuckle and Zorbit™

Please note: See product instruction manuals for complete clearance information or different user scenarios.

SECURASPAN® CLEARANCE SPECIFICATIONS

(Required above lower level or obstruction)

Span Length	1 to 2 Users - 6 ft. Lanyard	1 to 2 Users SRL
0 ft. - 10 ft.	14 ft.-2 in.	10 ft.-9 in.
10 ft. - 20 ft.	15 ft.-5 in.	11 ft.-11 in.
20 ft. - 30 ft.	16 ft.	13 ft.-2 in.
30 ft. - 40 ft.	17 ft.-10 in.	14 ft.-6 in.
40 ft. - 50 ft.	19 ft.	15 ft.-7 in.
50 ft. - 60 ft.	20 ft.-2 in.	16 ft.-8 in.

IRON WING™ PORTABLE HORIZONTAL LIFELINE SYSTEM

The easy to install, fully customizable Iron Wing™ Horizontal Lifeline System is ideal for larger beams and multi-span horizontal lifeline length systems. Strong and robust, it is carefully engineered for continuous fall protection while providing freedom of movement. The 3-point Claw/Contact system offers reliability without tie-back, reducing trip fall hazards.

- All metallic system: designed for durability and safety.
- Galvanized Cable Lifeline offset from the beam by 12 in. for easy passage and elevated 40 in. for use as a handrail.
- DBI-SALA 3-point Claw/Contact system offers reliability without tie-back, reducing trip fall hazards.
- Internal In-Line Energy Absorber.
- Instructional video.



Iron Wing™ Systems	
7003020	20 ft. System
7003030	30 ft. System
7003040	40 ft. System
7003050	50 ft. System
7003060	60 ft. System

IRON WING™ CLEARANCE SPECIFICATIONS
(Required above lower level or obstruction)

Span Length	1 to 2 Users - 6 ft. Lanyard	1 to 2 Users SRL
0 ft. - 10 ft.	17 ft.-6 in.	9 ft.-6 in.
10 ft. - 20 ft.	18 ft.-4 in.	10 ft.-4 in.
20 ft. - 30 ft.	19 ft.-2 in.	11 ft.-2 in.
30 ft. - 40 ft.	19 ft.-9 in.	11 ft.-9 in.
40 ft. - 50 ft.	20 ft.-7 in.	12 ft.-7 in.
50 ft. - 60 ft.	21 ft.-5 in.	13 ft.-5 in.

Please note: See Product Instruction Manuals for complete clearance information and/or different user scenarios.

IRON WING™ CUSTOMIZE YOUR SYSTEM	
7006606	Stanchion with Energy Absorber
7006608	Stanchion - Intermediate
7006602	Stanchion - Standard
7000000	Cable Assembly w/turnbuckle, 20-100 ft. Lengths available in 10 ft. increments (last 3 digits in stock number specify length)
7001000	Cable with Swage Fitting, 20-100 ft. Lengths available in 10 ft. increments (last 3 digits in stock number specify length)
7006925	Front Extension to fit 12 in. to 18 in. flange
7006926	Front Extension to fit 18 in to 24 in. flange

EZ-LINE™ CABLE RETRACTABLE HORIZONTAL LIFELINE

- Retractable Lifeline pulls out for installation and retracts with built-in winch.
- Customize system length in any increment up to 60 ft.
- Attaches to any 5,000 Lbs. rated anchorage connector or stanchion.
- Built-in pretension and impact indicators.
- 33% lighter than conventional systems.



EZ-LINE™ CLEARANCE SPECIFICATIONS
(Required above lower level or obstruction)

Span Length	1 User- 6 ft. Lanyard	2 Users SRL 6 ft. Lanyard	1 User SRL	2 Users SRL
0 ft. - 10 ft.	18 ft.-2 in.	19 ft.	7 ft.-5 in.	8 ft.-2 in.
10 ft. - 20 ft.	18 ft.-10 in.	20 ft.-3 in.	8 ft.	9 ft.
20 ft. - 30 ft.	19 ft.-6 in.	21 ft.-6 in.	8 ft.-7 in.	9 ft.-10 in.
30 ft. - 40 ft.	20 ft.-2 in.	22 ft.-10 in.	9 ft.-2 in.	10 ft.-8 in.
40 ft. - 50 ft.	20 ft.-10 in.	24 ft.-1 in.	9 ft.-10 in.	11 ft.-6 in.
50 ft. - 60 ft.	21 ft.-6 in.	25 ft.-4 in.	10 ft.-4 in.	12 ft.-4 in.

EZ-Line™ Cable System	
Stock No.	Length
7605060	60 ft. Long

CONCRETE AND I-BEAM PORTABLE HORIZONTAL LIFELINE SYSTEM

A simple and versatile horizontal system specifically designed for multiple applications.

The Concrete and I-Beam Portable Horizontal Lifeline System gives you an easy-to install tie-off point before decking or other fall protection is available. The Portable Horizontal System connects to rebar or prestressed concrete beams, shear connector studs or directly to steel I-beams with an optional adaptor. The stanchions are adjustable from vertical 20˚ left or right for easy passage or completely horizontal for transportation to the jobsite.



- Complete system includes: Stanchions, Cable Assembly and Zorbit™ Energy Absorber.
- Easily installed with a standard torque wrench.
- Provides 100% tie-off for two users per span, a maximum of six users per system.
- Traverse entire system without disconnecting.
- Single span systems up to 60 ft. Multi-span systems for unlimited distances.

PORTABLE HORZ. LIFELINE CLEARANCE SPECIFICATIONS
(Required above lower level or obstruction)

Span Length	1 to 2 Users- 6 ft. Lanyard	1 to 2 Users SRL
0 ft. - 10 ft.	14 ft.-2 in.	10 ft.-9 in.
10 ft. - 20 ft.	15 ft.-5 in.	11 ft.-11 in.
20 ft. - 30 ft.	16 ft.	13 ft.-2 in.
30 ft. - 40 ft.	17 ft.-10 in.	14 ft.-6 in.
40 ft. - 50 ft.	19 ft.	15 ft.-7 in.
50 ft. - 60 ft.	20 ft.-2 in.	16 ft.-8 in.

Please note: See Product Instruction Manuals for complete clearance information and/or different user scenarios.

CONCRETE H.L.L. SYSTEMS		CUSTOMIZE YOUR SYSTEM	
7003520	20 ft. Complete System	7006334	Additional Stanchion
7003530	30 ft. Complete System	7006333	Additional Tie-Back Assembly (Must use with Stanchion on each end of System).
7003540	40 ft. Complete System	7006335	I-Beam Adaptor Base for Stanchion: fits 10 in. to 25 in. flange width, 1/2 in. to 3 in. thickness.
7003550	50 ft. Complete System	7006340	I-Beam Tie-Back Assembly
7003560	60 ft. Complete System	7403020	20 ft. Cable Assembly with turnbuckle and Zorbit® (Last 3 digits in Stock Number specify length.)

DBI-SALA Horizontal Lifeline Systems

SAYFLINE™ SYNTHETIC HORIZONTAL LIFELINE SYSTEMS

Sayfline™ Synthetic Horizontal Lifeline Systems are not only lightweight and easy to install, but they are also extremely portable. Just disassemble and take to the next location. Engineered with DBI-SALA attention to quality and detail, the Sayfline™ Synthetic Horizontal Lifeline System is a complete system in its own carrying bag. Sayfline™ Synthetic Horizontal Lifelines are easily installed with no special tools or equipment.



- Complete with kernmantle rope lifeline assembly with a tensioning device for ease-of-use.
- Two 6 ft. Tie-Off Adaptors are included to anchor the system to the structure.

SAYFLINE™ SYNTHETIC SYSTEMS	
Stock No.	**Length**
7600502	20 ft. Long
7600503	30 ft. Long
7600504	40 ft. Long
7600505	50 ft. Long
7600506	60 ft. Long
7600507	70 ft. Long
7600508	80 ft. Long
7600509	90 ft. Long
7600510	100 ft. Long

SYNTHETIC SAYFLINE™ CLEARANCE SPECIFICATIONS
(Required above lower level or obstruction)

Span Length	1 User- 6 ft. Lanyard	2 Users - 6 ft. Lanyard	1 User SRL	2 Users SRL
0 ft. - 10 ft.	19 ft.-1 in.	19 ft.-5 in.	7 ft.-11 in.	8 ft.-11 in.
10 ft. - 20 ft.	19 ft.-5 in.	21 ft.-5 in.	8 ft.-5 in.	10 ft.-3 in.
20 ft. - 30 ft.	19 ft.-9 in.	23 ft.-4 in.	8 ft.-10 in.	11 ft.-6 in.
30 ft. - 40 ft.	21 ft.-3 in.	25 ft.-9 in.	9 ft.-4 in.	12 ft.-9 in.
40 ft. - 50 ft.	22 ft.-6 in.	27 ft.-11 in.	11 ft.-3 in.	15 ft.-6 in.
50 ft. - 60 ft.	23 ft.-10 in.	30 ft.-2 in.	13 ft.-2 in.	18 ft.-3 in.

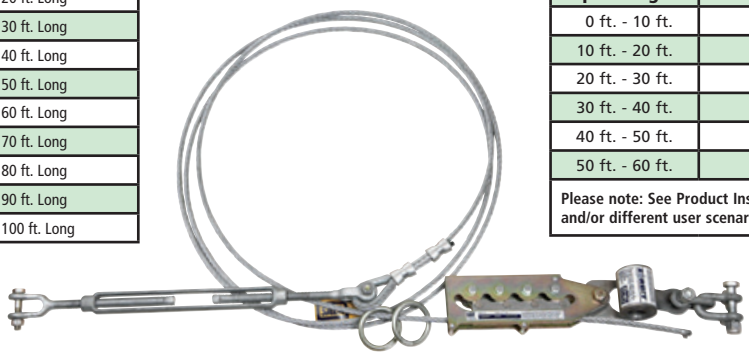
Please note: See Product Instruction Manuals for complete clearance information and/or different user scenarios.

SAYFLINE™ CABLE HORIZONTAL LIFELINE SYSTEM

Sayfline™ Cable Horizontal Lifeline Systems are highly portable and ideal for use in situations where welding, sparks or harsh environments are present or where minimal clearance exists. The all metal, Sayfline™ Cable Horizontal Lifeline System is durable enough to be left in place for long periods of time and light enough to be moved easily from one job to another. Engineered with DBI-SALA attention to quality and detail, Sayfline™ Cable Horizontal Lifeline Systems are a complete system that is easily installed with no special tools or equipment.

- Lightweight and extremely portable allowing you to move and reuse it.
- Cable Lifeline Assembly and Wedgegrip Termination for easy adjustability and installation.
- Zorbit™ Shock Absorber for added safety, allowing you to use a standard 5,000 Lbs. rated anchorage connector such as our: Tie-Off Adaptor, Fixed Beam Anchor, D-Ring Anchorage Plate, etc.

SAYFLINE™ CABLE SYSTEMS	
Stock No.	**Length**
7602020	20 ft. Long
7602030	30 ft. Long
7602040	40 ft. Long
7602050	50 ft. Long
7602060	60 ft. Long
7602070	70 ft. Long
7602080	80 ft. Long
7602090	90 ft. Long
7602100	100 ft. Long



CABLE SAYFLINE™ CLEARANCE SPECIFICATIONS
(Required above lower level or obstruction)

Span Length	1 to 2 Users - 6 ft. Lanyard	1 to 2 Users SRL
0 ft. - 10 ft.	17 ft.-11 in.	6 ft.-11 in.
10 ft. - 20 ft.	19 ft.-2 in.	8 ft.
20 ft. - 30 ft.	20 ft.-6 in.	9 ft.-1 in.
30 ft. - 40 ft.	21 ft.-10 in.	10 ft.-2 in.
40 ft. - 50 ft.	23 ft.-1 in.	11 ft.-4 in.
50 ft. - 60 ft.	24 ft.-5 in.	12 ft.-5 in.

