

Beru ignition components

Passing the exhaust
emission test is not a problem

perfection built in

Perfection
built in



Action plan against misfiring:

The catalytic converter requires a fault-free ignition system

The catalytic converter reduces the emission of harmful substances and therefore makes an effective contribution towards protection of the environment. It is however, sensitive to mechanical loads, overheating and control faults. Such excessive demands can reduce the cleaning effect or even lead to complete failure (which can cause harmful emissions to increase tenfold!).

In order to carry out its important task, the catalytic converter requires a reliable and fault-free ignition system. Regular testing of the catalytic converter is a precautionary measure which can save you money. It need not be expensive to rectify damage discovered early: a complete ignition lead set with plugs or a set of spark plugs costs little when compared with the costs incurred when the catalytic converter must be replaced as a result of consequential damage.

On the following pages you will see pictures of various damage to help you quickly recognise faults, defects or worn ignition components.

A break and hair-line fracture in ceramic carrier caused by defective ignition lead



Pictures: HJS



Breakage and melting of ceramic carrier due to worn spark plugs.

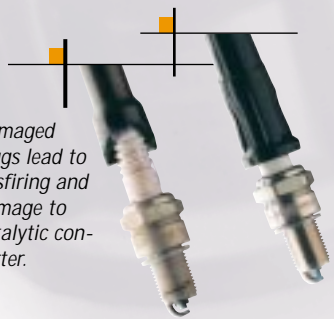
Checking ignition components!

Check ignition leads and plugs and replace if necessary

Checklist: 1. Ignition leads: porosity, hair-line fractures, wear, charred and braised areas, damaged water protection caps, leaking plug-lead connection, oxidation of connection components?

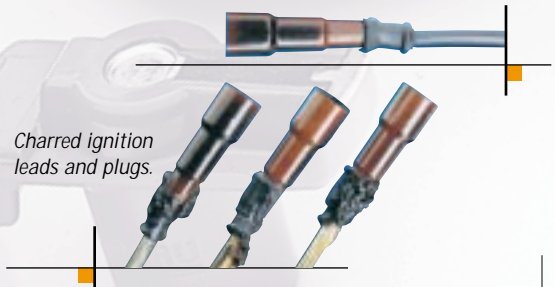
2. Plugs: Hair-line fractures on spark plugs and distributor plugs, brittleness, leaking plug-lead connection, damaged sealing lips, oxidation?

Remedy: Replace damaged ignition leads/connections, individually or as a complete set. With resistive ignition leads, fit Beru PowerCable or Beru CarbonCable. Replace copper leads with Beru lead sets or Beru CopperCable individual ignition leads.




Damaged plugs lead to misfiring and damage to catalytic converter.

New ignition leads and plugs ensure reliable ignition.



Charred ignition leads and plugs.

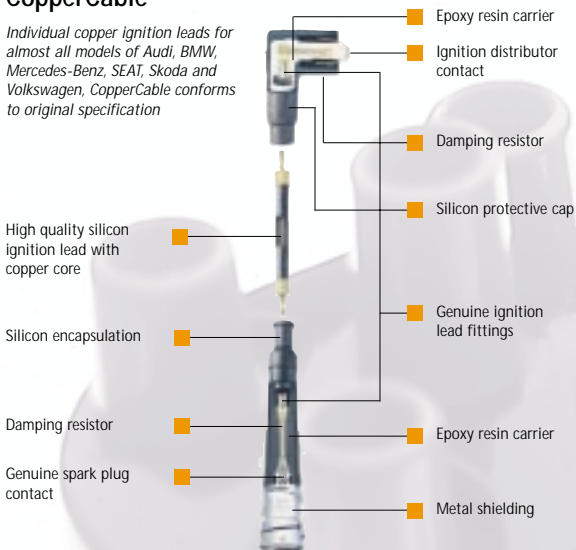


Ignition lead damaged due to rodent attack.

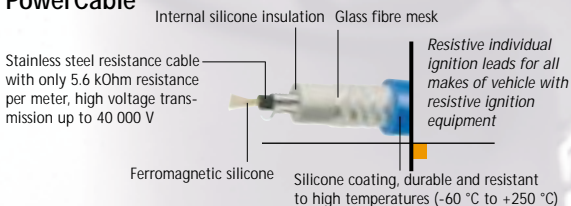
Beru ignition leads

CopperCable

Individual copper ignition leads for almost all models of Audi, BMW, Mercedes-Benz, SEAT, Skoda and Volkswagen, CopperCable conforms to original specification



PowerCable

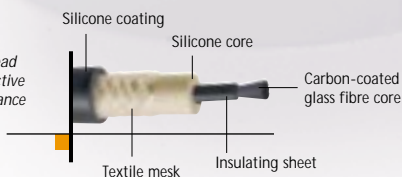


Economy tip:

PowerCable and CopperCable are high-quality, exceptionally durable ignition leads. It is not always necessary to replace the whole set. These ignition leads are also available individually. Therefore only the actually defective parts need to be replaced.

