

Reparaturanleitung  
Repair Manual  
Manuel de Réparation  
Manual de Reparaciones  
Manuale di Riparazione

**ZF-ECOSPLIT**  
16 S 251

1316 751 102a



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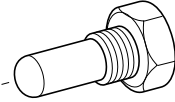
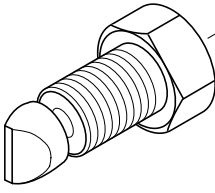
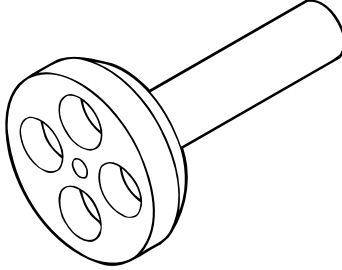
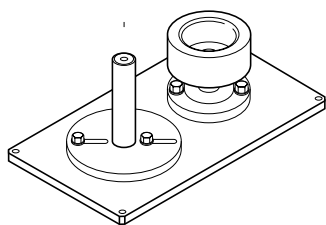
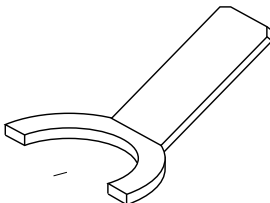


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Description ZF reference no.	Name	Approx. quantity	Application	Remarks
Sealing compound 0666 690 017	Loctite Nr. 241	0,25 g 5 g 300 mm <sup>3</sup>	cover breather articulation bolt	shift system selector housing planetary range
Sealing compound 0666 690 022	Loctite Nr 262	120 mm <sup>3</sup>	threaded insert M10, M12	GP-housing
Sealing compound 0666 790 017	Wevo-L100 A	6 g	shaft sealing ring	connection plate
Sealing compound 0666 790 033	Loctite Nr. 574	1 g 1 g  6 mm <sup>3</sup> 80 mm <sup>3</sup>	M10x70 M10x140 pump cover sealing plug sealing cover	trans.-housing trans.-housing  pulse sensor IT planet carrier
Grease 0671 190 016	Vaseline 8420		slightly grease vulcanized sheathing of shaft sealing rings	
Grease 0671 190 050	Olista Longtime 3EP	2 g	bush	connection plate
Grease 0750 199 001	for example: Spectron FO 20	4 g 5 g 5 g 5 g 3 g 6 g	bearing inner ring scraper bearing bush cap collar double u-packing sealing ring for general assembly	main shaft shift turret Ausleger GV-shift system GV-shift system GP-shift system
Anti-corrosive oil 0750 199 008	for example: Renolin MR 40 Z	0,50 ml	external rotor	pump shaft

**NOTE:** Inquire about the size of bundles that can be delivered before placing any orders!

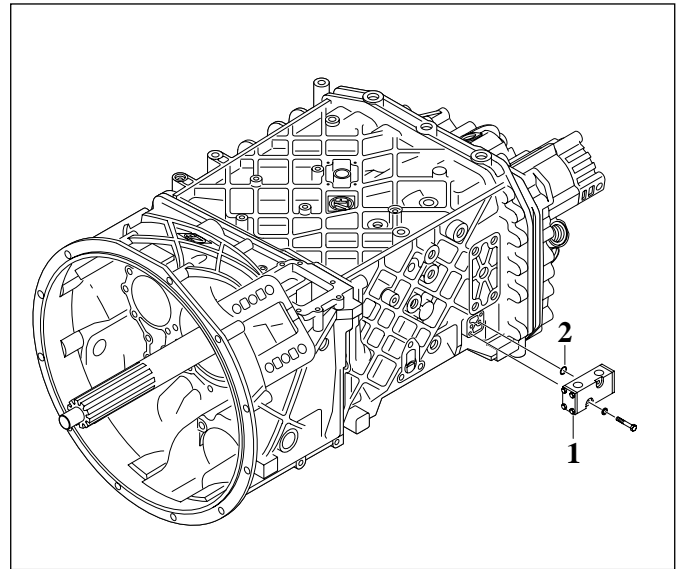
Fig. no.	Special tools	Order no.	Application	Qty.	Remarks
16		1X56 137 287	Fixing screw for removal and installation of shafts	1	Chapter 5.3
17		1X56 137 579	Fixing device for panel stop	1	Chapter 1.5 1.6 5.1 5.5
18		1X56 137 651	Adapter for locking plate / output flange	1	Chapter 1.2
19		1X56 137 675	Holding fixture for shaft package	1	Chapter 5.3
20		1X56 137 676	Adapter for split ring / main shaft	1	Chapter 10.1

