

## 15-711 Checking preglow system with afterglow function

### Commercially available tool

Engines 602/603

Multimeter

e.g. Sun, DMM 5

### Checking

Electrical wiring diagrams (see 15-705).

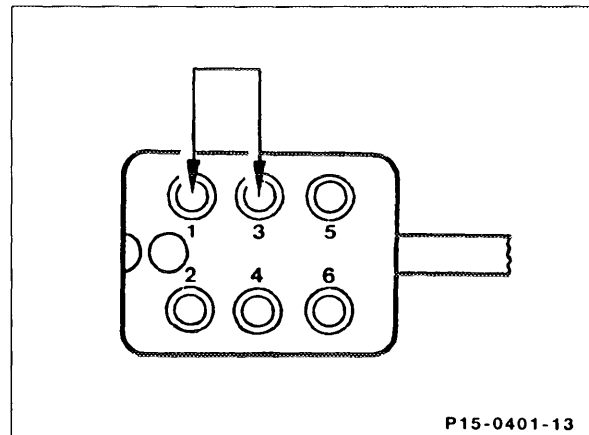
#### Checking glow bulb and its wiring

Problem:

Preglow indicator lamp fails to light up when turning on the preglow system despite start readiness.

Pull 6-pin coupling off preglow time relay, turn key to position "2", bridge jacks 1 and 3 of the coupling.

If the preglow indicator lamp fails to light up, check or replace glow bulb.

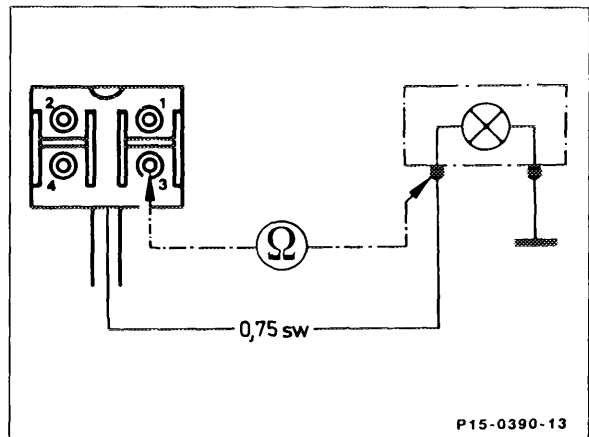


If the glow bulb is OK, check black wire from coupling jack 3 of the preglow time relay to the preglow indicator lamp for an open circuit. Eliminate open circuit.

If the preglow indicator lamp lights up, the preglow time relay is defective, replace preglow time relay.

Lamp lights up permanently.

Fault: Preglow time relay defective (relay sticking).

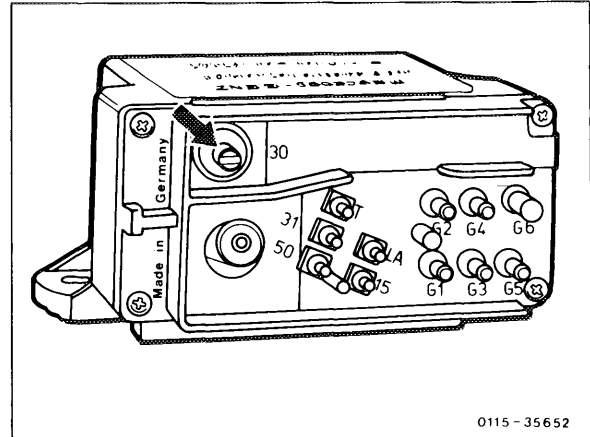


### Checking main power circuit of preglow system for open circuit

Problem:

Preglow indicator lamp fails to light up, engine cannot be started.

Using the multimeter volt measuring range, check the voltage on terminal 30 of the preglow time relay against ground (arrow).



If no voltage is present, check 4 mm red wire from the terminal block X35 terminal 30 to the preglow time relay terminal 30 for open circuit and eliminate open circuit.

If no fault was established to this point, measure voltage on jack 1 of the 6-pin coupling of the preglow time relay against ground.

### Model 201

If no voltage is present with the preglow system switched on, check red black wire from the central electrical coupling S jack 4 to the coupling jack 1 of the preglow time relay for open circuit and eliminate open circuit.

If voltage is present, connect multimeter volt measuring range to jack 1 (terminal 15) and jack 4 (terminal 31) and measure voltage.

If no voltage is indicated, check brown wire from jack 4 to ground for open circuit and eliminate open circuit.

If no fault was established to this point, the preglow time relay is defective, replace preglow time relay.

### Checking pencil-type glow plugs and their lines

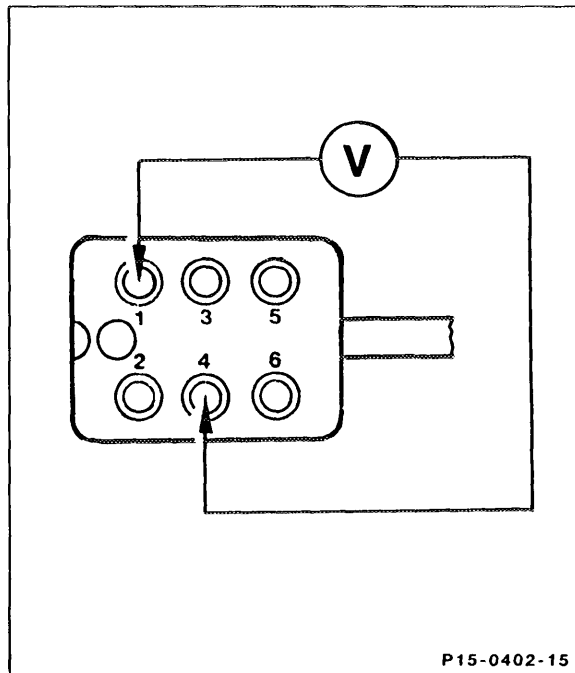
Problem:

Preglow indicator lamp fails to light up when switching on.