Please note: See Product Instruction Manuals for complete clearance information and/or different user scenarios.

HORIZONTAL LIFELINE COMPONENTS

The revolutionary, new Energy Absorber and Wedgegrip termination included in the Cable Sayfline™ Horizontal Lifeline Systems is also available to customize your own system for additional safety.

CUSTOMIZE YOUR SYSTEM	
7401031	Zorbit™ Energy Absorber complete with two shackles, bolts and nuts for easy installation.
7401032	The 7401031 kit with a turnbuckle for tensioning of system.
7401033	The 7401031 kit with a turnbuckle for tensioning, thimble and cable clips for attaching cable (cable not included).
7401013	Zorbit™ only.
7608008	Wedge grip easily adjusted termination for 3/8" wire rope cable. Requires no tools to install and is 5,000 Lbs. rated.



STRENGTH and DURABILITY FOR RELIABLE PROTECTION

Netting systems provide passive fall protection, which means protection that does not require the active involvement of a user. Netting Systems consist primarily of two types: personnel nets and debris nets.

Strength, structural integrity and installation of netting systems are referenced in OSHA and ANSI regulations.

PERSONNEL NETS

Personnel Nets are designed to catch personnel who fall from a bridge, building, tower, dam, silo or other structure or to catch workers in areas left undecked during construction, across atriums, shafts, stairwells and skylights.

Personnel Nets must be erected so that the exposed user can never fall more than 25 ft. This is done to maintain the net strength and to reduce the risk of injury to the user from impacting the net. To minimize the injury due to a fall, Personnel Nets should be positioned as close as possible, below the work level.

DEBRIS NETS

Debris Nets are designed to catch lightweight construction debris, tools and building materials that are dropped, kicked, pushed or blown out of place. Debris Nets can prevent falling debris from hurting people or damaging traffic below.

Debris Nets offer protection from falling objects for the entire person; hard hats protect only the head. A perimeter Debris Net meets OSHA and ANSI standards to provide fall protection from the working surface of the floor to which it is mounted.

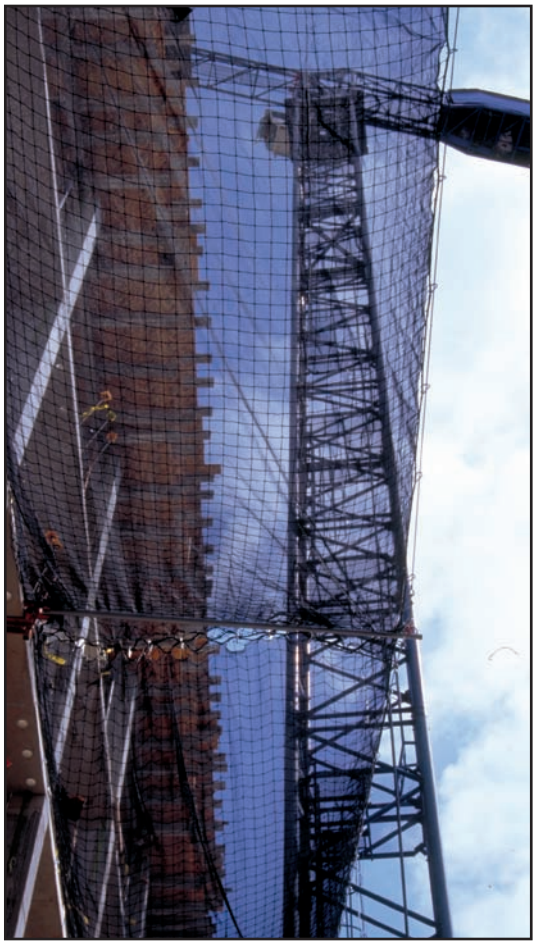
DEBRIS NET LINERS

Personnel Nets are often lined with Debris Nets so that they can catch debris as well as personnel. Debris Net Liners should be cleaned daily because a person falling on residual debris can be seriously hurt.

ADVANTAGES OF NETTING SYSTEMS

- Nets save lives and reduce lost time.
- Workers feel more secure with nets.
- Secure workers are more productive.
- Nets provide protection without hampering worker performance.
- Nets save equipment from loss, destruction or damage.
- Nets provide visibility, ventilation and increased productivity when compared to planks.
- Nets are more economical than alternatives such as scaffolding, stay-in-place forms, planking, etc.
- Nets are reusable, easily re-rigged and can be factory repaired.





WHAT TO LOOK FOR IN A NETTING SYSTEM

SNAP HOOKS
DBI-SALA netting systems feature a staggered system of lashed-in Snap Hooks, allowing nets to be easily connected.



ANCHORING POINTS AND INSTALLATION
DBI-SALA Netting Systems are available with the appropriate cable and hardware for installation to steel or concrete. DBI-SALA Netting Systems are lightweight and easy to handle for fast, safe installation.



MESH SIZE
Mesh is available in many sizes and strengths depending on the job and the weight and size of the debris to be contained. The most common Debris Net mesh size is 1/8 in.

A typical Personnel Net mesh size is 3-1/2 in. Diamond-shaped mesh. The mesh dissipates impact throughout the net.

ADJUSTABILITY
The patented DBI-SALA Adjusta-Net™ is the only Personnel Net available that can be adjusted to fit the work area.

NETTING MATERIAL
Typical Netting System materials are manila, polypropylene and nylon. Nets made of nylon are 50% stronger than manila and 47% stronger than polypropylene. Nylon Nets provide a softer catch and resist chafing and abrasion. Nylon has a higher melting point of 480° vs. 300° for polypropylene. (Manila chars). Nylon Nets also absorb eight times the energy of Manila Nets and 5.3 times that of Polypropylene Nets.

DBI-SALA Netting is rot and mildew proof and features UV protection for a longer service. Special flame retardant protection treatments can be applied at the factory for added safety, on request.

NETTING SYSTEM SELECTION GUIDE

Product	Description	Recommended For	Material	Adjustable Size	UV / FIRE Retardent Treatment	Used as Guard Rail	Installation
Pour In Place Net	**Debris** Protection around floor openings during construction.	• Construction	Nylon	✓			Cable ties
Adjust -A- Net™	**Personnel** The only adjustable Personnel Netting System available.	• Construction • Bridges & Towers • Chemical Plants • Cooling Towers • Power Plants • Drilling Rigs • Refineries • Silos • Dams • Ships	Nylon	✓	✓		Can be installed to steel or concrete using cable with related hardware. (Hardware is not included).
Vertical Net	**Debris** The most complete and cost-effective debris containment and guard rail system available.	• Construction • Bridge Construction	Polypropylene		✓	✓	Snap-on Cable Clips and Tie-Down Plates.
Perimeter Net	**Debris** The first lightweight system for rigging nets around the perimeter of new concrete buildings.	• Concrete Construction • Steel Construction	Nylon	✓	✓		**For concrete:** Floor Clamps installed on concrete slabs. Arm extends off clamp to support cable and net. **For steel:** Arms are mounted to each column with Adapter Assembly.
Floor -to- Ceiling Net	**Debris** Provides perimeter protection and complete containment of project debris during construction.	• Construction	Nylon		✓	✓	Snap-on Cable Clips and Tie-Down Plates.
Flying Form Net	**Debris/Personnel** Provides fast, easy and safe fall protection while placing forms and decking.	• Construction	Nylon	✓	✓		Attaches to form trusses with Snap Hooks.

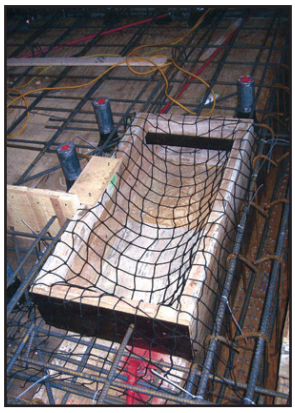
POUR-IN-PLACE NETTING SYSTEM

Most construction sites, including high-rise structures contain small floor openings such as stairwells or elevator shafts that create fall hazards for workers. A common way to abate the hazard is to cover the openings with planking or plywood which is often improperly fastened or secured creating a false sense of security. DBI-SALA's Pour-In-Place Netting System is the solution, providing safe and secure fall protection as well as debris retention for personnel working on the protected floors.

- Provides passive fall arrest and debris retention.
- Innovative netting design.
- Net is sized on site for custom fit.
- Durable nylon mesh.
- Fast and easy removal.
- Extremely economical.

Stock No. 4102001:
Pour-In-Place Netting System, 8 ft. x 50 ft.
One strip of 375 nylon mesh and 25 plastic Cable Ties.

Stock No. 4102002:
Pour-In-Place Netting System, 8 ft. x 100 ft.
One strip of 375 nylon mesh and 25 plastic Cable Ties.
Custom sizes are available, contact us for information.



ADJUST-A-NET™ PERSONNEL / DEBRIS NET SYSTEM

Adjust-A-Net Personnel/Debris Net Systems are a one-of-a-kind patented Net System that is specially designed to be easily adjustable, thereby fitting any and all workspaces where personal fall protection or debris capturing is required. Four net sizes adjust to fit any size or shaped application. Shrink the Adjust-A-Net™ down for compact areas or expand to full size. Snap together for larger areas. Reduce one side or the other for long, narrow applications. With Adjust-A-Net™, custom or multiple single sized nets are no longer necessary.

- Easily adjustable straps allow adjustment on all nets to 50% of the original size.(15 ft. x 30 ft. maximum size).
- Reduce sag with quick adjustment buckles.
- 3-1/2" diamond mesh for better protection.
- Coated for protection against UV degradation and bonding at convergent points in the net body.
- Inspection test cords allow for the evaluation of Adjust-A-Net's™ structural integrity.
- Steel Snap Hooks at 48 in. intervals on entire net perimeter allows nets to be connected.
- Attached Debris Liners available.
- Nets feature high tenacity nylon, tested to withstand a force greater than 17,500 Lbs.

ADJUST-A-NET™ SPECIFICATIONS
Snap Hooks and Webstraps are included.

Stock No.	Description	Color
4100400	15 ft. x 30 ft. With 1/8" Liner	Black
4100401	20 ft. x 40 ft. With 1/8" Liner	Black
4100402	25 ft. x 50 ft. With 1/8" Liner	Black
4100403	30 ft. x 60 ft. With 1/8" Liner	Black
4100100	15 ft. x 30 ft. Without Liner	Black
4100101	20 ft. x 40 ft. Without Liner	Black
4100102	25 ft. x 50 ft. Without Liner	Black
4100103	30 ft. x 60 ft. Without Liner	Black

Please Note: It is the user's responsibility to furnish and install cable according to all applicable federal, state and local regulations.



FLOOR-TO-CEILING NETTING SYSTEM

During construction, substantial debris accumulates on the floors of the building. Standard vertical barriers typically are 42 in. tall. Debris is often knocked or blown over the top of these barriers creating a hazard to workers, the public and the surrounding properties below. "Floor-to-Ceiling" panels provide complete containment of project debris and workers. Multiple floors are protected while work progresses, prior to clean up. Once clean up is complete the Floor-to-Ceiling Netting System is moved upward ahead of the cladding or glazing operations as the structure progresses upward. Panels are easily installed to a top and bottom cable and are reusable throughout the life of the project.

