

The removal and installation procedures of the prechambers for the OM 636 and the OM 621 are identical. With the OM 636, the prechamber, the threaded ring and the gasket between prechamber and nozzle holder have been modified. In the description for the removal and installation procedures these modifications are pointed out to.

## a) Removal of Nozzle Holder with Injection Nozzle

1. Remove the air filter, or the oil bath air filter or air hose (depending on version).
2. Unscrew the cap nut (1) securing the injection line (see Figure 01-1/1).
3. Unscrew the hex nut (2) securing the adapter (3) and the hollow screw (5) connecting and securing the drip-oil line (4) (Figure 01-1/1). If all 4 nozzle holders are removed, disconnect the drip-oil line at the T-section (connector of drip-oil line, by-pass line and return line) and remove the drip-oil line.

**Note:** The hollow screw (5) securing the drip-oil line (4) must only be loosened after loosening the hex nut (2) of the adapter (3). This prevents the nozzle holder (6) from being loosened instead of the hex nut (2) if the latter should stick. If the nozzle holder starts to unscrew too, hold it in place with a spanner 24 mm wide.

4. Unscrew the nozzle holder (1) with injection nozzle by using the Box Spanner Insert Part. No. 3125890009 and remove the sealing ring (4) (also called nozzle ring, see Figure 01-1/9). Cover the hole to keep out dust and foreign bodies.

**Note:** Disassembly, cleaning and assembly of nozzle holder and/or injection nozzle. Testing and/or adjusting opening pressure of nozzle and observation of spray pattern (see Job No. 07-18).

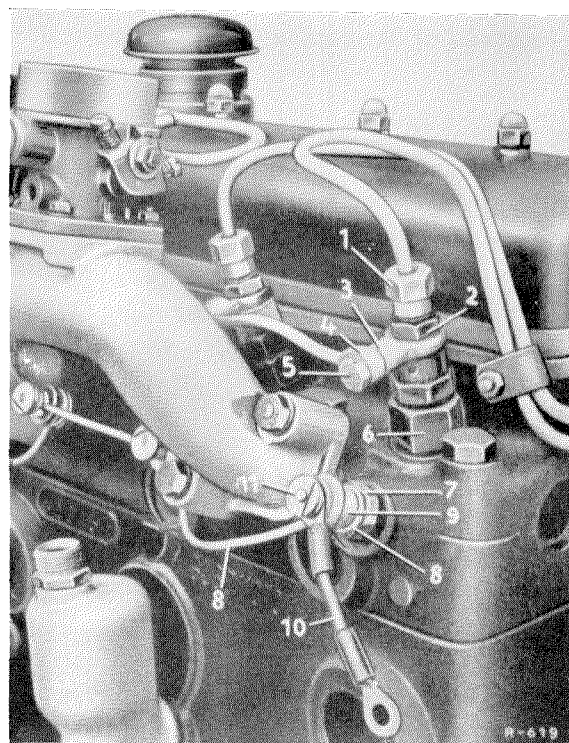


Figure 01-1/1

- |                                    |   |
|------------------------------------|---|
| 1 Cap nut to secure injection line | 7 Glow plug   |
| 2 Hex nut to fix adapter           | 8 Power lead  |
| 3 Adapter                          | 9 Connecting insulator  |
| 4 Connector of drip-oil line       | 10 Connecting cable and/or ground cable (at the two outer glow plugs) |
| 5 Hollow screw                     | 11 Knurled nut  |
| 6 Nozzle holder                    |   |

## b) Removal of Glow Plug

5. Disconnect the connecting cable (10) at the 1st or 4th glow plug by unscrewing the knurled nut (11) (see Figure 01-1/1).

6. Unscrew all other knurled nuts and remove the insulators (9) and the power leads (8) (see Figure 01-1/1).
7. Unscrew the glow plug with a box spanner 21 mm wide.

### c) Removal of Pre-combustion Chamber

8. Then unscrew the threaded ring (2) securing the pre-combustion chamber (5) (see Figure 01-1/9) with the Special Wrench Part No. 636 589 01 07 (see Figure 01-1/2). To do this, take the keyed sleeve (3) (see Figure 01-1/2) corresponding to the width of the groove (4) of the threaded ring (see Figure 01-1/3) and slide it over the pressure spindle (1) (see Figure 01-1/2).

