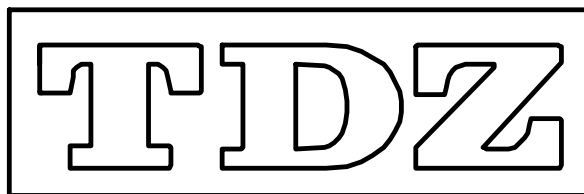


# HIDRAULICA



## SPARE PARTS FOR HYDRAULIC VANE PUMPS

For over 50 years TDZ's group has been working on the manufacturing of high precision products, like Injection equipments for Diesel engines and Hydraulic equipments.

We manufacture original products for such prestigious Companies as Mercedes-Benz, General Motors (Electromotive Diesel) or Land Rover, just as other spare part brands for the aftersales market. Half our production is exported all over the world.

The present catalogue is an indication of our spare part line for Vickers and Caterpillar Vane Pumps, which includes complete single and double pumps, as well as their cartridges and other parts.

We can supply our own make spare parts for all original references shown on the following sheets. These spare parts are interchangeable functionally and dimensionally. However, internal constructive differences, which do not affect the interchangeability may exist.

This is just an informative catalogue, and even though we have paid a lot of attention to its elaboration, some mistakes, of which we are not responsible, may occur.

Due to the continuous setting up to date of the references, it is possible that some of them are not included on these pages. If so, do not hesitate and contact us.

**Zaragoza, August 1<sup>st</sup>, 1990**

|                                                                  |           |
|------------------------------------------------------------------|-----------|
| <i><b>SPARE PARTS FOR VICKERS VANE PUMPS</b></i>                 | <b>sV</b> |
| Complete pumps, cartridges and parts for repairs                 |           |
| <i><b>SPARE PARTS FOR CATERPILLAR VANE PUMPS</b></i>             | <b>sC</b> |
| Complete pumps, cartridges and parts for repairs                 |           |
| <i><b>TDZ CARTRIDGE REFERENCES</b></i>                           | <b>Tc</b> |
| Cartridges for mobile and industrial applications                |           |
| <i><b>DIRECTIONS FOR USE AND REPAIRS</b></i>                     | <b>Dr</b> |
| Cartridge identification, rotation change, standards for repairs |           |

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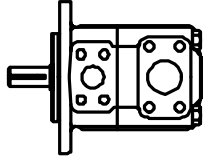
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## *SPARE PARTS FOR VICKERS VANE PUMPS*

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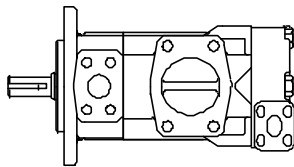
- Complete single and double vane Pumps
- Single and double vane pump Shafts
- Cartridges
- Single and double vane pump Parts
- Cartridge Parts



### SINGLE VANE PUMPS

|              |                                      |
|--------------|--------------------------------------|
| (F3)25V(Q) - | 8, 12, 14, 17, 19, 21 Gal./1200 rpm. |
| (F3)26V(Q) - |                                      |
| (F3)35V(Q) - | 21, 25, 30, 35, 38 Gal./1200 rpm.    |
| (F3)36V(Q) - |                                      |
| (F3)45V(Q) - | 42, 47, 50, 57, 60 Gal./1200 rpm.    |

High variety of available shafts. Ask for your concrete needs

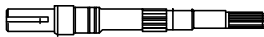


### DOUBLE VANE PUMPS

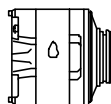
|                |                                                               |
|----------------|---------------------------------------------------------------|
| (F3)2520V(Q) - | 8, 12, 14, 17, 19, 21 + 2, 5, 8, 9, 11, 12, 14 Gal./1200 rpm. |
| (F3)2620V(Q) - |                                                               |
| (F3)3520V(Q) - | 21, 25, 30, 35, 38 + 2, 5, 8, 9, 11, 12, 14 Gal./1200 rpm.    |
| (F3)3620V(Q) - |                                                               |
| (F3)3525V(Q) - | 21, 25, 30, 35, 38 + 8, 12, 14, 17, 19, 21 Gal./1200 rpm.     |
| (F3)3625V(Q) - |                                                               |
| (F3)4520V(Q) - | 42, 47, 50, 57, 60 + 2, 5, 8, 9, 11, 12, 14 Gal./1200 rpm.    |
| (F3)4525V(Q) - | 42, 47, 50, 57, 60 + 8, 12, 14, 17, 19, 21 Gal./1200 rpm.     |



### SINGLE AND DOUBLE SHAFTS



|        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|
| 233369 | 238929 | 243448 | 254964 | 289084 | 394036 | 413024 |
| 233370 | 242287 | 243449 | 255533 | 361760 | 394517 | 413027 |
| 233524 | 242747 | 247019 | 258249 | 361761 | 402105 | 413433 |
| 233527 | 242767 | 247102 | 261275 | 361762 | 413019 | 413436 |
| 233624 | 242784 | 247803 | 285417 | 361763 | 413022 | 419082 |
| 238755 | 242885 | 254848 | 289083 | 392669 | 413023 | 422541 |

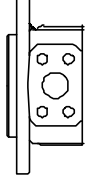


## CARTRIDGES

|        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|
| 413418 | 421563 | 580919 | 591005 | 919761 | 922647 | 923243 |
| 413419 | 421564 | 581663 | 591091 | 919762 | 922649 | 923251 |
| 413420 | 421565 | 581664 | 591092 | 919806 | 922650 | 923252 |
| 413421 | 421566 | 581862 | 591093 | 919807 | 922651 | 923253 |
| 413422 | 421567 | 582348 | 591094 | 919808 | 922652 | 923254 |
| 416427 | 421570 | 582349 | 591095 | 919809 | 922654 | 923255 |
| 416428 | 421571 | 582350 | 591096 | 919810 | 922655 | 923256 |
| 416429 | 421572 | 582572 | 591097 | 919811 | 922656 | 923257 |
| 416435 | 421573 | 584306 | 591098 | 919812 | 922657 | 923258 |
| 416436 | 421574 | 584307 | 591109 | 919813 | 922674 | 923259 |
| 416437 | 421576 | 584308 | 591110 | 919814 | 922675 | 923260 |
| 416439 | 421577 | 584309 | 591111 | 919828 | 922676 | 923261 |
| 416440 | 421578 | 584312 | 591112 | 919829 | 922677 | 923262 |
| 416441 | 421579 | 584313 | 919732 | 919830 | 922740 | 923293 |
| 416442 | 421580 | 584314 | 919733 | 919831 | 922744 | 923297 |
| 416452 | 421582 | 584324 | 919734 | 919842 | 922746 | 923305 |
| 417052 | 421583 | 584325 | 919735 | 919843 | 922758 | 923442 |
| 417053 | 421584 | 584326 | 919736 | 919844 | 922775 | 923445 |
| 417054 | 421585 | 584327 | 919737 | 919845 | 922776 | 923446 |
| 419509 | 421586 | 585471 | 919738 | 919862 | 922887 | 923447 |
| 419510 | 421588 | 585473 | 919742 | 919863 | 923025 | 923448 |
| 419511 | 421589 | 585475 | 919743 | 919864 | 923026 | 923449 |
| 421232 | 421590 | 585476 | 919744 | 919865 | 923031 |        |
| 421233 | 421591 | 585477 | 919745 | 919925 | 923032 |        |
| 421234 | 421592 | 585478 | 919746 | 919926 | 923033 |        |
| 421235 | 421645 | 586331 | 919747 | 919927 | 923034 |        |
| 421236 | 421646 | 588573 | 919748 | 919928 | 923039 |        |
| 421237 | 421954 | 588574 | 919749 | 919929 | 923040 |        |
| 421238 | 421955 | 588575 | 919750 | 919930 | 923041 |        |
| 421239 | 423096 | 588576 | 919755 | 922543 | 923042 |        |
| 421240 | 423097 | 588577 | 919756 | 922640 | 923043 |        |
| 421241 | 578311 | 588578 | 919757 | 922641 | 923072 |        |
| 421242 | 578312 | 591002 | 919758 | 922642 | 923122 |        |
| 421243 | 578313 | 591003 | 919759 | 922643 | 923127 |        |
| 421244 | 578314 | 591004 | 919760 | 922646 | 923153 |        |

