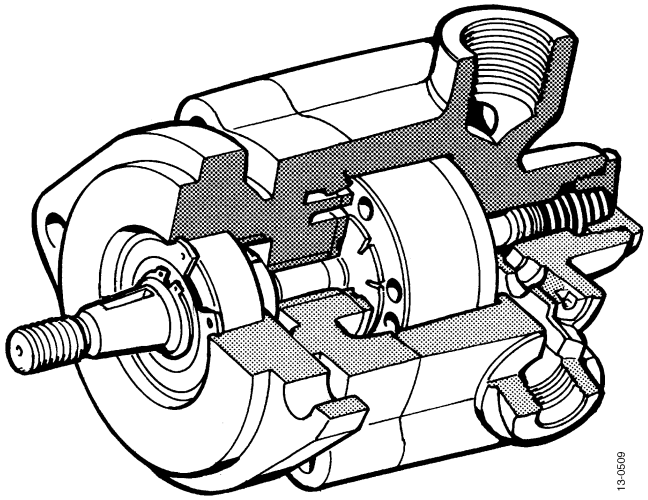
SCANIA

13:01-03

Issue 2 **en**

Power steering hydraulic pump LUK VT75A

Function and Work descriptin



1 585 745

Contents

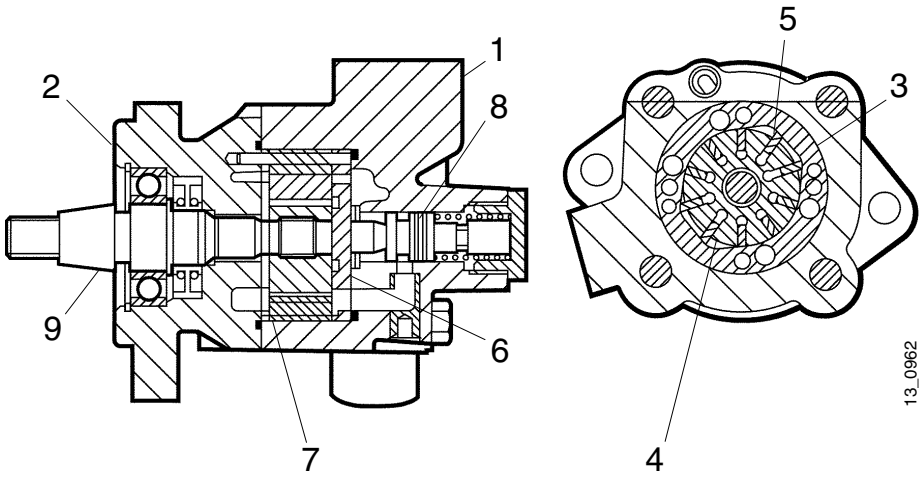
Description of operation

Hydraulic pump

General

This pump is a vane pump. The pump maintains a constant oil flow at all engine speeds above breakaway.

There are two versions (flows) of the pump; 16 l/min och 22 l/min at pump speeds above 1000 rpm. For engine speed based flows, see Workshop Manual main group 13, Steering gears and hydraulic pumps, specifications.



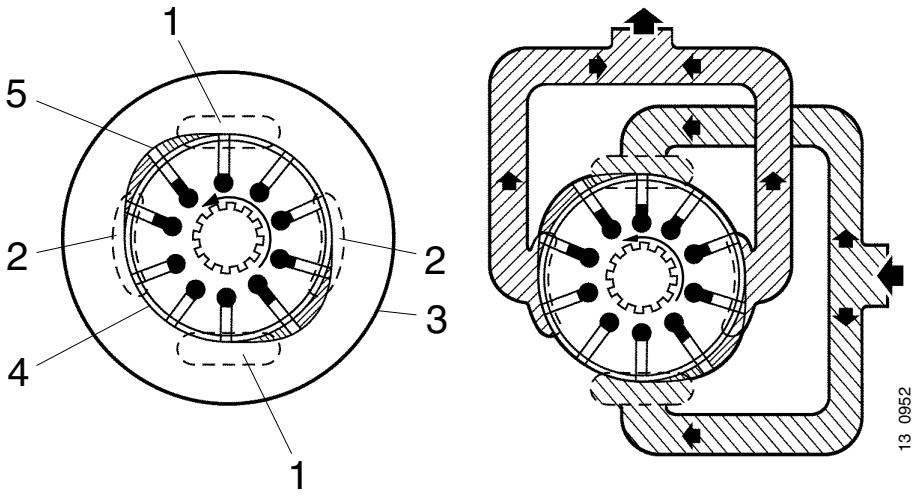
Main pump components.