Use the Keyed Sleeve Part No. 636 589 02 07 for the threaded ring with a groove 9 mm wide. Then screw the pressure spindle into the threaded ring as far as possible, insert the keyed sleeve in the groove of the threaded ring, screw the hex nut (2) to the pressure spindle (1) and fasten tightly against the keyed sleeve with a box spanner (see Figure 01-1/2).

To prevent breaking of the pegs on the keyed sleeve, the latter must be well pressed against the threaded ring.

Now unscrew the threaded ring by turning the keyed sleeve (3) (see Figure 01-1/2).

9. Extract the pre-combustion chamber with the Extractor Part No. 636 589 01 33. For this purpose screw the pressure spindle (1) (see Figure 01-1/3) into the pre-combustion chamber as far as possible, then turn the lifting socket (6), so that the cutout (2) of the lifting socket corresponds truly to the groove (3) in the cylinder head and therefore also to the nose of the pre-combustion chamber. Now extract the pre-combustion chamber by tightening the hex nut (5) (see Figure 01-1/3).

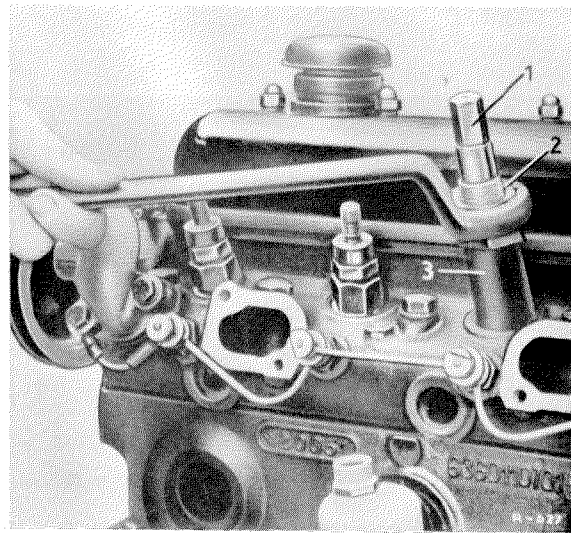


Figure 01-1/2

- 1 Pressure spindle
- 2 Hex nut to force the keyed sleeve against the threaded ring
- 3 Keyed sleeve with 5 or 9 mm wide pegs

**Note:** During extracting make sure that the lifting socket is not turned, otherwise the nose of the pre-combustion chamber will be sheared off by the lifting socket.

**Furthermore, never forget to remove the glow plugs before extracting the pre-combustion chambers, because otherwise the heating wire of the glow plug, which protrudes into the pre-combustion chamber, will be sheared off by the pre-combustion chamber.** (see Figure 01-1/9 for OM 636 and 01-1/10 for OM 621).

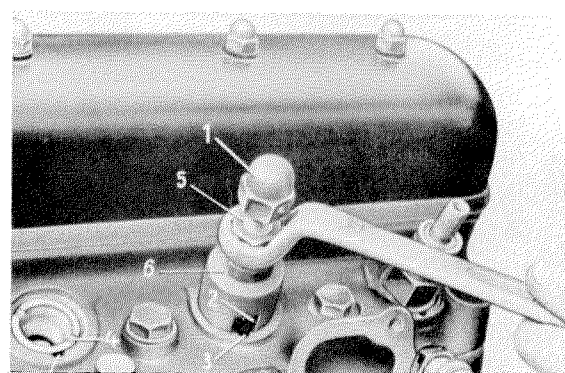


Figure 01-1/3

- 1 Pressure spindle
- 2 Cutout in the lifting socket (6)
- 3 Groove in the cylinder head for the securing nose of the pre-combustion chamber
- 4 Groove in the threaded ring to insert the keyed sleeve  
Width of groove at the 1st version = 5 mm  
Width of groove at the 2nd version = 9 mm
- 5 Hex nut
- 6 Lifting socket

Change: 1st paragraph on page 01-1/4 extended, Figure 01-118a added, Figure 01-1110 changed

10. Remove extractor and/or pressure spindle from the precombustion chamber and take the sealing ring (3) out of the cylinder head (see Figure 01-1/9).