- Provides passive fall arrest and debris retention.
- Innovative netting design.
- Custom sizing available.
- Durable nylon mesh.
- Fast and easy installation.

Stock No. 412000:
Floor-to-Ceiling Vertical Net System.
3-layer Netting with Snap Hooks.
9 ft.-6 in. Tall x 30 ft. Wide

Stock No. 4195436:
Fastener Plates, 16-Pack

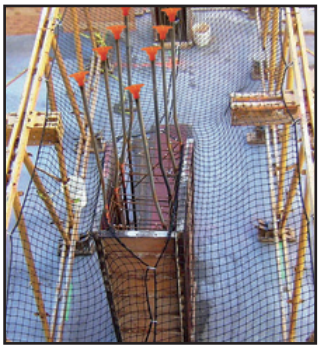
Custom sized Net Systems are available.
Contact us for futher details.

FLYING FORM NETTING SYSTEM

Many of today's multi-story buildings are built using "flying forms" to construct the concrete floors of the structure. These forms typically consist of a series of trusses which support a forming deck. Once a floor is poured the truss supports are lowered from the pour, pulled from the building and flown to the top of the building to repeat the process for the next floor. While the workers are placing the forming deck they are exposed to falls greater than 6 ft.
It becomes very difficult to protect the workers using standard fall protection equipment as no structure exists above the workers to provide an anchorage for tie-off. Flying Form Netting Systems are a perfect solution to resolve the safety hazards associated with the use of flying forms.

- Provides passive fall arrest and debris retention.
- One time installation.
- Custom sizing required.
- UV protected nylon mesh.

Stock No. 4102003:
Flying Form Netting System
(You must specify size).



VERTICAL DEBRIS NET CONTAINMENT SYSTEM

Vertical Net Debris Containment Systems are the most complete and cost-effective debris containment and guardrail system available. Vertical Net Debris Containment Systems protect workers from falling debris and serve as a guardrail. Easier and more economical to install than a guardrail, when installed properly, Vertical Debris Containment Nets eliminate the need for mid-rail and toe boards. Designed for use with traditional cable set-ups, Vertical Debris Nets are easy to remove, relocate, handle and store. Vertical Debris Nets attach to the cable with DBI-SALA snap-on clips. The bottom edge of the net is quickly secured using a power actuated tool to fire nails into the Tie-Down Plate.

- Made of performance-proven polyethylene mesh which is UV resistant and fire retardant. Vertical Debris Nets exceed OSHA lateral strength requirements of 200 Lbs. and New York City Construction Code requirements.
- High visibility so you know it is in place even from the ground level.
- Also useful as temporary partitions for crowd control or demolition.
- Vertical Debris Nets are 48 in. high x 100 ft. long. Vertical Debris Net Containment Systems are supplied complete with everything needed: Vertical Netting, snap-on Cable Clips for easy and secure net installation and Tie-Down Plates to replace toe-boards. 1/8 in. hole construction is compliant with most city requirements.



Easy installation—Easy to Remove and Relocate

- Works with traditional wire cable (not included) at top and fastened to floor at bottom.
- Top of net is attached with snap-on Cable Clips, placed 2 ft. (on center).
- Bottom of net is secured with Tie-Down Plates 5 ft. on center using Power Actuated Fasteners.

VERTICAL DEBRIS NET CONTAINMENT SYSTEM SPECIFICATIONS

Stock Number	Description	Color
4100200	48 in. H x 100 ft. L - No hardware	Orange
4100201	66 in. H x 100 ft. L - No hardware	Orange
4100300	48 in. H x 100 ft. L - With hardware	Orange
4100301	66 in. H x 100 ft. L - With hardware	Orange
4100003	Hardware Kit - 55 Snap-on Cable Clips, 22 Tie-Down Plates	

Please note: It is the user's responsibility to furnish and install cable according to federal, state and local regulations.

BORDER GUARD™ DEBRIS NET SYSTEM

The DBI-SALA Border Guard™ Perimeter Net Debris System is the first lightweight system for rigging nets around the perimeter of new concrete buildings. It is a convenient, economical way to ensure protection, confidence and productivity at any building site. Unlike old perimeter systems, the netting is purchased in convenient 25 ft. segments and installed with sturdy hardware that is half the weight of old style nets. The Border Guard™ Debris Net System allows single floor attachment for closer protection at the pour level.



- Meets ANSI and OSHA standards by providing fall protection from the working surface of the floor to which the system is mounted.
- The entire system can be moved up to the next floor level as construction progresses.
- Easily installed from one level without the use of a crane or specialized equipment.
- Non-destructive Floor Clamps are easily attached to concrete slabs.
- Nets extend 10 ft. out from floor edge on arms that are attached securely to the Floor Clamps, meeting standards for fall distance of up to 5 ft. (A fall from the working surface of the floor to which it is mounted).

BORDER GUARD™ NET SYSTEM SPECIFICATIONS

Starter Kit 4100006	Add-On Kit 4100007	Corner Kit 4100005
1 ea. net 10 Ft. x 25 Ft., 4 in. black mesh with 1/8 in. debris liner & snap hooks 2 ea. floor clamps 2 ea. 10 Ft. arms 2 ea. 1/2 in. shackles 8 ea. bolts 6 ea. cable assemblies 2 ea. straps with cam buckles	1 ea. net 10 Ft. x 25 Ft., 4 in. black mesh with 1/8 in. debris liner & snap hooks 2 ea. floor clamps 1 ea. 10 Ft. arm 1 ea. 1/2 in. shackle 4 ea. bolts 3 ea. cable assemblies 1 ea. strap with cam buckle	1 ea. net 10 Ft. x 10 Ft. x 15 Ft., 4 in. black mesh with 1/8 in. debris liner & snap hooks 1 ea. cable assembly

Please note: System is not designed for steel beam construction or when shape and design of building do not allow for standard installation of a net system.

DBI-SALA CONFINED SPACE ENTRY, RESCUE AND DESCENT EQUIPMENT

When it comes to rescue, it is essential that equipment operates perfectly and fast. DBI-SALA has developed rescue and retrieval systems that are more effective than any other available. Safety engineers and site directors trust DBI-SALA for high quality, rugged systems that will ensure top performance when it is needed.



Rescue and retrieval are critical components of any fall protection program. The fast and effective performance of these tasks often means the difference between life and death. Often the longer a fallen employee remains suspended or trapped, the worse the injuries become.

Rescue and Descent Equipment choices depend on the job site, the tasks being performed and available personnel. Rescue and Descent Equipment includes: Tripods, Davit Arms, Winches, Comprehensive Rescue Systems and Descent Devices.

DBI-SALA is the name to trust for Rescue/Descent Equipment. The DBI-SALA product line includes a number of rescue and positioning systems that are easy to use, safe and allow for maximum control. Our descent control systems are safe, reliable and built to perform when you really need them.

RESCUE BASICS

- If a fallen worker can be accessed using a lift, bucket or ladder, one of these should be used. In some cases industrial sites may rely on local fire departments to assist in rescue, but in-house rescue response time is usually much shorter.
- Rescuers should always be backed up with a secondary redundant system, such as a Self Retracting Lifeline that is totally independent of the primary rescue means.
- All rescue team members should receive training and practice on a regular basis.

CONFINED SPACE RESCUE

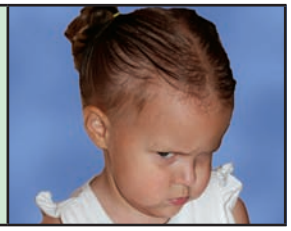
Confined spaces, such as sewers, tanks or silos, are one of the most challenging rescue situations. Cramped space and narrow openings can make rescue access difficult. At the same time, these situations often have problems such as inadequate ventilation or noxious air that make immediate rescue imperative. Generally a person without oxygen after four minutes will die or suffer brain damage.

The critical nature of these rescues sometimes leads to poorly planned attempts. Two-thirds of deaths in confined space rescue occur to people trying to rescue someone else. Proper equipment to perform quick, safe rescue is essential in any operation where confined spaces must be entered. DBI-SALA Confined Space and Rescue Equipment is engineered for perfect performance in critical, emergency situations.





Aubrey Kay Gelskey, future General Manager is happy that Dad received a very large order. Grandpa Gelskey is working with Aubrey to help her learn we can't have every order!



WHAT TO LOOK FOR IN A CONFINED SPACE ENTRY AND RESCUE SYSTEM

EASE-OF-USE

During an emergency, speed and safety are your primary concerns and decisions must be made quickly. There is no room for error. DBI-SALA Confined Space and Rescue Systems provide you with the confidence to handle emergencies in a confined space.

MECHANICAL SYSTEMS

The mechanical device is one of the most critical parts of the Confined Space Rescue System. It provides the means to retrieve an incapacitated worker. Lifeline type and length are just a few of the options. In some situations, a secondary or back-up system is required.

DURABILITY

Confined Space Systems have to be built to stand up to the harshest environments. Components must be designed from quality materials strong enough to endure rough use and exposure to the elements.

VERSATILITY

The Confined Space Rescue System should be adjustable, readily adapting to extreme environments and uneven terrain. A modular design is also helpful, allowing you to add-on to the system.

STRENGTH

The system you choose must be rated for the application you plan on using it for, such as fall arrest, rescue, man-riding or material handling. Choose a system that has been designed to maximize strength and minimize weight.

PORTABILITY

The portability of a Confined Space Rescue System is an important factor. It must be lightweight, easy to transport, set-up and store. Remember, in an emergency situation, every second counts.



ACCESSORIES



Y-Lanyard
Connects to shoulder D-ring harness.
Stock No. 1231460



Boatswain's Chair
Ideal for confined space entry.
Stock No. 1001140

WHAT TO LOOK FOR IN A RESCUE / DESCENT SYSTEM

The DBI-SALA product line includes a number of rescue and positioning systems, as well as descent and escape systems that are safe, easy to use and allow maximum control during use.

VERSATILITY

Systems like the Rollgliss R350 series provide ultimate versatility. You can change hauling ratios with a variety of pulleys.



EASE-OF-USE

The RPD provides a simple rescue system and incorporates general raising/lowering and positioning functions.



PORTABILITY

The Rollgliss® Self Rescue Kit is the simplest rescue system on the market.



DBI-SALA CONFINED SPACE ENTRY, RESCUE AND DESCENT EQUIPMENT

Whether lifting, lowering or supporting personnel or materials, our Confined Space Rescue and Retrieval Systems are designed for versatility and ease of use. Confined Space Rescue and Retrieval Systems provide routine work support and fall protection and perform as perfectly engineered rescue and retrieval systems during emergencies.



ALUMINUM TRIPOD

DBI-SALA Aluminum Tripods are lightweight, portable and are ideal for manhole entry and retrieval applications. Tripods are easily set-up by one worker and can be transported from one location to another. Attach one or two mechanical devices and you're ready to go.

- UL Classified Aluminum Tripod.
- Quick-Mount Bracket for attachment of the mechanical device.
- Rated Work Load is 350 Lbs. for work support or rescue.
- Adjustable locking legs with safety chains.
- Rubber safety shoes containing spiked edges for uneven surfaces.
- Top pulley assembly for routing of lifeline and eyebolt anchor points.

Stock No.	Description	Height	Weight
8000000	Aluminum Tripod	7 Ft.	47 Lbs.
8000010	Aluminum Tripod	9 Ft.	56 Lbs.