**1.4 5/2-way valve****Removal**

- 1 Unscrew 5/2-way valve **(1)** from centre housing.
- 2 Remove O-rings **(2)**.

**NOTE**

Do not dismantle 5/2-way valve since it is a complete part.



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**Mounting**

- 1 Insert new O-ring **(2)** into 5/2-way valve **(1)**.
- 2 Screw 5/2-way valve **(1)** onto centre housing.  
Tightening torque = 9.5 Nm.

- 1 Insert 4 plate spring (11) and axial ball bearing (10) into planet carrier.

**NOTE**

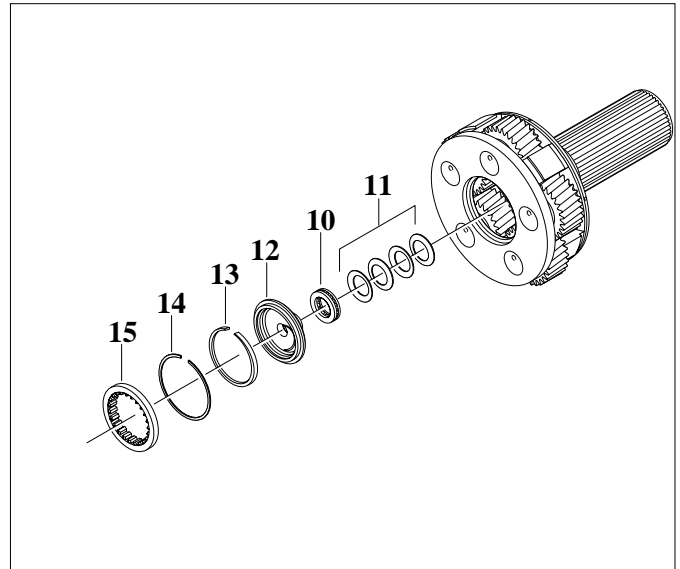
For teh arrangement of the 4 plate springs (11) see Fig. 012317.

- 2 Insert cover (12) and snap-rings (13 and 14).

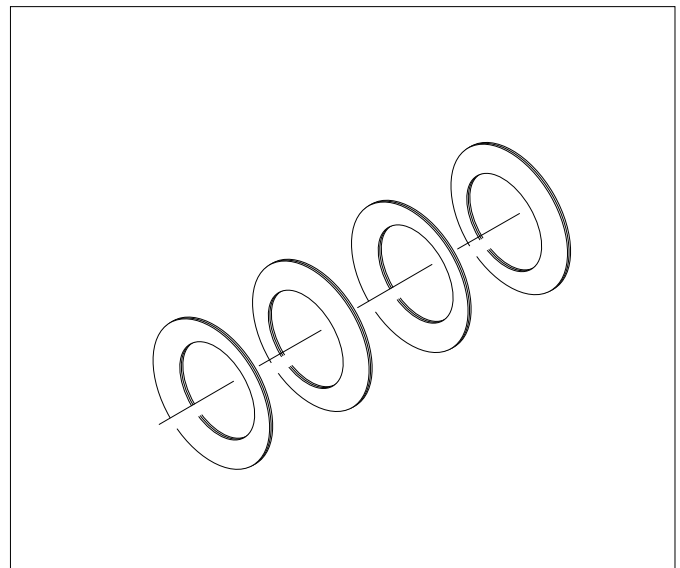
**NOTE**

For propper installation of the snap-ring (13) see Fig. 012318.