**Note:** If the installation is not done right away, the holes must be covered to keep out dirt.

11. If the removed pre-combustion chambers of the OM 636 are installed again, then check their condition, that is, check for **tight seat** of ball pins and possible damages. The ball pin should not have retracted more than 0.5 mm in relation to the outside diameter of the pre-combustion chamber (see Figure 01-1/9). If the ball pins are not in order a new pre-combustion chamber must be installed. **Pre-combustion chambers are now also available in our exchange system (Part No. 636 010 02 52 80).**

Versions of pre-combustion chambers installed in OM 636 up to now:

1st Version: Pre-combustion chamber without ball pin (good starting properties but slightly noisy when idling).

2nd Version: Pre-combustion chamber with ball pin  $d = 3$  mm (replace pre-combustion chamber if this version was installed).

3rd Version: Pre-combustion chamber with ball pin  $d = 4$  mm and  $r = 2$  mm fillet radius.

(Replace pre-combustion chamber if this version was installed.)

4th Version: Pre-combustion chamber with ball pin  $d = 4$  mm and  $r = 10$  mm fillet radius.

(If there are complaints about starting trouble with these pre-combustion chambers, then the pre-combustion chambers of the 5th version can be installed.)

5th Version: Pre-combustion chamber with ball pin  $d = 4$  mm and  $r = 4$  mm fillet radius.

(See Figure 01-1/4 for new standard design.)

**Note:** The ball pins in the pre-combustion chambers are exposed to great stresses due to the prevailing differences in tem-

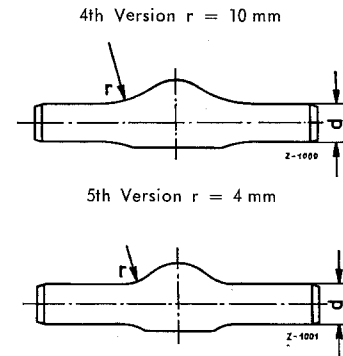


Figure 01-1/4

Ball pin for pre-combustion chamber OM 636

perature. It can therefore not always be completely prevented that a small percentage of the ball pins becomes defective before the engines are exchanged or removed for general overhauling. Serious engine damages on OM 636 can be caused if the ball reaches the combustion chamber and is not immediately discharged through the exhaust valve.

**In order to prevent such damages on the OM 636, check prechambers from time to time.** A check should definitely be made when the injection nozzles are removed or when repairs are made on the cylinder head, as for example grinding valves, etc. on engines with a mileage of 30 000 miles. It is irresponsible if engines break down shortly after repairs have been performed on the cylinder heads, simply because the prechamber have not been checked.

**On OM 621:** The prechamber, part No. 621 010 03 54 is standard up to engine No. 621.910-10-017 171. As known, prechambers in Diesel engines are heavily stressed because of the high temperatures prevailing there. The prechamber, Part No. 621 010 03 54 should therefore be exchanged for Part No. 621 010 07 54 after approx. 42 000 miles (70 000 km) or approx. 2300 operating hours; this is imperative in order to ensure further trouble-free and economical operation of the Diesel engine.

The engines with engine No. 621.910-10-95 11 115 up to 95 13 898 and 621.910-10-017 172 up to 621.910-10-018 245 are equipped with the prechamber Part No. 621 010 04 54.

As from engine No. 621.910-10-018 246 prechambers of Part No. 621 010 07 54 are installed. Since the burner is made of temperature-proof material (Nimonic 80 A), replacement of the prechambers 621 010 04 54 and 621 010 07 54 is not included in the Customer Service. The new prechambers cannot be distinguished from the former prechambers from the outside, but only by the groove which is indented in the bevel of the prechamber (see Figure 01-1/10) as from engine No. 621 910-10-026 795. This makes it possible to recognize the changed prechamber design immediately after unscrewing the nozzle and without previous removal of the prechamber.

The ball pin fitted in both prechamber versions has a fillet radius of 10 mm. The ball pin (a) has a press fit at the side of the larger diameter, while on the other side it has a sliding fit which allows easy expansion and contraction ensuring high durability (see Figure 01-1/5 and 01-1/10).