1 Housing	*4 Rotor*	*7 Wear plate*
2 End plate	*5 Vanes*	*8 Valve unit*
3 Rotor housing	*6 Pressure plate*	*9 Drive shaft*

Principle of operation

The shaft, which is driven by the timing gears, drives the rotor in the rotor housing. When the rotor turns, the vanes are forced outwards by the centrifugal force and follow the rotor housing inner elliptic wall. The circular rotor movement and the vane outward movement increases the chamber volume between the vanes when they pass the inlet, creating a suction, whereby the atmospheric pressure forces oil into the rotor housing.

The inflowing oil is contained between the vanes and led past the expansion chamber. When the oil reaches the outlet, the rotor housing diameter decreases and the oil is pressed out through the outlet. Oil is contained behind the vanes at system pressure, in order to provide the best possible seal between the vanes and the rotor housing.



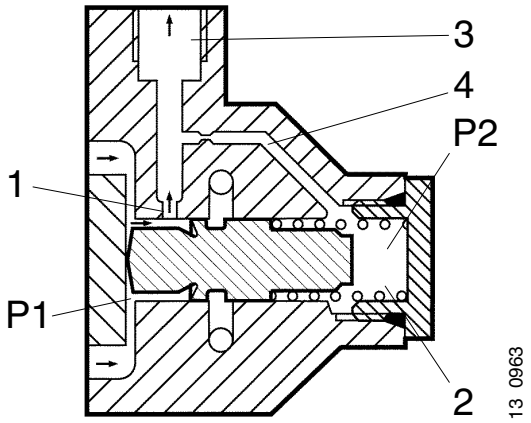
Principle of operation for the pump.

1 Inlet
2 Outlet
3 Rotor housing
4 Rotor
5 Vane

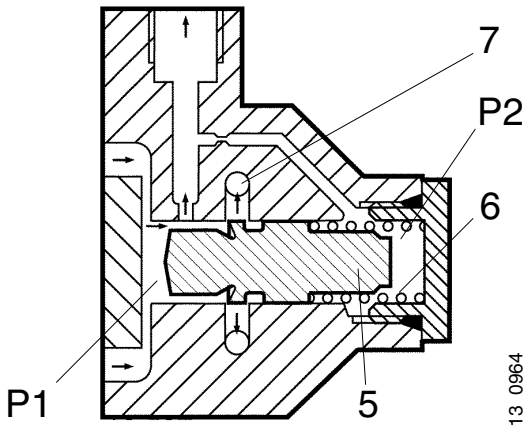
Flow limitation valve

The pump has an integrated flow limitation valve that limits the oil flow. When the flow exceeds a pre-set value, surplus oil is led back to the pump inlet through a bypass channel in the pump.

A pressure drop occurs at the restriction 1 through which the full pump flow passes. This condition only occurs at low pump speeds. The large spring chamber 2 is connected to pressure port 3 through channel 4. The oil pressure and spring pressure in the chamber overcomes the oil pressure from the pump side of the valve plunger and the valve remains closed.



When the maximum flow is reached, the pressure difference P1-P2 becomes so large that the spring pressure from spring 6 is exceeded. The plunger 5 then moves so that the passage 7, which is connected to the inlet, opens. Surplus oil then returns to the inlet.



Work description

Important information

The power steering pump - a component with high demands on product safety

Among other things, this work description covers renewal of seals in the power steering pump.

This work requires partial dismantling of the power steering pump in order to rectify leakage.

Correct function of the power steering pump is extremely important from a road safety perspective. For this reason, any action that involves work on the power steering pump must meet high product safety requirements.

For this reason, work must only be carried out under the following conditions:

- Test the function of the power steering pump and establish the cause of the fault using the method advised by Scania. See Workshop manual, group 13 Steering - Checking and troubleshooting.
- Work must be carried out in accordance with this description and using the tools specified.
- Cleanliness is essential when working on the power steering pump.
- Welding, grinding or other work which may generate dust must not be carried out in the vicinity while the work is carried out.
- No work may be carried out on the power steering pump additional to this Work Description.
- Check function of power steering pump in vehicle as mentioned above after work is completed.

Cleanliness - very important when working on the power steering pump

The need to keep everything clean when working on power steering pumps cannot be emphasised enough.

Contamination in the hydraulic system can cause damage and malfunction in the power steering system.