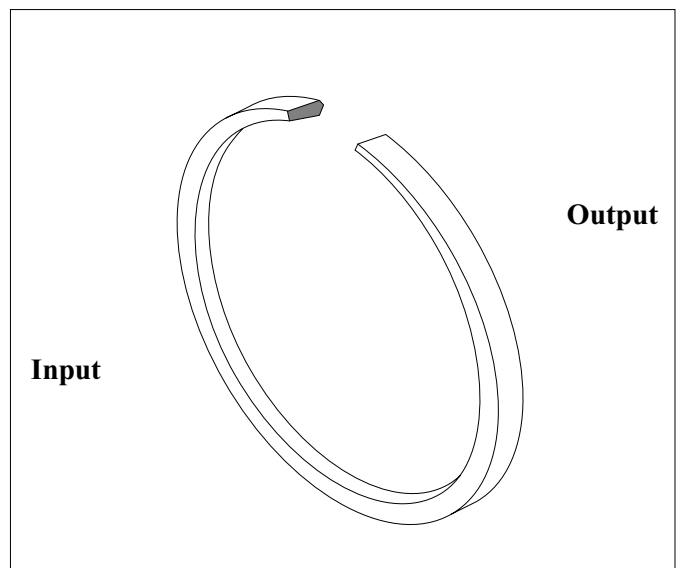
- 3 Add thrust washer (15).



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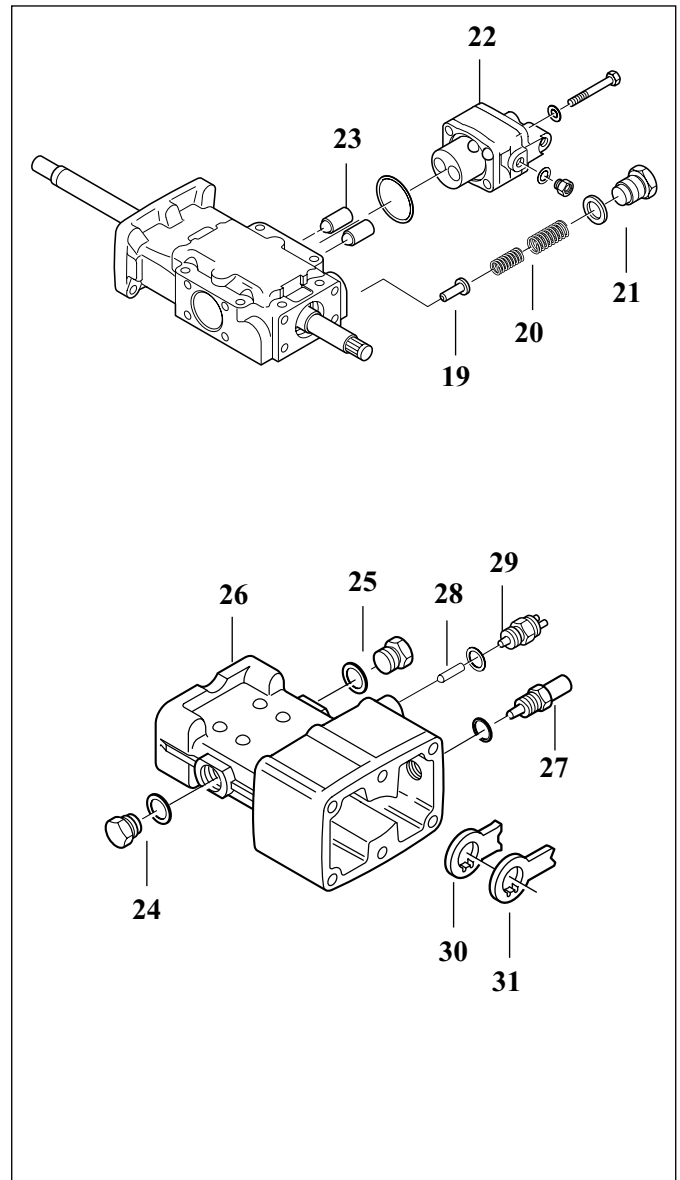
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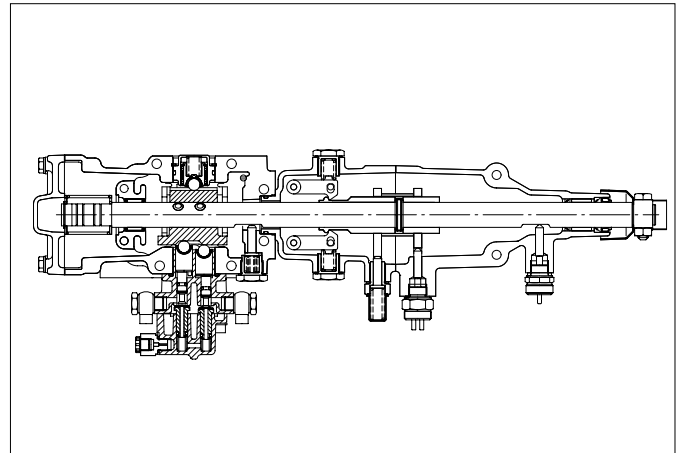
- 12 Insert detent (19), spring (20) and screw plug (21) together with new seal ring and tighten.  
Tightening torque = 60 Nm.
- 13 Insert cutoff valve (22) into shift housing together with new O-ring, ensuring it is positioned the correct way round, and fix using hex bolts.  
Tightening torque = 23 Nm.
- 14 Insert screw plugs (24 and 25) into housing (26) together with new seal ring and tighten.  
Tightening torque = 50 Nm.
- 15 Screw detent plunger (27) into housing together with new seal ring.
- 16 Insert greased pin (28) into bore. Close off using switch or screw plug (29) and new seal ring.  
Tightening torque = 35 Nm.
- 17 Insert detent (30) and detent plate (31) into housing, ensuring they are positioned the correct way round.