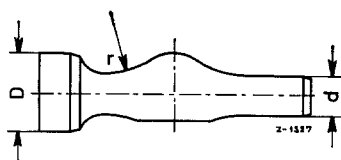


Figure 01-1/5

Ball pin for prechamber OM 621

#### d) Installation of Pre-Combustion Chamber

12. Install new sealing ring (3) in the cylinder head. For this purpose, only the original sealing ring with the specified thickness and shape must be used (see Figure 01-1/9), so that the distance (c) which is marked by arrows, can be attained between the pre-combustion chamber and the cylinder head.

Part No.	Thickness of Seal Rings
636 017 0119	1.9-2.1 mm (standard)
636 017 0219	2.2-2.4 mm
636 017 0319	2.5-2.7 mm
636 017 0419	2.8-3.0 mm

The above named seal ring thicknesses are available. When installing thicker seal rings, the prechamber bore for the glow plug is offset. The bore "e" (see Figure

01-1/10) must be remachined in accordance with the basic bore in the cylinder head and then blown with compressed air.

13. Install the pre-combustion chambers in the cylinder head.
14. Screw in the threaded ring (2) (see Figure 01-1/9) with the Special Wrench Part No. 636 589 01 07 and tighten with the prescribed torque by means of socket wrench insert Part No. 636 589 04 09 00 (see Job No. 01-0). A keyed sleeve with 9 mm or 5 mm wide pegs must be used depending on the width of the groove in the threaded ring.

**Note:** Replace threaded rings with damaged grooves. During installation make sure that the height of the threaded ring (2) corresponds to the subsequently installed sealing ring (4) (nozzle ring between the pre-combustion chamber and the nozzle holder or injection nozzle, respectively, see Figure 01-1/9).

#### e) Installation of Glow Plug

15. Before the installation of the glow plugs clean the glow plug holes and the holes in the pre-combustion chambers with the Reamer Part No. 636 509 03 53. To do this, fill the grooves of the reamer with grease and ream the plug holes (Figure 01-1/6).

**Note:** Regarding the OM 621, observe the distance between the parting line of the cylinder head and the front surface of the prechamber. **The distance "c" should amount to  $5.7 + 0.2$  mm** (see Figure 01-1/10). If the parting line of the cylinder head had been re-machined, do not fail to install thicker seal rings (13) between cylinder head and prechamber when installing the prechambers. Thus the measure "c" is maintained (see Figure 01-1/10).

A commercial reamer 11 mm in dia. can also be used to clean the glow plug holes. However, the following must then be observed:

The reamer should only be inserted approx. 55 mm, so that the ball pin in the pre-combustion chamber will not be damaged. (See Figure 01-1/9).

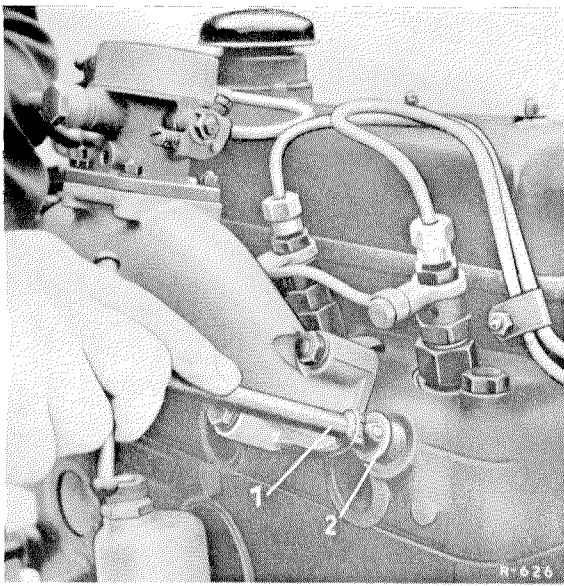


Figure 01-1/6

1 Reamer Part No. 636 589 03 53  
2 Limiting collar at the reamer

For this purpose the reamer must be furnished with a stop (tightly fitting rubber ring, or the like).

**Note:** In the course of time oil carbon is formed in the glow plug holes. This can possibly cause short-circuiting of the glow plugs and starting trouble; the glow plug holes should therefore be cleaned during larger repairs on the cylinder head and during the replacing of glow plugs in addition to the regular cleanings specified for the service operations.