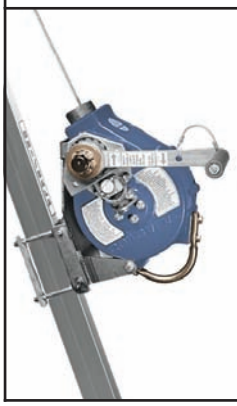
SALALIFT® II WINCH

SALALIFT® II work support and rescue winches are man-rated, lightweight and easy to use. It is manually operated by simply rotating the handle to raise or lower personnel or materials. Galvanized cable is standard. Stainless cable and specialty ropes are available.



- Gear ratio is 6:1 with an average lifting speed of 12.75 ft per minute.
- Quick-Mount Bracket for attachment to Tripod and Safety Hook with Impact Indicator.
- Free-wheel mode for operator maneuverability and Overload Clutch for added safety.
- Polyethylene Housing for reduced weight and superior corrosion resistance.

Stock No.	Description	Length	Lifeline Type	Weight
8102001	SALALIFT® II Winch	60 ft.	1/4" Galvanized Cable	36 Lbs.
8102009	SALALIFT® II Winch	90 ft.	3/16" Galvanized Cable	36 Lbs.
8102005	SALALIFT® II Winch	120 ft.	3/16" Galvanized Cable	36 Lbs.



3-WAY SEALED SELF RETRACTING LIFELINE

The man-rated, 3-Way Sealed Self Retracting Lifeline incorporates a Retrieval Winch suitable for raising and lowering personnel in emergency rescue/retrieval situations. In the event of a fall, the brake will stop the fall and limit arresting forces to 900 Lbs. or less.

- Quick-Mount Bracket for attachment to Tripod.
- Sealed design for the ultimate in durability and corrosion resistance.
- Aluminum and stainless steel construction for additional service life.
- Safety Hook with Impact Indicator.

Stock No.	Description	Length	Lifeline Type	Weight
3400115	Sealed SRL with Bracket	50 ft.	3/16" Galvanized Cable	41 Lbs.
3400311	Sealed SRL with Bracket	85 ft.	3/16" Galvanized Cable	59 Lbs.
3400509	Sealed SRL with Bracket	130 ft.	3/16" Galvanized Cable	83 Lbs.

TRIPOD & SALALIFT® II RESCUE SYSTEM

The DBI-SALA Tripod and SALALIFT® II Rescue System are ideal for use with typical manholes and combines our lightweight and portable Aluminum Tripod with the SALALIFT® II Winch. The system is easily set-up by one worker and can be transported from one location to another.



- Complete Confined Space Entry/Retrieval System.
- Includes: Tripod, Winch and/or Self Retracting Lifeline.
- All systems are man-rated.
- All mounting hardware and brackets are included.

Stock No.	Tripod	Winch Cable	Self Retracting Lifeline	Weight
8300030	7 ft.	60 Ft. 1/4 in. Galvanized	N/A	83 Lbs.
8300032	7 ft.	60 Ft. 1/4 in. Galvanized	N/A	83 Lbs.
8300034	7 ft.	60 Ft. 1/4 in. Galvanized	N/A	84 Lbs.
8301000	7 ft.	60 Ft. 1/4 in. Galvanized	50 ft. 3/16 in. Galvanized	94 Lbs.
8304010	7 ft.	60 Ft. 1/4 in. Galvanized	50 ft. 3/16 in. Galvanized	133 Lbs.
8304012	9 ft.	60 Ft. 1/4 in. Galvanized	50 ft. 3/16 in. Galvanized	146 Lbs.

DBI-SALA CONFINED SPACE ENTRY, RESCUE AND DESCENT EQUIPMENT



ADVANCED BASIC HOIST SYSTEM

Advanced Basic Hoist Systems are the most efficient and economical confined space entry and retrieval alternative to a tripod. The Advanced Basic Hoist System has all the features and benefits of the standard "Red" Basic Hoist system. In addition, the high-visibility, fluorescent green Advanced Basic Hoist System features a collapsible base to reduce storage and transport space.

- Lightweight aluminum construction.
- Includes 5,000 Lbs. Anchor Point for fall-arrest devices.
- All hardware is zinc plated for corrosion resistance.
- Top Pulley Assembly for routing of lifeline.

Stock No.	Description	Weight
8517069	Advanced Basic Hoist (order Winch separately)	58 Lbs.
8525001	Advanced Basic Hoist with Basic Winch	80 Lbs.
8515900	Adapter for Permanent Mount Bases	15 Lbs.

COUNTERWEIGHT SYSTEM

Counterweight Systems are composed of a central base unit to accommodate a variety of anchoring options, positioning and adjustment legs and extension assemblies. Anchoring options include a weight rack for counter balanced applications, a rail clamp assembly for anchorage to railway track rails and a wheel pad assembly to allow counter balance of the unit with an attendant vehicle.

System shown with the following items:

- **8512894** Counterweight System
- **8518383** Adjustable Upper Davit Arm
- **8518560** Digital 100 Series Winch
- **3400115** 3-Way Sealed SRL
- **8516824** Bracket for Winch or SRL
- **8510207** Bracket for SRL

Stock No.	Description	Weight
8512894	Counterweight System	199 Lbs.





ADVANCED 5-PIECE HOIST SYSTEM

Advanced 5-Piece Hoist Systems are constructed of lightweight materials including high strength aluminum. The Davit pivots for ease of rescue and the base adjusts to fit most standard entries. Other bases are available.

System comes complete with:

- 12 to 29 in. Adjustable Offset Mast **Stock No. 8518001**
- 33 in. Lightweight Lower Mast **Stock No. 8518002**
- Three-piece Lightweight Base **Stock No. 8518005**

Please Note: Winch and SRL sold separately

Stock No.	Description	Weight
8518000	Advanced Basic Hoist System	100 Lbs.
8518001	Adjustable Upper Davit Arm, 12 to 29 in.	22 Lbs.
8518002	Lower Mast Extension, 33 in.	18 Lbs.
8512285	Adj. Barrel Mount Sleeve, 24 in. maximum opening	56 Lbs.
8510140	Vehicle Hitch Mount Sleeve	57 Lbs.
8510109	Core Mount Sleeve Fixed Base	8 Lbs.
8516190	Floor Mount Sleeve Fixed Base	13 Lbs.
8516191	Wall Mount Sleeve Fixed Base	12 Lbs.

OPTIONAL PORTABLE & FIXED BASES



Stock No. 8512285



Stock No. 8510140



Stock No. 8510109



Stock No. 8516190



Stock No. 8516191

DBI-SALA CONFINED SPACE ENTRY, RESCUE AND DESCENT EQUIPMENT



ADVANCED DIGITAL SERIES WINCHES

Advanced Digital Series Winches are rated for 450 Lbs. with an 11:1 design factor. Advanced Digital Series Winches offer 2 cranking speeds capable of retrieval/descent at average speeds from 13 ft./minute to 30 ft./minute.

- Digital Usage Indicator counts revolutions of drum for servicing.
- Braking system with 3 independent working pawls and centrifugal back-up system.
- Lifeline includes swiveling Snap Hook with Overload Indicator.

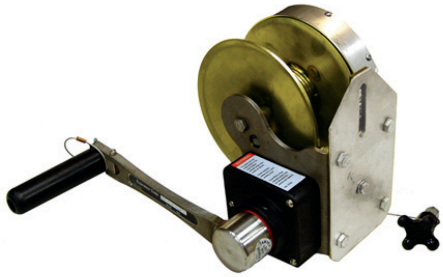
Stock No.	Description	Length	Lifeline Type	Weight
8518560	Advanced Digital 100 Winch	60 ft.	3/16 in. Galvanized	31 Lbs.
8518558	Advanced Digital 100 Winch	60 ft.	3/16 in. Stainless	31 Lbs.

BASIC SERIES WINCHES

Basic Series Winches include a permanently mounted handle Hub Drive (5/1) with an average speed of 30 ft./minute. The handle is simple to use and features a foldaway crank.

- Zinc plated winch with bolt-on plate.
- Comes with Load Limiter Clutch to indicate a fall or misuse.

Stock No.	Description	Length	Lifeline Type	Weight
8518669	Basic Winch	40 ft.	3/16 in. Galvanized	22 Lbs.
8518670	Basic Winch	40 ft.	3/16 in. Stainless	22 Lbs.





Stock No. 8510207

WINCH MOUNTING BRACKETS

Stock No.	Description
8510207	Winch/SRL adapter bracket, used with 8516824, allows DBI-SALA SALALIFT® Winches and 3-Way Sealed Self Retracting Lifelines to attach to Advance Series Davits.
8516824	Quick Release Mounting Bracket, mounts to Advanced Series Upper and Lower Mast.



Stock No. 8516824

ROLLGLISS® RESCUE LADDER

The Rollgliss® Rescue Ladder was designed to provide a means of assisted rescue after a fall has occurred. The Rollgliss® Resue Ladder can be anchored to a structure and dropped down to the victim's level so they can climb either up or down to safety. Rollgliss® Rescue Ladders are available in 8 ft. sections. Extra sections can be added to lengthen for specific site requirements. Rollgliss Rescue Ladders come with three connecting carabiners enabling fast and easy anchorage to structures.

Stock No. 8516294 – Rescue Ladder, 8 ft. section, 3 Carabiners and Carrying Bag.

Stock No. 8516316 – Accessory Plate for mounting Rescue Ladder to a Davit Arm or single Anchorage Point.



DBI-SALA IS THE NAME TO TRUST FOR RESCUE/DESCENT EQUIPMENT.

The DBI-SALA product line includes a number of rescue and positioning systems that are easy to use, safe and allow for maximum control. Our descent control systems are safe, reliable and built to perform when you really need them.

DBI-SALA CONFINED SPACE ENTRY, RESCUE AND DESCENT EQUIPMENT



ROLLGLISS® SRL RESCUE DEVICE

The Rollgliss® SRL Rescue Device is designed to rescue a person that has fallen while using a cable Self Retracting Lifeline. Utilizing either the Anchoring Chain or Anchoring Cable Grab, it can be anchored to a separate structure, around the SRL housing or in-line with the SRL cable. Once anchored, it takes seconds to complete the installation and begin the rescue procedure.

The Rollgliss® SRL Rescue Device Self Retracting Lifeline accepts cable diameters from 5/32 in. to 5/16 in. for complete versatility. Rollgliss® SRL Rescue Devices have an approximate lifting ratio of 6:1. Victim is raised about 5 inches per stroke for rapid rescue.

Stock No. 3604100



ROLLGLISS® RESCUE SYSTEM

Rollgliss® Rescue Systems include the patented, One Way Top Sheave (only turns when raising) providing efficient hauling, but more importantly very controlled lowering. Rollgliss® Rescue Systems also allow you to change the hauling ratios with a quick release double locking button on the top and auto locking carabiners on the bottom. Rollgliss® Rescue Systems can be used for a roof top rescue, tower rescue or two person rescues. Standard system comes complete with the Rollgliss® Device, Rope Control Device, Anchor Sling and Carrying Bag.

Stock No.	Description	Travel Length	Lifeline Type
8902004	Rollgliss® Rescue System, 3:1 Ratio	50 ft.	200 ft. of 3/8 in. Rope
8902006	Rollgliss® Rescue System, 3:1 Ratio	100 ft.	400 ft. of 3/8 in. Rope
8900249	Rope Control Device Only		

NOTE: Rope sold in increments of 10 ft. Many other accessories, including pulleys for ratios of 2:1, 4:1 and 5:1 and Winch Handles are available. Contact us for details.



