

Removal and Installation of Timing Housing Cover

OM 636

Job No.

01-15

The removal and installation of the timing housing cover is only slightly different on the engines of the individual types in spite of the different versions. If the cover is replaced, however, the design version must be observed, because different versions of timing housing covers cannot be interchanged (see Job No. 01-16). The main characteristic features are described briefly to eliminate mix-ups.

The timing housing covers Part No. 636 010 05 17 and 636 010 16 17 and/or 636 010 18 17 have a collar at the bore for the crankshaft (see Figure 01-16/2).

The timing housing cover Part No. 636 010 23 17 has no collar at the bore for the crankshaft.

The timing housing covers of the engines of the type 636.915, 916, 918, 931 and part of the type 636.914, 930 and 917 are still equipped with annular ball-bearings with an outer diameter of 32 mm for the injection pump drive.

Together with the installation of the injection timing device the bearing of the pump drive was uniformly reinforced on the engines of all types. On this timing housing cover design a cast-in steel bushing was installed to receive the annular ball-bearings, the diameter of the bore and/or the outer diameter of the annular bearings is 35 mm.

At engines with operating time indicator it must be observed that the timing housing cover is provided with boreholes for dowel pins to locate the protecting cover. All timing housing covers are now produced with these fit boreholes, even if no operating time indicator is installed.

On the types 636.930, 919 and 934 threaded bushings are cast into the timing housing cover for the mounting of the engine front support.

On the types 636.917/28 and/or 917-022 and 636.917/33 and/or 917-023 a special timing housing cover is installed, which is completely machined by the customer and sent to DB for assembly (see Figure Page 28).

Removal:

1. Remove the fuel main filter (see Job No. 09-1).
2. Remove the injection pump (see Job No. 07-11).

Note: In an emergency the timing housing cover can also be removed with injection pump still attached.

3. Remove the support of fan bearing bracket with fan bearing bracket, belt pulley and fan (see Job No. 20-15).

Note: This operation is not applicable for the engines without fan bearing bracket.

4. Remove the belt pulley from the crankshaft (see Job No. 03-1).

5. Remove the protecting cover of the timing housing cover and set the engine in such a way that the marked teeth are engaged (see Figure 07-27/1 and 07-25/1).

6. On engines with injection timing device unscrew the fixing nut (22) and extract the injection timing device with 2 screwdrivers see Figure 07-27/4). If necessary, pull off the injection timing device with the Extractor Part No. 319 589 12 33 (see Figure 07-25/3).

Then take the Woodruff key (24) out of the groove of the shaft and remove the sleeve (19) and the thrust washer (18) from the shaft (see Figure 07-27/4).

7. On engines without injection timing device unscrew the fixing nut of the pump drive gear, pull off the pump drive gear

with the Extractor Part No. 636 589 02 33 (see Figure 07-27/2) and take the Woodruff key out of the groove.

Note: On the engines without injection timing device, the timing housing cover can be removed without removal of the pump drive gear. In this case unscrew the slotted fillister head screws which are located inside the timing housing cover and can be reached through 2 holes in the pump drive gear (see Figure 01-15/1).

Turn the pump drive gear in such a way that one of the holes coincides with one of the screws.