16. If the glow plug holes were cleaned with the cylinder head installed, then crank the engine several times with the starter to blow the dirt out of the combustion chamber.
17. Grease the thread of the glow plugs lightly with graphited oil. Install glow plugs in the cylinder head and tighten with 5 mkg.
18. Connect the glow plugs with the power leads (8). Install the two outer leads with the larger connecting eyes, which connect 1st with 2nd and 3rd with 4th glow plug, then the power lead connecting the 2nd and 3rd glow plug, put the insulators (9) on top of the power lead, and secure with the knurled nuts (11). Secure the ground cable (10) at the opposite end with a knurled nut (see Figure 01-1/1).

19. Check function of glow plugs (also see Job No. 15-32).

#### f) Installation of Nozzle Holder with Injection Nozzle

20. Crank engine with starter to blow out particles possibly left in the combustion chamber.

Insert sealing ring (4) between nozzle and pre-combustion chamber (see Figure 01-1/9). Make sure that the cylindrical part of the sealing ring (4), Part No. 636 017 01 20 is properly seated in the hole of the pre-combustion chamber and that the threaded ring (2) is only 11 mm thick.

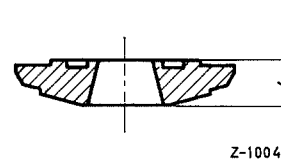


Figure 01-1/7

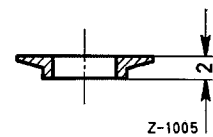


Figure 01-1/8

**Note:** The sealing ring (4) between nozzle holder and pre-combustion chamber (see Figure 01-1/9) was modified to eliminate knocking during take-off and driving. The new sealing ring Part No. 636 017 01 20 (Figure 01-1/8) with a total height of 2 mm is 2 mm lower than the 1st version according to Part No. 312 017 04 20 (Figure 01-1/7) and is standard now in all types of engine models OM 621 and OM 636.

**The cylindrical part of the seal acc. to Figure 01-1/8 was extended by 1 mm now, and the bottom thickness increased by 0.5 mm, which results in 3.5 mm total height of the seal (Figure 01-1/8a).**

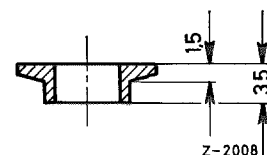


Figure 01-1/8a

The new sealing rings, Part No. 636 017 01 20 can be subsequently installed in all engines of model OM 636.

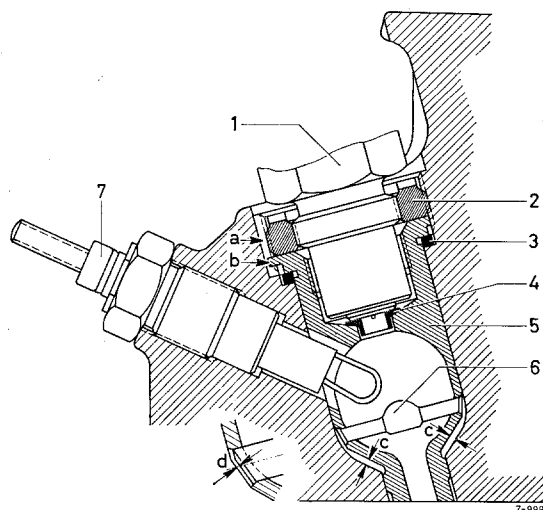


Figure 01-1/9

OM 636

- a Groove in cylinder head
- b Securing nose of pre-combustion chamber to prevent torsional stresses
- c Distance between pre-combustion chamber (5) and cylinder head
- d Max. permissible distance 0.5 mm between ball pin and O. D. of pre-combustion chamber
- 1 Nozzle holder or union nut of nozzle holder
- 2 Threaded ring
- 3 Sealing ring between pre-combustion chamber and cylinder head
- 4 Sealing ring between pre-combustion chamber and nozzle holder (nozzle ring)
- 5 Pre-combustion chamber (version with ball pin)
- 6 Ball pin in pre-combustion chamber
- 7 Glow plug

In this case make sure that the threaded ring Part No. 636 017 02 03, which serves to secure the pre-combustion chamber, is replaced by the threaded ring Part No. 636 017 03 03 or remove 2.5 mm from the lower contact surface for a total height of 11 mm (see Figure 01-1/11), because the nozzle holder (1) is seated 2.5 mm deeper in the pre-combustion chamber if the new sealing ring (4) is used. If this modification is not made, the nozzle holder will come into contact with the threaded ring (2) and the nozzle cannot be properly pressed against the sealing ring (4) (see Figure 01-1/9).