Above all, remember the following:

- Clean the power steering pump at the hose connections before these are disconnected. Remove any dirt and impurities from the power steering pump.
- Always change oil and oil filter after renewing any seals or renewing the power steering pump.
- Immediately seal the connection holes in the power steering pump.
- Always clean the fluid reservoir on the outside before a filter change.
- Disconnect the fluid reservoir hose connections and drain oil that has been contaminated when changing the filter.
- Always use a clean container when filling oil.
- The oil is not filtered until it returns from the steering gear.
- Never top up with used fluid.

Renewal

Note: Correct function of the power steering pump and the steering is extremely important from a road safety perspective. Observe strict cleanliness at all times when working on the power steering pump and the steering. Refer to the section Important information.

Removal

1 Tilt the cab according to Workshop Manual main group 18, Cab - Removing and fitting.

2 Drain the oil from the steering. Place a receptacle under the fluid reservoir. Disconnect the suction line first from the fluid reservoir and then from the hydraulic pump.

3 Clean and remove the connections to the power steering pump.

4 Detach and remove the power steering pump.

Fitting

1 Screw the power steering pump to the engine.

2 Screw the two oil hoses to the power steering pump.

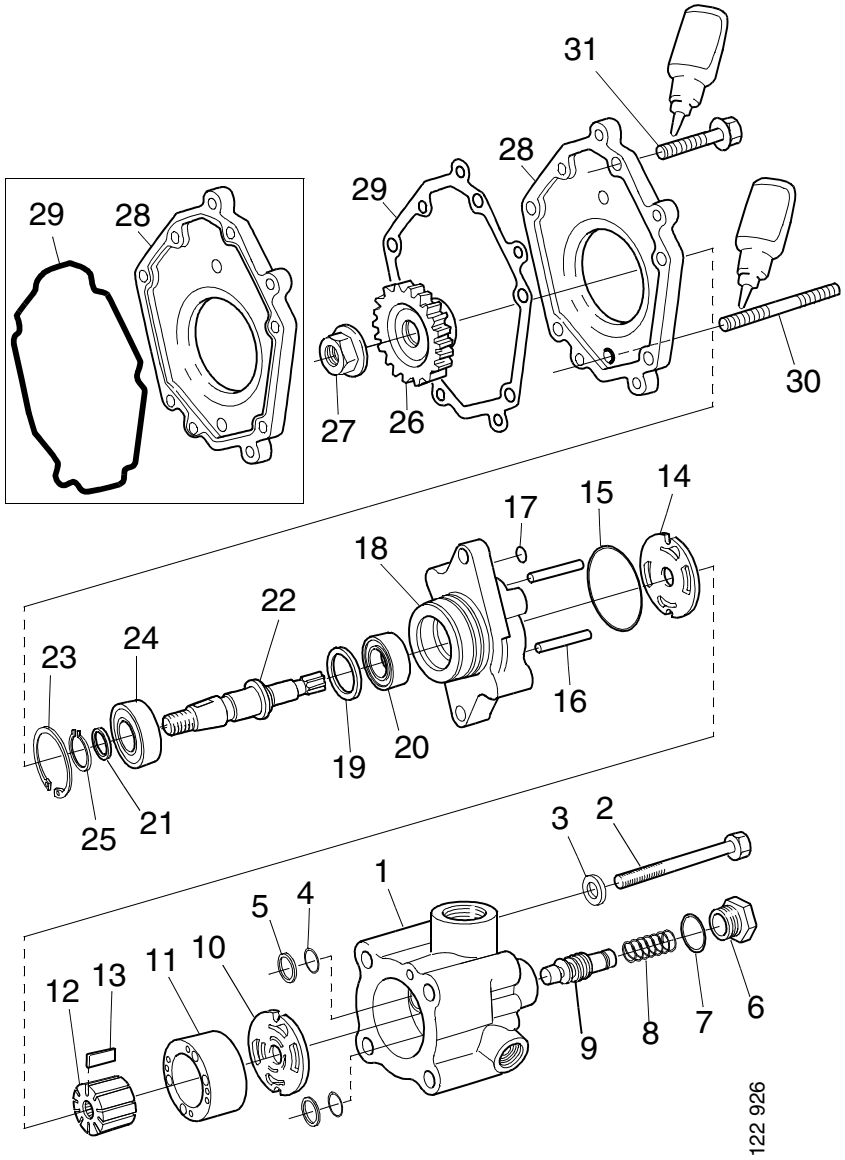
3 Fill with oil and bleed the steering according to the Workshop Manual main group 13, Steering - Checking and trouble-shooting.