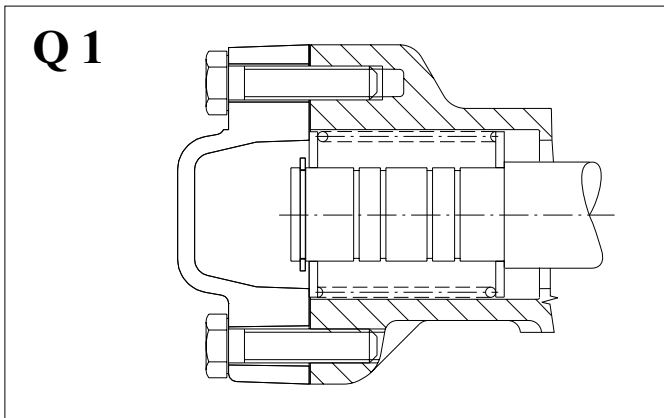
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3.4.4 Horizontal torque shaft right /  
Selector pattern II

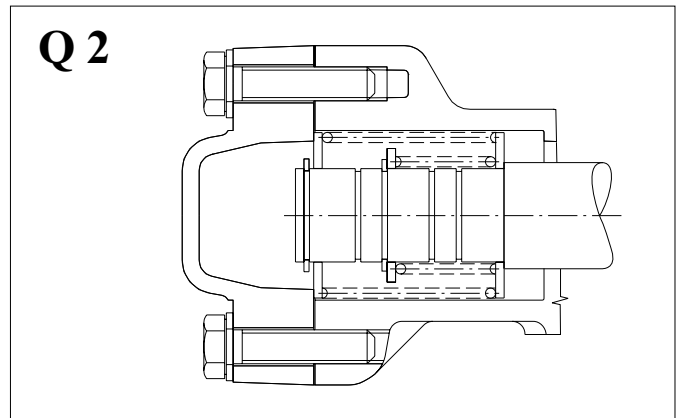
Spring pack arrangements Q1 - Q6



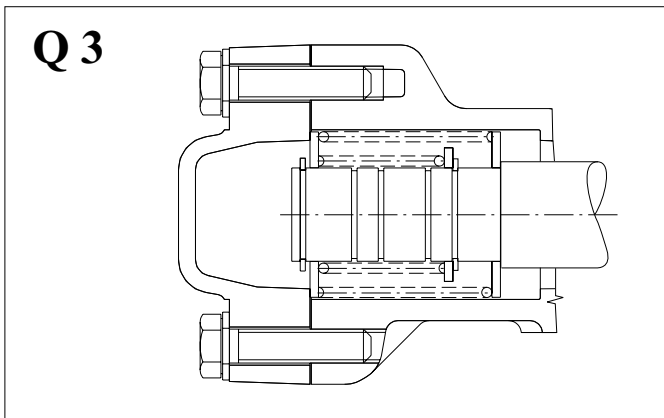
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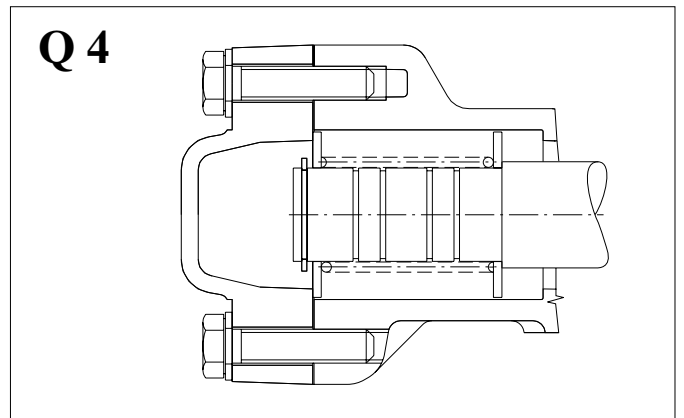
