

H. Checking Vacuum Bore in Venturi Control Unit

In case of complaints regarding surging in the over-run, check whether the vacuum bore (2) in the venturi control unit (1) is sufficiently cleared for the ignition advance (Fig. 07–14/35).

For this purpose, measure vacuum at test connection of the venturi control unit and at the vacuum connection for the ignition advance. The vacuum measured at the connection for the ignition advance must at least be as high as the one measured at the test connection.

The vacuum must furthermore be built up again immediately after brief acceleration. If this is not the case, or if a minor vacuum is measured at the connection for the ignition advance, clean bore. Should the cleaning produce no results, remove venturi control unit and check whether bore (2) is covered up by the

throttle valve (3). If so, slightly chamfer inner side of throttle valve (see arrow in Fig. 07–14/35) until bore is completely cleared.

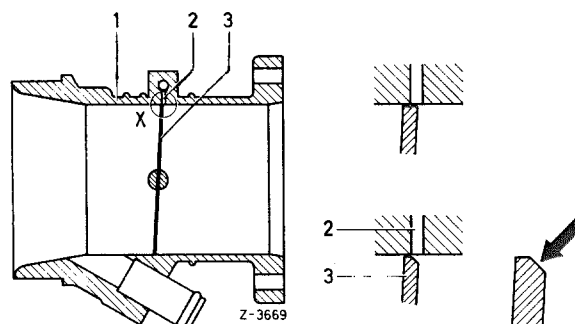


Fig. 07–14/35

- 1 Venturi control unit
2 Bore
3 Throttle valve

I. Adjusting Injection Pump under Load

a) Adjustment on Dynamometer

Drive vehicle on dynamometer, connect exhaust emission tester. In compliance with general instructions (see Job No. 00–0/11), perform test program on the below listed tables for the respective vehicle types.

Types 280 SE/8, 280 SEL/8, 280 SL/8 and 300 SEL/8

Exhaust emission values of injection pumps with Bosch end designations R 20, R 21, R 22, R 23, R 24, R 25 and R 24 W in % CO.

	R 20, R 21, R 22, R 23, R 24, R 25 % CO	R 24 w % CO
Full load n = 3000 rpm in 3rd speed	2.0–4.0 ¹⁾	
Lower partial load range 50 km/h in 4th speed at 10 HP load	1.5–3.0	0.2–1.0
Upper partial load range 100 km/h in 4th speed at 23 HP load	0.2–1.5	0.1–1.0
Idle speed	3.5–4.5	2.0–3.5 ²⁾

1) Should this adjustment value produce poor pickup or lean surge in operation, the full load adjustment value may be raised to a max. of 5.5 % CO.

2) Should the engine stall when additional units are engaged, the max. permissible value is 4.5 % CO.

Type 300 SEL/8 6.3

Exhaust emission values of injection pumps with Bosch end designations L 17 z, L 17 x and L 17 w

	L 17 z % CO	L 17 x % CO	L 17 w % CO
Full load n = 2000 rpm in 4th speed	2.0–4.0		
Lower partial load range n = 1500 rpm in 3rd speed and 400 mm Hg vacuum	0.5–2.0	0.1–1.0	0.2–1.0
Upper partial load range n = 2500 rpm in 3rd speed and 400 mm Hg vacuum	0.2–1.0	0.1–0.6	0.1–1.0
Idle speed	3.5–5.5		2.0–3.5 ²⁾

2) Should the engine stall when additional units are engaged, the max. permissible value is 4.5 % CO.

1. Adjustment of Full Load

To correct the full load point, only adjust control rod end (6) by one or more notches to rich or lean. Perform adjustments carefully and, if lacking experience, always proceed in single notches (Fig. 07–14/38).

To do this, unscrew screw plug (10) at regulator cover and make adjustments with a suitable screw-driver (Fig. 07-14/36 and 37).

Adjustment at control rod end:

Turning counterclockwise = richer,
turning clockwise = leaner.

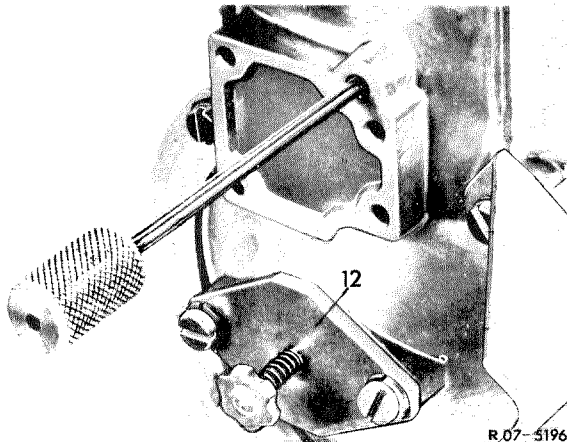


Fig. 07-14/36

12 Sealing flange

2. Adjustment of Lower Partial Load Range

The lower partial load range is adjusted by means of the black adjustment screws (8). Turn these screws in pairs and two notches per step in the desired direction. For this purpose, remove regulator screw plug or sealing flange (12) (Fig. 07-14/36 and 37).

