


05-412 Removal and installation of intermediate gear shaft


Tightening torques	Nm	(kpm)
Bolts for cylinder head cover (engine 615)	5	(0.5)
Nuts for cylinder head cover (engines 615, 616, 617)	15	(1.5)
Waisted bolt for camshaft sprocket	80	(8)
Fastening bolt, injection timing device	40	(4)
Nut for injection timing device	70	(7)
Cap nuts of injection lines	25	(2.5)
Bolt and nuts for oil filter cover (type 123.1)	20-25	(2.0-2.5)

Special tools

Socket 27 mm, 1/2" drive to crank engine		001 589 65 09 00
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Box wrench socket open, 17 mm, 1/2" drive for injection lines		000 589 68 03 00
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Impact extractor for bearing pin (basic unit)		116 589 20 33 00
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Threaded stud M 6, 50 mm long for impact extractor		116 589 01 34 00
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Socket 13 mm, 3/8" drive		000 589 21 07 22
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Overflow pipe		636 589 02 23 00
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Supporting plate		616 589 02 40 00
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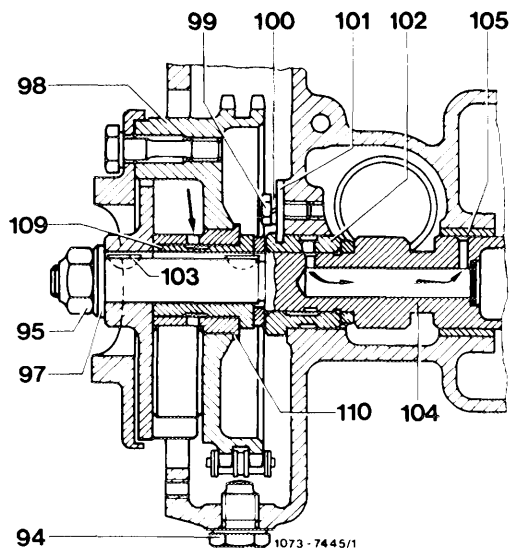
Note

In August 1976 the bearing bushings (109 and 110) were modified from splash to pressurized lubrication (arrows).

The bearing bushings are connected to the engine oil cycle via drillings along and across intermediate gear shaft (104) and also via a drilling in bearing bushing (109).

1st version

- | | |
|----------------------------|--|
| 94 Retaining bolt | 102 Bearing bushing front |
| 95 Nut M 14 | 103 Woodruff key |
| 97 Washer | 104 Intermediate gear shaft |
| 98 Injection timing device | 105 Bearing bushing rear |
| 99 Bolt M 6 x 12 | 109 Bearing bushing |
| 100 Lock washer B 6 | 110 Bearing bushing, injection timing device |
| 101 Retaining washer | |



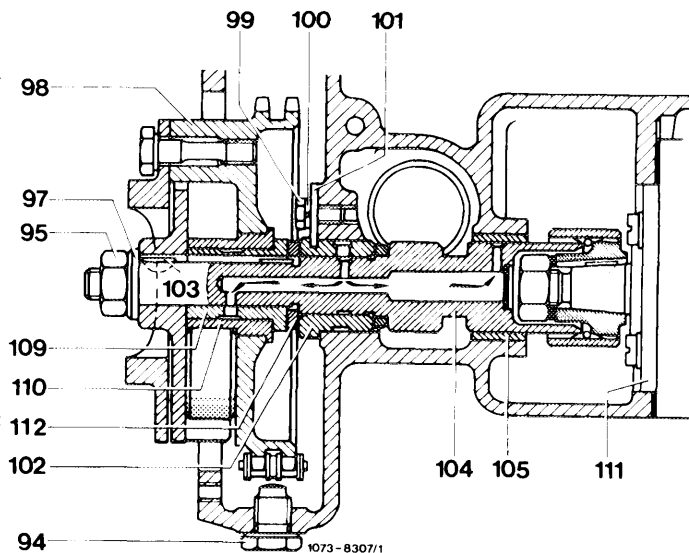
Bearing bushing (110) no longer has any drillings.

To avoid confusion in the event of repair, the inside diameters of bearing bushing (110) and bearing bushing (109) have additionally been reduced to 23 mm (previously 24 mm).

Nut (95) has been modified from poly-stop to a normal hexagon type.