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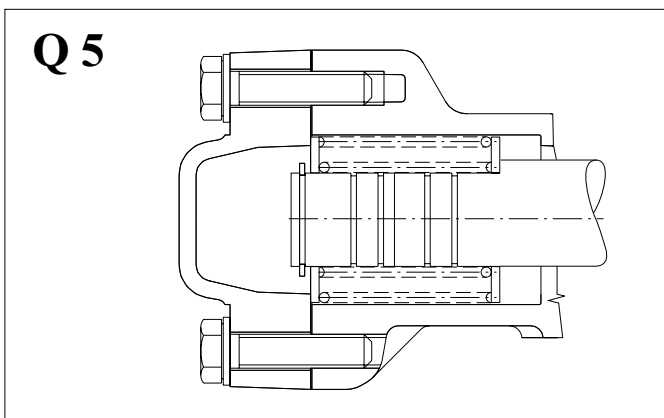
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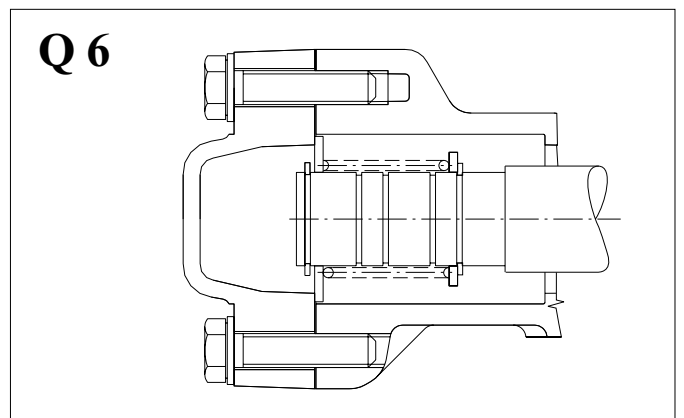
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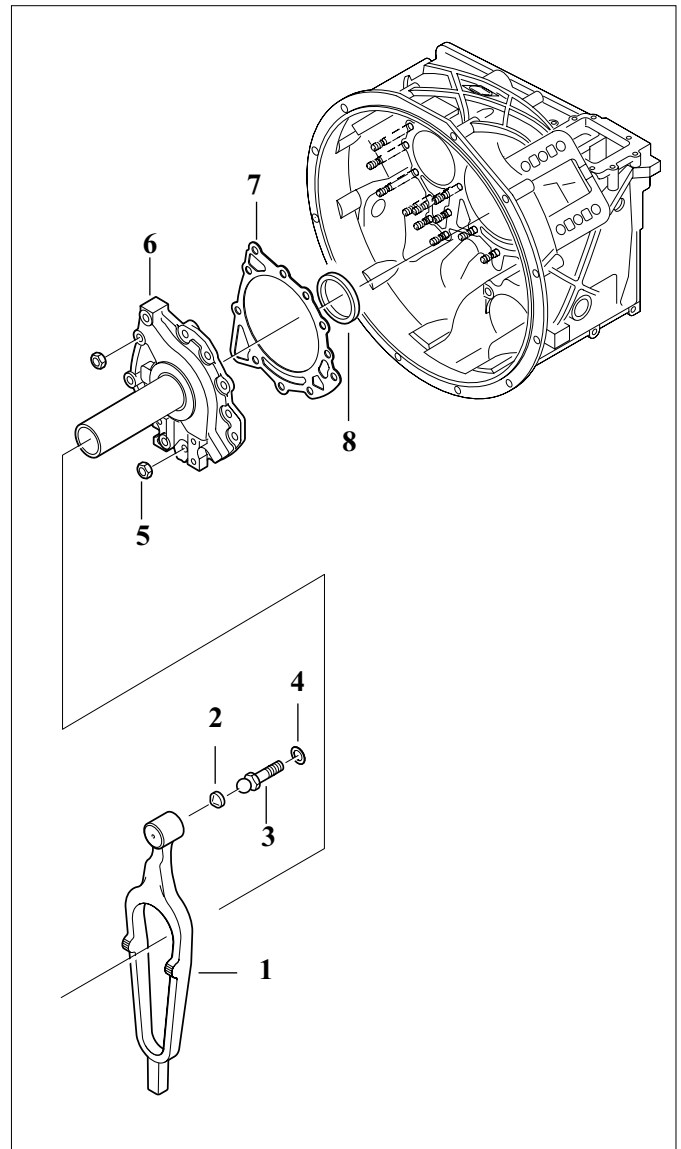
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**4.1.3 Removing release fork (pushed)**