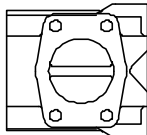
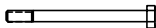
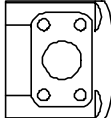
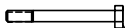


SINGLE AND DOUBLE VANE PUMP PARTS

|               |  |  |  |  |  |  |  |
|---------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|               | <b>BODY</b>                                                                       | <b>SHAFT<br/>SEAL</b>                                                             | <b>SHAFT<br/>SEAL</b><br>(Secondary)                                              | <b>BEARING</b>                                                                    | <b>SNAP RING</b><br>(Shaft)                                                         | <b>SNAP RING</b><br>(Bearing)                                                       |  |
| <b>25 V</b>   | 942353<br>233709                                                                  | 394976                                                                            | 429283<br>413029                                                                  | 1705                                                                              | 120128                                                                              | 191400                                                                              |  |
| <b>35 V</b>   | 942355<br>212647                                                                  | 394973                                                                            | 412009                                                                            | 38441                                                                             | 119982                                                                              | 193144                                                                              |  |
| <b>45 V</b>   | 942356<br>194881                                                                  | 394974<br>195287                                                                  | 413028                                                                            | 131812                                                                            | 102949                                                                              | 158630                                                                              |  |
| <b>2520 V</b> | 942353<br>233709                                                                  | 394976                                                                            | 429283<br>413029                                                                  | 1705                                                                              | 120128                                                                              | 191400                                                                              |  |
| <b>3520 V</b> | 942355<br>212647                                                                  | 394973                                                                            | 412009                                                                            | 38441                                                                             | 119982                                                                              | 193144                                                                              |  |
| <b>3525 V</b> | 942355<br>212647                                                                  | 394973                                                                            | 412009                                                                            | 38441                                                                             | 119982                                                                              | 193144                                                                              |  |
| <b>4520 V</b> | 942356<br>194881                                                                  | 394974<br>195287                                                                  | 413028                                                                            | 131812                                                                            | 102949                                                                              | 158630                                                                              |  |
| <b>4525 V</b> | 942356<br>194881                                                                  | 394974<br>195287                                                                  | 413028                                                                            | 131812                                                                            | 102949                                                                              | 158630                                                                              |  |
| <b>4535 V</b> | 942356<br>194881                                                                  | 394974<br>195287                                                                  | 413028                                                                            | 131812                                                                            | 102949                                                                              | 158630                                                                              |  |



## SINGLE AND DOUBLE VANE PUMP PARTS

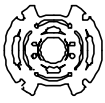
|  |  |  |  |  |  |  |  |
|--|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <b>INLET<br/>BODY</b>                                                             | <b>SCREW</b><br>(inlet Body)                                                      | <b>COVER</b><br>(Double pump)                                                     | <b>SCREW</b><br>(Double pump cover)                                               | <b>COVER</b><br>(Single pump)                                                      | <b>SCREW</b><br>(Single pump cover)                                                 | <b>SEAL KIT</b><br>(Shaft seals not<br>included)                                    |
|  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 224309                                                                             | 96168                                                                               | 922850                                                                              |
|  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 234248                                                                             | 11173                                                                               | 922851                                                                              |
|  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 229633                                                                             | 61321                                                                               | 922852<br>919850                                                                    |
|  | 251263                                                                            | 38523                                                                             | 250824                                                                            | 1296                                                                              |                                                                                    |                                                                                     | 922856                                                                              |
|  | 250818                                                                            | 42023                                                                             | 250824                                                                            | 1296                                                                              |                                                                                    |                                                                                     | 922859                                                                              |
|  | 230189                                                                            | 42955                                                                             | 231532                                                                            | 11163                                                                             |                                                                                    |                                                                                     | 922862                                                                              |
|  | 252283                                                                            | 87947                                                                             | 250824                                                                            | 1296                                                                              |                                                                                    |                                                                                     | 922863                                                                              |
|  | 233699                                                                            | 237138                                                                            | 231532                                                                            | 11163                                                                             |                                                                                    |                                                                                     | 922865                                                                              |
|  | NOT<br>AVAILABLE                                                                  | 269879                                                                            | NOT<br>AVAILABLE                                                                  |                                                                                   |                                                                                    |                                                                                     | 922866                                                                              |

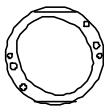
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## SPARE PARTS FOR VICKERS VANE PUMPS

### CARTRIDGE PARTS: 180 AND 20 (VQ) DESIGN

|             |  |  |  |  |  |  |  |  |
|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|             | <b>INLET PLATE</b>                                                                | <b>OUTLET PLATE</b>                                                               | <b>FLEX SIDE PLATES</b><br>(2 Units)                                              | <b>SEALS</b><br>(2 seals + 2 O'ring)                                              | <b>ROTOR</b>                                                                      | <b>VANE KIT</b><br>(10 vanes + 10 inserts)                                          | <b>SCREW</b>                                                                        | <b>PIN</b>                                                                          |
| <b>20 V</b> | 344367<br>344368<br>416420<br>416421<br>419501<br>419502                          | 341763<br>416430<br>419500                                                        | 416423<br>923955                                                                  | 433761<br>433762                                                                  | 275307<br>275308<br>346728<br>351067<br>402690<br>403539                          | 922741<br>922743                                                                    | 289473<br>416426                                                                    | 158465<br>422206                                                                    |
| <b>25 V</b> | 324429<br>324435<br>326983<br>330224<br>419080<br>430805                          | 324431<br>326981<br>330225<br>419079                                              | 415520<br>923956                                                                  | 433763<br>433764                                                                  | 270597                                                                            | 922710                                                                              | 289472<br>413834                                                                    | 229662<br>422207                                                                    |
| <b>30 V</b> | 326990<br>430805                                                                  | 326981<br>419079                                                                  | 923956                                                                            | 433763<br>433764                                                                  | 262152                                                                            | 922648                                                                              | 289474<br>416454                                                                    | 224583<br>422207                                                                    |
| <b>35 V</b> | 325450<br>327006<br>364423<br>412005<br>430806                                    | 325452<br>327008<br>364426<br>412003                                              | 923953                                                                            | 433765<br>433766                                                                  | 262154                                                                            | 922700                                                                              | 289475<br>410609                                                                    | 280031<br>418108                                                                    |
| <b>45 V</b> | 327010<br>351050<br>415384<br>430807                                              | 327012<br>351048<br>415382<br>425510                                              | 416444<br>923954                                                                  | 433767<br>433768                                                                  | 283871                                                                            | 922701                                                                              | 289476<br>380109                                                                    | 220888<br>422208                                                                    |



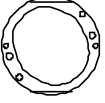
### RING

| <b>20 V</b> |                  | <b>25 V</b> |                  | <b>30 V</b> |                  | <b>35 V</b> |                  | <b>45 V</b> |                  |
|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|
|             | Gal.<br>1200 rpm |             | Gal.<br>1200 rpm |             | Gal.<br>1200 rpm |             | Gal.<br>1200 rpm |             | Gal.<br>1200 rpm |
| 388683      | 2                | 291671      | 12               | 234470      | 24               | 394961      | 21               | 297510      | 42               |
| 254846      | 5                | 326984      | 12               | 224525      | 28               | 280724      | 25               | 350684      | 42               |
| 333624      | 5                | 291457      | 14               |             |                  | 283570      | 25               | 297718      | 47               |
| 250820      | 8                | 326985      | 14               |             |                  | 319396      | 25               | 297502      | 50               |
| 333625      | 8                | 280721      | 17               |             |                  | 287826      | 30               | 350685      | 50               |
| 374799      | 9                | 326986      | 17               |             |                  | 319397      | 30               | 306772      | 57               |
| 250819      | 9                | 326987      | 19               |             |                  | 297990      | 35               | 297503      | 60               |
| 333626      | 11               | 293364      | 21               |             |                  | 319398      | 35               | 350686      | 60               |
| 256581      | 12               | 326988      | 21               |             |                  | 309812      | 38               |             |                  |
| 353901      | 12               |             |                  |             |                  | 319399      | 38               |             |                  |
| 257953      | 14               |             |                  |             |                  |             |                  |             |                  |
| 353902      | 14               |             |                  |             |                  |             |                  |             |                  |