2nd version

- | | |
|----------------------------|--|
| 94 Retaining bolt | 102 Bearing bushing front |
| 95 Nut M 14 | 103 Woodruff key |
| 97 Washer | 104 Intermediate gear shaft |
| 98 Injection timing device | 105 Bearing bushing rear |
| 99 Bolt M 6 x 12 | 109 Bearing bushing |
| 100 Lock washer B 6 | 110 Bearing bushing, injection timing device |
| 101 Retaining washer | 111 Injection pump |



The modified injection timing device and the modified bearing bushing (109) must not be used with the intermediate gear shaft as per the 1st version, because no oil would be able to reach the bearings. In contrast, the modified intermediate gear shaft may be used with the injection timing device and the bearing bushing as per the 1st version.

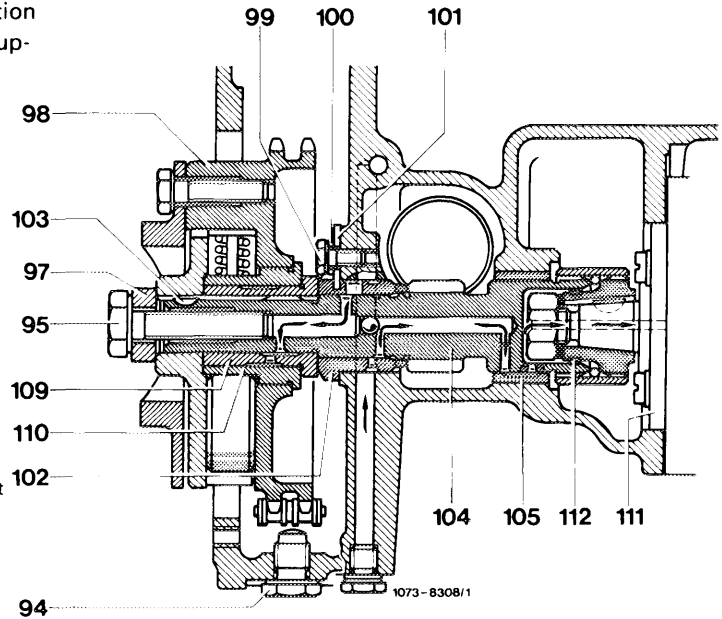
Bearing bushing (110) cannot be exchanged singly.

The oil supply for the injection pump and the injection timing device mounting have been modified on the up-rated engines.

The injection timing device is attached to the intermediate gear shaft by an M 10 x 45 bolt (95).

3rd version

- | | |
|----------------------------|--|
| 94 Retaining bolt | 102 Bearing bushing front |
| 95 Bolt M 10 x 45 | 103 Woodruff key |
| 97 Washer | 104 Intermediate gear shaft |
| 98 Injection timing device | 105 Bearing bushing rear |
| 99 Bolt M 6 x 12 | 109 Bearing bushing |
| 100 Lock washer B 6 | 110 Bearing bushing, injection timing device |
| 101 Retaining washer | 111 Injection pump |



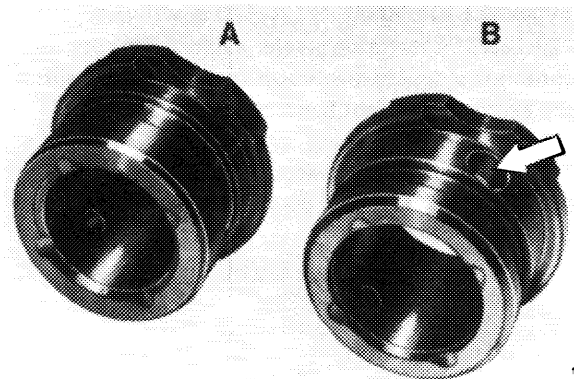
Due to bolt (95) the outside diameter of intermediate gear shaft (104) and the inside diameter of bearing bushings (102 and 109) have had to be enlarged by 1.3 and 2.0 mm, respectively.

Bearing bushing (109) is 3 mm larger in outside diameter to avoid confusion.

Thrust washer (112) and the rear Woodruff key have been discarded.

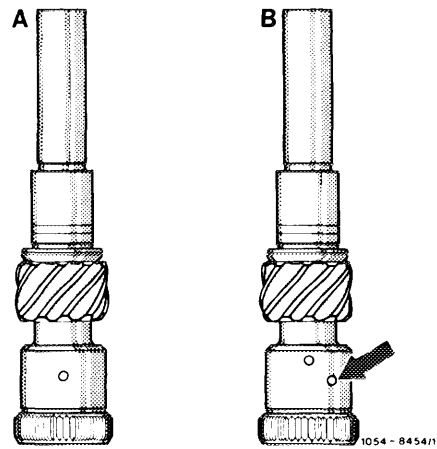
Injection timing device (98) has not been modified but for the larger bearing bushing (110).