21. Screw nozzle holder with injection nozzle into the pre-combustion chamber and tighten with 7 to 8 mkg by using the Box Spanner Insert Part No. 312 589 00 09. Before installation of the nozzle holder (1) check again if the sealing ring (4) is properly seated with its cylindrical part in the hole of the pre-combustion chamber (see Figure 01-1/9).

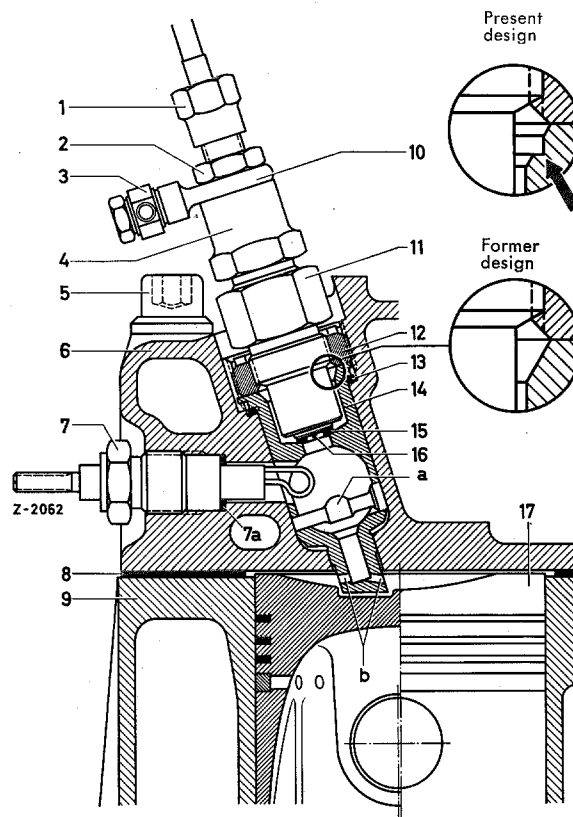
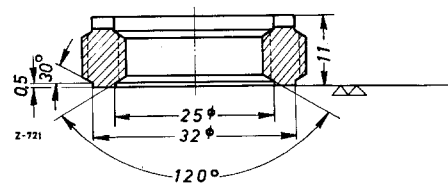


Figure 01-1/10

OM 621

- 1 Union nut of injection line
- 2 Hexagon nut
- 3 Fuel leak line
- 4 Nozzle holder
- 5 Cylinder head screw
- 6 Cylinder head
- 7 Glow plug
- 7a Sealing ring
- 8 Cylinder head gasket
- 9 Cylinder crankcase
- 10 Fitting
- 11 Union nut of nozzle holder
- 12 Threaded ring
- 13 Sealing ring
- 14 Pre-combustion chamber
- 15 Seal
- 16 Nozzle needle
- 17 Piston
- a Ball pin
- b Outlet bores of multi-hole burner
- c Distance between front face of prechamber and separating line of cylinder head = 5.5-5.9 mm
- d Minimum distance between front face of prechamber and recess of piston head = 1.35 mm
- e Bore for glow plug filament



Max. lateral deflection in relation to thread 0.05 mm

Figure 01-1/11

22. Attach the adapter (3) to the nozzle holder (6) (see Figure 01-1/1). The contact surfaces of the nozzle holder and the adapter must be absolutely level and smooth to obtain sealing of connection. If necessary, level the contact surfaces or replace the adapter.
23. Screw on the hex nut (2) to secure the adapter (3), but do not yet tighten, because the drip-oil line (4) must be installed first (see Figure 01-1/1).
24. Secure the drip-oil line (4) with the hollow screw (5) at the adapter (3); use new sealing rings on both sides (see Figure 01-1/1).
25. Tighten the hex nut (2) with the torque wrench with 5 mkg. On no account try to seal a leaky connection by excessive tightening. Excessive tightening will damage the thread and will make the nozzle holder unserviceable. Leaks are always caused by bad contact surfaces of the adapter and the nozzle holder (see Figure 01-1/1).
26. Connect the injection line to the nozzle holder by securing the cap nut (1) (see Figure 01-1/1).
27. Attach the air filter or the oil bath air filter or the air hose to the throttle duct. Operate engine and check tightness of all connections.