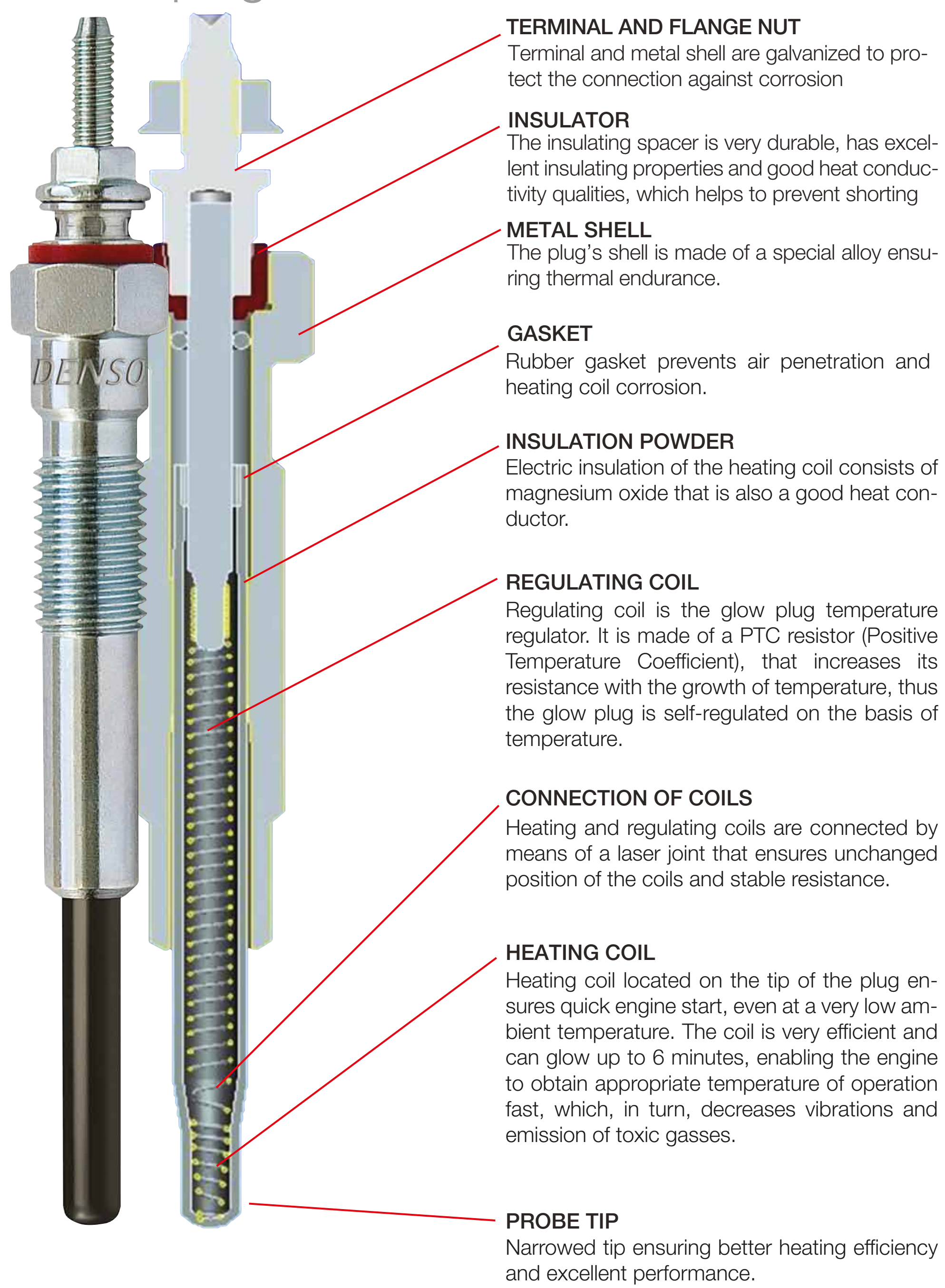


## DENSO glow plugs

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### Glow plug construction



### Visual inspection of glow plugs

#### Enlarged probe tip

- Cause:**
- > Excessive voltage (e.g. 12V Glow Plug in a 24V system or vice versa).
  - > Failure of alternator and regulator.
  - > Dampness during storage.
- Solution:**
- > Check on-board and Glow Plug Voltage.
  - > Check charging system.
  - > Check quality of storage condition.



#### Broken probe tip

- Cause:**
- > Excessive voltage (e.g. 12V Glow Plug in a 24V system or vice versa).
  - > Failure of alternator and regulator.
- Solution:**
- > Check contact on Glow Plugs regulator.
  - > Check on-board and Glow Plug Voltage.
  - > Check charging system voltage.



