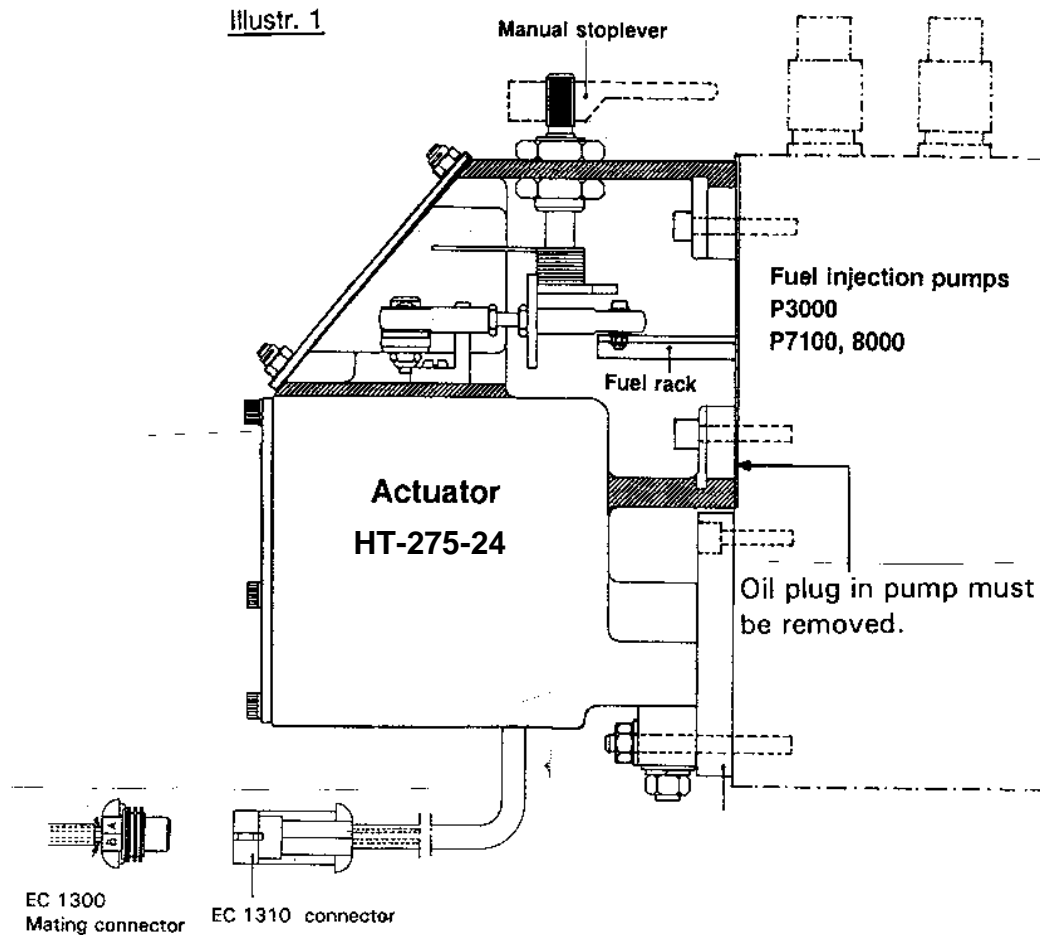


Installation Instructions for HT-275-24 on P3000, P7000 and P8500 Pumps

Note: For the proper function of the HT-275-24 actuator follow these instructions

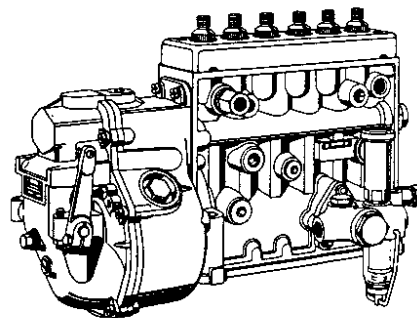


1. Installation Preparation

- 1.1 If the fuel injection pump is equipped with a mechanical governor, remove it according to the manufacturer's instructions.

Attention: Collect the internal lube oil

- 1.2 Clean the surface of the pumpface from all remaining gasket material. Polish the surface if scratched.
If present, remove the oil drain plug between the fuel rack and the camshaft.



NOTE: All screws and nuts must be tightened according to the torque table, page 5

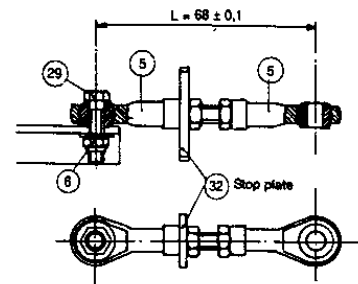
2. Installation.

