

## A. OM 636

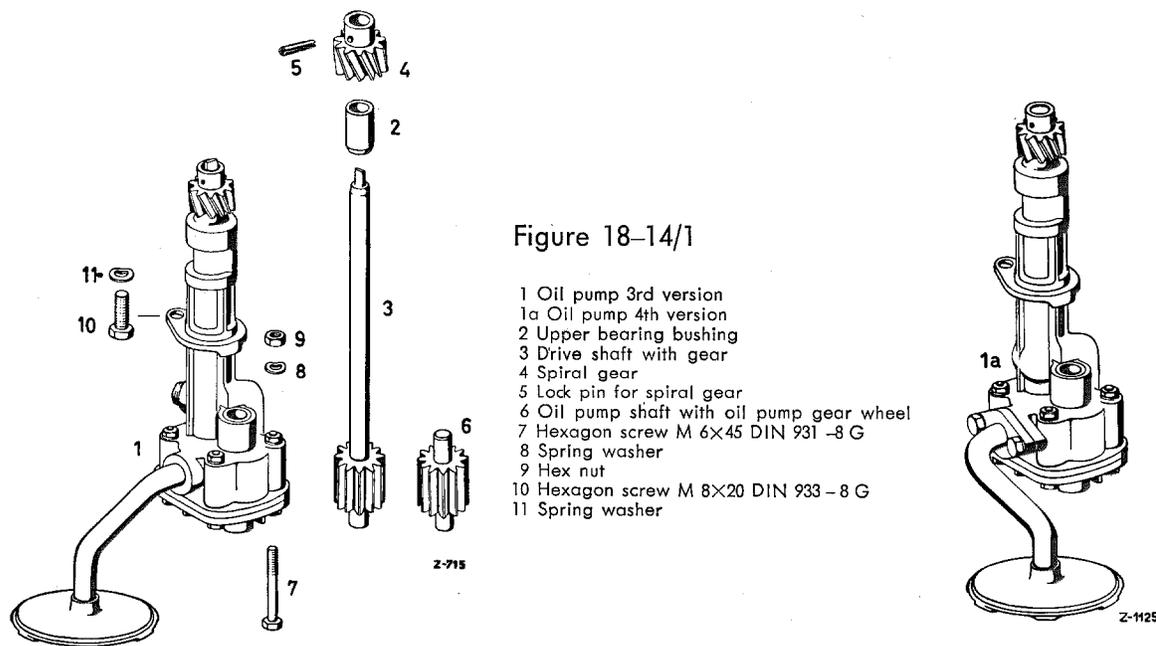


Figure 18-14/1

- 1 Oil pump 3rd version
- 1a Oil pump 4th version
- 2 Upper bearing bushing
- 3 Drive shaft with gear
- 4 Spiral gear
- 5 Lock pin for spiral gear
- 6 Oil pump shaft with oil pump gear wheel
- 7 Hexagon screw M 6x45 DIN 931 -8 G
- 8 Spring washer
- 9 Hex nut
- 10 Hexagon screw M 8x20 DIN 933 -8 G
- 11 Spring washer

### General:

The oil pump is a geared pump and is driven by the camshaft by way of the spiral gear (4). The oil sucked through the suction strainer (10) is forced through the passage (k) into the drive shaft bore (c). Between the seating shoulders (a) and (b) is the outlet passage (d), through which the oil reaches the oil filter connector (3) screwed into the housing (Figure 18-14/2 and 18-14/3).

The recess (g) located on the opposite side of the outlet passage (d) serves as a passage for the oil to the main oilway (see Figure 18-14/2).

The outlet passage (d) is sealed off against the main oilway by two vertical dividing walls (1). The pump must have a snug fit in the housing at the seating shoulders a and b, so that the oil pressure will not be reduced (Figure 18-14/2 and 18-14/3).

There are four different design versions:

**1st version:** Suction pipe with suction strainer screwed to the bottom part of the housing, height of gear housing  $h = 28$  mm, gears 24 mm high (see Figure 18-14/6). The gears are only pivoted in the upper part of the housing.

The oil pump is no longer repaired and is not considered in this description (see Figure 18-14/3).

**2nd version:** Suction pipe with suction strainer screwed to the upper part of the housing, height of gear housing  $h = 28$  mm, gears 24 mm high (see Figure 18-14/1 and 18-14/2).

**3rd version:** Suction pipe with suction strainer screwed to the upper part of the housing, height of gear housing  $h = 33$  mm, gears 29 mm high (see Figure 18-14/1 and 18-14/2).

**4th version:** Suction pipe with suction strainer **flanged** to the upper part of the housing (see Figure 18-14/1), height of gear housing  $h = 33$  mm, gears 29 mm high.

