

Stopping of Engine:

The engine is idling. The throttle butterfly and the diaphragm (3) are in idling position.

When stopping the engine the diaphragm (3) is pressed against the Stupser (9) by way of the stop cable control, the adjusting lever (15) and the double lever (14) (Figure 07-0/15).

By this the additional spring (8) is compressed and the control rod (16) is pushed so far in the direction STOP that the pump plungers come into the no delivery range and the engine is stopped.

During this stopping operation the double lever (14) is lifted off the stop bolt (13) of the full load stop (Figure 07-4/15).

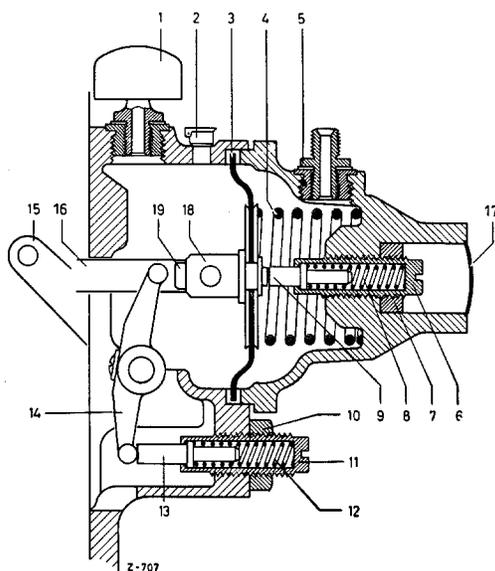


Figure 07-4/14

Idling Position

- 1 Air filter of the atmospheric chamber
- 2 Cap oiler to lubricate the governor linkage
- 3 Diaphragm
- 4 Control spring
- 5 Vacuum connector at the vacuum chamber
- 6 Adjusting screw with additional spring (Stupser)
- 7 Lock nut of adjusting screw
- 8 Additional spring
- 9 Stop bolt (Stupser)
- 10 Lock nut

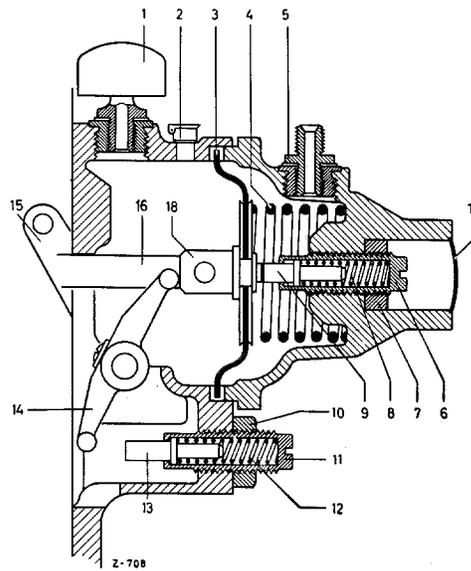


Figure 07-4/15

Stop and/or No Delivery Position

- 11 Adjusting screw with full load stop
- 12 Spring
- 13 Stop bolt
- 14 Double lever
- 15 Adjusting lever
- 16 Control rod
- 17 End plate in governor housing
- 18 Diaphragm bolt
- 19 Pressure bolt of adapting spring

IV. Speed Ranges

There are two different speeds in the max. speed range of an engine, namely the full load max. speed and the no-load max. speed.

a) Full Load Maximum Speed

The full load max. speed, also called rated speed, is the speed which the engine should reach during maximum output. The throttle butterfly is then opened completely. During low speed

there is only a weak vacuum in the vacuum chamber. The vacuum necessary for governing and the required force to pull back the control rod in the direction STOP will only be reached during full load max. speed with the throttle butterfly completely opened. The adapting spring will then be fully released, but the pressure bolt of the adapting spring still lightly touches the full load stop (see Figure 07-4/13). As soon as the engine has reached its full load max. speed the returning of the control rod in the direction STOP begins and with it the limiting of the full load max. speed (beginning of governing).

b) **No-Load Maximum Speed**

The no-load max. speed is the speed which the engine can possibly reach, but should never exceed for a longer period, without endangering the engine.

If for instance the throttle is opened fully while stationary or during a down-hill drive, the speed rises beyond the full load max. speed. The vacuum becomes now so strong that the diaphragm is lifted off the full load stop and is pulled further in the direction STOP against the Stupser.

Governing begins when the diaphragm leaves the full-load stop (the injection rate becomes lower), but the engine speed still increases due to the small load. The speed increases until the diaphragm is drawn so far back that the pump plungers pass through the partial load and idling position into the no-delivery range. During this procedure the additional spring (Stupser) is compressed by the diaphragm. The diaphragm and/or the control rod travel then beyond the idling position into the no-delivery range of the injection pump, exactly similar to the stopping operation of the engine (Figure 07-4/14 and Figure 07-4/15). A further increase of speed in this position of the governor is therefore not possible while the engine is stationary (end of governing), but not so during the down-hill drive under certain conditions due to the inertia of the vehicle.

Note: The above description clearly shows that the position of the Stupser is of essential importance for the no-load max. speed of an engine. A readjustment of the Stupser must only be conducted in accordance with specified test data sheet of the respective injection pump design and/or governor type (see Job No. 07-8, Pos. III).

c) **Idling Speed**

The idling speed of an engine is the lowest speed at which an engine without load continues to run without stalling; the engine is only loaded down through its internal friction and the aggregates continuously coupled to the engine such as generator, injection pump, fan etc.

The engine requires therefore only a low injection rate. This is automatically adjusted by the governor, as soon as the throttle butterfly is brought into the idling position.

V. **Centrifugal Governor**

a) **General**

As can be seen in the above description, the desired speed between idling and max. speed is kept in a certain range with the gas pedal or the gas linkage, if the engine is equipped with a pneumatic governor.