RPD - RESCUE POSITIONING DEVICE

The Rescue Positioning Device was designed to provide a safe and simple rescue system and incorporates features for general raising/lowering and positioning during normal work activities. The Rescue Positioning Device includes a speed sensing lock for added safety and allows the worker to manually lock off the device once the work level is reached. It is ideal for use in servicing buildings, bridges, dams and confined spaces. The Rescue Positioning Device may be operated by the user or a second standby worker. Comes complete with Device, Rescue and Anchor Slings, two Carabiners and Storage Bag.

Stock No.	Description	Travel Length	Lifeline Type
3600050	RPD System, 3:1 Ratio	50 ft.	200 ft. - 3/8 in. Rope
3600100	RPD System, 3:1 Ratio	100 ft.	400 ft. - 3/8 in. Rope
3602050	RPD System, 4:1 Ratio	50 ft.	250 ft. - 3/8 in. Rope
3602100	RPD System, 4:1 Ratio	100 ft.	500 ft. - 3/8 in. Rope

NOTE: Last three digits in stock number indicates length of travel.



ROLLGLISS® RESCUE KIT

The DBI-SALA Rollgliss® Rescue Kit is ideal for use as a peer rescue system in industrial environments. The Rollgliss® Rescue Kit is specifically designed for workers who don't perform rescue as part of their normal job functions. The Rollgliss® Rescue Kit is extremely simple, yet completely safe and efficient. It will enable the rescuer to remove a person from danger without putting themselves at risk by descending. The kit comes complete with Descender and Carabiner, Rope and Safety Hook, Extension Pole, Mini-Haul System Anchorage Strap and two Carrying Bags .

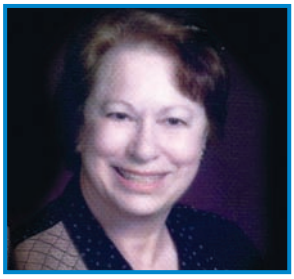
Stock No.	Description	Travel Length	Lifeline Type
8900292	Rollgliss® Rescue Kit	33 ft.	7/16 in. Nylon Rope
8900293	Rollgliss® Rescue Kit	66 ft.	7/16 in. Nylon Rope
8900294	Rollgliss® Rescue Kit	99 ft.	7/16 in. Nylon Rope

Special People in My Life

Those of us who have been fortunate enough to have special people come into our lives are truly blest. These special people shape us into who we become, leaving a lasting impression upon us. A kindly Nun told me at age seven that I had a pleasant voice. Sister Theresa's words were the spark that began my public speaking career in fifth grade. I would like to pay tribute to some of the most important, life altering personalities I have had the pleasure of knowing. To each of you, thank you for taking the time to make me and my company successful.



You don't pick your parents and I would never have been able to select better parents than Ed and Mary. My father is the best man I have ever known. He showed me what it meant to work hard, by providing for his family, joyfully and taught me to do any job to the best of my ability. My mother taught me at a young age what it meant to provide 100% customer satisfaction. Thanks to her I learned to always exceed my customer's expectations and that anything is possible.





My wife, Emily provides invaluable advice and supports me in all that I do. I can truly say that with her, I have lived the best years of my life. Thank you for being a strong woman who spends many lonely hours while I try and save the world. Thank you for standing by me, through tenuous times. Yes Darling, there is life after catalog!



Dennis St. Germain is one of the most brilliant men in the history of the rigging world. He will never know just how much I appreciate all that he has done to enable me to feed many Lift-It families. Thank you, my friend for sharing your dream with me.



Ken Keeble was the best salesman I have ever met. He taught me how to sell and because of the time he spent with me, I learned invaluable techniques from the best.



Darrell Dudley helped shape not only my business philosophy and acumen, but my degree of organization. I always enjoyed our talks, for which he always found time.



George McColl was a customer and then an employer in my early years. I went to work for George not for money, but to learn from and to emulate him. The time I spent with George enabled me to start and sustain Lift-It. He provided me with a better education than I could have received at the finest learning institution. George was always a gentleman and I never heard him say a cross word.



Bud York was my high school debate coach. He taught me how to speak effectively and to think quickly. He was a nurturing force during a difficult time in my life, those wonderful teenage years! He enabled me to save countless lives and to put groceries on the tables of many Lift-It families.

My son, Junior leads our business with such bravado and panache! His enthusiasm is contagious, genuine and priceless. I have learned so much from him. Junior, thanks for keeping the train on the tracks and allowing me the luxury of spending hundreds of hours in my "catalog cave".

I would also like to express my profound and sincere gratitude to Michelle Brown, who is more than I could have ever hoped for in a colleague. She single handedly completes innumerable special projects, while supporting my outside training and sales efforts. In her spare time she helped me in the development of the catalog, while assisting Junior run the business. Michelle, you are truly the best!

Thank you Jessica Ramse for the tremendous job you did during countless hours of tedious typing and chart development for our catalog, a true labor of love. Your accuracy and speed while attending college and working part time was not only unbelievable, it was inspirational.

KNOWLEDGE• QUALITY •INTEGRITY •COURTESY •SERVICE •INNOVATION

Lift-It® Manufacturing offers the above with dedicated employees who have centuries of combined manufacturing and sales experience. Any organization is only as good as it's people and our people are the best.



Michael J. Gelskey, Jr.
Vice President and G.M.
19 Years of Service
"Junior"



Michelle Brown
Asst. Gen. Manager
23 Years of Service
"Power Point Princess"



Wolfgang Keil
Production Specialist
33 Years of Service
"Big Daddy Wolf"



Christopher Shultz
Sales
2 Years of Service
"Junior's Wing Man"



Christina Araujo
Team Leader
17 Years of Service
"Tina"



Misiafa Lepule
Production Specialist
24 Years of Service
"Mr. Missy"



Anthony Mitchell
Layout Team Leader
23 Years of Service
Mr. "T"



DeQuoy Weaver
Sales
1 Year of Service
"Senior's Wing Man"



Sailini Smith
Special Fabrication
18 Years of Service
"Little Mama"



Guadalupe Quijada
Tag Department Lead
18 Years of Service
"Christina's Mother"



Andre Lyles
Twin-Path® Specialist
16 Years of Service
The Doctor - "Dr. Dre"



Genaro Claros
Production Specialist
13 Years of Service
"Frosty"



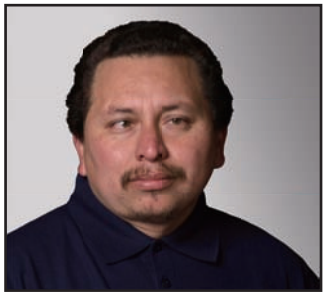
Jose Rivas
Production Specialist
12 Years of Service
"Mr. Get It Done"



Eliezer Rivas
Production Specialist
10 Years of Service
"MacGyver"



Erika Collazo
Production Specialist
10 Years of Service
"Spider Woman"



Jaime Romero
Twin-Path® Specialist
9 Years of Service
"The Bull"



Martin Tejada
Twin-Path® Specialist
8 years of Service
"Movie Star"



Viviana Collazo
Clerical/Accounting
"Erika's Little Sister"
8 Years of Service



Hector Melendez
Fabrication Specialist
5 Years of Service
"Smiley"



Jose Orellana
Fabrication Specialist
4 Years of Service
"Mr. Cool"



Jose Sanchez
Fabrication Specialist
3 Years of Service
"Jordan, J.J."



Jaime Hernandez
Shipping and Receiving
3 Years of Service
"Last Man Standing"



Chrissy Wendel-Smith
Marketing Support
2 Years of Service
"Ms. Claus"



Pedro Tovar
Shipping and Receiving
1 Year of Service
"Mr. Wrap it Up"



Cody Nuss
Purchasing/Sales
1 Year of Service
"Cool Hand Luke"



Richard Pfirrman
Testing/Q.C.
1 Year of Service
"The Professor"



Luisa Figueroa
Fabrication Specialist
1 Year of Service
"Lucy"



Parker Cox
Testing Dept.
1 Year of Service
"Future Superstar"



Jessica Wilson
Sales/Accounting
"Michelle's Wing Woman"
1 Year of Service



Nicolas Moran
Twin Path® Specialist
1 Year of Service
"Speedy One"



Edna Quintero
Living La Vida Loca!
26 Years of Service
Mama "Q"



Dave Barthule
Friend and Teacher
40 Years of Service
1923-2003

In addition to our standard products, we custom design and fabricate special slings and assemblies to handle a wide range of applications. Examples which exemplify the results of the challenges presented by special design requirements are provided for your consideration. Remember, when the chips are down, call us and we'll make you famous!

CUSTOM DESIGN AND FABRICATION



Wheel Nets with a Work Load Limit of 100,000 lbs. per set were fabricated by our experienced fabrication specialists. All intersections were sewn with an intense sew pattern, making Lift-It® Wheel Nets the standard, world wide. I sewed our first wheel net in 1982 and many more have been made by two of the best men I have ever had the pleasure of working with: Mr. Wolfgang Keil and Mr. Misiafa Lepule.



A hydro-electric utility contacted us because their original net manufacturer refused to duplicate the 28 ft. x 30 ft. oval net, claiming it was too difficult to remake. We didn't think so. The production experts at Lift-It® produced the net, which included over 14,280 sew patterns and shipped ahead of schedule. Update: Years later, we did not receive the re-order; the low bidder did. After three failed attempts by the low bidder to make the net properly, Lift-It® will again supply the new net.



42 in. x 228 in. specialty slings were fabricated and tested in a matter of hours. The two, custom slings were used to basket a 60 ton rocket motor. The slings were tested by an independent facility to 60,000 vertical pounds. The testing was done, not by customer request, but as an expression of our corporate responsibility.



Twin-Path® Sparkeater® Slings were selected to lift a two million dollar stainless cask, filled with spent nuclear fuel. The slings (50,000 lbs. Vertical Work Load) were tested to 100,000 lbs. The desired sling length 445 inches (+/-.50 in.) was documented by a facility, source inspector at 445.12 inches. Precision fabrication is done daily at Lift-It®.

SERVICE WITH A SMILE



Friday afternoon and the Shaw Group needed eight slings, Monday morning in a remote, Arizona town. The slings would be used to make a series of 500,000 Lbs. lifts at a power plant construction site. Mike Gelskey, Jr. and the Twin-Path® production experts began work on the slings, each rated at 300,000 lbs. Vertical Work Load. Team Lift-It® worked into the late hours Saturday evening and completed production. All slings were tested on Sunday to 600,000 lbs. and delivered to the airport. The slings arrived earlier than the customer expected. Great Job, Junior and Team Lift-It®.





If you need an all fabric, two leg bridle with 80,000 Lbs. of capacity or a custom bridle assembly with five legs to lift a 50 ton water wheel, we've got you covered.

Custom Master Subassemblies were fabricated for the Five Leg Assembly and both assemblies featured patented, High Performance Fiber, Twin-Path® Extra Slings. Twin-Path® Extra Slings are just one of many Slingmax® Solutions, a phone call away!



Three fabrication specialists worked simultaneously on very large, 60 ft. slings. The DOE in Scoville, Idaho arranged and received same day delivery from our facility in Los Angeles for a critical lift that had to be made, on time. Now, that's moving and shaking. When you say, "JUMP", we bring out the trampoline.



The Safety professionals at Alyeska Pipeline Service were amazed that 90 Web Slings, four ply thick, weighing a total of 1100 pounds were received within 48 hours in Fairbanks, Alaska. In addition to the enormous job of fabrication, all slings were tested vertically to 45,600 lbs. Our dedicated people make Lift-It®, the leader in unparalleled service.