## CARTRIDGE PARTS: 282 (12 VANES) DESIGN

|             |  |  |  |  |  |  |
|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|             | INLET<br>PLATE                                                                    | OUTLET<br>PLATE                                                                   | ROTOR                                                                             | VANE KIT<br>(12 vanes + 12 inserts)                                                | SCREW                                                                               | PIN                                                                                 |
| <b>25 V</b> | 591016<br>941396                                                                  | 588690                                                                            | 584618                                                                            | 941214                                                                             | 289472                                                                              | 229662                                                                              |
| <b>35 V</b> | 575480<br>576265<br>941399                                                        | 575479                                                                            | 575478                                                                            | 941019                                                                             | 289475                                                                              | 280031                                                                              |
| <b>45 V</b> | 578903<br>941400                                                                  | 580921                                                                            | 578900                                                                            | 941049                                                                             | 289476                                                                              | 220888                                                                              |

sV

|  <b>RING</b> |                  |             |                  |             |                  |
|-------------------------------------------------------------------------------------------------|------------------|-------------|------------------|-------------|------------------|
| <b>25 V</b>                                                                                     | Gal.<br>1200 rpm | <b>35 V</b> | Gal.<br>1200 rpm | <b>45 V</b> | Gal.<br>1200 rpm |
| 584610                                                                                          | 12               | 576210      | 25               | 581679      | 42               |
| 584612                                                                                          | 14               | 576212      | 30               | 582570      | 45               |
| 584614                                                                                          | 17               | 576214      | 35               | 581680      | 50               |
| 584616                                                                                          | 21               | 575476      | 38               | 578904      | 60               |

|  <b>TESTED RING, ROTOR AND VANES READY TO BE ASSEMBLED</b> |                  |             |                  |             |                  |             |                  |             |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|
| <b>20 V</b>                                                                                                                                   | Gal.<br>1200 rpm | <b>25 V</b> | Gal.<br>1200 rpm | <b>30 V</b> | Gal.<br>1200 rpm | <b>35 V</b> | Gal.<br>1200 rpm | <b>45 V</b> | Gal.<br>1200 rpm |
| VK20902                                                                                                                                       | 2                | VK25908     | 8                | VK30924     | 24               | VK35921     | 21               | VK45942     | 42               |
| VK20905                                                                                                                                       | 5                | VK25912     | 12               | VD30924     | 24               | VD35921     | 21               | VD45942     | 42               |
| VK20908                                                                                                                                       | 8                | VD25912     | 12               | VK30928     | 28               | VK35925     | 25               | VK45947     | 47               |
| VK20909                                                                                                                                       | 9                | VK25914     | 14               | VD30928     | 28               | VD35925     | 25               | VD45947     | 47               |
| VK20911                                                                                                                                       | 11               | VD25914     | 14               |             |                  | VK35930     | 30               | VK45950     | 50               |
| VK20912                                                                                                                                       | 12               | VK25917     | 17               |             |                  | VD35930     | 30               | VD45950     | 50               |
| VK20914                                                                                                                                       | 14               | VD25917     | 17               |             |                  | VK35935     | 35               | VK45957     | 57               |
|                                                                                                                                               |                  | VK25919     | 19               |             |                  | VD35935     | 35               | VD45957     | 57               |
|                                                                                                                                               |                  | VD25919     | 19               |             |                  | VK35938     | 38               | VK45960     | 60               |
|                                                                                                                                               |                  | VK25921     | 21               |             |                  | VD35938     | 38               | VD45960     | 60               |
|                                                                                                                                               |                  | VD25921     | 21               |             |                  |             |                  |             |                  |

VK\*\*\*\*: Design 180 &amp; 20 (VQ) Pumps; VD\*\*\*\*: Design 282 (12 vanes) Pumps.

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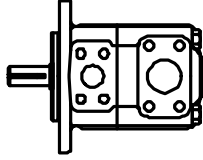
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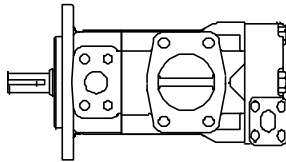
## *SPARE PARTS FOR CATERPILLAR VANE PUMPS*

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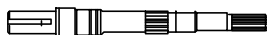
- Complete single and double vane Pumps
- Single and double vane pump Shafts
- Cartridges
- Single and double vane pump Parts
- Cartridge Parts


**SINGLE VANE PUMPS**

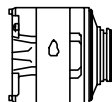
|         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 2J 3355 | 4J 8674 | 6J 0805 | 7J 0591 | 7J 5568 | 9J 5051 | 9J 8192 |
| 2J 6266 | 4J 9458 | 6J 4800 | 7J 0602 | 7J 6477 | 9J 5060 | 9J 8193 |
| 3A 1692 | 4J 9633 | 6J 7000 | 7J 0605 | 7J 7417 | 9J 5065 | 9J 8195 |
| 3G 4071 | 5J 4959 | 6J 7400 | 7J 0607 | 8J 2382 | 9J 5066 | 9J 8197 |
| 3G 4091 | 5J 4960 | 6J 7638 | 7J 0614 | 9J 5046 | 9J 5073 | 9J 8200 |
| 3G 6846 | 5J 6219 | 6J 7725 | 7J 3318 | 9J 5047 | 9J 8179 |         |
| 4J 5723 | 5J 7655 | 6J 9836 | 7J 4748 | 9J 5048 | 9J 8190 |         |


**DOUBLE VANE PUMPS**

|         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 1U 0422 | 4K 4306 | 6J 9823 | 7J 0860 | 8J 1650 | 9J 5068 | 9J 8199 |
| 2D 9646 | 5J 0095 | 6J 9893 | 7J 0861 | 8J 3880 | 9J 5070 | 9J 8201 |
| 3G 4092 | 5J 0287 | 6J 9897 | 7J 0881 | 8J 6177 | 9J 5071 | 9J 8202 |
| 3G 4094 | 5J 1173 | 6J 9898 | 7J 1114 | 8J 6810 | 9J 5074 | 9J 8203 |
| 3G 4095 | 5J 1405 | 7J 0590 | 7J 1920 | 8J 9997 | 9J 5084 | 9M 5587 |
| 3G 4097 | 5J 2576 | 7J 0593 | 7J 2030 | 9J 5050 | 9J 5133 |         |
| 3K 2786 | 5J 2684 | 7J 0594 | 7J 4349 | 9J 5052 | 9J 5134 |         |
| 3K 6945 | 5J 8064 | 7J 0595 | 7J 4634 | 9J 5053 | 9J 8177 |         |
| 3K 8726 | 5J 8765 | 7J 0599 | 7J 6230 | 9J 5054 | 9J 8180 |         |
| 3R 2446 | 5J 8798 | 7J 0604 | 7J 6245 | 9J 5055 | 9J 8182 |         |
| 4J 0823 | 65 8970 | 7J 0609 | 7J 6258 | 9J 5058 | 9J 8184 |         |
| 4J 6378 | 6J 1100 | 7J 0611 | 7J 6476 | 9J 5061 | 9J 8186 |         |
| 4J 6379 | 6J 7700 | 7J 0612 | 7J 7418 | 9J 5062 | 9J 8187 |         |
| 4J 6569 | 6J 7730 | 7J 0616 | 7J 7419 | 9J 5063 | 9J 8188 |         |
| 4J 9651 | 6J 7738 | 7J 0740 | 8J 0151 | 9J 5064 | 9J 8189 |         |
| 4K 3331 | 6J 8880 | 7J 0741 | 8J 0182 | 9J 5067 | 9J 8196 |         |


**SINGLE AND DOUBLE SHAFTS**


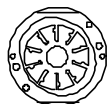
|         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 4J 0974 | 5J 0147 | 650723  | 7J 6228 | 9J 5090 | 9J 5095 | 9M 9931 |
| 4J 1660 | 5J 1219 | 658094  | 7J 6229 | 9J 5091 | 9J 5100 | 9M 9964 |
| 4J 2088 | 5J 1571 | 7J 0615 | 8J 0205 | 9J 5092 | 9J 5101 |         |
| 4J 6353 | 5J 1764 | 7J 2155 | 8J 8624 | 9J 5093 | 9J 5102 |         |
| 4J 7780 | 5J 9761 | 7J 3976 | 9J 5088 | 9J 5094 | 9J 5104 |         |