The injection pump receives the necessary lubricating oil via the intermediate gear shaft (arrows). For this purpose an additional oil drilling (B, arrows) is provided in both bearing bushing (102) and intermediate gear shaft (104).



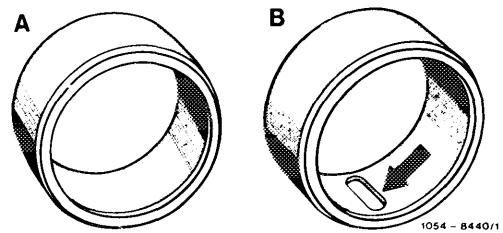
A Front bearing bushing (1st and 2nd versions)
 B Front bearing bushing (3rd version)

106-15635



A Intermediate gear shaft (1st and 2nd versions)
 B Intermediate gear shaft (3rd version)

Moreover, bearing bushing (105) also has an oil groove (B, arrow).



A Rear bearing bushing (1st and 2nd versions)
 B Rear bearing bushing (3rd version)

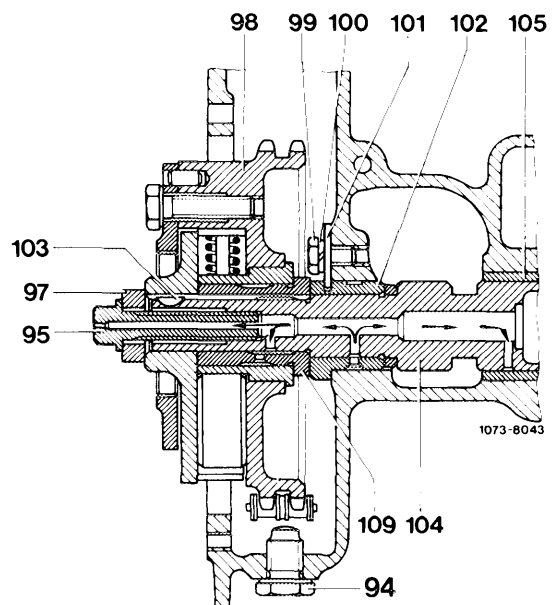
In the event of repair the rear bearing bushing (105) may also be used in engines featuring the 1st and 2nd versions.

For the 1st and 2nd versions, parts (98, 102, 104 and 109) must always be installed as a complete set.

Starting about August 1978, partial engines in general are equipped with the 3rd version.

Types 123.102/103/105/125/130 as well as types 123.183/190 featuring greater payload capacity incorporate a double diaphragm vacuum pump (with the exception of right-hand drive models).

The double diaphragm vacuum pump receives the necessary lubricating oil via the hollow bolt (95).



The double diaphragm vacuum pump can be used only with the modified injection timing device (without cam) and with the hollow bolt (95).

The hollow bolt must not be used in the single diaphragm vacuum pump because the diaphragm might otherwise be damaged by hot oil.

Types 123.105/132 and type 123.190 featuring greater payload capacity have been equipped at short notice with intermediate gear shaft (A). In the event of repair the latter can be replaced by the intermediate gear shaft with the second drilling (B).

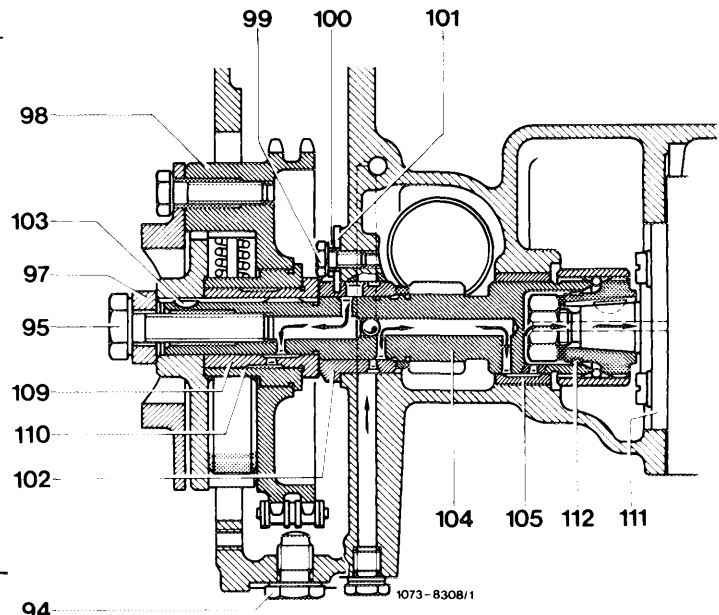
Removal

- 1 Remove radiator and fan.
- 2 Remove vacuum pump (42–610).
- 3 Remove injection timing device (07.1–210).
- 4 Remove helical gear shaft (05–410).