The following description on repairs is only valid for the 2nd, 3rd, and 4th pump version.

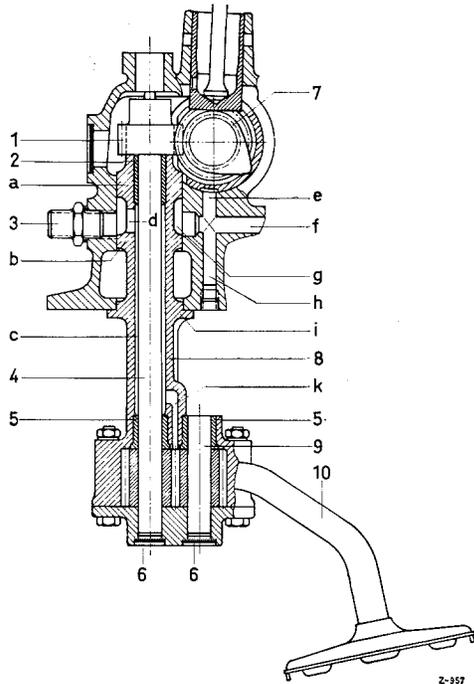


Figure 18-14/2

Oil pump with suction pipe connected to upper part of oil pump housing

- a Upper collar on pump housing
- b Lower collar on pump housing
- c Oilway and bore for the oil pump drive shaft
- d Oil outlet passage of the oil pump housing to the oil filter
- e Oilway to camshaft bearing
- f Oilway to main bearing
- g Recess in pump housing for the oil passage from the main filter of the main oilway in the crankcase
- h Machining bore plugged with screw plug
- i Mounting flange
- k Oilway from the gears to the oilway c
- l Dividing wall between the main oilway and the oil outlet passage to oil filter

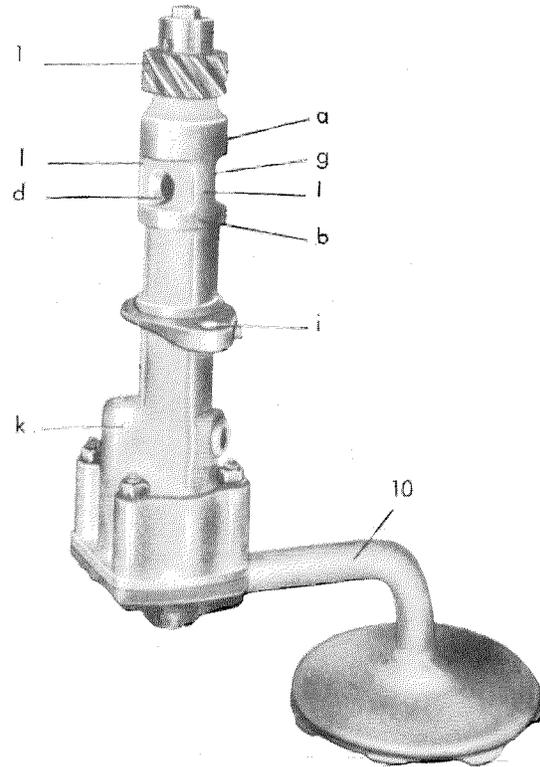


Figure 18-14/3

Oil pump with suction pipe connected to bottom part of oil pump housing

- 1 Spiral gear on the oil pump drive shaft
- 2 Upper bearing bushing in pump housing
- 3 Connector (oil outlet of the pump to the oil filter)
- 4 Oil pump drive shaft with gear
- 5 Lower bearing bushing in pump housing
- 6 Plug in bottom part of oil pump housing
- 7 Camshaft with spiral gear
- 8 Pump housing
- 9 Shaft with gear
- 10 Suction pipe with suction strainer

### Disassembly:

1. Unscrew the suction pipe with suction strainer (10) and also the bottom part of the oil pump housing and remove the gear (9) with shaft (Figure 18-14/2 and 18-14/3).

**Note:** In case of reinstallation mark the engagement of the gears before the removal.

2. Drive out the lock pin (5) of the spiral gear, pull off the spiral gear (4) and pull out the drive shaft with gear (3) (Figure 18-14/1).

Clean all parts and check for wear.

- If the bearing bushing (2) is worn, press it out and install a new bushing (Figure 18-14/1).
- If the bushings (5), which are cast into the pump housing, are worn, replace the entire oil pump (see Figure 18-14/2).

If the drive shaft with gear (4) or the shaft with gear (9) is worn, replace these shafts complete with pressed-on gears.

If the teeth surfaces of the spiral gear (4) are worn, replace the spiral gear (see Figure 18-14/1).

Check levelness of the contact surfaces of the upper and bottom part of the oil pump housing on a surface plate; lightly recondition if necessary. The end play of the oil pump gears must also be observed.