## CARTRIDGES

|         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 1U 2664 | 3G 2237 | 3G 7651 | 4J 4707 | 4T 0422 | 6J 7630 | 7J 0579 |
| 1U 2665 | 3G 2238 | 3G 7652 | 4J 4875 | 4T 1893 | 6J 7635 | 7J 0580 |
| 1U 2666 | 3G 2239 | 3G 7653 | 4J 5128 | 4T 2008 | 6J 7938 | 7J 0581 |
| 1U 2667 | 3G 2717 | 3G 7654 | 4J 6790 | 4T 3196 | 6J 8874 | 7J 0880 |
| 1U 2668 | 3G 2718 | 3G 7655 | 4J 6843 | 5J 0100 | 7J 0552 | 7J 1397 |
| 1U 2669 | 3G 2719 | 3G 7656 | 4J 7474 | 5J 0101 | 7J 0553 | 7J 1780 |
| 1U 2670 | 3G 2720 | 3G 7657 | 4J 7948 | 5J 0563 | 7J 0554 | 7J 1921 |
| 1U 2671 | 3G 2721 | 3G 7658 | 4J 7949 | 5J 0925 | 7J 0555 | 7J 3978 |
| 1U 3519 | 3G 2722 | 3G 7659 | 4J 8448 | 5J 1251 | 7J 0556 | 7J 3979 |
| 1U 3952 | 3G 2723 | 3G 7660 | 4J 8478 | 5J 3646 | 7J 0557 | 7J 5567 |
| 1U 3953 | 3G 2746 | 3G 7661 | 4J 8479 | 5J 4502 | 7J 0558 | 7J 7416 |
| 2J 8281 | 3G 2747 | 3G 7662 | 4J 8480 | 5J 4894 | 7J 0559 | 7J 7962 |
| 3G 1266 | 3G 2748 | 3G 7663 | 4J 8481 | 5J 5070 | 7J 0560 | 7J 7963 |
| 3G 1267 | 3G 2749 | 3G 7664 | 4J 8483 | 5J 5924 | 7J 0561 | 7J 7964 |
| 3G 1268 | 3G 2750 | 3G 7665 | 4J 8484 | 5J 6217 | 7J 0562 | 7J 7966 |
| 3G 1269 | 3G 2751 | 3G 7666 | 4J 8485 | 5J 7517 | 7J 0563 | 7J 7967 |
| 3G 1270 | 3G 2752 | 3G 7667 | 4J 8489 | 5J 8764 | 7J 0564 | 7J 7968 |
| 3G 1271 | 3G 2801 | 3K 7943 | 4J 8490 | 5J 9852 | 7J 0565 | 8J 6293 |
| 3G 2194 | 3G 2802 | 3K 8301 | 4J 8491 | 647300  | 7J 0566 | 8J 8716 |
| 3G 2195 | 3G 2803 | 3K 8926 | 4J 8492 | 650710  | 7J 0568 | 9J 0473 |
| 3G 2196 | 3G 2804 | 4J 0990 | 4J 8493 | 6J 0050 | 7J 0569 | 9J 0739 |
| 3G 2197 | 3G 2806 | 4J 1310 | 4J 8494 | 6J 1101 | 7J 0570 | 9J 4863 |
| 3G 2198 | 3G 2807 | 4J 1401 | 4J 8495 | 6J 1541 | 7J 0571 | 9J 7890 |
| 3G 2199 | 3G 2832 | 4J 1781 | 4J 8496 | 6J 1543 | 7J 0572 | 9J 7891 |
| 3G 2200 | 3G 2833 | 4J 1782 | 4J 8497 | 6J 1578 | 7J 0573 | 9J 7892 |
| 3G 2201 | 3G 2834 | 4J 2401 | 4J 8933 | 6J 1579 | 7J 0574 | 9J 9852 |
| 3G 2233 | 3G 2835 | 4J 2460 | 4K 0738 | 6J 2186 | 7J 0575 |         |
| 3G 2234 | 3G 2836 | 4J 2461 | 4K 1944 | 6J 3138 | 7J 0576 |         |
| 3G 2235 | 3G 2837 | 4J 3447 | 4K 4634 | 6J 6614 | 7J 0577 |         |
| 3G 2236 | 3G 2889 | 4J 3538 | 4K 4835 | 6J 7625 | 7J 0578 |         |

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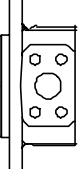
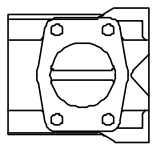
## TESTED RING, ROTOR AND VANES READY TO BE ASSEMBLED

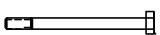
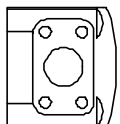
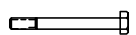
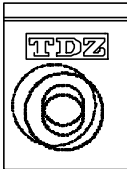
| VK20<br>(20V & 20VQ) | Gal.<br>1200 rpm | VK25<br>(25V & 25VQ) | Gal.<br>1200 rpm | VK30<br>(30V & 30VQ) | Gal.<br>1200 rpm | VK35<br>(35V & 35VQ) | Gal.<br>1200 rpm | VK45<br>(45V & 45VQ) | Gal.<br>1200 rpm |
|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|
| VK20902              | 2                | VK25908              | 8                | VK30924              | 24               | VK35921              | 21               | VK45942              | 42               |
| VK20905              | 5                | VK25912              | 12               | VK30928              | 28               | VK35925              | 25               | VK45947              | 47               |
| VK20908              | 8                | VK25914              | 14               |                      |                  | VK35930              | 30               | VK45950              | 50               |
| VK20909              | 9                | VK25917              | 17               |                      |                  | VK35935              | 35               | VK45957              | 57               |
| VK20911              | 11               | VK25919              | 19               |                      |                  | VK35938              | 38               | VK45960              | 60               |
| VK20912              | 12               | VK25921              | 21               |                      |                  |                      |                  |                      |                  |
| VK20914              | 14               |                      |                  |                      |                  |                      |                  |                      |                  |



## SPARE PARTS FOR CATERPILLAR VANE PUMPS

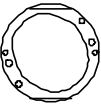
### SINGLE AND DOUBLE VANE PUMP PARTS

|                                      |  |                                      |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| BODY                                                                                                                  | SHAFT SEAL                                                                        | SHAFT SEAL<br>(Secondary)                                                                                             | BEARING                                                                           | SNAP RING<br>(Shaft)                                                              | SNAP RING<br>(Bearing)                                                              | INLET<br>BODY                                                                       |
| 1U 3937<br>1U 3966<br>1U 3968<br>2J 7760<br>2J 8165<br>7J 4733<br>7J 8081<br>9J 5120<br>9J 5121<br>9J 5123<br>9J 5124 | 2J 7764<br>2J 8169<br>4D 0866<br>4J 0980<br>5P 0903<br>5P 0904<br>9J 7814         | 3G 2325<br>3G 9193<br>3G 9194<br>5P 9382<br>5P 9383<br>6V 2318<br>8J 6888<br>8J 6889<br>9J 5150<br>9J 5151<br>9J 5152 | 2J 7762<br>2L 5271<br>3L 1425<br>6B 1124                                          | 1J 6474<br>1L 8497                                                                | 2D 1518<br>2J 8172<br>3F 6389<br>3J 7719<br>3K 4027<br>4M 5285<br>4M 7652           | 4J 1658<br>4J 2457<br>4J 3429<br>4J 4670<br>4K 0413                                 |