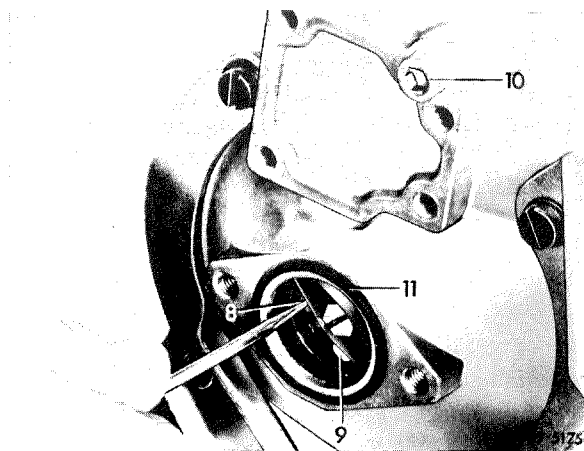


Fig. 07-14/37

8 Lower partial load range adjusting screw
9 Upper partial load range adjusting screw
10 Screw plug
11 Rubber ring

On type 300 SEL/8 6.3, use a short box wrench, Part. No. 100 589 01 03 00, to slacken the screw plug. Loosen screw plug by striking the end of the wrench. Adjust partial load range screws using a small screw-driver and a mirror.

Turning clockwise = richer,
Turning counterclockwise = leaner.

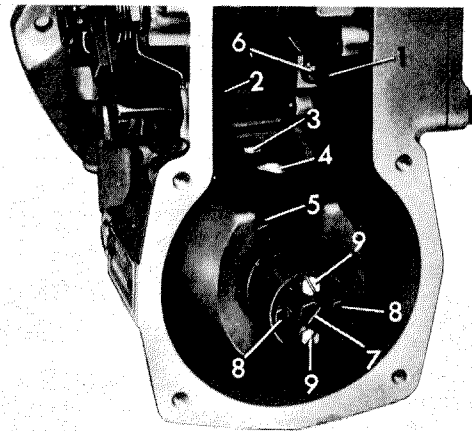


Fig. 07-14/38

1 Starting lever	7 Idle speed adjusting screw
2 Roller arm	8 Lower partial load range adjusting screws (black)
3 Cam roller	9 Upper partial load range adjusting screws (white)
4 Three-dimensional cam	
5 Regulator springs	
6 Adjusting screw control rack rod end	

3. Testing Upper Partial Load Range

Testing the upper partial load range merely comprises a check of the white adjusting screws, the setting of which must not be altered. Alteration is not authorized because the adjustment of the white screws would also result in an alteration of the full load range or in a displacement of the entire performance graph which could then no longer be kept under control.

4. Adjustment of Idle Speed

Adjust idle speed and set engine to specified exhaust emission values with the aid of the idle speed adjusting screw. The correct fuel/air ratio is achieved by the mutual adjustment of the idle speed adjusting screw on the injection pump and the idle air adjusting screw (see section B).

Note: As a rule, no road test is required if the adjustments were carried out carefully. In case of particularly critical customers owning vehicles with manual transmission, however, short road tests should under certain conditions be made in order to determine whether rich or lean surging, which is sometimes experienced, is actually eliminated. It is useful to have the road testing done by the mechanic who made the adjustments. Using the road test as a basis he can then decide whether the black screws for the adjustment of the lower partial load range must be slightly adjusted to rich or lean.

When making adjustments to gasoline injection engines, the measured vacuum data must remain within the tolerances listed in the tables. In case of strongly deviating vacuum data, first diagnose and eliminate the fault causing this condition. It may be caused by:

Defective intake valves, leaking intake line, poor ignition timing, wrong coordination at throttle control linkage.

b) Adjustment on the Road

Section a) lists an accurate adjustment procedure for injection pumps with the aid of a dynamometer. To provide a means of correct testing and adjustment of gasoline injection pumps for workshops which are not equipped with a dynamometer, we have drawn up a procedure which allows the testing of gasoline injection pumps in the vehicle with the vehicle on the road.