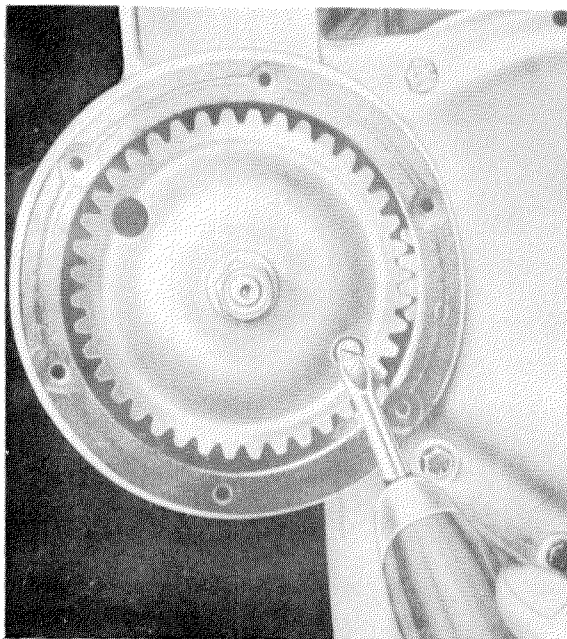


Figure 01-15/1

8. On engines without injection timing device, unscrew the two fillister head screws (Figure 01-15/1) and on engines with injection timing device, the two hexagon screws (1) (Figure 01-15/2) of the timing housing cover.
9. On engines of the type 636.930, 636.919 and 636.934, where the engine front support is fixed to the timing housing cover, the engine must be lifted slightly and the oil pan must be jacked-up after unscrewing the hexagon screws fixing the engine supports to the engine suspensions before removing the timing housing cover.

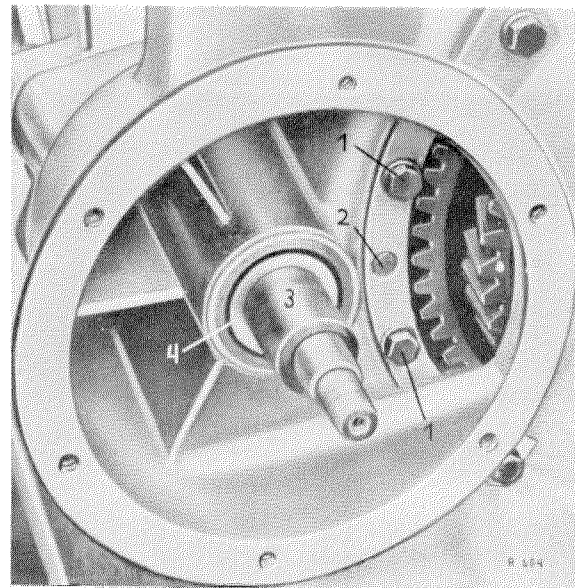


Figure 01-15/2

- 1 Hexagon screws located in the timing housing cover (engines with injection timing device)
- 2 Dowel pin
- 3 Bushing
- 4 Thrust washer

10. Unscrew all fixing screws of the timing housing cover located on the outside and remove the timing housing cover, if necessary, drive it out of the dowel pins by light knocks with a plastic hammer.
11. Drive out the driving shaft (9) towards the rear with a brass punch (see Figure 07-27/3 and 07-27/4).
12. Extract the rear annular ball-bearing (7) from the driving shaft (9), if it should stay on the shaft during the driving-out of the driving shaft (9). Should the bearing stay in the timing housing cover (3), however, drive out the annular ball-bearing (7) towards the rear with a suitable punch (see Figure 07-27/4).

Take the spacer out of the timing housing cover.

13. Take the front guard ring (12) out of the groove and punch out the front annular ball-bearing (11) towards the front (see Figure 07-27/4).