- 2.1 Unpack the appropriate bearing kit. Install it on to the pump according to instruction in this page
- 2.2 Remove the actuator top cover (33).
- 2.3 Remove the linkage (30) from the actuator operating lever (7). If necessary, adjust the linkage length according to illustration 3. Align both ball links (5) exactly horizontally, the stop plate (32) must be at 90°.
- 2.4 Install the linkage (30) with screw (29) and nut (6) to the outside hole of the fuel rack. Tighten the nut (6) with 3,5 - 4,5 Nm. The stop plate (32) must point up vertically.
- 2.5 Coat the flat gasket (2) slightly with MTS 5024 Optid sealing paste or similar, and lay it symmetrically on to the pump face.
- 2.6 Loosen the two mounting bar fixation nuts (15) just slightly, so that the mounting bar (12) can be slid.
- 2.7 Slide the actuator carefully over the linkage (30) and place it symmetrically onto the pump face. Install the 4 upper screws (4) with washers (3) and tighten them with 7-9 Nm. Make sure the gasket (2) is centered properly.
The stoplever (34) must engage behind the stop plate (32).
- 2.8 Press the mounting bar (12) against the bearing plate and hand tighten the 2 vertical fixation nuts (15).
- 2.9 Install the washers (16) and nuts (19) onto the threaded bolts (19). Tighten the nuts with 7-9 Nm.
- 2.10 Now tighten the vertical nuts (15) with 17-21 Nm.
- 2.11 With the screw (29) washer (28) and nut (6) connect the rear ball link to the operating lever (7) and tighten the nut (6) so that the ball link is still loose on the operating lever.

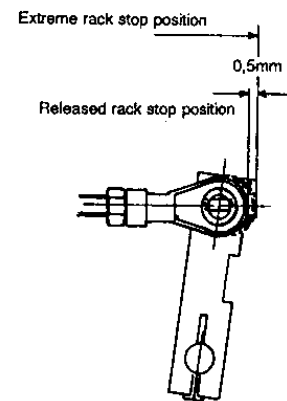
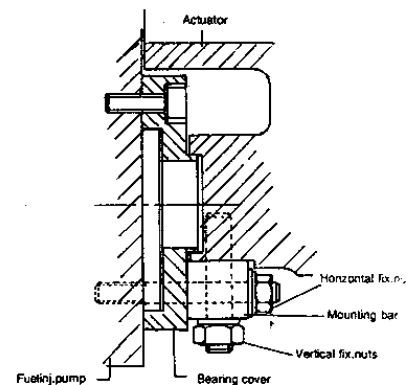
Important: To avoid wear of internal pump parts the operating lever must not pull the rack in its extreme shut off position. The rack must be approx. 0,5 mm away from its extreme shut off position (see illustr. 5).

- 2.12 With the operating lever (7) in its stop position pull the rack also in the extreme stop position, then move it 0,5 mm forward. Hold it in this position and tighten the nut (6) on screw (29) to 3,5 - 4,5 Nm. Illustration 6 shows this arrangement from the top.
- 2.13 It is imperative to check that the linkage moves freely over its entire travel, without any binding, hard points or play. The linkage must move radially by about 15°. Manually move the actuator lever with its linkage through its full range of motion. No binding must be felt. When releasing the lever, it should instantly snap back to the stop position.