Junior not only figured out the precise length, but had the 3.75 inch diameter masterlinks, made, load tested, NDT tested and shipped ahead of the deadline.



Custom Slings designed with special sling protection to efficiently handle concrete tunnel segments.
(Photo courtesy of the John A. Batchelor Co.)



The 220 Ton cement kiln was handled effortlessly by Twin-Path® Extra Slings.



Custom Five Leg Assembly handles a 50 Ton Water Wheel.
(Photo courtesy of the good people at Grant County PUD).



Wolfang and Misiafa made sixty, large, 30 Ton Wheel Nets for the USN- Seabee Construction Battalion.

When I said jokingly that the order had been tripled, Misiafa replied, "Bring it On, Big Mike!"

(No. 1 Raiders Fan) (No. 1 Elvis Fan)

In Giving, You Recieve!

When you are on a sacred mission to save lives, the loneliness, the stinky, bug infested hotel rooms and "wonderful" cuisine really doesn't matter. Not having hot water for and early morning shower in February while doing seminars in Sioux Falls, South Dakota was not only memorable, but stimulating!

I have met some of the nicest and most genuine people during my travels, presenting accident prevention seminars. What keeps me sane in noisy, crowed airports and germ infested airplanes that are either too cold or piping hot are the wonderful people I meet and the support of my wife and my Lift-It family.

As I type these words, I complete a labor of love, our new catalog. Sixteen months, thousands of hours (that somehow were found in my spare time) and the grace the Dear Lord enabled me to complete this enormous project. It is finally done and now the work begins as my trusty, outside sales professional, Mr. Dequoy Weaver and I blaze trails to get the good news out.

Recently, I was humbled by two individuals I was fortunate enough to meet; one in person and another through an email request for a catalog.

I met Mr. Don Merrell, a safety professional who works for J.R. Simplot while doing seminars in Idaho. Mr. Merrell shared some of his "safety limericks" with me. After he recited a couple of his "limericks", I renamed him the Official Safety Poet Laureate of Planet Earth! His poems proclaim various safety messages in a melodic and effective way. Mr. Merrell sent the following message.

Thank You for your kind words and God bless you for the work you are doing.

I signed up for the class because I needed information on web sling use and inspection. I expected you to be a good instructor based on the information flyer from BISCO. I was delighted to see the focus of your class was on keeping people safe instead of just the regulations and technical aspects of slings.

You did a fantastic job of communicating your commitment to the lives and well-being of people. We need more people like you out there.

As I promised I have attached a number of poems, both safety and others, feel free to share them with anyone who might find them of interest and to use any of them in your training programs and materials.

When we opened our doors, thirty-three years ago, we circulated our 24 page catalog. Given the times, it was one of the better catalogs available. Since that time we have literally passed out tens of thousands of catalogs. Recently, I received the following email from Mr. Gerald Bernhardt, who works at Puget Sound Naval Shipyard.

I've been spending a lot of my spare time reading, for the third time, your catalog. It is very well written, precise, lots of info and excellent graphics.

I spend the majority of my day in the field watching outside contractor crane providers and the Base Operating Services Contractors perform WHE ops. I also observe the operations of our uniformed personnel in the performance of aircraft maintenance and servicing.

With 43 years behind me watching the world of cranes and rigging, I use every opportunity for "teaching moments". Imagine my opportunities as the average age of our 600 operators is 19.

Having your catalog as a ready reference to sharpen my sword is invaluable. You provided this catalog at no charge. Amazing, it is priceless, no pun intended.

Thank you for your service to my Mission. I hope to someday meet you and shake your hand.

Mr. Bernhardt, we are truly twin sons from different mothers and I look forward to the honor of meeting you and shaking your hand. You, sir will be the first recipient of our new resource guide.

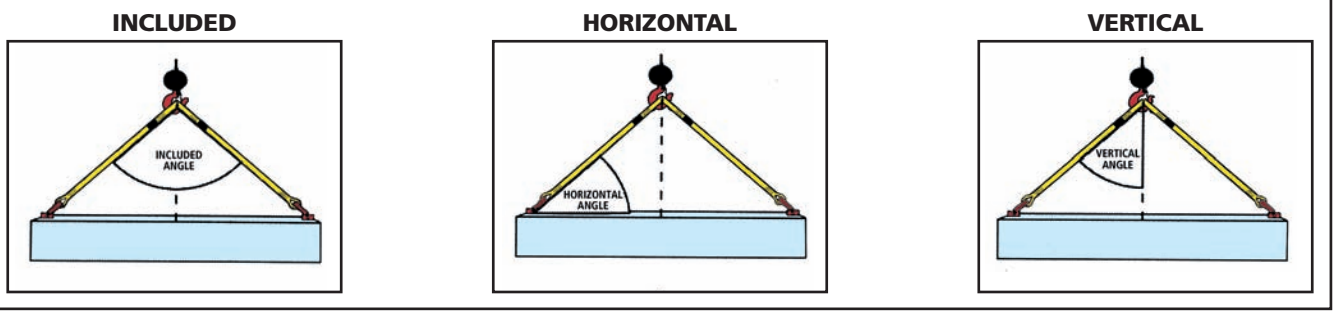
When the printer tells you that you need a couple more pages, some leave them blank or rule them for notes. Blank pages are not an option and it was providential to be able to herald the praises of the two men who made my dream a reality. I could not have accomplished this herculean labor without the assistance and dedication of Mr. William Jackson and Mr. Pedro Martinez. They are truly the best printers I have ever worked with and after what I have put them through; it is amazing that they continue to provide our company with incredible service. Thank you, Bill and Pedro!

It's people like Don Merrell and Gerald Bernhardt that put a smile on my face, spring in my step and intensifies my passion to keep Moms and Dads going home to their babies. Mr. Merrell, God has, does and continues to truly bless me!

Sincerely,
Mike Gelskey Sr.
The Sling Guy

ABRASION: The mechanical wearing of surfaces resulting from frictional contact between materials and/or objects.

ANGLE:



ANGLE OF CHOKE: The angle formed in the sling body at the bite of a choker hitch. Choker angles less than 120 degrees decrease sling capacity.

ANGLE OF LOADING: Inclination of a leg or sling branch as measured from the horizontal or vertical plane.

ARAMID: A group of lightweight, strong, heat resistant, synthetic, aromatic polyamide materials that are formed into fibers, filaments or sheets for use in textiles, plastics or slings.

BEARING PRESSURE: The compressive stress developed at the contact surfaces between two objects when they are attached together and then loaded.

BREAKING STRENGTH: The total force (lbs. or kgs.) at which the sling fails. The total weight strain which can be applied before failure, also known as Ultimate Load.

BUNCHING: Squeezing a synthetic sling into a narrow hardware or connection point.

COEFFICIENT OF FRICTION: Reluctance of two objects to slip or slide.

COMPETENT PERSON: A person who is capable of identifying existing and predictable hazards and has the authority to take prompt, corrective measures to eliminate the hazard(s).

CREEP: Non-recoverable stretch.

DESIGN FACTOR: The ratio of breaking strength to Work Load Limit for new items, generally expressed as a ratio, i.e., 5 to 1 or 7 to 1.

DESIGNATED PERSON: A person who is selected or assigned by the employer or employer's representative as being competent to perform certain duties.

DECELERATION STRESS: Additional Stress imposed on rigging resulting from the decrease in load velocity.

DYNAMIC LOADING: Loading introduced into rigging or equipment by forces of motion.

ELASTIC LIMIT: Stress above which a permanent deformation occurs within a given material.

ELONGATION: The measurement of stretch, at a given load, expressed as a percentage of the original, unloaded length.

FITTING: A load bearing metal component which is attached to the sling.

HIGH PERFORMANCE FIBER (HPF): Synthetic fiber that has grams per denier of 15 or more. K-Spec®, Technora®, Spectra® and Dyneema®are examples of HPF and are generally two to three times as strong as nylon or polyester fibers.

LENGTH: The distance between the extreme bearing points of the sling, including fittings, if applicable.

LOAD: The total weight or force to be overcome by the hoisting or rigging equipment.

LOAD ANGLE FACTOR (LAF): The multiplier derived by dividing Leg Length (L) by Headroom (H) used to multiply the share of a specific sling, branch or component to determine the actual tension applied during lifting.

PROOF TEST: A non-destructive test of the sling to a multiple of the Work Load Limit. The multiple of test is usually twice the Work Load, not exceeding 40% of the break strength.

QUALIFIED PERSON: A person, who, by possession of a recognized degree or certificate of professional standing in an applicable field, or who by, extensive knowledge, training and experience has demonstrated the ability to solve or resolve problems relating to the subject matter and work.

SELVAGE EDGE: The finished edge of synthetic webbing which prevents raveling.

SHARE OF THE LOAD (SOL): The portion of the total weight of a load that a particular component is responsible to carry, generally expressed in percentages.

SHOCK LOAD: Any condition of rapid lift, sudden shifting or the arrest of a falling load. Shock Loads are significantly greater than Static Loads.

SIDE LOADING: A load applied at an angle to the vertical plane of a crane boom or the lifting axis of rigging hardware.

SLING SERVICE:

Normal: service that involves use of loads within the rated load.

Severe: service that involves normal service coupled with abnormal operating conditions.

Special: service other than Normal or Severe, which is approved by a qualified person.

SYNTHETIC FIBER: Materials produced and used for the cover, core, webbing and thread in synthetic sling products.

THREAD: The synthetic yarn which is used to sew the slings, sling covers and tags.

ULTIMATE STRENGTH: The maximum stress, tensile, compressive or shear that a material can stand without failure.

WORK LOAD LIMIT: The maximum recommended load that should be exerted on the item. The following terms are also used for the term Work Load limit: “Work Load”, “Working Load”, “Rated Load” and “Rated Capacity”. All Work Load Limit values, unless noted otherwise, are for in-line pull with respect to the center line of the item, with no shock load.

Some glossary terms provided as a courtesy by RiggSafe Solutions, founded by Mr. Mike Riggs, a friend and true gentleman.

METRIC/ENGLISH CONVERSIONS:			
LENGTH		**WEIGHT**	
MM X .0394	= INCHES	.4536 KG.	= 1 LB.
25.4 MM	= 1 IN.	1 KG.	= 2.2046 Lbs.
1 CM	= .3937 IN.	**VOLUME**	
2.54 CM	= 1 IN.	.028 CU. M	= 1 CU. FT.
.3048 M	= 1 FT.	1 CU. M	= 35.314 CU. FT.
1 M	= 3.281 FT.	1 CU. FT.	= 7.5 GALLONS

FRACTIONAL - DECIMAL EQUIVALENTS
Inches and Millimeters

In.	In.	mm.	In.	In.	mm.
1/64	.016	.40	33/64	.516	13.10
1/32	.031	.79	17/32	.531	13.49
3/64	.047	1.19	35/64	.547	13.89
1/16	.063	1.59	9/16	.563	14.29
5/64	.078	1.98	37/64	.578	14.68
3/32	.094	2.38	19/32	.594	15.08
7/64	.109	2.78	39/64	.609	15.48
1/8	.125	3.18	5/8	.625	15.88
9/64	.141	3.57	41/64	.641	16.27
5/32	.156	3.97	21/32	.656	16.67
11/64	.172	4.36	43/64	.672	17.06
3/16	.188	4.76	11/16	.688	17.46
13/64	.203	5.16	45/64	.703	17.86
7/32	.219	5.55	23/32	.719	18.25
15/64	.234	5.95	47/64	.734	18.65
1/4	.250	6.35	3/4	.750	19.05
17/64	.266	6.75	49/64	.766	19.45
9/32	.281	7.14	25/32	.781	19.84
19/64	.297	7.54	51/64	.797	20.24
5/16	.313	7.94	13/16	.813	20.64
21/64	.328	8.33	53/64	.828	21.03
11/32	.344	8.73	27/32	.844	21.43
23/64	.359	9.13	55/64	.859	21.83
3/8	.376	9.53	7/8	.875	22.23
25/64	.391	9.92	57/64	.891	22.62
13/32	.406	10.32	29/32	.906	23.02
27/64	.422	10.71	59/64	.922	23.41
7/16	.438	11.11	15/16	.938	23.81
29/64	.453	11.51	61/64	.953	24.21
15/32	.469	11.90	31/32	.969	24.60
31/64	.484	12.30	63/64	.984	25.00
1/2	.500	12.70	64/64	1.000	25.40

POUNDS / CUBIC FT.

