

Figure 01-3/9

Engine OM 621

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| 1 camshaft sprocket | 14 hex. hd. screw M 8x50 |
| 2 hex. hd. screw M 14x1.5x40 | 15 holder for guide rail, inner |
| 3 chain tightener | 16 guide rail, inner |
| 4 venting line for water pump | 17 guide rail pivot pin on cylinder head |
| 5 water pump | 18 screw plug for guide sprocket pivot pin |
| 6 generator | 19 return spring |
| 7 pulley on the crankshaft | 20 injection timing device |
| 8 collar screw | 21 screw plug for oil pressure relief valve |
| 9 counterweight, graduated | 22 screw plug with guide rail pivot pin, bottom in cylinder crankcase |
| 10 adjusting pointer | 23 box wrench |
| 11 engine support, front, left | 24 intermediate plate on cylinder crankcase for starter motor mounting |
| 12 sliding rail, outer | |
| 13 screw plug for idler sprocket bearing pin | |

B. OM 621

In order to prevent distortion of the cylinder head, dismount it only **in cold condition**.

Removal:

1. Drain cooling water. Observe additives!
2. Loosen the water hose from the cooling water return pipe, the venting line (4) from the water pump to the cylinder head and the feed line to the heat exchanger from the cylinder head (see Figure 01-3/9).
3. Remove the air filter and unhook the control linkage on the throttle duct.
4. Unscrew the union nut of the venting pipe, if any, from the throttle duct.

Remove cylinder head cover, after loosening the mounting screws of the bracket with angular lever of the additional control and the mounting screws of the cylinder head cover.

5. Disconnect the vacuum line, the injection lines and the drip-oil line. Unscrew the two mounting screws of the fuel main filter and move filter sideways.
6. Loosen the exhaust manifold on flange from the exhaust pipe.
7. Disconnect the connection cable for the glow plugs and unscrew the transmitter for the cooling water tele-thermometer.
8. Loosen the necked-down bolts for the mounting of the rocker arm brackets and dismount the brackets including rocker arms, turning the camshaft so that the rocker arms are unloaded.
9. Remove the inner guide rail (16) in the cylinder head. To do this loosen the mounting screw (14) and pull out the connecting bracket (15) (see Figure 01-3/9).
10. Unscrew the mounting screw (2) for the camshaft sprocket (1) retaining the camshaft sprocket. Dismount the chain tightener (3), then remove the camshaft sprocket (1), if necessary, use puller, part No. 187 589 01 33 (see Figure 01-3/9). Take care of the spacer washer and the Woodruff key. Then place the chain into the sprocket box.
11. Loosen the cylinder head bolts from inside towards outside and then remove; also remove the brackets for the cylinder head cover. Do not forget the 4 hex. socket screws at the front side of the cylinder head.
12. Lift off the cylinder head and remove the gasket.

Disassembly:

13. Removal and installation of outer guide rail (12) (see Figure 01-3/9 and Job No. 05-29).

Removal and installation of intake line with throttle duct (see Job No. 14-1 and 14-5).

Removal and installation of camshaft with bearings (see Job No. 05-36).

Removal and installation of glow plugs (see Job No. 15-31).

Removal and installation of nozzle holder with injection nozzles (see Job No. 07-17).

Removal and installation of prechambers (see Job No. 01-1).

Removal and installation of valves (see Job No. 05-11).

Removal and installation of idler sprocket and idler sprocket bearing (see Job No. 05-23).

Removal and installation of guide sprocket (see Job No. 05-25).

14. **Cleaning, checking and preliminary procedures**, see point A items 13, 14, 16, 17, 18, 19.

Installation:

15. Set 1st cylinder of engine to compression TDC. To do this, lift chain out of the sprocket box and turn the engine in direction of rotation until fuel comes out of the pipe connection of the 1st cylinder, then go on turning until the piston of the 1st cylinder is at TDC.
16. Clean the separating surfaces of the cylinder crankcase and the cylinder head. Fit a new cylinder head gasket and then fit the cylinder head.
17. Place the cylinder head cover clamps on the cylinder head. Apply graphite oil to the thread of the cylinder head bolts and the surfaces of the washers and then screw in the cylinder head bolts.
18. Tighten the cylinder head bolts in the sequence as shown on Figure 01-3/10 and apply torque gradually according to the following table.

- 1st torque 3 mkg
- 2nd torque 6 mkg
- 3rd torque 8 mkg
- 4th torque (check torque) 8 mkg
- Re-tightening of cylinder head bolts, refer to item 36.

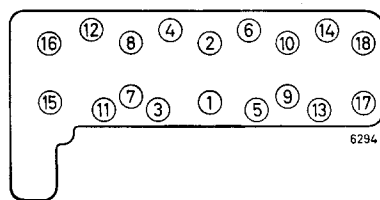


Figure 01-3/10

Note: After tightening of the cylinder head bolts, the camshaft must turn easily by hand.

19. Screw in the 4 hex. socket screws at the front side of the cylinder head and tighten with the Allen wrench (part No. 186 589 08 07). Fix the ground cable from the glow plugs to the screw below the fuel main filter.
20. Insert the Woodruff key into the camshaft and fit the spacer washer. Then turn the camshaft so that the marks on the spacer washer coincide with that on the 1st camshaft bearing (see Figure 01-3/11).
21. Use a hook to remove the chain out of the sprocket box and press the camshaft sprocket on the camshaft with the chain placed on the sprocket. Observe the marks on the spacer washer and on the camshaft bearing! (see Figure 01-3/11).

The left side of the chain must then be tensioned, because otherwise the camshaft adjustment would vary after cranking the engine. Then fit the washer and the lock washer and tighten with the hex. hd. screw (2) (see Figure 01-3/9).