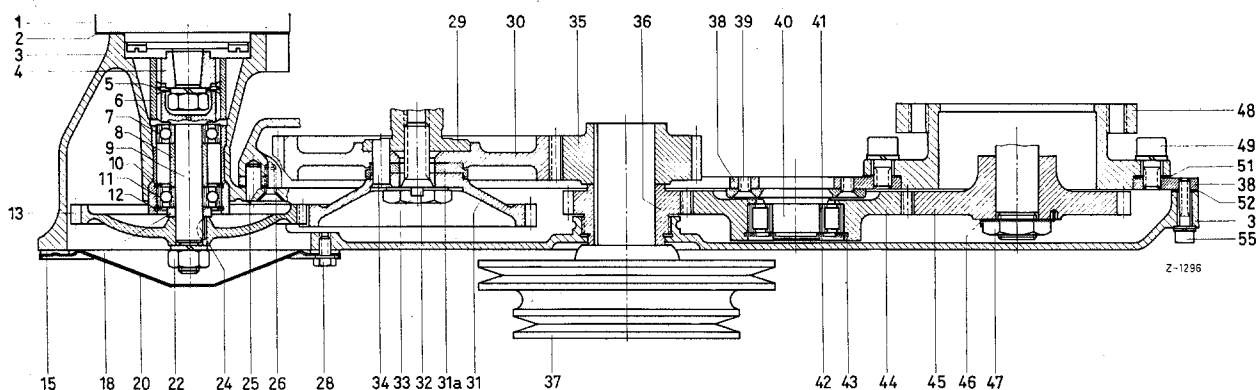


Figure 01-15/3

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| 1 injection pump | 31a intermediate ring (part No. 636 052 00 51) |
| 2 gasket between injection pump and timing gear housing cover | 32 locking plate |
| 3 timing gear housing cover (part No. 636 010 22 17) | 33 mounting screw (part No. 636 052 01 71) |
| 4 follower on injection pump shaft (part No. 636 077 03 09) | 34 follower pin (part No. 636 052 03 74) |
| 5 snap ring in the coupling sleeve | 35 crankshaft gear |
| 6 coupling sleeve | 36 intermediate gear piece (part No. 636 052 00 02) |
| 7 grooved bearing, rear | 37 pulley |
| 8 spacer tube | 38 base plate (part No. 636 015 00 19) |
| 9 drive shaft | 39 countersunk screw M 6×10 with hex. socket INFA-SK-8G (without toothed washer, tighten well and secure by punch) |
| 10 locking ring, inner | 40 intermediate gear pin (part No. 636 052 00 05) |
| 11 grooved bearing, front | 41 cylindr. roller bearing (DIN 5412 NU PL 25) |
| 12 locking ring, outer | 42 locking ring 25×1.2 DIN 471 |
| 13 injection pump drive gear | 43 locking ring 52×2 DIN 472 |
| 15 gasket (part No. 636 015 05 80) between cover and timing gear housing cover | 44 intermediate gear (part No. 636 052 01 02) |
| 18 ring (part No. 636 077 02 52) | 45 pump shaft gear |
| 20 cover for the timing gear housing cover | 46 locking plate |
| 22 hex. nut with lock washer | 47 hex. nut |
| 24 Woodruff key | 48 connecting flange (part No. 636 015 06 30) |
| 25 cylindrical pin 8×20 8 h DIN 7 | 49 fill. hd. screw M 10×18 DIN 912 with lock washer B 10 |
| 26 countersunk screw M 6×25 with hex. socket INFA-SK-8G with toothed washer V 6.4 DIN 6797 | 51 gasket (paper part No. 636 015 00 70) between base plate and connecting flange |
| 28 hex. hd. screw M 6×15 with spring washer B 6 DIN 137 | 52 gasket (paper part No. 636 015 00 20 between base plate and timing gear housing cover |
| 29 camshaft | 55 fill. hd. screw M 6×28 and M 6×40 with washer 6.4 DIN 125 and lock washer B 6 |
| 30 camshaft gear (part No. 636 050 02 04) | |
| 31 intermediate gear | |

Note: For removal of the base plate (38) of the engines of type 636.917-022 and 636.917-023, remove the locking ring (42) from the lower intermediate gear (44) and pull the intermediate gear (44) by hand after dismantling the pulley (37) and the timing gear housing cover (3). Then remove the bearing, the intermediate gear pin (40) with flange by unscrewing the 6 mounting screws (39) (see Figure 01-15/3).

Caution! Only then the two countersunk screws covered by the flange of the intermediate gear pin (40) can be unscrewed. These two screws are mounted without toothed washer. After unscrewing all mounting screws for the base plate (38), remove same!

14. Clean and check all parts (also see Job No. 01-16). If necessary, replace the grooved bearings.

15. Check the boreholes for the dowel pins in the timing housing cover and the dowel pins in the cylinder block. They must be in perfect condition, replace dowel pins if necessary.

16. Check the alignment of the oil pan and the cylinder block at the separating line. Minor misalignments can be set right by light punches with a hammer after loosening the oil pan.

