

Checking Injection Nozzles and Glow Plugs

Job No.

00-4

If the engine vibrates and/or runs out-of-round or suddenly shows continuous load combustion noises (knocking) or drops considerably in power output, these troubles can be caused by fouled and sticking needles and/or too low opening pressure of the nozzle, faulty pre-combustion chamber or leaking vacuum system and/or leaky diaphragm. If you have one of these troubles conduct the following checks and/or operations:

a) Pre-heating Check:

1. Pre-heat; if the glow control light on the instrument panel is illuminated too brightly or not at all, then check pre-heating system and determine which glow plug is defective. To do this, successively bridge and/or draw sparks at the individual terminals and turn the starting switch to position 1 at the same time (see Figure 15-32/1 and Job No. 15-33).

Note: A defective glow plug can be an indication that the corresponding nozzle is not in order or that the pre-combustion chamber has become faulty.

2. Replace faulty glow plug and remove corresponding injection nozzle and pre-combustion chamber, clean injection nozzle and replace pre-combustion chamber if necessary (see Job No. 01-1 and Job No. 07-18).
3. Testing glow plugs (see Job No. 15-32).

b) Observation of Exhaust Gases:

While stationary, open throttle fully and/or partly for a short period and observe the exhaust gas jet and watch out for noises (rumble) at the mouth of the exhaust.

Irregular black clouds are often an indication that one or several nozzles function irregularly. An increase of the injection volume can also be caused by an extensive reduction of the nozzle pressure and/or through normal wear or leaky vacuum system or injection pump diaphragm. Remove injection nozzles, clean and test them (see Job No. 07-17 and Job No. 07-18). (Further reference is made to Job No. 0-10, Page 0-10/4, Engine is sooting heavily.) Check for leaks at injection pump governor.

If an irregular noise (rumble) is observed at the mouth of the exhaust, then one cylinder misfires (see following point c, Working and Sound Test).

c) Running and Sound Test:

1. During idling and increased idling loosen the cap nuts of the individual injection lines at the injection pump successively by half a turn and tighten again and observe smooth running and sound of engine.
2. If there are no changes in the smooth running and sound of the engine while the cap nuts are loosened, it is an indication for the fact that **the corresponding nozzle can be defective and has to be removed and checked** (see Job No. 07-17, and Job No. 07-18).
3. If the engine runs out-of-round while one cap nut is loosened, then the corresponding injection nozzle is faultless.

Note: If the injection nozzles are removed, the pre-combustion chambers must also be visually checked (see Job No. 01-1). In engines which knock heavily or emit dense exhaust smoke injection nozzles with a somewhat larger throttle gap should possibly be installed (see Job No. 07-0 and 07-18).