22. Check the end clearance of the camshaft (see Figure 01-3/11).

The clearance should amount to 0.05–0.128 mm. If the end clearance is not correct, re-grind the camshaft on its front face (see Job No. 05-38).

23. Install the inner guide rail (16) in the cylinder head (see Figure 01-3/9).

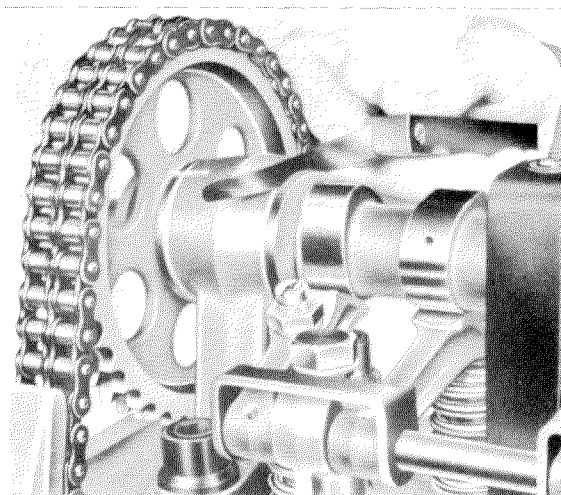


Figure 01-3/11

This figure represents the gasoline engine of the 190

24. Provide chain tightener (3) with a new gasket and screw onto the cylinder head **without oil filling** (see Figure 01-3/9).
25. Use the bleeder lever, part No. 187 589 02 63, or, in emergencies, a screw driver to press the idler sprocket bearing to the stop and fill the oil pocket in the cylinder head with motor oil. With the lever or screw driver, move then slowly back whilst re-filling oil at the same time so that the oil pocket is filled and the chain tightener cannot draw in air.

Then slowly press the idler sprocket bearing (2) with sprocket downwards and repeat this procedure until no air bubbles show up at the chain tightener (3). It is important that the oil pocket is always filled with a sufficient quantity of oil during the bleeding procedure (see Figure 01-3/12)

If properly bled, the chain tightener has no free travel; maximum force must be applied all the way to compress the chain tightener.

The bleeding procedure of the chain tightener should be carried through very carefully, because improperly bled chain tighteners will cause noises during idling. (Also see 'Checking chain tightener', Job. No. 05-22).

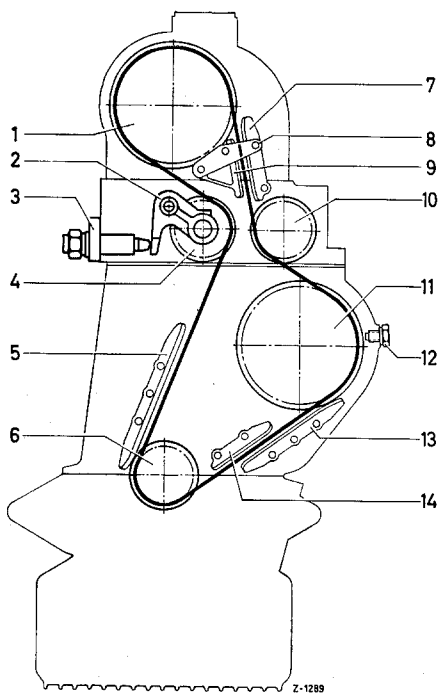


Figure 01-3/12

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|--|--------------------------------|
| 1 camshaft sprocket | 8 holder for guide rail, inner |
| 2 idler sprocket bearing with idler sprocket | 9 guide rail, inner |
| 3 chain tightener | 10 guide sprocket |
| 4 idler sprocket | 11 intermediate sprocket |
| 5 guide rail, outer | 12 locking screw |
| 6 crankshaft sprocket | 13 guide rail, outer |
| 7 guide rail, outer | 14 guide rail, inner |

26. Insert the fitted sleeves for the rocker arm brackets into the bores in the cylinder head and knock in. The sleeves must fit snugly.

27. Install the mounted rocker arm brackets and tighten the necked-down bolts with a torque of 3.75 mkg.

Note: When installing the mounted rocker arm brackets, turn the camshaft so that the rocker arms are unloaded.

28. Adjust the valve clearance with **cold** engine (see Job No. 00-3).

29. Connect the vacuum line and the leak oil line. Mount the fuel main filter.

30. Connect the line for the glow plugs and screw in the transmitter for the cooling water tele-thermometer.

31. Install the water hose from the cooling water return flow pipe, the venting line (4) from the water pump to the cylinder head and the feed line to the heat exchanger on the cylinder head (see Figure 01-3/9).

32. Mount the exhaust manifold on the exhaust pipe flange.

33. Mount the cylinder head cover, the breather pipe and the bracket with angular lever of the additional control. Observe the correct seat of the gasket for the cylinder head cover. Also check the wire cable (18) for free movement in the slot of the stop angle at the angular lever (24) (see Figure 00-11/2).

34. Hook in the control linkage and mount the air filter.

35. Fill in cooling water. Observe treating agents!

36. Re-tighten the cylinder head bolts as follows:

Run the engine with low load until a cooling water temperature of 80° C is reached. After another 5 minutes of operation with the above cooling water temperature, re-tighten the cylinder head bolts according to the diagram of Figure 01-3/10 to **8 mkg**.

After the test run, latest after a distance of 20 km, check the tightening torque of the cylinder head bolts (8 mkg). Also check all oil, water and fuel line connections and further check the cylinder head cover for leaks and all screws for firm seat.

Then check the valve clearance again with **cold engine**.

After 500 km make a third check of the tightening torque of the cylinder head bolts (8 mkg), the engine being run warm.