Installation:

During the installation of the timing housing cover the different versions of timing housing covers have to be taken into consideration (also see Job No. 01-16).

17. Oil the front annular ball-bearing (11) and press it into the timing housing cover (see Figure 07-27/4).

Note: If a new timing housing cover is installed, the inner guard ring (10) must be inserted first (see Figure 07-27/4).

18. Insert the guard ring (12) in the outer annular groove (see Figure 07-27/4).

19. Press the rear annular ball-bearing (7) onto the new and longer driving shaft (9) Part No. 636 077 05 05 (see Figure 07-27/4).

20. Put the spacer (8) on the driving shaft (9) and press the driving shaft into the timing housing cover (see Figure 07-27/4). (Length of spacer (8), see Note below).

Note: On engines without injection timing device but with 1st bearing version with annular ball-bearings with an outer diameter of 32 mm on the driving shaft the length of the spacer is 27.2 mm, the length of the driving shaft 57.2 mm, measured from thread to shoulder at coupling end.

On engines without injection timing device but with 2nd version (reinforced bearing with annular ball-bearings with an outer diameter of 35 mm) the length of the spacer is 21.2 mm, the length of the driving shaft 64.2 mm. In this design a compensating ring 4 mm thick (with groove for Woodruff key) Part No. 636 077 01 52 must be installed between pump drive gear and lock washer and/or fixing nut of the pump drive gear.

On engines with injection timing device the length of the spacer (8) is 24.2 mm and the length of the driving shaft (9) is 94.5 mm (see Figure 07-27/4).

21. Set piston of 1st cylinder to TDC. The marked teeth of the camshaft and crankshaft timing gear must be engaged (see Figure 05-31/6).

22. Clean and lightly grease the contact surfaces of cylinder block and timing housing cover and put the new gasket over the dowel pins on the contact surface of the cylinder block.

23. Place the timing housing cover over the dowel pins, the cover should go on without force. Mount all fixing screws with washers and tighten (also see Figure 01-15/2). On the engines of the type 636.919, 930 and 934, screw in the screw provided as a timing needle right above the right-hand fit borehole.

Caution! Do not forget the two screws located behind the timing housing cover. Hexagon screws M 6×20 are used on engines with injection timing device, fillister head screws AM 6×20 DIN 84-4 are installed in the engines of all other types.

24. Install the injection timing device on engines with injection timing device (see Job No. 07-27, Paragraph 15 to 19).

25. Put the pump drive gear on the driving shaft on engines without injection timing device, so that the marked teeth are engaged (see Figure 07-27/1). Install a lock washer and tighten the pump drive gear with hex nut (also see Note after Paragraph 20, Compensating Ring Part No. 636.077 01 72).

26. Check with feeler gauge the backlash between the pump drive gear and the intermediate gear at several points.

The Backlash should be 0.05 to 0.07 mm.

If necessary, the pump drive gear must be replaced by a suitable larger or smaller pump drive gear.

27. Mount the protecting cover with a new paper gasket.

Note: In order to drive a **tachometer** the hex nut securing the pump drive gear can be replaced by a nut with engaging dog Part No. 636 064 01 09 in addition to the installation of the corresponding cover with mounting flange and sealing ring A 8×16 DIN 6503 (see Figure 01-12/1).

28. Mount the engine front support (if installed) to the timing housing cover with lock washers and hexagon screws.

Note: With the engines of the types 636.930, 636.919 and 636.934, install the hex. hd. screw for fixing the right rubber mounting before screwing on the engine carrier. If with these engines, the timing gear housing cover is mounted with the engine installed in the vehicle, lift the engine, remove the chock and screw the hex. hd. screws for mounting the engine carrier into the two engine mountings and tighten.

29. Mount the belt pulley on the crankshaft (see Job No. 03-1).

30. On engines with fan bearing bracket, install the support of the fan bearing bracket with fan bearing bracket, belt pulley and fan (see Job No. 20-15).

31. Install the injection pump (see Job No. 07-11).

32. Install the fuel main filter (see Job No. 09-1).