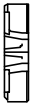
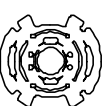
|              |  |  |  |  |                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCREW<br>(Inlet Body)                                                                           | COVER<br>(Double pump)                                                              | SCREW<br>(Double pump cover)                                                        | COVER<br>(Single pump)                                                              | SCREW<br>(Single pump cover)                                                         | SEAL KIT<br>(Shaft seals not included)                                                                                                                                                                                                                                                                                                 |
| 1D 4572<br>1D 4596<br>1D 4597<br>1D 4599<br>1K 6580<br>2D 1504<br>4J 1668<br>4J 3427<br>5A 8606 | 4J 1657<br>4K 0415                                                                  | 1M 0811<br>2B 0947<br>T 319<br>5P 4849                                              | 3D 6156<br>4J 0975<br>4J 1395                                                       | 1D 4569                                                                              | 4J 0983<br>4J 1783<br>4J 3380<br>4J 4705<br>4J 6354<br>4J 7947<br>4J 9259<br>4J 9278<br>4J 9279<br>4J 9280<br>4J 9281<br>4J 9282<br>4J 9286<br>4J 9287<br>4J 9289<br>5J 0102<br>8J 9982<br>8J 9984<br>9J 3000<br>9J 5106<br>9J 5107<br>9J 5108<br>9J 5109<br>9J 5110<br>9J 5111<br>9J 5112<br>9J 5113<br>9J 5114<br>9J 5115<br>9J 5119 |



## CARTRIDGE PARTS

|  |  |                                                                                  |    |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| INLET<br>PLATE                                                                    | OUTLET<br>PLATE                                                                   | RING                                                                                                                                                              | ROTOR                                                                               | VANE KIT<br>(10 vanes + 10 inserts)                                                | SCREW                                                                               | PIN                                                                                 |
| 4J 3382<br>6J 7620<br>6J 7622<br>6J 9073<br>6J 9075                               | 4J 0976<br>4J 1664<br>6J 7621<br>6J 8112<br>6J 9074                               | 4J 0973<br>4J 1309<br>4J 3539<br>4J 4668<br>4J 5192<br>4J 7477<br>4J 8937<br>4K 1791<br>5J 1255<br>5J 5926<br>6J 1576<br>6J 3139<br>9T 5064<br>9T 5072<br>9T 5080 | 4J 5251<br>4J 7475<br>4J 7476<br>4K 0403<br>5J 5928<br>647310<br>9T 5104<br>9T 5109 | 4J 0982<br>4J 1397<br>4J 2462<br>4K 0735<br>647311<br>9T 5054<br>9T 5058           | 4B 2538<br>4K 0405                                                                  | 4J 1393<br>4J 1665<br>4K 0407<br>5J 0079                                            |

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|  |  |  |  |                        |  |  |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| INLET<br>PLATE<br><small>VQ cartridges</small>                                      | OUTLET<br>PLATE<br><small>VQ cartridges</small>                                     | PLATES<br>& SEALS<br>KIT                                                            | FLEX SIDE<br>PLATES<br><small>(2 units)</small>                                     | "O"<br>RINGS<br><small>(2 units)</small>                                                                  | SEAL PACK<br>SUBASSEM.<br><small>("O" ring not included)</small>                      | SCREW                                                                                 | PIN                                                                                   |
| 9T 5046<br>9T 5047<br>9T 5049<br>9T 5052                                            | 9T 5089<br>9T 5090<br>9T 5093<br>9T 5095                                            | 1U 0378<br>1U 0379<br>1U 0380<br>1U 0381                                            | 9T 5096<br>9T 5098<br>9T 5100<br>9T 5102                                            | 3G 1265<br>3G 2191<br>3G 2240<br>3G 2715<br>3G 9199<br>3G 9200<br>3G 9201<br>8C 3078<br>8C 3079<br>092062 | 3G 1264<br>3G 2192<br>3G 2241<br>3G 2714                                              | 9T 5110<br>9T 5112<br>9T 5114<br>544673                                               | 9T 5041<br>9T 5042<br>9T 5044<br>544672                                               |

TFDZ

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## *TDZ CARTRIDGE REFERENCES*

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-TDZ cartridge references for single,double & triple  
Vickers and Caterpillar vane pumps.

**Tc**

## MOBILE APPLICATIONS

**CR:** NBR seal, 10 vanes

**CT:** VITON seal, 10 vanes

**CQ:** NBR seal, 10 vanes, with bimetalic plates

**CF:** VITON seal, 10 vanes, with plates

| SINGLE PUMPS                                    |                        |                      |                       |         |                         |         |
|-------------------------------------------------|------------------------|----------------------|-----------------------|---------|-------------------------|---------|
| TRHU DRIVE SINGLE PUMPS                         |                        |                      |                       |         |                         |         |
| DOUBLE PUMPS (FIRST CARTRIDGE)                  |                        |                      |                       |         |                         |         |
| PUMP TYPE                                       | FLOW                   |                      | CAST IRON PLATES (VK) |         | BIMETALIC PLATES (VQ)   |         |
|                                                 | gal/min.<br>(1200 rpm) | l/min.<br>(1000 rpm) | ROTATION              |         | ROTATION                |         |
|                                                 |                        |                      | RIGHT                 | LEFT    | RIGHT                   | LEFT    |
| 20V<br>V*20                                     | 2                      | 8                    | CR10102               | CR11102 | CQ10102                 | CQ11102 |
|                                                 | 5                      | 18                   | CR10105               | CR11105 | CQ10105                 | CQ11105 |
|                                                 | 8                      | 27                   | CR10108               | CR11108 | CQ10108                 | CQ11108 |
|                                                 | 9                      | 29                   | CR10109               | CR11109 | CQ10109                 | CQ11109 |
|                                                 | 11                     | 36                   | CR10111               | CR11111 | CQ10111                 | CQ11111 |
|                                                 | 12                     | 39                   | CR10112               | CR11112 | CQ10112                 | CQ11112 |
|                                                 | 14                     | 46                   | CR10114               | CR11114 | CQ10114                 | CQ11114 |
| 25V<br>V*25<br>V*4T<br>2520V*<br>V*43           | 8                      | 26                   | CR10005               | CR11009 | CQ10005                 | CQ11009 |
|                                                 | 12                     | 40                   | CR10000               | CR11004 | CQ10000                 | CQ11004 |
|                                                 | 14                     | 45                   | CR10001               | CR11005 | CQ10001                 | CQ11005 |
|                                                 | 17                     | 55                   | CR10002               | CR11006 | CQ10002                 | CQ11006 |
|                                                 | 19                     | 60                   | CR10004               | CR11008 | CQ10004                 | CQ11008 |
|                                                 | 21                     | 67                   | CR10003               | CR11007 | CQ10003                 | CQ11007 |
|                                                 | 24                     | 80                   | CR10007               | CR11011 | CQ10007                 | CQ11011 |
|                                                 | 27                     | 88                   | CR10006               | CR11010 | Not mounted in VQ model |         |
| 30V                                             | 24                     | 76                   | CR10010               | CR11012 | CQ10010                 | CQ11012 |
|                                                 | 28                     | 88                   | CR10011               | CR11013 | CQ10011                 | CQ11013 |
| 35V<br>V*35<br>V*6T<br>35**V<br>V*6*            | 21                     | 66                   | CR10024               | CR11028 | CQ10024                 | CQ11028 |
|                                                 | 25                     | 81                   | CR10020               | CR11024 | CQ10020                 | CQ11024 |
|                                                 | 30                     | 97                   | CR10021               | CR11025 | CQ10021                 | CQ11025 |
|                                                 | 35                     | 112                  | CR10022               | CR11026 | CQ10022                 | CQ11026 |
|                                                 | 38                     | 121                  | CR10023               | CR11027 | CQ10023                 | CQ11027 |
|                                                 | 45                     | 142                  | CR10025               | CR11029 | CQ10025                 | CQ11029 |
| 45V<br>V*45<br>V*7T<br>45**V<br>V*7*            | 42                     | 138                  | CR10030               | CR11034 | CQ10030                 | CQ11034 |
|                                                 | 47                     | 148                  | CR10031               | CR11035 | CQ10031                 | CQ11035 |
|                                                 | 50                     | 162                  | CR10032               | CR11036 | CQ10032                 | CQ11036 |
|                                                 | 57                     | 180                  | CR10034               | CR11038 | CQ10034                 | CQ11038 |
|                                                 | 60                     | 193                  | CR10033               | CR11037 | CQ10033                 | CQ11037 |
|                                                 | 67                     | 214                  | CR10035               | CR11039 | CQ10035                 | CQ11039 |
|                                                 | 75                     | 240                  | CR10036               | CR11040 | CQ10036                 | CQ11040 |
|                                                 |                        |                      |                       |         |                         |         |
| DOUBLE PUMPS (SECOND CARTIDGE)                  |                        |                      |                       |         |                         |         |
| 2520V<br>3520V<br>4520V<br>V*43<br>V*63<br>V*73 | 2                      | 8                    | CR20020               | CR21026 | CQ20020                 | CQ21026 |
|                                                 | 5                      | 18                   | CR20021               | CR21027 | CQ20021                 | CQ21027 |
|                                                 | 8                      | 27                   | CR20022               | CR21028 | CQ20022                 | CQ21028 |
|                                                 | 9                      | 29                   | CR20026               | CR21032 | CQ20026                 | CQ21032 |
|                                                 | 11                     | 36                   | CR20023               | CR21029 | CQ20023                 | CQ21029 |
|                                                 | 12                     | 39                   | CR20024               | CR21030 | CQ20024                 | CQ21030 |
|                                                 | 14                     | 46                   | CR20025               | CR21031 | CQ20025                 | CQ21031 |
| 3525V<br>4525V<br>V*64<br>V*74                  | 8                      | 26                   | CR20015               | CR21019 | CQ20015                 | CQ21019 |
|                                                 | 12                     | 40                   | CR20010               | CR21014 | CQ20010                 | CQ21014 |
|                                                 | 14                     | 45                   | CR20011               | CR21015 | CQ20011                 | CQ21015 |
|                                                 | 17                     | 55                   | CR20012               | CR21016 | CQ20012                 | CQ21016 |
|                                                 | 19                     | 60                   | CR20014               | CR21018 | CQ20014                 | CQ21018 |
|                                                 | 21                     | 67                   | CR20013               | CR21017 | CQ20013                 | CQ21017 |
|                                                 | 24                     | 80                   | CR20017               | CR21021 | CQ20017                 | CQ21021 |
|                                                 | 27                     | 88                   | CR20016               | CR21020 | Not mounted in VQ model |         |
| 4535V<br>V*76                                   | 21                     | 66                   | CR20004               | CR21008 | CQ20004                 | CQ21008 |
|                                                 | 25                     | 81                   | CR20000               | CR21004 | CQ20000                 | CQ21004 |
|                                                 | 30                     | 97                   | CR20001               | CR21005 | CQ20001                 | CQ21005 |
|                                                 | 35                     | 112                  | CR20002               | CR21006 | CQ20002                 | CQ21006 |
|                                                 | 38                     | 121                  | CR20003               | CR21007 | CQ20003                 | CQ21007 |
|                                                 | 45                     | 142                  | CR20005               | CR21009 | CQ20005                 | CQ21009 |