Illustr. 3



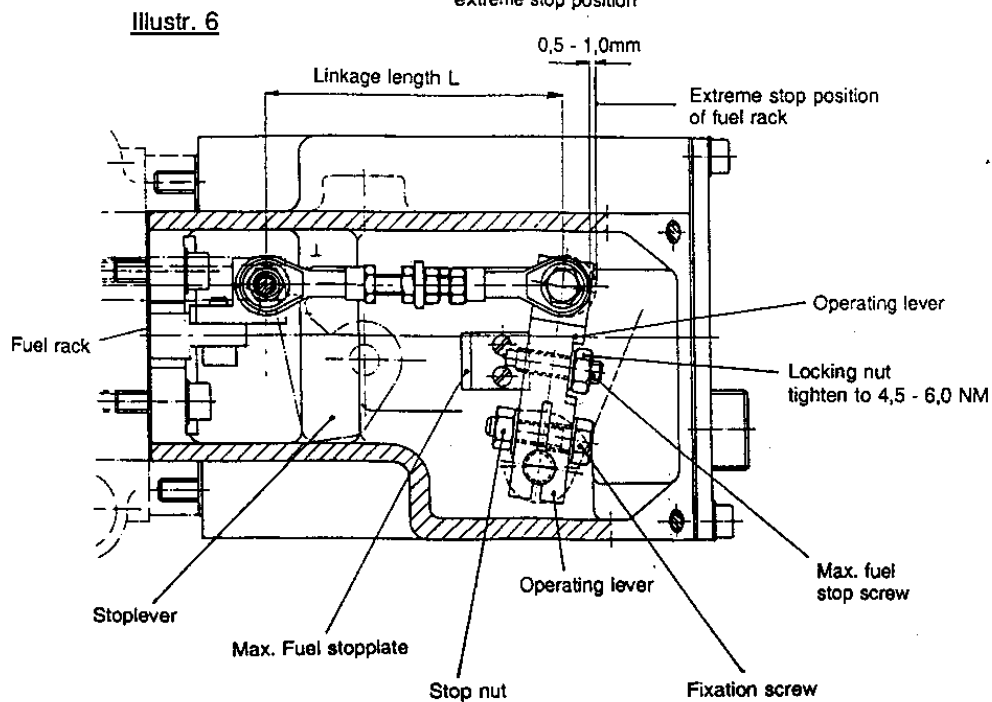
Illustr. 4



Illustr. 5

- 2.14 Turn the manual stoplever (1) in its extreme stop position. It should lock the operating lever (7) also in its stop position.
- 2.15 If the full load rack travel is known, it can be preset with the max. fuel set screw (10). The counter nut (9) should be tightened to 3,5 - 4,5 Nm. Otherwise the final max. fuel setting must be made on a test stand.
- 2.16 After the final setting of the max. fuel screw (10) re-install the top cover (33) with its gasket (27). Observe the location of the sealing screws (26). Tighten all 4 screws to 0,5 Nm. Seal the sealing screws with sealing wire.

Adjust linkage length so that when fastened to the operating lever the fuel rack is approx. 0,5 - 1,0mm away from its extreme stop position



Note: When fastening, hold fixation screw still and torque stop nut to 12 - 13.0 NM

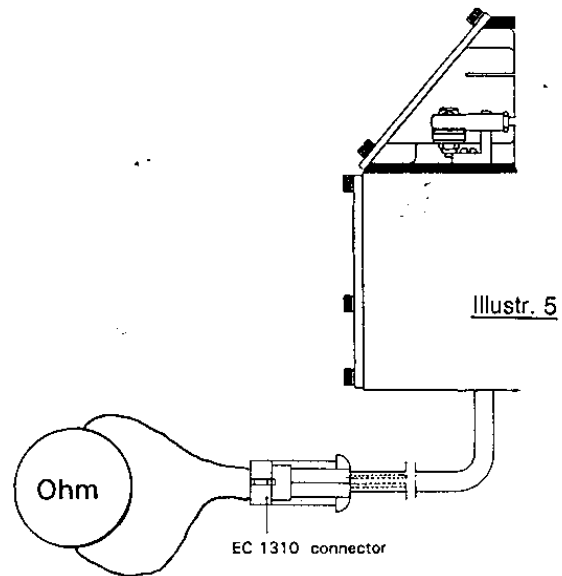
Torque values for Screws, Nuts

Illustr.	Qty.	Location	Torque Value
4	4	Actuator fixation screws	7 - 9 NM
6	2	Ball link lock nut	3.5 - 4 NM
7	1	Operating lever stop nut	12.5 - 13.0 NM
9	1	Full fuel screw lock nut	4.5 - 6.0 NM
15	2	Mounting bar to actuator	17.0 - 21.0 NM
18	2	Mounting bar to bearing cover	7 - 9 NM
24, 26	8	Lower cover lock screws, upper cover screws	0.5 - 1.0 NM
31	2	Linkage lock nut	3.5 - 4.5 NM

3. Electrical Connection

- 3.1 The two internal coil cables are assembled in a 2-pin watertight Packard connector. The mating connector is EC 1300. Support the supply cable close to the actuator to avoid excessive cable vibration and connector damage.
- 3.2 Prior to connecting the two cables from the actuator to the control unit it is recommended to conduct the following tests:
- Measure the resistance across the two cables
It should be between 4,5 - 5,2 Ohm
 - If the resistance is correct, apply 24V to the two cables. The actuator should snap in its forward position.
When the power is released it should snap back to its extreme no fuel position.
 - Apply again 24V to the actuator. Check whether the manual stop can push the fuel rack to zero fuel.

Illustr. 7



3.3 Current consumption

With the proper linkage arrangement the actuator currents should be:

No load $1,5 \pm 0,2$ Amp.

Full load $2,5 \pm 0,2$ Amp.

