

Removing and installing glow plugs



Note

- ♦ *Metal glow plugs are always fitted in the 2.7 ltr. common rail engine.*
- ♦ *Two different types of glow plugs are fitted in the 3.0 ltr. common rail engine (engine code letters BMK and BNG): Bosch ceramic glow plugs or Beru metal glow plugs.*
- ♦ *It is very important to use the correct type of glow plugs depending on the software version of the engine control unit, otherwise the glow plugs will be irreparably damaged when the ignition is switched on.*

The following safety precautions are only required on 3.0 ltr. common rail engines with engine code letters BMK and BNG up to and including model year 2005.



Caution

Mixed installation of ceramic glow plugs and metal glow plugs on the same engine is not permissible.

The software of the engine control unit is specifically adapted to either the ceramic or the metal glow plugs, so it is important to install the correct type.

The glow plugs must not be removed when checking cylinder compression. The compression test is performed via the Guided Fault Finding function.

Transport and store only in original packaging or packed separately in bubble wrap.

Do not remove from packaging until immediately prior to installation.

After removal, the cylinder head must not be put down on the gasket side with the glow plugs still installed, because the glow plugs project beyond the gasket surface.

Identifying the different types of glow plugs for the 3.0 ltr. common rail engine:

- A - Ceramic glow plugs are colour-coded with a "white seal"-arrow- and have a chamfered shoulder at the tip.
- B - Metal glow plugs are colour-coded with a "red seal"-arrow-.

Removing ceramic glow plugs (Bosch)



Caution

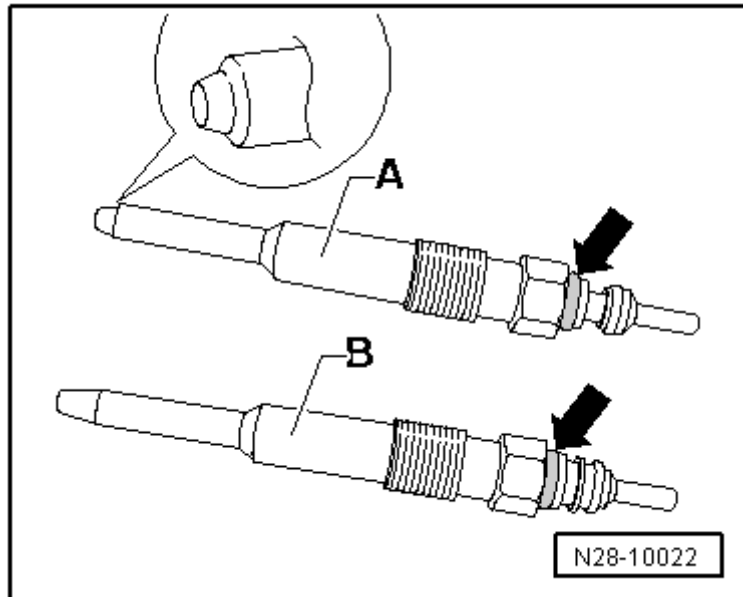
Due to the special properties of the material used, the ceramic glow plugs (Bosch type GSK3) are easily

damaged and require extra care when handling and installing.

Always install a new ceramic glow plug if you are not sure the old one is in perfect condition.

If a ceramic glow plug has been damaged or the heater pin is broken, this will invariably cause engine damage.

If the heater pin of the glow plug is broken, the fragments must be removed from the engine before starting for the first time, otherwise this will cause mechanical damage (piston seizure). Remove the relevant cylinder head if necessary.



- Before removal, the ceramic glow plugs must be burnt clean using the final control diagnosis function in the diagnostic tester.



Note

- ♦ Wait for 60 seconds each time after performing final control diagnosis of glow period control unit. The ignition must remain switched on.
- ♦ If you do not wait for 60 seconds (if ignition is switched off and immediately switched on again), the glow plugs can be damaged (due to repeated pre-heating).
- ♦ The activation of the glow plugs is controlled according to coolant temperature.
- Clean glow plug openings in cylinder head; make sure no dirt gets into cylinder.



Note

- ♦ Cleaning procedure:
- ♦ Use a vacuum cleaner to remove coarse dirt.
- ♦ Spray brake cleaner or suitable cleaning agent into glow plug openings, let it work in briefly, and blow out with compressed air.
- ♦ Then clean the glow plug openings using a cloth moistened with oil.
- When loosening and tightening ceramic glow plugs, use special tool U/J extension and socket, 10 mm -3220- and a suitable torque wrench.