# TDZ CARTRIDGES REFERENCES



## INDUSTRIAL APPLICATIONS

**CR:** NBR seal, 10 vanes

**CS:** NBR seal, 12 vanes

**CV:** VITON seal, 12 vanes

| SINGLE PUMPS<br>TRHU DRIVE SINGLE PUMPS<br>DOUBLE PUMPS (FIRST CARTRIDGE) |                     |                   |         |         |
|---------------------------------------------------------------------------|---------------------|-------------------|---------|---------|
| PUMP TYPE                                                                 | FLOW                |                   | RIGHT   |         |
|                                                                           | gal/min. (1200 rpm) | l/min. (1000 rpm) |         |         |
| 25V<br>VS4T<br>2520VS<br>VS43                                             | 8                   | 26                | CS10008 | CS11008 |
|                                                                           | 12                  | 40                | CS10012 | CS11012 |
|                                                                           | 14                  | 45                | CS10014 | CS11014 |
|                                                                           | 17                  | 55                | CS10017 | CS11017 |
|                                                                           | 19                  | 60                | CS10019 | CS11019 |
|                                                                           | 21                  | 67                | CS10021 | CS11021 |
|                                                                           | 24                  | 80                | CS10024 | CS11024 |
|                                                                           | 27                  | 88                | CS10027 | CS11027 |
| 35V<br>VS35<br>VS6T<br>35**VS<br>VS6*                                     | 21                  | 66                | CS30021 | CS31021 |
|                                                                           | 25                  | 81                | CS10025 | CS11025 |
|                                                                           | 30                  | 97                | CS10030 | CS11030 |
|                                                                           | 35                  | 112               | CS10035 | CS11035 |
|                                                                           | 38                  | 121               | CS10038 | CS11038 |
|                                                                           | 45                  | 142               | CS10045 | CS11045 |
| 45V<br>VS45<br>VS7T<br>45**VS<br>VS7*                                     | 42                  | 138               | CS10042 |         |
|                                                                           | 47                  | 148               | CS10047 |         |
|                                                                           | 50                  | 162               | CS10050 |         |
|                                                                           | 57                  | 180               | CS10057 |         |
|                                                                           | 60                  | 193               | CS10060 |         |
|                                                                           | 67                  | 214               | CS10067 |         |
|                                                                           | 75                  | 240               | CS10075 |         |
| DOUBLE PUMPS (SECOND CARTIDGE)                                            |                     |                   |         |         |
| **20VS<br>VS*3                                                            | 2                   | 8                 | CR20020 | CR21026 |
|                                                                           | 5                   | 18                | CR20021 | CR21027 |
|                                                                           | 8                   | 27                | CR20022 | CR21028 |
|                                                                           | 9                   | 29                | CR20026 | CR21032 |
|                                                                           | 11                  | 36                | CR20023 | CR21029 |
|                                                                           | 12                  | 39                | CR20024 | CR21030 |
|                                                                           | 14                  | 46                | CR20025 | CR21031 |
|                                                                           |                     |                   |         |         |
| 3525VS<br>4525VS<br>VS64<br>VS74                                          | 8                   | 26                | CS40008 | CS41008 |
|                                                                           | 12                  | 40                | CS40012 | CS41012 |
|                                                                           | 14                  | 45                | CS40014 | CS41014 |
|                                                                           | 17                  | 55                | CS20017 | CS21017 |
|                                                                           | 19                  | 60                | CS20019 | CS21019 |
|                                                                           | 21                  | 67                | CS20021 | CS21021 |
|                                                                           | 24                  | 80                | CS20024 | CS21024 |
|                                                                           | 27                  | 88                | CS20027 | CS21027 |
| 4535VS<br>VS76                                                            | 21                  | 66                | CS40021 | CS41021 |
|                                                                           | 25                  | 81                | CS20025 | CS21025 |
|                                                                           | 30                  | 97                | CS20030 | CS21030 |
|                                                                           | 35                  | 112               | CS20035 | CS21035 |
|                                                                           | 38                  | 121               | CS20038 | CS21038 |
|                                                                           | 45                  | 142               | CS20045 | CS21045 |

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## *DIRECTIONS FOR USE AND REPAIRS*

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- Cartridge identification, rotation change, standards for repairs.

Due to the difficulty in finding out spare cartridge references, either for the loss of the pump feature plate, or for the lack of the machine spare part catalogue, it is most convenient to include some sheets to identify the sample accurately and to give some advice for a right assembly.

To identify properly cartridge and pump, use the 3 following pages as follows:

**- DIMENSIONS AND FLOW**

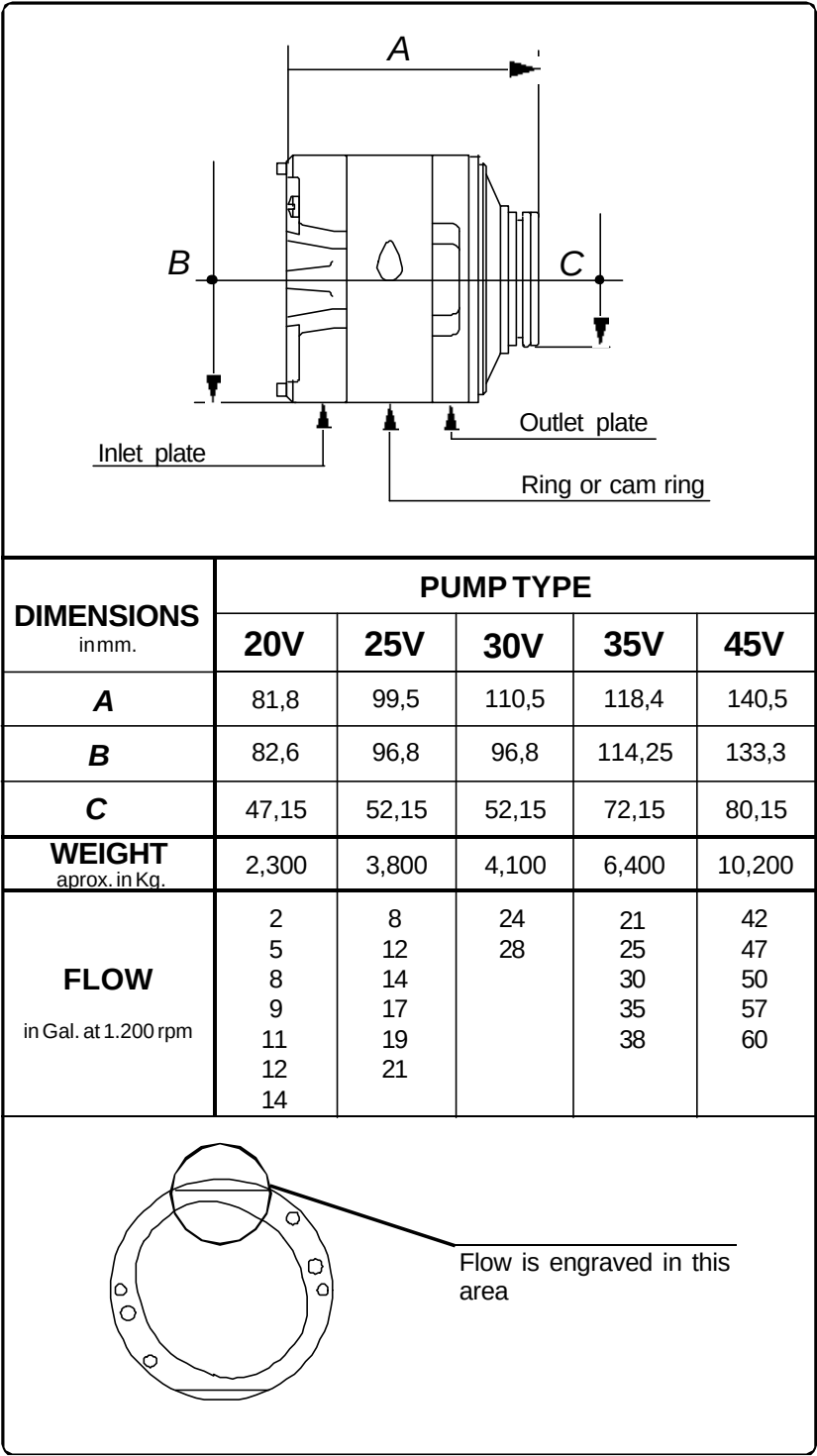
Find out pump type and flow in the dimensions chart, look the figure engraved on the ring as shown (gallons/min. at 1200 rpm).

**- SUPPORT BUSHING AND SHAFT ROTATION**

Locate support bushing to know whether the cartridge belongs to a single or double pump. On this page there are also some clues to identify shaft rotation.



DIMENSIONS AND FLOW

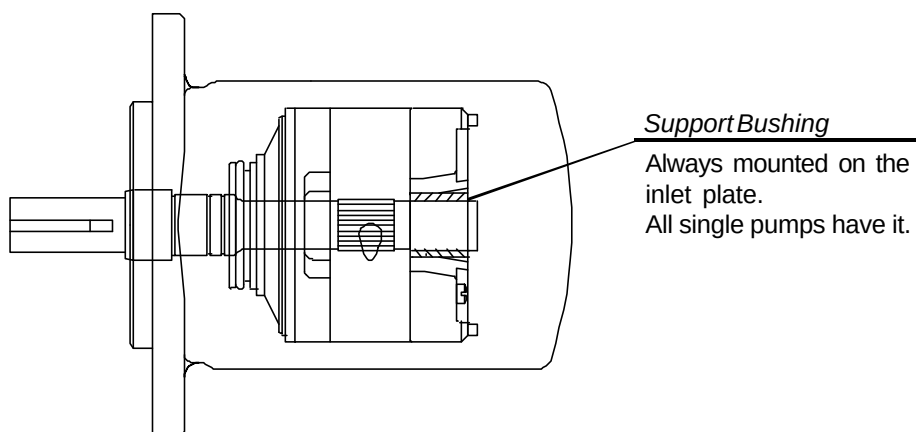


Dr

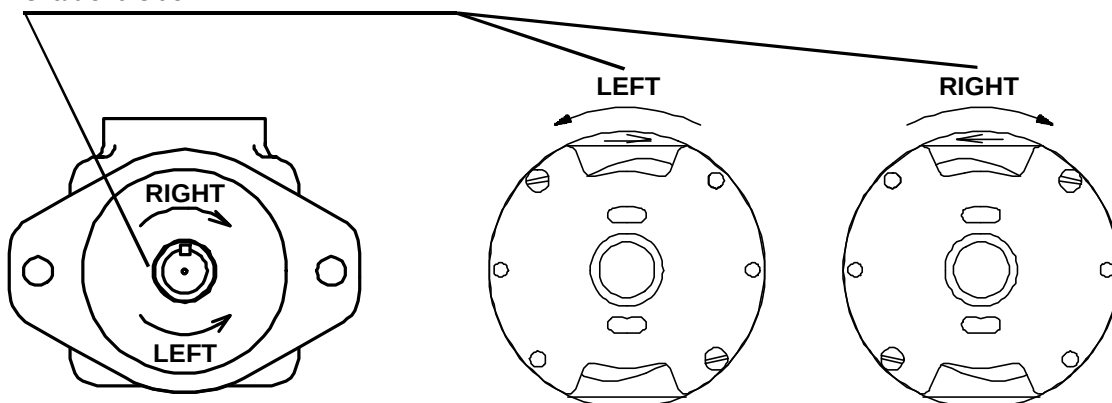
## PUMP ROTATION

To determine pump rotation look at it from the shaft end side. So, if clockwise it is right hand rotation, on the contrary, it is left hand rotation.

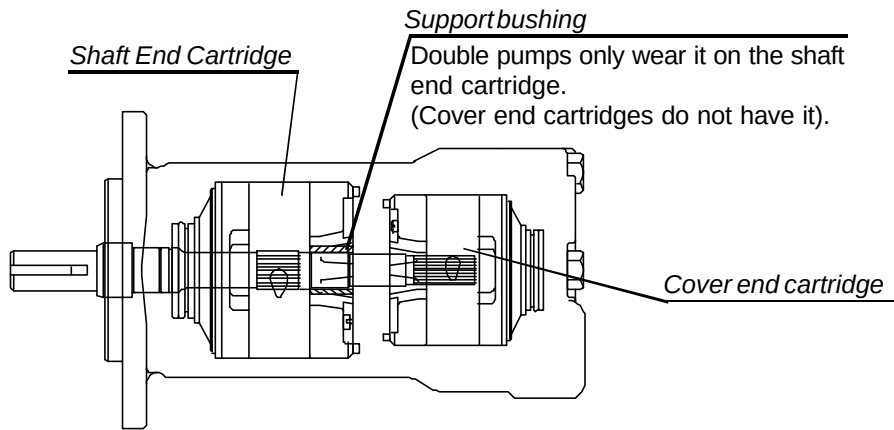
When taking out cartridge and putting it on to the outlet plate take into account that rotation is seen on the other way round; anyway, an arrow engraved in the ring or cam ring shows the real turning sense. (See pictures.)