- 1 Remove release fork (1) together with ball cup (2).
- 2 Remove ball pin (3) together with washer (4).

**Removing connection plate**

- 1 Loosen hex nuts (5).
- 2 Remove connection plate (6) together with gasket (7).
- 3 Remove shaft ring (8) from connection plate.

## 5 Components / centre housing

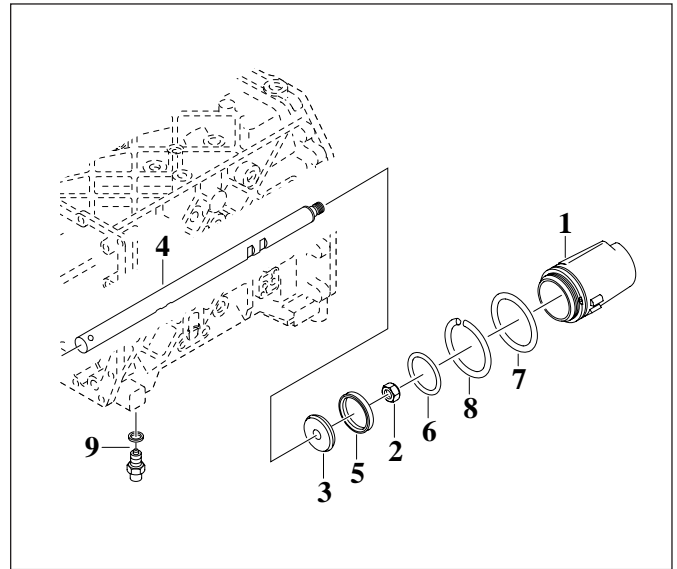
### 5.1 Splitter (GV) cylinder

#### Removal

- 1 Remove cylinder (1) by hand.
- 2 Remove detent plunger (9) together with circlip. Insert fixing device 1X56 137 579.
- 3 Remove locking nut (2).
- 4 Remove spring (8) from housing.
- 5 Remove piston (3) from shift rail (4).
- 6 Remove double-grooved ring (5) from piston.
- 7 Remove two O-rings (6 and 7) from cylinder.