4 Lower the cab into drive position according to Workshop Manual main group 18, Cab - Removing and fitting.

5 Check the function.

Repairing

Hydraulic pump VT75A, exploded view

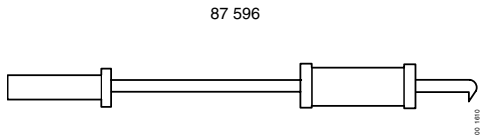


1 *Pump housing*
2 *Bolt, 4 off*
3 *Washer, 4 off*
4 *O-ring, 2 off*
5 *Support ring, 2 off*
6 *Plug*
7 *Gasket*
8 *Compression spring*
9 *Control valve*
10 *Pressure plate*
11 *Rotor housing*
12 *Rotor*
13 *Vanes*
14 *Wear plate*
15 *O-ring*
16 *Guide pin, 2 off*
17 *O-ring*
18 *End plate*
19 *Spacer*
20 *Seal*
21 *Washer*
22 *Shaft*
23 *Retaining ring*
24 *Bearing*
25 *Retaining ring*
26 *Gear*
27 *Nut*
28 *Flange*
29 *Gasket*
30 *Stud, 2 off*
31 *Bolt, 5 off*

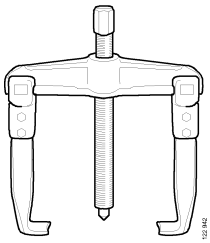
A new flange 28 and gasket 29 was introduced from chassis number SSS 1 272 522, SNL 4 455 051, SAN 9 062 838, SLA 3 527 565 and SBK 1 840 169.

Dismantling

Special tools

Number	Description	Illustration	Location
87 596	Slide hammer		D2

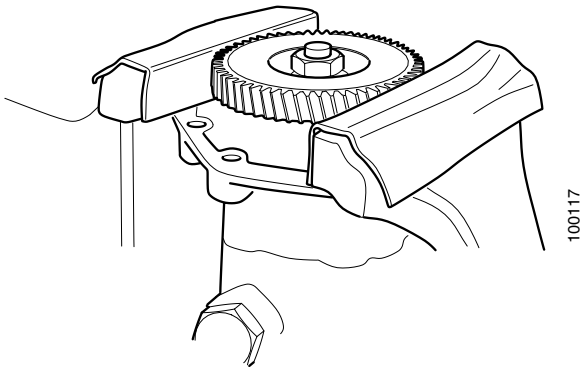
General workshop equipment

Number	Description	Illustration
587 315	Puller	

The numbers after the item descriptions refer to the illustration at the start of this section.

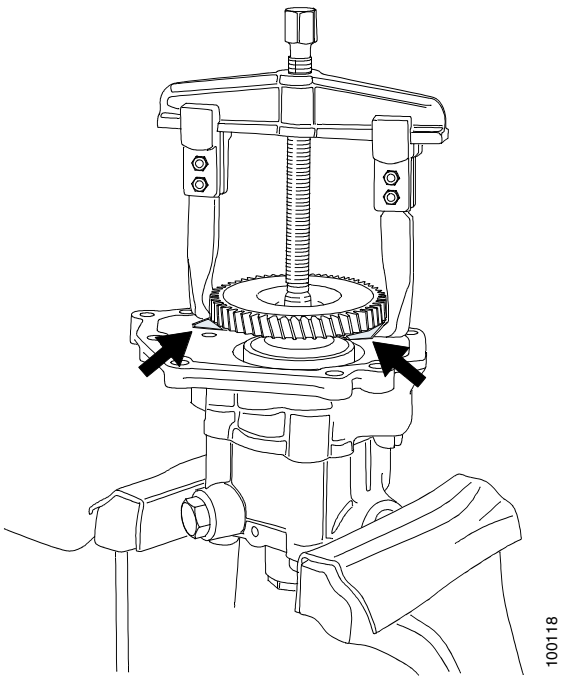
1 Drain all oil from the pump and clean it on the outside.

2 Clamp the gear 26 in a vice with protective jaws. Remove the nut 27.



3 Clamp the pump in the vice. Remove the gear 26 using puller 587 315 as illustrated.

Note: Use soft jaws on the puller to protect the gear from damage.