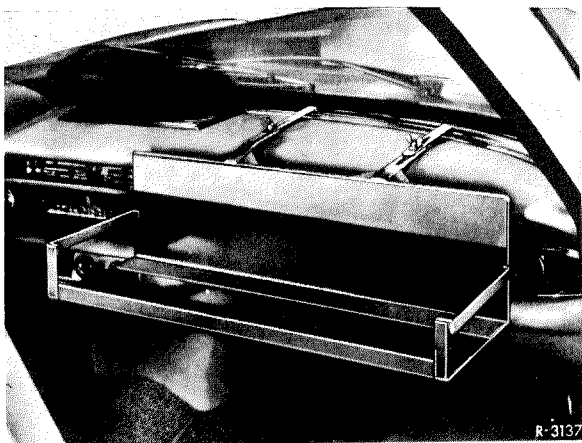


Fig. 07—14/39

The same exhaust emission data apply for this procedure as for the test on the dynamometer. However, the measuring points were changed.

Measuring Instruments

Mount the following measuring instruments on a local manufacture rack positioned (Fig. 07—14/39) on the front passenger side in front of the instrument panel:

- 1 Vacuum gauge 0—650 mm Hg
- 1 Electrical tachometer
- 1 Exhaust emission tester

For the application of the Bosch CO tester, the proportioning pump must be accommodated in the vehicle trunk. The necessary hose lines must be taped to suitable points for the duration of the road tests. Secure the probes and/or hoses to the tail pipe to prevent them from falling off.

Evacuate exhaust emissions emerging from the SUN exhaust emission tester through the vehicle vent window via a separate hose line.

Testing

Now operate the vehicle on the road with the calibrated instruments switched on. Since the test speed is no higher than 60 km/h, any more or less level road is suitable. For the test, run vehicle in 3rd speed. The measuring point is balanced by stepping on the brake pedal with the left foot and simultaneously depressing the accelerator with the right foot.

One after the other, run vehicle through the following phases:

Types 280 SE/8, 280 SEL/8, 280 SL/8 and 300 SEL/8

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	R 20, R 21, R 22, R 23, R 24, R 25 % CO	R 24 w % CO
Full load n = 3000 rpm in 3rd speed	2,0–4,0 ¹⁾	
Lower partial load range n = 1500 rpm in 3rd speed and 300 mm Hg vacuum	1,5–3,0	0,2–1,0
Upper partial load range n = 3000 rpm in 3rd speed and 300 mm Hg vacuum	0,2–1,5	0,1–1,0
Idle speed	3,5–4,5	2,0–3,5 ²⁾

For footnotes refer to opposite table.

Type 300 SEL/8 6.3

Keep full load measurement in 3rd speed as short as possible as the service brake must absorb the entire output. Nevertheless one must wait until the instruments indicate steadily. The partial load measurements are slightly more difficult because an equilibrium must be obtained between the accelerator and brake pedal positions. You can take your time since the brakes can easily handle the low output. The idle speed measurement is well known.

Note: Minor gradients in the course of the road are of no concern as long as the specified vacuum is attained.

J. Testing Injection Valves

a) Sight Test of Jet Shape

With the pressure gauge switched off, test injection valves by depressing the pump lever quickly. The jet must be well and evenly atomized and feature an integral cone-shaped shell. If not, the injection valve must be replaced.

b) Ejection or Opening Pressure

With the pressure gauge connected, press down pump lever slowly. The opening or ejection pressure on new injection valves should be 17.5–18.5 atü or 14–16 atü

Adjustment of Injection Pump

Adjust according to section a).

After the adjustment, perform road test to decide whether a minor readjustment is necessitated by rich or lean mixture surging in the lower partial load range. It is useful to take suitable tools along and to do all the adjustments on the road.

Exhaust emission values of the injection pumps with Bosch end designations L 17 z, L 17 x and L 17 w

	L 17 z % CO	L 17 x % CO	L 17 w % CO
Full load n = 2000 rpm in 3rd speed	2,0–4,0		
Lower partial load range n = 1500 rpm in 3rd speed and 400 mm Hg vacuum	0,5–2,0	0,1–1,0	0,2–1,0
Upper partial load range n = 2500 rpm in 3rd speed and 400 mm Hg vacuum	0,2–1,0	0,1–0,6	0,1–1,0
Idle speed	3,5–5,5	2,0–3,5 ²⁾	

1) Should this adjustment value produce poor pickup or lean surge in operation, the full load adjustment value may be raised to a maximum of 5.5 % CO.

2) Should the engine stall when additional units are engaged, the max. permissible value is 4.5 % CO.

on type 300 SEL/8 6.3. Pressure of used injection valves should be 15.0–18.5 atü or 13–16 atü on type 300 SEL/8 6.3. Replace the injection valve if the deviation exceeds the listed tolerances.

c) Leak Test

With the pressure gauge connected, press down pump lever until the ejection pressure is reached. Release pump lever and watch pressure gauge. Pressure may then drop by 3 atü. Should the pressure continue to drop, the injection valve is leaking and must be replaced.