Aluminum	165	Concrete (Reinforced)	150	Glass	162	Paper	60
Asphalt	81	Copper	560	Ice	56	Rubber	94
Brass- Cast	534	Crushed Rock	95	Iron-Cast	450	Sand - Dry	105
Brick-Common	125	Diesel	52	Lead-Cast	710	Sand - Wet	120
Bronze	554	Earth - Dry (Loose)	76	Lumber - Fir	32	Steel	490
Cement - Loose	90	Earth - Dry (Packed)	95	Lumber - Oak	62	Water-Pure	63
Cement - Set	183	Granite	96	Lumber - RR Ties	50	Water- Salt	65
Coal	56	Gasoline	45	Oil, Motor	58	Zinc-Cast	440

POUNDS / SQUARE FT.						**COEFFICIENTS OF FRICTION**	
Steel Plate		Aluminum Plate		Lumber		Steel on Steel	.10
1/8"	5	1/8"	1.75	3/4" Fir	2	Concrete on Concrete	.65
1/4"	10	1/4"	3.50	3/4" Oak	4	Wood on Wood	.50
1/2"	20	**POUNDS PER GALLON**				Nylon on Steel	.15 to .25
1"	40	Gasoline - 6.0	Diesel - 7.0	Water - 8.3		Load on Ice	.01

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Table Of Contents

Adjust-A-Leg Wire Rope Slings 293, 294
Adjustable Rope Slings. 123-128
Aerospace Slings. 82
Anchorages & Connectors (Fall Prevention) 437-442
Beam Anchors 440
Carabiners 440
Roof Anchors 441
Angles (Sling) 19, 20
Armor Jacket Slings 68
Auger Slings 75
Bailey Bernard (Mr. B) 130
Bar Codes 350
Barrier Grabs. 291
Bars and Beams
Forklift 292
Lifting & Spreader 271-281
Spreader Bar Systems 295-301
Basket Hardware Slings (Web) 64
Beam Anchors (Fall Prevention) 440
Beam Clamps 337, 340
Beam Tongs 289
Beam Trolleys 311, 320, 340
Blade Socks (Wind Power). 85
Blended Rope (Polyplus™ & Poly/Dac™). 413
BLOCKS
Crane 344
Fixed Bail 343
Oilfield 345
Overhaul Balls 343
Safety Information. 341, 342
Sheaves 346
Snatch 345, 347
Swivels 346
Tilt Up 348
Wedge Sockets 346
Boat Slings 73, 74
Bolt Type Shackles 218, 219, 242
Braided Chain Slings 198
Braided Polyester Roundslings. 110
Bridle Slings
Adjustable Synthetic Rope 127, 128
Roundslings 107, 108
Tool Bag. 85
Twin-Path® 119
Twin-Path® Adjustable 121, 122
Twin-Path® Military Adjustable 122
Web Sling 65-67
Wire Rope Sling. 142
Bundle Straps 82
Bushing Slings 75
CM Hoists (Manual and Electric) 314-320
Cable Winch Hoists 326-328
Carabiners. 440
Cargo Nets 91
Cargo Slings 62
Cargo Winches 380
Certification. 37
Chaffing Gear 50
Chain Hoists - Electric. 315-317
Chain Hoists - Manual 305-308, 310, 318
Chain Saddle Ring 194
Chain Slings 155-194
Check-Fast® Inspection (Twin-Path®) 114
Chemical Considerations 18, 41, 42
Choker Hardware Slings (Web) 63
Cleaning Synthetic Slings. 37
Coil Handler Sling. 45
Coil Lifters. 283-285
Concrete Barrier Tongs. 291
Confined Space Rescue Equipment. 462-467
Considerations
Center of Gravity. 21
Chemical 18, 41, 42
Effects of "Minor" Damage 47
Environmental 18, 38
Fitting and Hardware 200
Mechanical 39, 40
Purchase and Use 17, 18
Sling Protection 17, 43-52
Sling Tension 19-22, 81
Training 17
Container Lifting Slings & Lugs 153, 154
Continental Western (CWC). 410-416
Conversion & Weight Tables 477
CORDAGE 385-416
Corner Protectors (Magnetic). 46
CornerMax® Pads. 45
CornerMax® Sleeves. 45
Crane Blocks. 343, 344, 347, 348
Crane Books and Cards 12
Crosby® Products 211-238
Custom Design & Fabrication 92, 471-473
Cylinder Slings 71
Definition of Terms. 475, 476
Delta™ II Harnesses 429, 430
Design Factor 54
Design Features (Web Sling) 53, 54
Dirt Slings 76
Disclaimer & Warranty. 478
Draw Bar Slings 77
Drum Slings. 72
Drum Turner 84
Dynamometers 353-355
Dyneema® Rope. 399
Endless Slings (Web) 59
Environmental Considerations. 18, 38
Equipment Rental. 361
Exofit Nex™ Harnesses 422-425
Exofit™ Harnesses 426-428
Eye & Eye Slings (Web). 60
Eye Bolts 230-232
Eye Hooks 226, 228, 241
FALL PREVENTION EQUIPMENT 417-467
Anchorage & Connectors 437-442
Confined Space (Rescue & Retrieval). 462-467
Harness Sizing Chart. 427
Harnesses. 421-430
Horizontal Lifelines 452-457
Inspection 418
Lanyard Hooks. 432
Lanyards 431-436
Netting Systems 458-461
Self Retracting Lifelines. 443-451
Suspension Trauma Straps 427
Training & Consulting. 419, 420
Vertical & Ladder Systems 442
Fiber Characteristics 41, 42, 389, 403, 409
Fiber Optic Inspection (Twin-Path®) 114
Five Gallon Pail Sling 82
Flat Pak Slings. 83
Flight Deck Nets 91
Force Measurement (Electronic) 353-355
Forklift Beams. 292
Foundry Hooks 228, 266
G-Links 207-210
Gas Cylinder Slings. 71
Gator-Flex® Wire Rope Slings 149, 150
Gator-Laid® Wire Rope Slings 147
Gator-Max® Wire Rope Slings. 148
Ginger 296, 359, 469
Glass Handling Slings. 83
GrabiQ® Chain Sling System 169-183
Hand Signals (Crane) 362
Hardware (Rigging) 199-266
Harnesses 421-430
Accessories 430
Arc Flash-Flame Resistant. 425, 429
Construction 424, 428, 429
Cross Over 423, 428, 429
Iron Worker 428, 429
Miner 425
Positioning. 429
Retrieval. 423, 429
Standard 428, 429
Tower. 424
Vest Style. 423, 428
Wind Energy 425
Harrington Hoists and Accessories 302-313
Haul Truck Dump Body Slings (Mining) 79, 80
Headache Balls. 343
Heat Resistant Synthetic Slings 120
High Performance Sling Connectors 203, 204

Table Of Contents

Hitch and Rigging Information 19, 23, 24, 135
Hoist Rings (Swivel) 249-264
Forged 261, 262
Metric.....259, 260
Safety Information.....249-255
Sideload.....263
Stainless.....256
Standard 257, 258
Ultra Lifting Ring.....264
Wind Worker.....86
HOISTS
Cable Winch 326-328
Chain Hoists - Electric.....315-317
Chain Hoists - Manual 305-308, 310, 318
Lever Hoists.....303, 304, 309, 319
Lineman Hoists 321-325
Safety Information.....302, 314
Hooks
Design a Hook.....269
Eye Chain Hooks 229
Eye Grab Hooks.....228
Eye Hooks 226, 241
Eye Sling Hooks 228
Foundry Hooks 228, 266
J Hooks 265
Round Body Latch Hooks.....265
S Hooks 265
Shur-Lock®.....227
Swivel Eye Hooks 227, 241
Horizontal Lifeline Systems 452-457
Permanent Systems.....453
Portable & Temporary.....454-457
Hose Handling Slings 83
How to Use Our Catalog 2
ISO.....15
Inspection
Adjustable Synthetic Rope Sling.....126
Cargo Net 90
Chain Sling 168
Check-Fast® (Twin-Path®).....114
Fall Prevention 418
Fiber Optic (Twin-Path®).....114
Haul Truck Dump Body Sling 80
Hook 215
Inspection Loop 54
Mine Tow Strap.....81
RFID.....349-352
Rope (Synthetic) 394-396, 405
Roundsling.....93, 94, 102
Shackle.....215
Tags 55
Tie Down.....363, 364
Twin-Path® 117, 118
Vehicle Strap.....84
Web Sling 33-35
Wheel Net.....90
Wire Mesh Sling 198
Wire Rope Sling.....133, 134, 146
Interior Van Straps 382
J Hooks 265
Knives 13
Ladder Systems (Vertical Fall Prevention) 442
Lanyards 431-436
Positioning & Restraint.....436
Retractable 434
Shock Absorbing.....434-436
Tie Back.....435
Lanyard Hooks 432
Lawrence Welk.....36
Lever Hoists.....303, 304, 309, 319
Lift Planning 16
Lift-It® Family Photos.....468-470
Lifting Beams 271-278
Lineman Hoists.....321-325
Liquid Crystal Polymer Rope 408
Load Leveling Slings (Wire Rope) 293, 294
Load Securement - Tie Down Assys.....363-384
Logistic Straps.....382
Lok-A-Loy Connecting Links.....229
Loosepin Shackles 74
LOUPS High Strength Synthetic Rope Slings.....129
Low Bid Insanity.....184
Lug-All Cable Winch Hoists 326-328
Lug-All Web Strap Pullers 321-325
Machinery Eye Bolts.....230
Magnetic Protectors.....46
Man Baskets.....357, 358
Manhole Lifters.....286, 287
Manila Rope 413
Marine Slings 73, 74
Masterlinks 222, 240
Masterlinks W/Sub Assys.....240, 246
MATERIAL HANDLING EQUIPMENT 267-299
Barrier Grabs.....291
Coil Lifters and Upenders 283-285
Drum Turner (Manual) 84
Forklift Beams 292
Lifting Beams.....271-278
Lifting Plates 247
Load Leveling Slings 293, 294
Manhole Handling 286, 287
Modulift Spreader Bar Systems 295-301
Pallet Lifters.....282
Pipe Grabs.....290
Safety Information.....268-270
Sheet Lifters.....288
Spreader Bars 279-281
Tongs and Pullers 289
Maximizer Braided Chain Sling 198
Mechanical Considerations 39, 40
Mechanical Splice Grommets 143
Mesh Guard® 46
Military Adjustable Bridle Assys.....121
Mine Tow Straps 81
Mining Industry Slings 79-81
Mobile Apps 4
Modulift Spreader Bar Systems 295-301
NAS Tie Down Assemblies 376
Nets.....89-92
Cargo.....91
Flight Deck.....91
Rope.....91
Specialty.....92
Wheel 89, 90
Netting Systems (Fall Prevention) 458-461
Nylon Rope.....398 ,407, 414, 415
OSHA 1926.1400 9
Oilfield Blocks.....345
Outrigger Pads 359, 360
Overhaul Balls.....343
Overhead Door Slings.....82
Pad Eye Tester 356
Pallet Lifters 282
Pallet Puller.....289
Personnel Baskets.....357, 358
Pipe Grabs.....290
Pipe Lifting Slings.....83
Plasma Rope.....416
PLATE CLAMPS.....329-337
Pole Choker Slings 76
Pole Handling Slings.....75
Polyester Max Edge™ Slings 69, 70
Polyester Rope 397, 407, 408
Protection (Sling) 43-52
Pullers (Web Strap) 321-325
Push Trolleys (Hoist).....311, 320
Quality Control and Traceability 15
RFID.....349-352
Radome Slings 83
Rail Industry Slings.....77, 78
Rail Tongs.....289
Ratchet Tie Down Assys.....377-378
Recreational Vehicle Tie Down Assys. 377
Reel Handler.....76
Reel Lifting Sling.....76
Regulatory Resources 14, 370
Remote Release Sling.....75
Renfroe Plate Clamps.....329-337
Rental Equipment.....361
Rescue & Retrieval Equipment.....462-467
Reversed Eye Slings (Web).....61
Rigger Books and Cards.....12