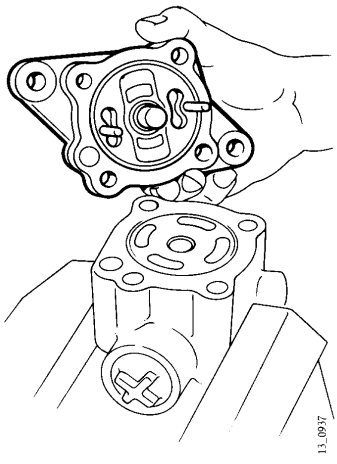
4 Remove the plug 6, spring 8 and valve 9.

Note: The plug is spring loaded and might fly off.

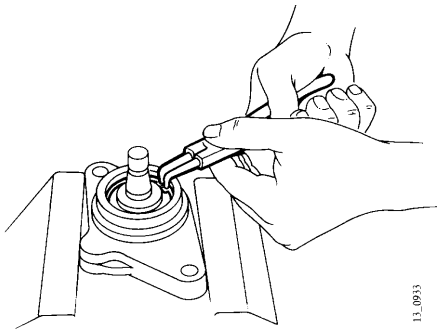
5 Remove the four bolts 2 which hold the housing and the end plate together. Remove the end plate.

6 Remove the wear plate 14 and the rotor housing 11 with rotor 12 and vanes 13.

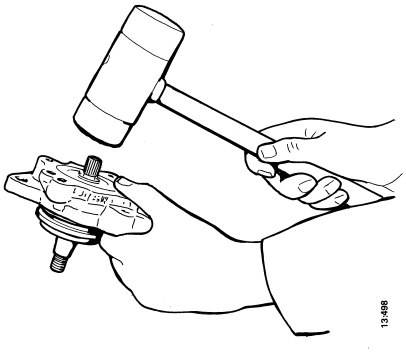
7 Remove the pressure plate 10 and two guide pins 16.



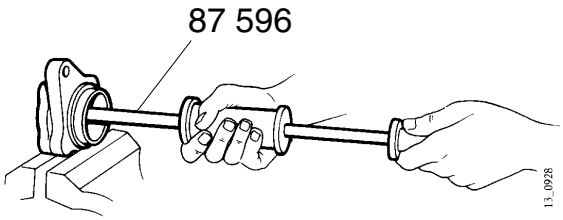
8 Remove the large retaining ring 23 from the end plate 18.



9 Tap out the shaft with a rubber mallet.



10 Remove the spacer 19. Remove the sealing ring 20 using tool 87 596 as illustrated.

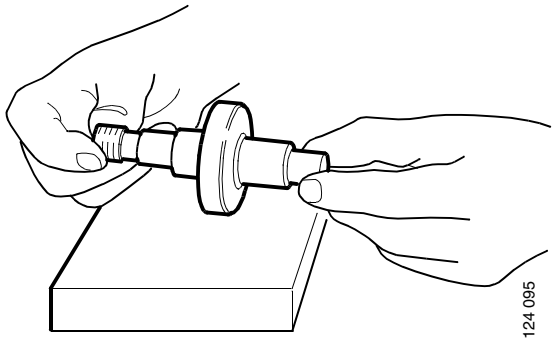


Checking and renewing parts

Clean and check the following parts:

- Drive shaft 22. Especially check the sealing surface of the sealing ring 20 and the bearing surface of the bush.
- Bush in end plate.
- The plunger 9 in the control valve. Jamming of the plunger in the housing is not permissible.
- Blow all channels in the housing clean.
- Ball bearing 24.

Note: If any of these parts are damaged or visually worn, the complete pump must be replaced.



Checking the ball bearing

Checking and renewing rotor assembly:

- Check the rotor housing 11 with rotor 12 and vanes 13 for wear. The vanes must rotate easily in the rotor.
- Check the wear plate 14 and pressure plate 10 for discolouring, wear and scratches. Especially check the surfaces contacting the rotor 12.

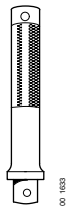
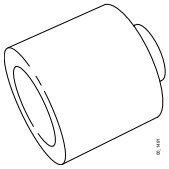
Note: If any of these parts are damaged or visually worn, the rotor assembly must be replaced.