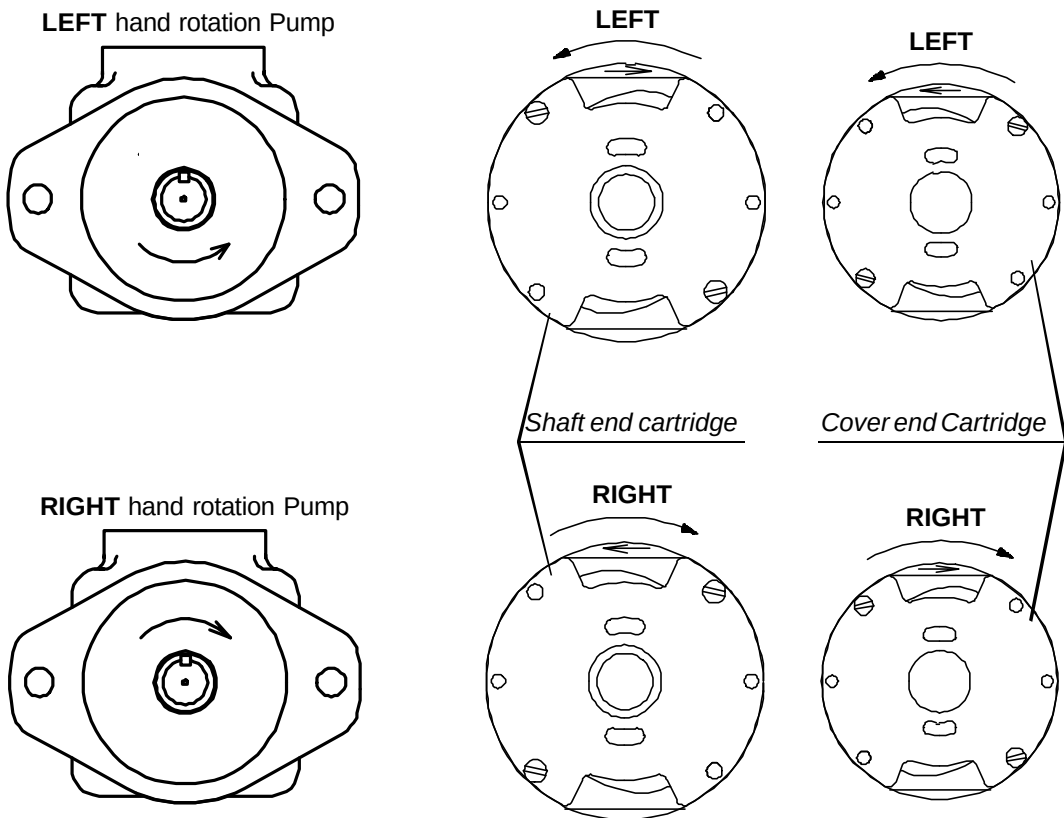
Pump rotation is viewed from the shaft end side.



## PUMP ROTATION



Double pump special feature is that their 2 cartridges are opposite to each other, therefore when putting them on the outlet plate, they will apparently have opposite turning sense. Anyway, the arrow in the ring shows the correct rotation. (Pump and cover end cartridge rotation always coincide.)



Since this is a high precision kit (mechanized in tolerances within thousandth of millimeter), any abrasive impurity can injure it in a few minutes or damage it to shorten its performance, before disassembling it is necessary that working place, tools and worker hands are completely clean and neat.

Please avoid any blow, however insignificant, taking special care with all edge sides, ring seat points and inlet and outlet plates.

All these preventive measures taken, proceed as follows:

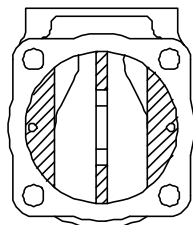
- 1° Lean the cartridge, holding it tightly, at the work bench on the outlet plate. Loosen the 2 screws which fix the kit, take them out as well as the pins (if there are any). Take out inlet plate shifting it laterally, as due to the protective oil it may be gummed up. Place it at the bench on a clean paper, white preferably.
- 2° Do the same with vanes, rotor and ring.  
Place the rotor, once disassembled, onto the outlet plate with arrow showing the required turning sense (see detail in the circle, fig. 3), afterwards, put inserts into vanes (fig. 4), and finally, introduce them in the slots, well at the bottom, with vane closing edge in forward rotation, as arrow shows in the corresponding picture.
- 3° Be sure there is no small dirty particles at the leaning surface, put ring on to the outlet plate, placing it in the required turning sense. Make coincide chamfer edges, in which flow and arrow are engraved, with inlet or admission port.
- 4° Set inlet plate, pins and the 2 screws as shown in the pictures, taking into account that these last ones must be in opposite position to the one they had before disassembling. (To do so, just turn ring, rotor and vanes 180°). Fasten the screws moderately and dip the whole cartridge kit into clean hydraulic oil for a while. After these steps it is ready to be assembled.

Please pay good attention to the cartridge and pump rotation, as they do not always coincide. Be very careful to identify them properly. (See previous pages.)



### CARTRIDGE REPLACEMENT

To have a successful cartridge replacement be sure to follow these warnings:



1° - Check if due to the use there is a tread on the cartridge seat zone (dark area in the picture).

If so, deepness must not be higher than 0,01 mm. (This could be observed even with a fingernail), being most convenient in such a case grinding or changing the pump body with this fault, as otherwise noise and performance values won't be the right ones. (In case you can't grind the seat, TDZ has -available for sale- a simple machine specially designed for this purpose).

2° - Look at the cartridge to be replaced, if wear is normal just change oil in tank circuit and change or clean filters.

3° - Should the used cartridge shows seizure in rotor, outlet & inlet plates, disassemble the pump completely. Check that the key is in good condition (it could be cut out). Then, put the shaft between points to make sure it is not twisted or crooked. Change it in case of any fault.

Take all the oil out of the circuit and other parts. Clean the tank carefully. If there is available any used cartridge mount it and start the machine for at least 15 minutes, driving all controls. To do so, spend the least possible amount of oil, since it will have to be replaced after this operation, although it could be reused again, after being filtrated in a filter no bigger than 5 microns, as it still keeps additives).

Replace or clean all filters, mount the new cartridge and fill the tank till the level with new oil.

### CARTRIDGE REPAIRS

#### MINIMAL CLEARANCE BETWEEN CAM RING AND ROTOR

| MODEL                                                                                              | Inches | Millimetres |
|----------------------------------------------------------------------------------------------------|--------|-------------|
| 20V                                                                                                | 0.0007 | 0,018       |
| 25V                                                                                                | 0.0008 | 0,020       |
| 30V                                                                                                | 0.0012 | 0,030       |
| 35V                                                                                                | 0.0011 | 0,028       |
| 45V                                                                                                | 0.0014 | 0,036       |
| * Vane length must be from 0,005 to 0,010 mm. (0,0002 to 0,0004 inches) less than rotor thickness. |        |             |

**To rebuild cartridges it is necessary to use grinding & lapping machines, as well as measurement tools able to work in microns.**

## TIGHTEN TORQUE FOR PUMP SCREWS

|                                                                                                                                                                               | Reference | Tighten torque in Kp.m. |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|------|------|
| <b>SINGLE PUMPS</b>                                                                                                                                                           | 25V       | 7,6                     | ±0,7 |      |
|                                                                                                                                                                               | 35V       | 12,5                    | ±0,7 |      |
|                                                                                                                                                                               | 45V       | 36,6                    | ±1,4 |      |
|                                                                                                                                                                               |           |                         |      |      |
| <b>DOUBLE PUMPS</b>                                                                                                                                                           | 25-20V    | Inlet body              | 9,7  | ±0,7 |
|                                                                                                                                                                               |           | Cover                   | 6,2  | ±0,7 |
|                                                                                                                                                                               | 35-20V    | Inlet body              | 12,5 | ±0,7 |
|                                                                                                                                                                               |           | Cover                   | 6,2  | ±0,7 |
|                                                                                                                                                                               | 35-25V    | Inlet body              | 12,7 | ±0,7 |
|                                                                                                                                                                               |           | Cover                   | 9,7  | ±0,7 |
|                                                                                                                                                                               | 45-20V    | Inlet body              | 36,6 | ±1,4 |
|                                                                                                                                                                               |           | Cover                   | 6,2  | ±0,7 |
|                                                                                                                                                                               | 45-25V    | Inlet body              | 36,6 | ±1,4 |
|                                                                                                                                                                               |           | Cover                   | 9,7  | ±0,7 |
|                                                                                                                                                                               | 45-35V    | Inlet body              | 36,6 | ±1,4 |
|                                                                                                                                                                               |           | Cover                   | 12,7 | ±0,7 |
| <p><i>Tighten the screws, with a torque no bigger than 0,5 to 1 Kp.m before beginning the last or final tighten.</i></p> <p><i>Follow the order shown in the picture.</i></p> |           |                         |      |      |