### Bearings of the Oil Pump Shafts

	Shaft diameter	Bore in upper and bottom part of oil pump housing
Drive shaft	$\frac{11.984}{11.973}$	$\frac{12.000}{12.018}$
Idler gear shaft	$\frac{11.973}{11.964}$	$\frac{12.000}{12.018}$

### Running Clearance of Drive Shaft and Idler Gear Shaft in the Pump Housing

Drive shaft	0.016 to 0.045 mm
Idler gear shaft	0.027 to 0.054 mm

### Play of Gears

Radial	0.020 to 0.047
Axial	0.020 to 0.062
Backlash	0.05 to 0.15

### Assembly:

- Check the radial and axial play of the gears before the assembly of the oil pump (Figure 18-14/4 and 18-14/5).

The radial play is the distance between the tip of the tooth and the wall of the housing (Figure 18-14/4).

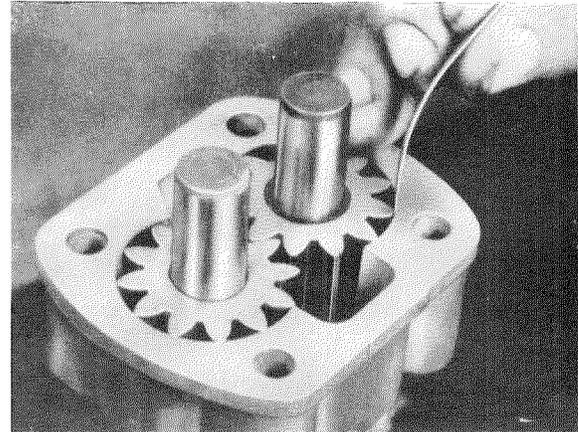


Figure 18-14/4

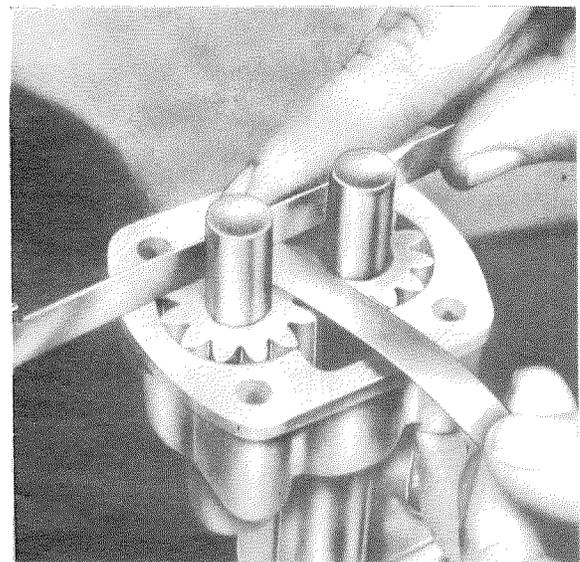


Figure 18-14/5

The axial play is the distance between the front surface of the gear and the contact surface of the upper part of the oil pump housing (Figure 18-14/5).

Measure always at each of the two gears when testing the radial and axial play. In order to obtain a sufficient feeding capacity the max. radial and axial play must not be exceeded.

6. Apply oil to the drive shaft (3) and the idler gear shaft (6) and install them in the housing (see Figure 18-14/1).

**Note:** During the reinstallation of the old drive shaft and idler gear shaft make sure that the marked teeth are engaged. If a new set of gears is installed, the idler gear must face with its countersunk bore towards the lower part.

7. Press the spiral gear (4) on the drive shaft and drive in the lock pin (5) (see Figure 18-14/1).

Check with feeler gauge the play (a) between the spiral gear and the pump

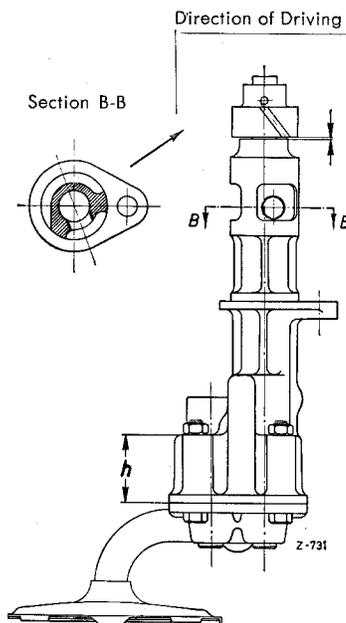


Figure 18-14/6

- a Minimum distance between spiral gear and pump housing = 0.25 mm  
h Height of pump housing at the 1st and 2nd pump version 28 mm  
at the 3rd and 4th pump version 33 mm

housing. The distance must be at least 0.25 mm, if not, rework the housing (see Figure 18-14/6).