Unplug the connector from the glow plug to be removed.

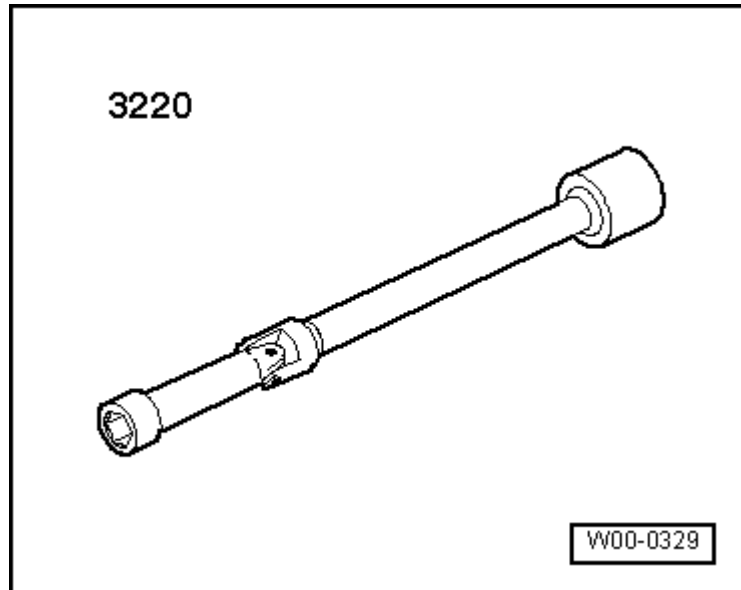
- When loosening a ceramic glow plug, do not exceed the “maximum release torque” of 20 Nm. When loosening, always use U/J extension and socket, 10 mm -3220- and a torque wrench.



Note

- ♦ If the ceramic glow plugs are difficult to remove (release torque more than 20 Nm), use a suitable penetrating oil spray and try again.
- ♦ If one of the ceramic glow plugs cannot be loosened by applying the maximum release torque of 20 Nm, the cylinder head must first be removed → *Rep. gr.15* so the glow plug can be unscrewed.

- Then unscrew ceramic glow plug carefully by hand or using a suitable hose. Keep the glow plug straight while unscrewing.
- Carefully pull ceramic glow plugs out from above using a suitable tool (such as a length of hose). Take care to prevent glow plugs from contacting other parts.



Installing ceramic glow plugs



Caution

IMPORTANT: always observe the precautions listed above.

The threads in the cylinder head and on the ceramic glow plugs must be dry, and free of oil and grease.



Note

Before installing glow plugs, clean combustion deposits out of glow plug openings in cylinder head.

- Screw in ceramic glow plugs finger-tight.

It is important to keep to the specified tightening torque for glow plugs: “12 Nm” (threads dry and free of oil and grease). The heater pins of the glow plugs can break if this torque setting is not observed, which invariably causes engine damage.

–

Check function of ceramic glow plugs after installation and before starting engine for the first time.

After installation, check electrical resistance directly at glow plug contacts: not greater than 1 Ohm

- If this specification is not obtained (resistance greater than 1 Ohm), remove defective ceramic glow plug again and check whether heater pin is broken. If a broken heater pin is visible, it is very important to remove the fragments from the engine before starting for the first time. Detach cylinder head if necessary; otherwise this will result in mechanical damage to the engine.
- Reconnect electrical connectors on ceramic glow plugs. Make sure that connector engages properly.

Additionally check ceramic glow plugs via self-diagnosis.

- Erase event memory of engine control unit. Do not start engine at this stage.
- Perform final control diagnosis (automatic glow period control unit - J179-).
- Interrogate event memory again. Do not start engine at this stage.
- The engine must not be started if the event memory has registered a fault relating to the ceramic glow plugs. Check that electrical connectors have engaged properly.

Removing metal glow plugs:

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-
- ♦ U/J extension and socket, 10 mm -3220
-



Caution

Mixed installation of ceramic glow plugs and metal glow plugs on the same engine is not permissible.

