

Glow Plug System

Job No.

15-30

The purpose of the glow plug system is to ensure the cold start of the engine by increasing the temperature of the compressed air and by igniting fuel particles on the surface of the glow plug filament.

In a Diesel engine combustion is brought about by self-ignition of the fuel injected into the highly compressed and therefore extremely hot combustion air. When the Diesel engine has reached its working temperature, the compression temperatures are in the range of 700–900° C. However, when the cold engine is started without a pre-heating process, the compression temperatures are only approx. 300° C and this temperature is not sufficient for the self-ignition of the fuel.

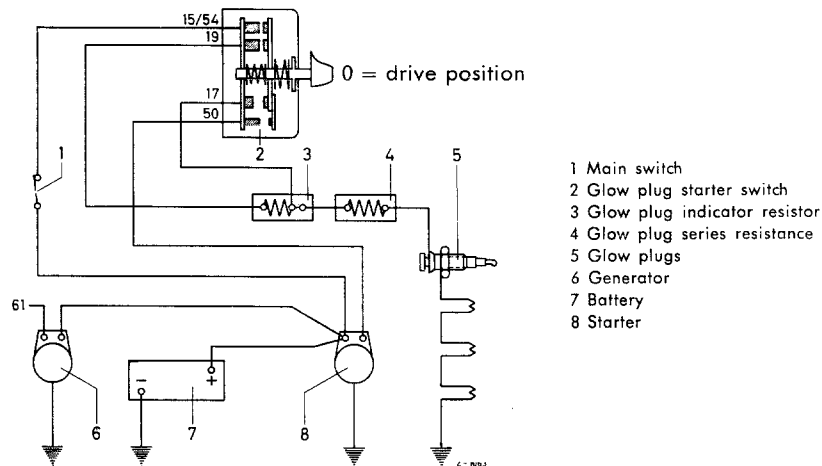


Fig. 15-30/1

Electrical circuit diagram of a glow plug system with glow plug starter and stop switch

The glow plugs are supplied with heating current from the 12 volt battery via the glow plug starter switch. In accordance with their rated voltage they are series-connected with the glow plug indicator resistor (3) and the additional glow plug series resistance (4) (see Fig. 15-30/1) so that the sum of all individual rated voltages, including the voltage drop in the leads, corresponds to the rated voltage of the battery.

When the engine is being started, the glow plug indicator resistor is short-circuited in order to ensure that the efficacy of the glow plug does not decrease too much in relation to the decreasing battery voltage (see Fig. 15-30/1 and Job No. 15-33, description of the four switch positions, Section 4).

The time required for pre-heating depends on the temperature of the engine and on the outside temperature.

Average pre-heating times with the engine cold:

Outside temperature + 20° C approx. 20 seconds
Outside temperature 0° C approx. 40 seconds
Outside temperature — 5° C approx. 1 minute
at lower temperatures 2 minutes maximum.

There are two different versions of the glow plug system:

1st Version: Glow plugs with a rated voltage of 1.4 volts each plus the glow plug indicator resistor with a rated voltage of 1.4 volts and the glow plug series resistance with a rated voltage of 5.0 volts.

2nd Version: Glow plugs with a rated voltage of 0.9 volts each plus the glow plug indicator resistor with a rated voltage of 0.9 volts and the glow plug series resistance with the rated voltage of 6.6 volts.

The rated voltage of glow plugs, glow plug indicator resistor, and glow plug series resistance is clearly marked on these parts. To avoid damage to the glow plug system make sure that only replacement parts of the correct rated voltage are installed.