#### NOTE

There may be three O-rings in the cylinder.



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#### Mounting

- 1 Remove supporting plate and cylinder.
- 2 Check locking nut on piston. Tightening torque = 150 Nm.
- 3 Fit spring washer (1) onto housing.
- 4 Fit cylinder (2) with new O-rings (3 and 4).

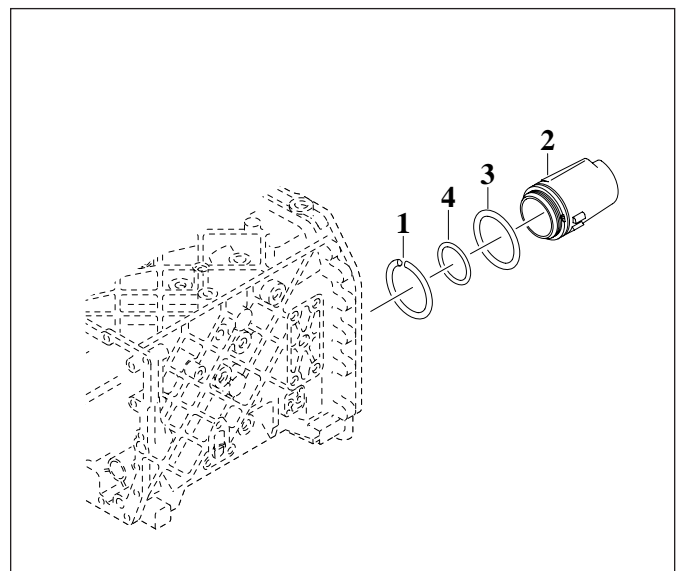
#### NOTE

If necessary, fit 3 O-rings.  
Hint: Lightly oil O-rings.

- 5 Insert cylinder onto centre housing.

#### NOTE

Line up lug on cylinder with groove in centre housing.



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## 6 Input shaft

### Dismantling

- 1 Remove complete input shaft unit from main-shaft.
- 2 Remove clutch body (1) and synchronizer ring (2) from input shaft synchronizer.
- 3 Remove ring (6) from inside clutch body.