Table Of Contents

Rigger Knives 13
Rigging Guidelines 135-139, 167
RIGGING HARDWARE 199-266
Rigging & Hitch Information 19, 23, 24, 135
Roof Anchors (Fall Prevention) 441
ROPE (SYNTHETIC) 385-416
Blended Ropes
PolyPlus™ & Poly/Dac™ 413
Chaffing Gear 400
Coatings and Finishes 390, 403
Connector Assys. (Nylite) 401
Construction 389
Dyneema® Ropes
Amsteel® Blue (12 Strand) 399
Amsteel® Plus (Double Braid) 399
Elongation 390
Index of Engineering 404, 406
Inspection 394-396, 405
Liquid Crystal Polymer
Vectrus™ 408
Nylon Ropes
3 Strand 398, 414
Double Braid 398, 415
Polydyne™ 407
Manila Rope 413
Plasma® Rope 416
Polyester Ropes
Double Braid . . . . . 397 ,407
Tenex-Tec (12 Strand) 397
Yalex™ (12 Strand) 408
Safety Information 385-396, 403-406, 409-412
Shackles 401
Spectra® Rope 416
Thimbles 402
Winch Lines 391-393
Rope Lifelines (Fall Prevention) 442
Rope Nets 91
Round Body Latch Hooks 265
Round Pin Shackles 216, 242
Roundslings 93-110
Rubber Rope (Tie Down) 381
S Hooks 265
SAFETY INFORMATION
Adjustable Synthetic Rope 123-126
BK Self Locking Hook 162-166
Blocks (Crane) 341-342
Bulletins 11
Chain Sling 155-161
Charts 11
Espanol para Amarres 366-368
Espanol para Enslingas Sinteticas 29-32
Espanol para Enslingas Sinteticas Redondas . . .97-100
Eye Bolts 231-232
Fall Prevention Equipment 417-420
GrabiQ® Chain Sling System 171-173
Handbooks 12
Hoist (Lever & Chain) 302, 314
Hooks & Latches 223-225
Material Handling Equipment 268-270
Plate Clamp . . . . . .329-331 & 338, 339
Reference Cards 12
Regulations and Standards 11
Regulatory & Association Resources 14
Rigging Hardware 199-266
Rigging Information 215
Rope (Synthetic) 385-396, 403-406, 409-412
Roundsling 93-104
Shackle 211-215
Swivel Hoist Ring 249-255
Tie Down (Load Securement) 363-370
Training Aids & Devices 13
Web Sling 25-32
Web Strap Puller 321, 322
Winch Hoist (Cable) 326, 327
Wire Mesh Sling 195, 196
Wire Rope Sling 131, 132
Samson Rope 385-402
Screw Pin Shackles 217, 218, 221, 242
Secutex Sleeve 49
Self Retracting Lifelines 443-451
Dual-Mode (Rescue) 449, 450
Kevlar® 448
Sealed Blok 445, 446
Shackles 201-221, 242-245
Alloy 218, 245
Bolt Type 218, 219, 242
Bow Safety Pin - GN 245
CM 242
Crosby® 201, 202, 216-221
Double Pin Connector - GN 248
Engraving 55
Round Pin 216, 242
Safety Information - Crosby® 211-215
Screw Pin 217, 218, 221, 242
Sling Protector - GN 244
Sling Saver - Crosby® 201, 202
Stainless Steel - Suncor 243
Synthetic Rope 401
Theatrical 221
Wide Body 220, 221
Shackle Pin Protector Pads 48
Sheaves (Wire Rope) 346
Sheet Lifter 288
Shock Absorbing Lanyards 434-436
Shoulder Nut Eye Bolts 230
Sleeves
Bulked Nylon, Web 51
Felt 46, 52
SLINGS
Adjustable Synthetic Rope Slings 123-129
Considerations 125
Four Leg Assys 128
Inspection 126
LOUPS High Strength Rope Slings 129
Safety Information 123-126
Single & Double Leg Slings 127
Chain Slings 155-194
BK Self Locking Hook Safety Info 162-166
Chain Saddle Ring 194
Component Specifications (Standard) 189-193
GrabiQ® Chain Sling System 169-183
How to Order 174, 181-182, 185-188
Inspection 168
Maximizer Braided Chain Sling 198
Safety Information 167, 168, 171-173
Ultimate Pole Sling 76
Usage Guidelines 167
Roundslings 93-110
Bearing Stress 104
Braided 110
Bridles 107, 108
Endless 106
Eye & Eye 106
Inspection 93-94,102
Protection Considerations 103
Safety Information 93-104
Specifications 105, 106
Stage Rigging 109
Twin-Path® Slings
Adjustable Bridles 121-122
Bridles 119
Check-Fast® HPF Single Path Sling 120
Check-Fast® Inspection 114
Coil Handler Sling 45
Considerations 115, 116
Draw Bar Slings (Rail) 77
Eye & Eye 119
Features 114
Fiber-Optic Inspection System 114
Haul Truck Dump Body Slings (Mining) 79, 80
Inspection 117, 118
Military Adjustable Bridle 121
Mine Tow Straps 81
Polyester 122
Sparkeater® (High Heat) 120
Tanker Slings (Rail) 78
Tattle Tails 114
Traction Motor Sling (Rail) 77
Twin-Path® Extra Specifications 113
Wheel Slings (Rail) 78
Web Slings 56-64
Aerospace 82

Table Of Contents

Web Slings
Armor Jacket 68
Auger 75
Basket Hardware 64
Boat 73, 74
Bridles 65-67
Bushing 75
Cargo (Attached Eye & Wide Body) 62
Choker Hardware 63
Cleaning 37
Dirt Sling 76
Drum Slings 72
Endless 59
Eye & Eye 60
Fittings (Triangle & Choker) 199
Five Gallon Pail 82
Gas Cylinder 71
Glass Handling 83
Hose Handling 83
How to Order 56
Inspection 33-35
Overhead Door 82
Pipe Handling 83
Pole Choker 76
Pole Handling 75
Polyester Max Edge® 69, 70
Radome 83
Rail 77, 78
Remote Release 75
Reversed Eye 61
Safety Information 25-32
Special Purpose 71-86
Stonehandling 68
Storage 37
Utility & Power Slings 75, 76
Vehicle Recovery Straps 84
Wind Power 85, 86
Wire Mesh Slings 195-198
How to Order 198
Inspection 198
Safety Information 195, 196
Specifications 197, 198
Wire Rope Slings 131-154
Bridles 142
Container Lifting 153, 154
How to Order 140
Inspection 133, 134, 146
Load Leveling 293, 294
Protection 140
Rigging Guidelines 135-139
Safety Information 131, 132
Single Body 141
Slingmax Wire Rope Slings 145-152
Strand Laid Grommet (Mechanical Splice) 143
Swage Socket Assemblies 144
Usage Guidelines 135-139
Sling Connectors - Crosby® S237/S238 . . . . . 203, 204
Sling Saver Fittings - Crosby® 203-206
Sling Saver Shackles - Crosby® 201, 202
Slingmax® Wire Rope Slings 145-152
Snatch Blocks 345, 347
Special Design and Fabrication 471-473
Special Purpose Slings 65-71
Spectra® Rope 416
Spreader Bars 279-281
Stage Rigging Shackles 221
Stage Rigging Slings 106, 109, 120
Stainless Steel Shackles 243
Standards and Regulations 11
Stonehandling Slings 68
Storage 37
Suspension Trauma Strap 427
Swage Socket Assemblies 144
Swivel Eye Hooks 227, 241
Swivel Hoist Rings 249-264
Forged 261, 262
Metric 259, 260
Safety Information 249-255
Sideload 263
Stainless 256
Standard 257, 258
Ultra Lifting Ring 264
Wind Worker 86
Swivels 346
Synthetic Rope 385-416
T&D Ultra-Flex™ Wire Rope Slings 152
Tags 54, 55
Tanker Slings (Rail) 78
Tarp Straps 381
Tattle Tails (Twin-Path®) 114
Tension (Sling) 19-22, 81
Tester (Hydraulic Pad Eye) 356
Theatrical Shackles 221
TIE DOWN - LOAD SECUREMENT 363-384
Accessories 381
Bundle Straps 82
Cargo Winches 380
Fitting Specs. (1, 1-3/4, 2, 3 and 4 In.) 372-375
How to Order 371
Inspection 363-364
Interior Van 382
NAS Assemblies 376
One Way (Unifixx) 383-384
Options 370
Protection 381
Ratchet Tie Down Assys 378
Recreational and Utility 377
Safety Information 363-370
Truck Tie Down Assys 379
Tilt Up Blocks 348
Tolerances (Mfg. - Web Slings) 54
Tongs 289, 291
Tool Bags 87, 88
Tote Bags 13
Traction Motor Slings (Rail) 77
TRAINING 5-10
Facility 7
Inspector 7, 8
NCCCO 10
Rigger 10
Signal Person 10
Train-the-Trainer 8
User 7
Training Devices 13
Transformer Slings 128
Triangle Lifting Plate 247
Tri-Flex® Wire Rope Slings 151
Trolleys (Hoist-Push) 311, 320
Truck Tie Down Assys 379
Turnbuckles 233-238
Twin-Path® Extra Slings 113
Twin-Path® Slings 111-122
Ultimate Pole Sling 76
Utility Tie Down Assemblies 377
Vectrus® Rope 408
Vehicle Recovery Straps 84
Warning Icon 3
Warranties 478
Web Sling Fittings (Triangle & Choker) 199
Web Sling Tolerances 54
Web Slings 56-86
Web Strap Pullers 321-325
Website Information 4
Wedge Sockets 346
Weight Tables 477
Wheel Nets 89, 90
Wheel Slings (Rail) 78
Whoopie Slings 123-128
Wide Body Cargo Slings (Web) 62
Wide Body Shackles 220
Winch Bars 381
Wind Power Slings and Products 85-88
Wire Mesh Slings 195-198
Wire Rope Saddle Protectors 140
Wire Rope Sheaves 346
Wire Rope Slings 131-154
Yale Cordage 404-408

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