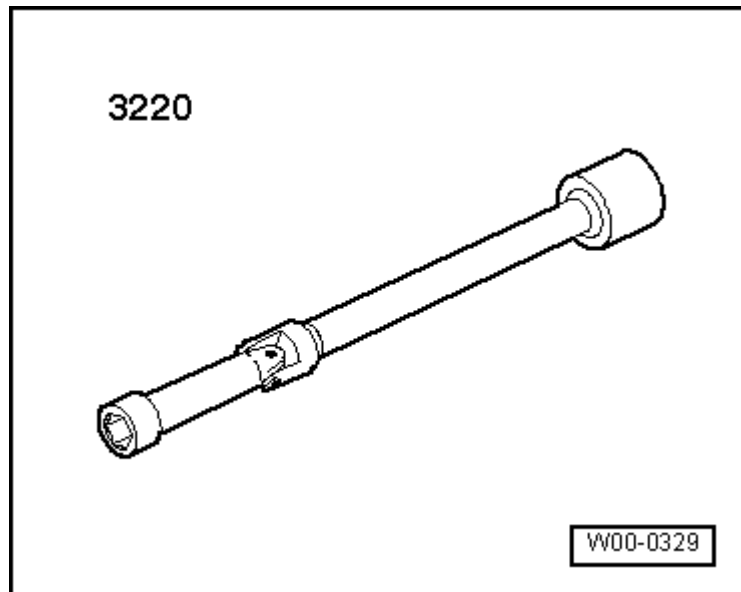
- Switch off ignition.
- Detach glow plug connectors from glow plugs which are to be removed.

- Clean glow plug openings in cylinder head; make sure no dirt gets into cylinder.



Note

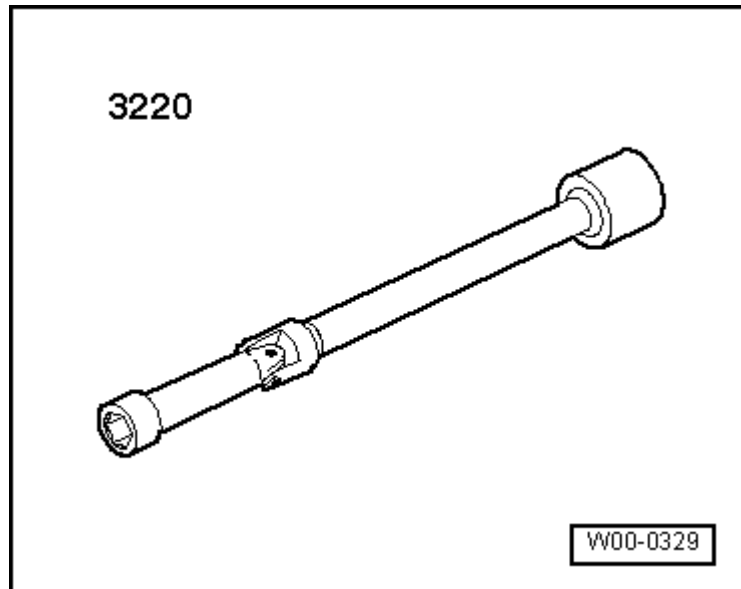
- ♦ *Cleaning procedure:*
- ♦ *Use a vacuum cleaner to remove coarse dirt.*
- ♦ *Spray brake cleaner or suitable cleaning agent into glow plug apertures, let it work in briefly, and blow out with compressed air.*
- ♦ *Then clean the glow plug openings using a cloth moistened with oil.*



- To slacken the glow plugs use special tool U/J extension and socket, 10 mm - 3220-.
- Then unscrew glow plugs carefully by hand or using a suitable hose. Keep the glow plugs straight while unscrewing.

Installing metal glow plugs

- Before installing glow plugs, clean out combustion deposits from glow plug bores in cylinder head.
- To tighten the glow plugs use special tool U/J extension and socket, 10 mm - 3220- with a suitable torque wrench.
- Then tighten glow plugs to specified torque.
- Tightening torque: 17 Nm



Caution

If the ceramic glow plugs (Bosch) have been replaced with metal glow plugs (Beru) the software of the engine control unit must be flashed accordingly before connecting the glow plug connectors. If this is not done, the metal glow plugs will be IRREPARABLY DAMAGED WHEN THE IGNITION IS SWITCHED ON.

- Attach glow plug connectors correctly and make sure they are securely fitted.