#### Damaged or missing probe tip

- Cause:**
- > Failure of ignition unit
  - > Direction or regularity of fuel jet incorrect
  - > Sealing fault causing spraying position error.
- Solution:**
- > Check the ignition unit is correctly installed.
  - > Check you are using the correct ignition unit for the vehicle model.
  - > Check the Glow Plug installation point for carbon deposit.



#### Swollen ring on the probe tip

- Cause:**
- > Oil in the combustion chamber, probably caused by engine wear.
- Solution:**
- > Check piston clearance in engine cylinders.
  - > Check oil consumption.
  - > Check turbocharger seals.
  - > Check the crankcase ventilation system.



#### Deformed probe (overheating)

- Cause:**
- > Failure of ignition unit.
  - > Direction or regularity of fuel jet incorrect.
  - > Wrong spraying position caused by faulty sealing.
  - > Excessive glowing/voltage (e.g. 24V Glow Plug in a 12V system or vice versa).
  - > Failure of alternator and regulator.
  - > Function or timing fault in injection unit.
- Solution:**
- > Check the ignition unit is correctly installed.
  - > Check the ignition unit works correctly.
  - > Check you are using the correct ignition unit for the vehicle model.
  - > Check the Glow Plug installation point for carbon deposits.
  - > Check contacts on glow Plug regulator.
  - > Check on-board and Glow-Plug voltage.
  - > Check charging system voltage.
  - > Check fuel injection timing.



#### Holes in probe/cracks/melting next to body of Glow Plug

- Cause:**
- > Failure of ignition unit.
  - > Direction or regularity of fuel jet incorrect.
  - > Wrong spraying position caused by faulty sealing.
  - > Function or timing fault in injection unit.
  - > Thread damage to opening of cylinder head.
  - > Glow Plug insufficiently tightened causing plug to sit incorrectly.
- Solution:**
- > Check you are using the correct ignition unit for the vehicle model.
  - > Check the ignition unit is properly installed.
  - > Check the Glow Plug installation for thread damage/carbon fouling.
  - > Check the opening of cylinder head for thread damage/carbon fouling.
  - > Check timing of injection pump and timing gear.



#### Carbon deposits between probe and body of Glow Plug

- Cause:**
- > Failure of ignition unit.
  - > Direction or regularity of fuel jet incorrect.
  - > Wrong spraying position caused by faulty sealing.
  - > Injection pump operation/timing failure.
- Solution:**
- > Check you are using the correct ignition unit for the vehicle model.
  - > Check the ignition unit is correctly installed.
  - > Check the Glow Plug installation point for carbon deposits.
  - > Check the opening of cylinder head for thread damage/carbon fouling.
  - > Check timing of injection pump.



#### Missing probe

- Cause:**
- > Ignition unit failure.
  - > Glow Plug insufficiently tightened causing plug to sit incorrectly.
  - > Direction or regularity of fuel jet incorrect.
  - > Wrong spraying position caused by faulty sealing.
  - > Damaged injectors.
  - > Function or timing fault in injection unit.
  - > Thread damage to opening of cylinder head.
- Solution:**
- > Check you are using the correct ignition unit for the vehicle model.
  - > Check the ignition unit is correctly installed.
  - > Check the Glow Plug installation point for thread damage/carbon fouling.
  - > Check timing of injection pump.
  - > Check the opening of cylinder head for thread damage/carbon fouling.



#### Probe touching body of glow plug

- Cause:**
- > Over-tightened torque.
  - > Wrong tool used.
  - > Thread damage to opening of cylinder head.
- Solution:**
- > Check the opening of the cylinder head for thread damage/carbon fouling.
  - > Check Glow Plug torque.



#### Broken/bent power terminal

- Cause:**
- > Over-tightened torque.
  - > Wrong tool used.
  - > Thread damage to opening of cylinder head.
- Solution:**
- > Check the opening of the cylinder head for thread damage/carbon fouling.
  - > Check Glow Plug torque.



### Glow plugs tightening torques

	Thread size	Recommended torque
Glow plug thread	M8x1,00	8-10 Nm
	M9x1,00	8-10 Nm
	M10x1,00	10-12 Nm
	M10x1,25	10-12 Nm
	M12x1,25	15-20 Nm
	M14x1,25	20-25 Nm
Terminal thread	M18x1,50	30-40 Nm
	M4x0,7	1-1,5 Nm
	M5x0,8	3-4 Nm

1. Use an appropriate tool for the plug and terminal.
2. During the replacement, make sure that oil, dirt or any other foreign from the removed Glow Plug do not penetrate into the combustion chamber.
3. Prior to assembly, clean the flange located on the engine and insert the new plug into threaded opening, maintaining coaxial position in relation to the opening.
4. Make sure that the glow is positioned coaxially in relation to the opening and tighten the plug by hand.
5. Tighten the plug with a torque wrench, using appropriate value from the table.