- 5 Remove injection pump (07.1–180).
- 6 Draw intermediate gear shaft out in aft direction.
- 7 Unscrew bolt (99) and remove retaining washer (101) from front bearing bushing (102). Draw bearing bushing (102) out in forward direction.

8 Drive out rear bearing bushing (105) in aft direction, using suitable drift.

- 99 Bolt M 6 x 12
- 100 Lock washer B 6
- 101 Retaining washer
- 102 Bearing bushing front
- 103 Woodruff key
- 104 Intermediate gear shaft
- 105 Bearing bushing rear



Installation

9 If a new rear bearing bushing (105) is required first chill in liquid nitrogen and then insert using suitable drift with flange.

10 Insert front bearing bushing (102), fit retaining washer (101) in groove on bushing and tighten with bolt (99).

11 Insert intermediate gear shaft from rear.

12 Fit injection timing device (07.1-210).

13 Fit injection pump (07.1-180).

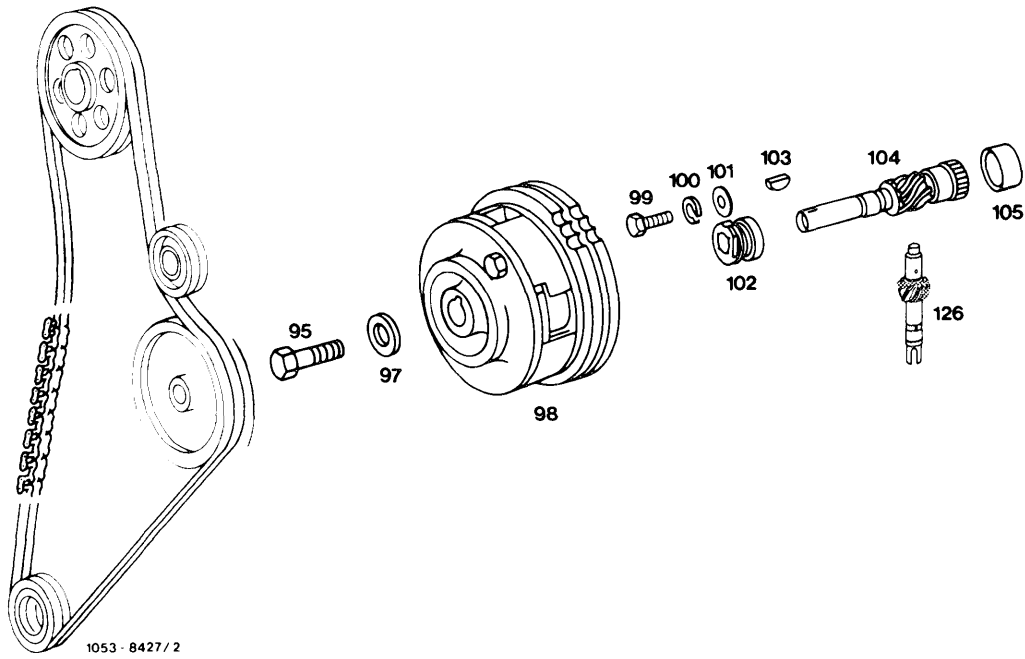
14 Check camshaft timing (05-215) and start of delivery at injection pump (07.1-110).

15 Attach vacuum pump (42-610).

16 Install radiator and fan.

17 Fill cooling system with coolant (20-010) and then pressure-test.

Intermediate gear shaft and injection timing device



Injection timing device, 3rd version

95	Bolt M 10 x 45	102	Bearing bushing front
97	Washer	103	Woodruff key
98	Injection timing device	104	Intermediate gear shaft
99	Bolt M 6 x 12	105	Bearing bushing rear
100	Lock washer B 6	126	Helical gear
101	Retaining washer		