CarbonCable

Carbon resistive ignition lead sets for vehicles with effective resistance (effective resistance 15-25 kOhm)



Checking ignition components!

Check distributor cap and rotor, ignition coil and ignition contact and replace if necessary

Checklist:

1. Distributor cap: Hair-line fractures, inner contamination due to carbon dust or oil, worn contacts?
2. Distributor rotor: Wear on contact?
3. Ignition coil: Hair-line fractures in plastic cap, contact resistances?
4. Contact breaker: Wear?

Remedy:

Remove components and replace with Beru ignition components.



*Fracture in distributor cap:
Misfiring, increased fuel
consumption, afterburning
in catalytic converter, total
failure of ignition*



Inside view



*Charred distributor
rotor contact:
Misfiring, poor
starting, loss of
performance*

Beru Ultra spark plugs

The spark plug is the heart of the engine.

It ignites the fuel-air mixture several thousand times a minute. This results in temperatures of approx. 4000 °C and pressure of over 100 bar. The spark plug is also subjected to sudden temperature changes and various chemical influences.

Faultless functioning of the spark plugs – even with such high demands – is largely dependent upon the adjustment of the mixture preparation system and the ignition as well as upon the fuel used. Another important factor when replacing spark plugs: Observe the correct heat value – or run the risk of engine damage.

Figure 1 shows the optimum spark plug face, using Beru Ultra as an example. Figures 2 to 9 show faces of worn or overloaded spark plugs, together with the possible fault causes and their remedies.

1 Optimum spark plug face

The insulation is coloured grey/white-grey/yellow to fawn brown. The electrode is only slightly burnt away. The heat value of the spark plug has been correctly selected. No thermal overload. The mixture and ignition adjustment is satisfactory, engine condition is in order.



Note:

The examples shown apply only to 4-stroke engines. Before assessing the plug face, the vehicle should be driven several kilometres at an average performance level in order to prevent the formation of soot deposits. Prolonged running at idle speed before removing spark plugs also leads to fouling, particularly if the engine is not warm from driving.

Take a closer look at the spark plugs!

2

Cause: Incorrect mixture adjustment: Mixture too greasy, air filter heavily contaminated, defective coldstart device. Excessive use in slow-moving traffic. Heat value of spark plug too high.

Effect: Poor coldstart performance and misfiring due to tracking currents. Unburnt fuel can therefore enter catalytic converter and damage it.

Remedy: Correctly adjust mixture and start device, check air filter. Install new genuine Beru quality spark plugs.

2 Fouled



3

Cause: Excessive oil in combustion chamber, oil level is too high, severely worn piston rings, cylinders and valve stem guides.

Effect: Misfiring, particularly when accelerating (insufficient ignition voltage for large electrode gap). Poor starting.

Remedy: Install new genuine Beru quality spark plugs.

4

Cause: Aggressive fuel and oil supplements, unfavourable airflow conditions in combustion chamber (possibly due to deposits), engine knocking, thermal overload.

Effect: Misfiring, particularly when accelerating (insufficient ignition voltage for large electrode gap). Poor starting.

Remedy: Install new genuine Beru quality spark plugs.

4 Severe wear
of electrodes



5

Cause: Thermal overload due to pre-ignition, e.g. due to advanced ignition timing, combustion residue in combustion chamber, defective valves, defective ignition distributor, poor fuel quality, incorrectly tightened spark plugs.

Effect: Before complete failure (engine damage) there is a loss of performance.

Remedy: Check engine, ignition and mixture adjustment, check tightening torque of spark plugs. Install new genuine Beru quality spark plugs.

5 Melted electrodes



3 Oiled-up



6 Glazing



7

Cause: Thermal overload due to pre-ignition, e.g. due to advanced ignition timing, combustion residue in combustion chamber, defective valves, defective ignition distributor, poor fuel quality, heat value possibly too low, tightening torque not observed.

Effect: Can lead to pre-ignition with loss of performance and to engine damage.

Remedy: Check engine adjustments. Install new genuine Beru quality spark plugs, if necessary change type of oil.

7 Melted centre electrode



8

Cause: Alloying constituents, particularly from oil, can build up residues which deposit in combustion chamber and on spark plugs.

Effect: Can lead to pre-ignition with loss of performance and to engine damage.

Remedy: Check engine adjustments. Install new genuine Beru quality spark plugs, if necessary change type of oil.

8 Deposits



9

Cause: Supplements to petrol and engine oil create ash-type deposits.

Effect: With too sudden full-load of engine these are liquefied and become electrically conductive.

Remedy: Accurately adjust fuel mixture, install new genuine Beru quality spark plugs.