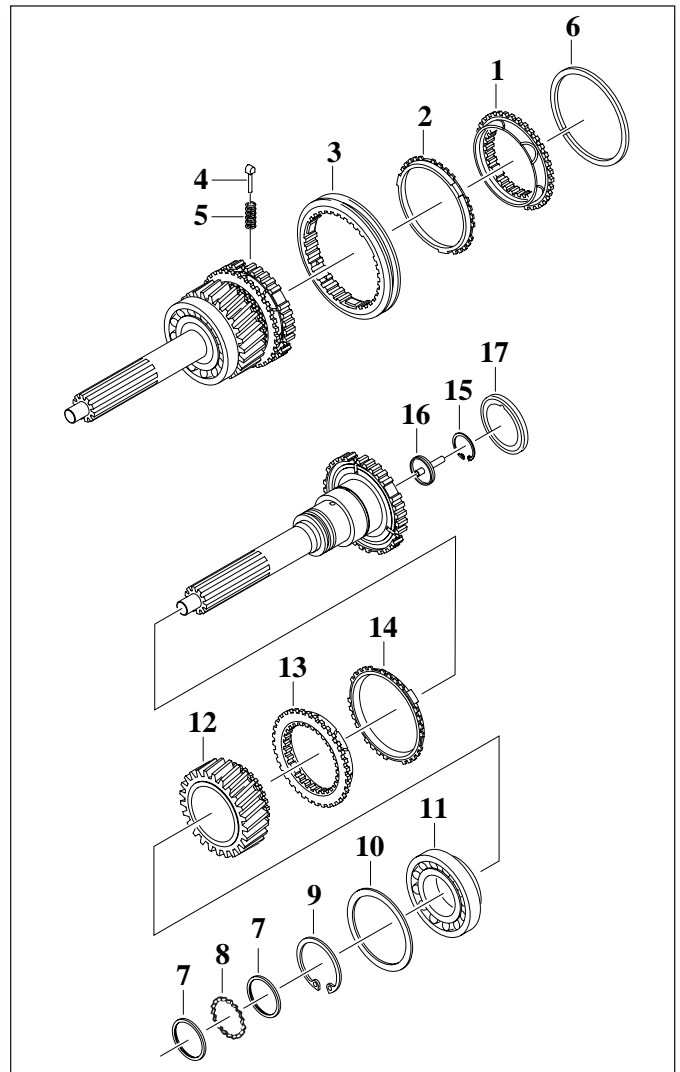
#### NOTE

Procedure for measuring and fitting ring (6) is shown in **Section 10.1**.

#### **⚠ DANGER**

**Pressure pieces are under spring pressure. Prevent pressure pieces from flying out.**

- 4 Pull off sliding sleeve (3) from input shaft. Catch released pressure pieces (4) and compression springs (5).
- 5 Remove washers (7) together with spacer ring (8).
- 6 Remove ring (10), loosen and remove circlip (9).
- 7 Pull off roller bearing inner race (11) from input shaft using gripper **1X56 136 722**, extension **1X56 122 310**, threaded insert **1X56 122 303** and basic tool **1X56 122 304**. To do this, slide gripper **1X56 136 722** over roller bearing inner race until firmly seated against rollers and tighten using knurled ring.
- 8 Remove helical gear (12) from input shaft.
- 9 Remove clutch body (13) and synchronizer ring (14) from input shaft.
- 10 Remove oil baffle plate (17), detach circlip (15) and remove pipe (16) from input shaft.



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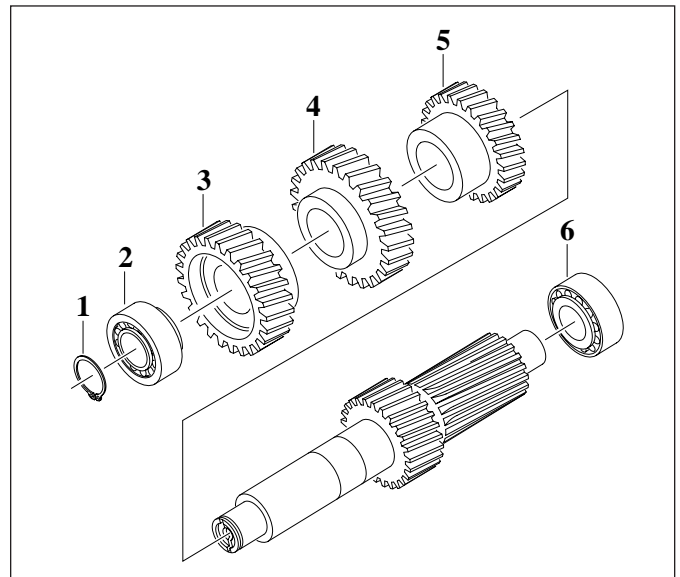
## 8 Layshaft

### Dismantling

#### CAUTION

**Do not damage layshaft. Always use aluminium clamping jaws when clamping layshaft .**

- 1 Clamp layshaft.
- 2 Detach circlip (1) from annular groove.
- 3 On input end slide gripper **1X56 136 756** over roller bearing inner race (2) and tighten knurled ring to grip roller bearing firmly. Screw on basic tool **1X56 122 304** and pull off roller bearing (2).
- 4 On output end, slide gripper **1X56 136 710** over roller bearing inner race (6) and tighten knurled ring to grip roller bearing firmly. Place adapter on output end of layshaft. Screw on basic tool **1X56 122 304** and pull off roller bearing (6).
- 5 Press off helical gears (3, 4 and 5) individually and in sequence.



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