8. Screw the bottom part of the housing to the upper part. A gasket is not installed. Before the tightening of the fixing screw check whether the gears can be moved easily. If the gears are sticking or running stiffly, correct misalignments of the bottom part by means of light hammer taps. Tighten the bottom part of the housing and check again the operational ease of the gears.
9. If a new drive shaft (3) was installed, the lock pin (5) hole with a diameter of 4.000 to 4.075 mm must be drilled into the shaft after forcing on the spiral gear (4). During this operation the distance (a) of at least 0.25 mm between the spiral gear and the housing must be observed (see Figure 18-14/1 and 18-14/6).

After this drive in the lock pin (5).

10. Screw the suction pipe to the oil pump housing; make sure that the suction strainer is in the proper position.
11. The oil pump is seated with the shoulder a and b in the crankcase and must be sufficiently sealed, so that the oil pressure will not be reduced (see Figure 18-14/2). The play can be determined with a micrometer and an internal measuring instrument. The max. permissible play of 0.03 mm must be observed.

#### Dimensions of the Pump Housing and the Bore in the Crankcase

Diameter of shoulder a and b at the pump housing	$\frac{33.011}{32.995}$
Bore in the crankcase	$\frac{33.000}{33.025}$
Overlap (+) or play (-) of the oil pump in the crankcase	$\frac{+ 0.011}{- 0.030}$

## Testing Capacity:

12. After the assembly check the oil pump for leaks and test the capacity. (Test data see the following table.) Oil pumps with a lower capacity must be repaired or replaced.

## Output

Pump speed rpm	2000
Motor oil	SAE 10
Oil temperature °C	100
Vacuum mm Hg	400
Overpressure atm.	5
Capacity kg/min for 2nd version with 24 mm high gears	10.2–13.6
Capacity kg/min for 3rd and 4th version with 29 mm high gears	12.5–16.5

## B. OM 621

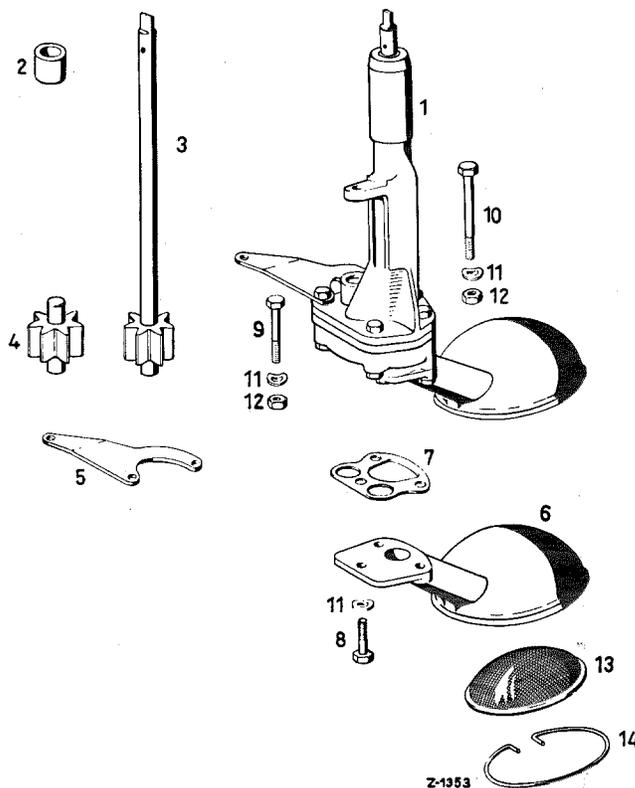


Figure 18-14/7

- 1 Oil pump
- 2 Bearing bushing, top
- 3 Drive shaft with gear
- 4 Oil pump shaft with gear
- 5 Bracket
- 6 Suction strainer
- 7 Gasket
- 8 Hex. hd. screw M 6×22 DIN 931-8 G
- 9 Hex. hd. screw M 6×35 DIN 931-8 G
- 10 Hex. hd. screw M 6×55 DIN 931-8 G
- 11 Spring washer B 6
- 12 Hex. nut M 6
- 13 Strainer
- 14 Snap ring

The oil pump is of the gear-type design; it is driven by the intermediate gear shaft (10) via the helical gear (39) (see Figure 18-16/1).

## Disassembly:

1. Unscrew the suction strainer (6).
2. Unscrew the oil pump housing lower part and remove the oil pump shaft with gear (4) as well as the drive shaft (3) with gear.

## Checking parts:

3. Clean all parts and check for wear; measures and tolerances (see Job No. 18-0).

If worn, the bearing bushing (2) should be pressed out and replaced by a new one.