Note: record the actual currents during the initial tests for future references.

3.4. Cables

Voltage losses due to cable resistance between control unit and actuator should be avoided. They can lead to poor performance or instability.

The following cable cross sections are recommended.

Length	cross-section
up to 10 Meter	1,5 mm ²
above 10 - 20 m	2,0 mm ²

- Important:**
- ▲ To avoid cable or connector damage by vibration, fasten the cable to the frame somewhere close to the actuator.
 - ▲ DO NOT disconnect the cable between actuator and control unit during operation. This can cause excessive voltage spikes which could lead to control unit damage.

Installation of bearing kits

KT 275 - (3000)

KT 276 - (7000)

Introduction

After removal of the mechanical governor the camshaft bearing must be covered up again with the correct bearing kit and simultaneously the correct lateral camshaft play must be adjusted.

The following bearing kits must be used:

KT 275 - 3000 for BOSCH pump series 3000

KT 276 - 7000 for BOSCH pump series 7000

Each bearing kit contains 24 parts, as per individual parts list.

Installation procedure

- Adjustment of camshaft play: correct dimension is: 0,02 - 0,1mm

Measure dimensions "A" and "B" (see illustration)

The thickness of the shimpackage is obtained by subtracting "B" from "A" less 0,1mm gasket compression, less play.

Example: A = 6,08mm B = 5,2mm

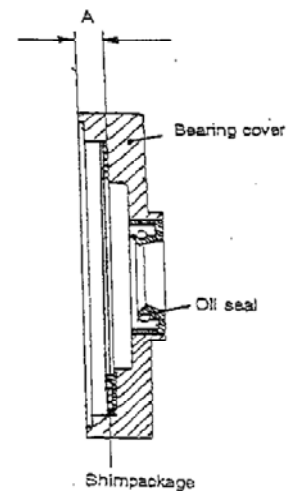
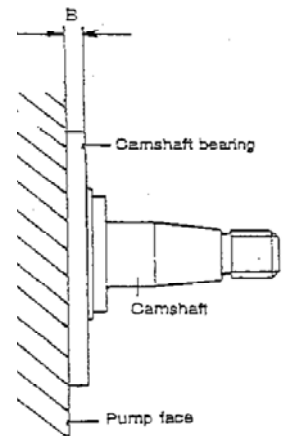
Shim package thickness : 6,08 - 5,2 - 0,1 = 0,78mm
 less play 0,02 - 0,1 = 0,68mm to 0,76mm

Selection of shims 1 x 0,5 = 0,5 (SR 276-4)
 2 x 0,1 = 0,2 (SR 276-1)