9

Cause: Mechanical damage due to improper handling. Frequently detectable in early stages only as hair-line fracture. In borderline cases, insulator can be shattered due to deposits between centre electrode and insulation, particularly with prolonged operation. Knocking engine.

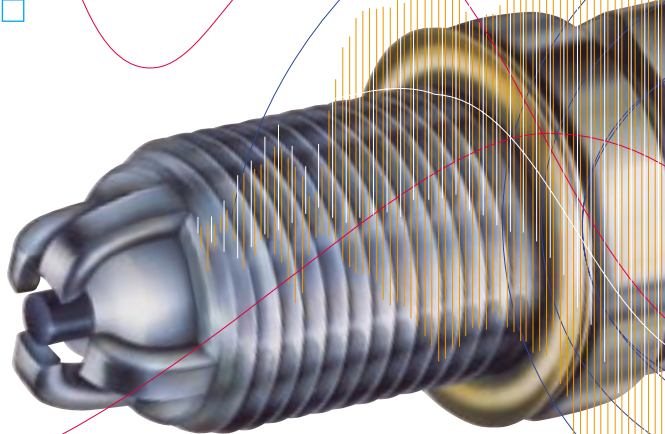
Effect: Misfiring, ignition spark jumps to places which are not effectively reached by fresh mixture.

Remedy: Install new genuine Beru quality spark plugs.

9 Broken insulation



Beru Ultra X

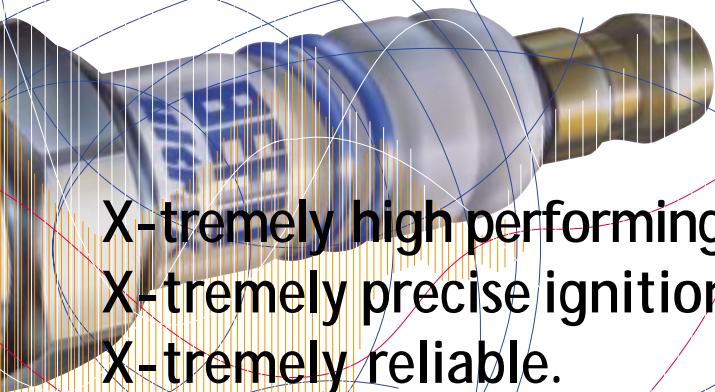


Our tip for the toughest demands: Beru Ultra X

Filigrée ground electrodes ensure better mixture distribution; the spark position which extends deep into the combustion chamber guarantees reliable combustion. The spark characteristics which remain constant over the entire life, even further improve ignition reliability of the Ultra X – with optimum engine performance. Ultra X meets the change intervals specified by automobile manufacturers.

Illustration shows an Ultra X, replaced during inspection: The insulation is free from deposits, ground and centre electrodes show only slight burning away.

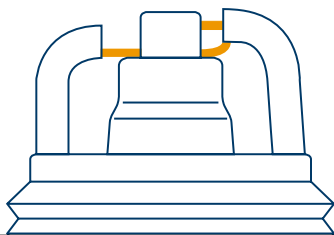




**X-tremely high performing.
X-tremely precise ignition.
X-tremely reliable.**

The air/surface discharge electrode with nickel-coated copper core and 4 ground electrodes placed in pairs and arranged in an X shape provide the highest ignition reliability.

*Schematic illustration of spark paths with Ultra X:
The spark has a total of 6 opportunities to ignite
the air-petrol mixture.*



What does Beru quality mean for you?

Our experience of almost 90 years, combined with the most up-to-date development, quality and production processes, make us, particularly with spark and glow plugs, an acknowledged OE-supplier to the automobile industry. Millions of satisfied motorists have genuine Beru quality products under their car bonnets. Products which reliably, economically and environmentally friendly fulfil their duties and which are only noticed when they are replaced, for safety's sake, at the specified service intervals.

All Beru factories are DIN ISO 9001 certified, all German factories additionally fulfil the stringent requirements of the QS 9000 and VDA 6.1 as well as the environmental standard DIN ISO 14001.

Genuine Beru quality products feature in the OE specification of all leading international automobile manufacturers.



Profitieren Sie von den Härtetest im Motorsport

From formula 1 to DTC – what proves itself in motorsport today, you use in your car tomorrow.

Because when victory and high performance are pursued on the race tracks of the world, when technical know-how, ability and experience are called for, when extreme loads are placed on vehicle and engine components Beru engineers are there, exploiting the high demands of motorsport as an endurance and limit test for your future standard products.

The knowledge acquired filters into the optimisation processes through which the genuine Beru quality products continually pass. Even today our (ignition) components are contributing to the future problem-free and reliable operation of your vehicle.

Beru ignition equipment is available from good vehicle component specialist suppliers and in work-shops.





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