Lights up for approx. 1 minute while driving.

Engine is hard to start.

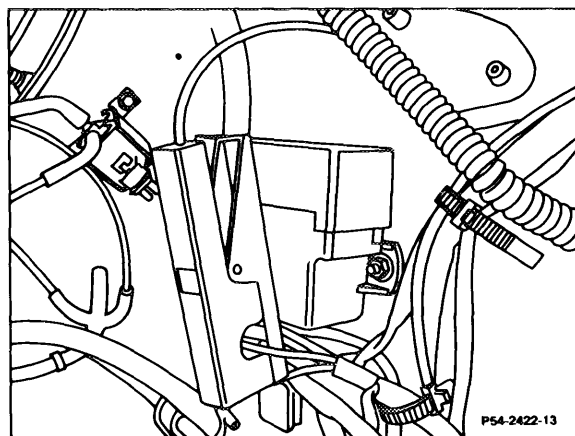
An open circuit of one or more pencil-type glow plugs or their lines to the pencil-type glow plugs is possible.



Measure power consumption of the pencil-type glow plugs using the multimeter ampere measuring range and DC current probe.

For this purpose place current probe over the individual wires on the preglow time relay.

- Cylinder 1 = 2.5 black/blue
- Cylinder 2 = 2.5 black/purple
- Cylinder 3 = 2.5 black/red
- Cylinder 4 = 2.5 black/yellow
- Cylinder 5 = 2.5 black/green
- Cylinder 6 = 2.5 black/white



Turn key in steering lock to position "2", the power consumption for each glow plug should be 14-16 A after approx. 8 seconds.

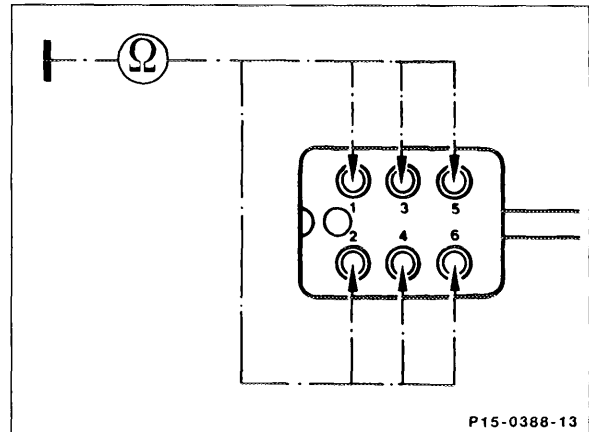
If the value is higher than 16 A, replace glow plug.

With a value below 14 A, check wire and glow plug for open circuit.

In order to check for an open circuit, pull 6-pin coupling off preglow time relay.

With the multimeter ohm measuring range measure the resistance against ground (engine block) one after the other as follows:

Jack 1 of coupling	= Pencil-type glow plug cylinder 1
Jack 2 of coupling	= Pencil-type glow plug cylinder 2
Jack 3 of coupling	= Pencil-type glow plug cylinder 3
Jack 4 of coupling	= Pencil-type glow plug cylinder 4
Jack 5 of coupling	= Pencil-type glow plug cylinder 5
Jack 6 of coupling	= Pencil-type glow plug cylinder 6



If infinite resistance is measured, an open circuit of the respective pencil-type glow plug or the feed line or the connection is the problem.

Eliminate open circuit in the feed line or replace glow plug.

### **Preglow power circuit protection**

An electronic cut-out is installed in the preglow time relay. If a short circuit occurs in the glow plugs or in the electrical lines the power circuit is interrupted.

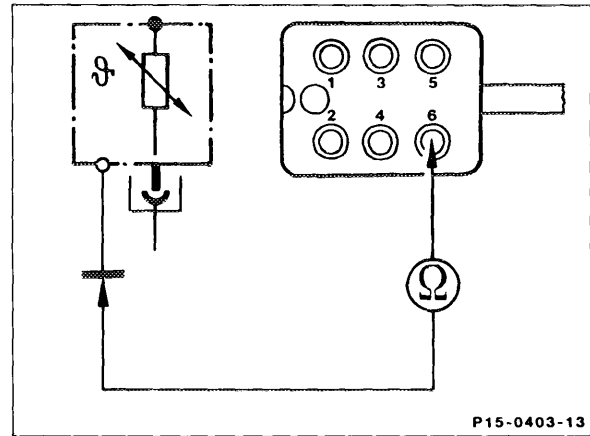
### **Note**

After a short circuit is repaired, the relay is operational again when the key in the steering lock is turned back to position "0".

### Checking temperature sensor with line

Preglow time until preglow indicator lamp goes out is excessive or too short. (see table).  
Pull plug off preglow time relay and measure resistance against ground using multimeter ohm measuring range.

Set value at +25 °C  $2442 \Omega \pm 170 \Omega$   
+80 °C  $291 \Omega \pm 16 \Omega$



If set value is not attained:  
Replace temperature sensor.

If infinite resistance is indicated:  
Eliminate open circuit in electrical wire.

If resistance  $< 1 \Omega$  is indicated:  
Eliminate short circuit in electrical line.