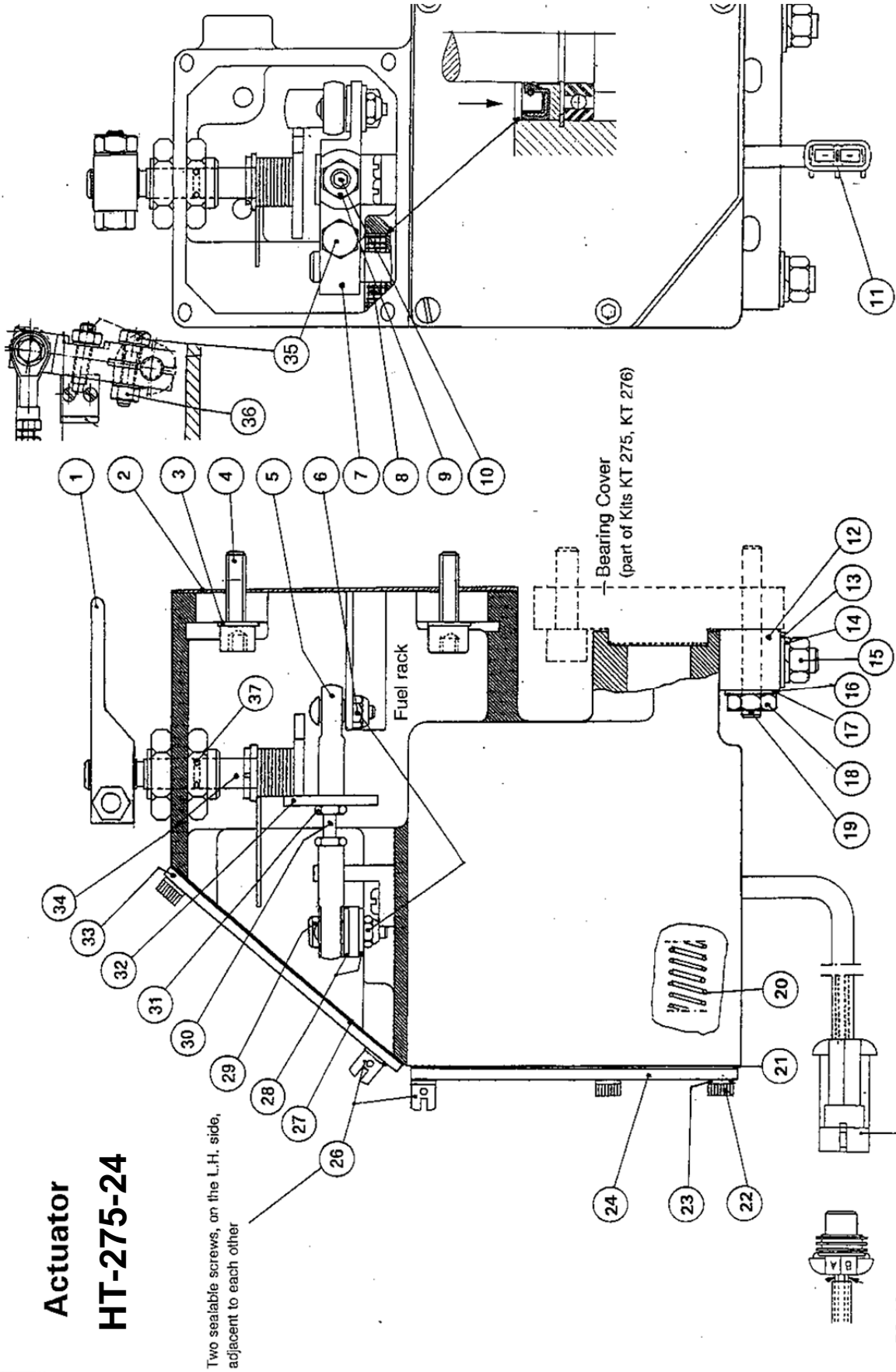
0,7 mm

Difference : 0,78 - 0,70 = 0,08 mm

Camshaft play is 0,08 mm
 =====



- Check for clean pump face. Polish off any old gasket material.
- Before installing the bearing cover, make sure the cylindrical camshaft surface is smooth and free of scratches or dents. If necessary, polish with some polish cloth. Grease camshaft end lightly.
- Insert shimpackage into bearing cover, install gasket on to pump face and slide bearing cover carefully over camshaft, so that the oilseal lip is not touching the keyway edges.
- Handtighten the upper two allen screws.
- Screw in the lower threaded bolts until they bottom and tighten them with 7-9 Nm.



Pos.	Qty.	Part No.	Description
01	1	LE 1400-4	stop lever
02	1 ²	GA 277	pump gasket
03	4 ³	WA6-125	washer
04	4	SC6/22-912	allen screw
05	2 ⁴	BR 300	ball link
06	2 ¹	NT5-985	stop nut
07	1	LE 131	operating lever
08	1	SE 10267	oil seal
09	1	NT6-934	counter nut
10	1	M6DIN985	stop screw
11	1	EC 1310	connector, included
12	1	PL 275	mounting bar
13	2	WA-125A	flat washer
14	2	WA-1127B	lock washer
15	2	NT8-934	nut
16	2 ³	WA6-BN 737/522	flat washer
17	2 ³	WA6-137A	lock washer
18	2 ³	NT6-934	nut
19	2 ³	SC6/50-835 FO	threaded bolt (part of bearing kit)
20	1	SP 202	actuator spring
21	1 ²	GA 271	gasket, lower cover
22	6	SC5/12-912	allen screw
23	8	WA5-137A	washer
24	1	CV 276	lower cover
25	1	EC 1300	mating connector
26	2	SC5/12-404	sealing screws
27	1 ²	GA 270	gasket, upper cover
28	2 ⁴	WA5-BN 737/522	flat washer
29	2 ¹	SC5-ISO 2320	screw, ball link
30	1 ¹	RD 120-1	connecting rod
31	2 ¹	NT 5-934	nut
32	1 ¹	PL 276	stop plate
33	1	CV 277	top cover
34	1	KT 281	manual stop device complete
all ⁰	1	LK 275	linkage complete comprise pos. 5, 6, 28, 29, 30, 31, 32
35	1	SC6/25-933	fixation screw
36	1	NTG-985	stop nut
37	1 ²	GA 1658	O-ring (on shaft of stop lever)
all ²	1	KT 275 GA	seal kit, comprise pos. 2, 21, 27, 37
all ³	1	KT 286	screw kit, comprise pos. 4, 16, 17, 18, 19