Renew the following parts:

- O-rings 4, 15 and 17
- support rings 5
- O-ring 7
- seal 20
- retaining ring 23

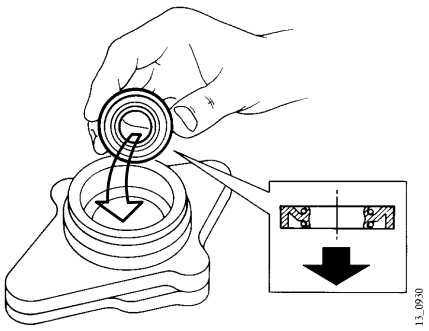
Assembly

Special tools

Number	Description	Illustration	Location
98 450	Shank	 98 450	R2, AD2, AM1
99 255	Mandrel	99 255 	AM2-A2

1 Lubricate the component parts with automatic transmission fluid.

2 Install the seal 20 as illustrated.



3 Press it on with mandrel 99 255 and shank 98 450.

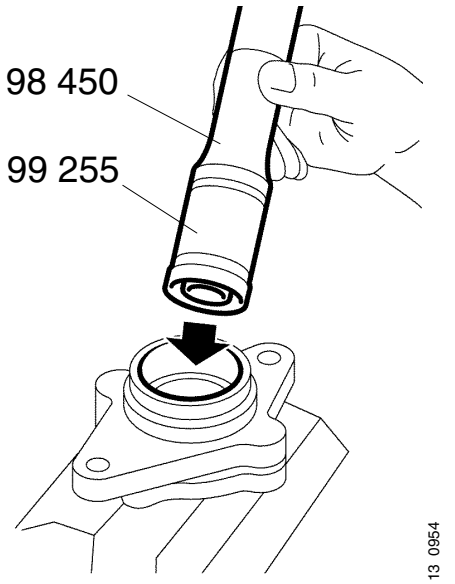
4 Fit the spacer 19.

5 Tap the shaft into the end plate with a rubber mallet.

6 Fit retaining ring 23.

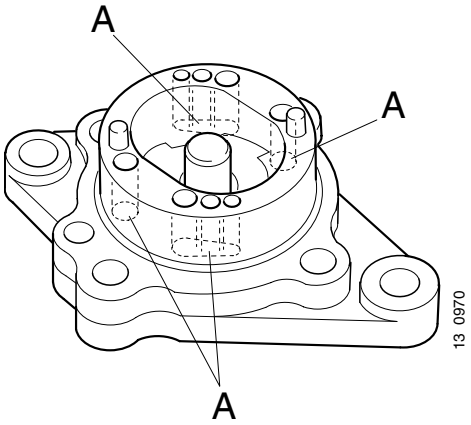
7 Fit two new O-rings (15 and 17) in the mating face. Fit two guide pins 16.

8 Fit wear plate 14. Turn the wear plate so that the groove faces the rotor housing.

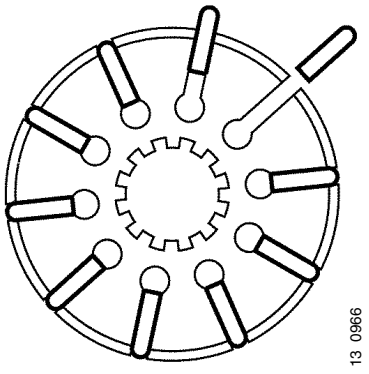


9 Fit the rotor housing 11.

Note: Turn the rotor housing so that the oil channels A can't be blocked.

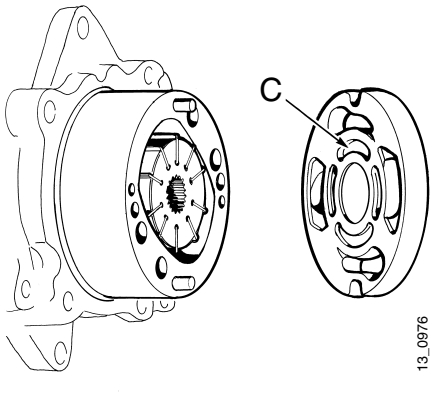


10 Fit the rotor 12 with the chamfered side facing the flange. Make sure that the rounded part of the vanes 13 is facing outwards.

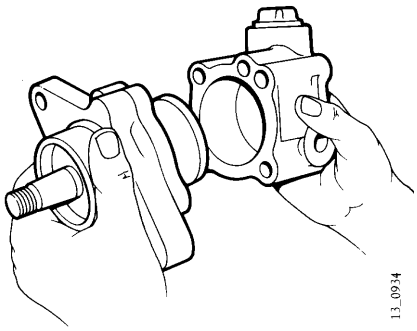


11 Fit the inner pressure plate 10 with oil channel C facing the rotor housing.

12 Fit new O-rings 4 and oil channel support rings 5 in the pump housing.

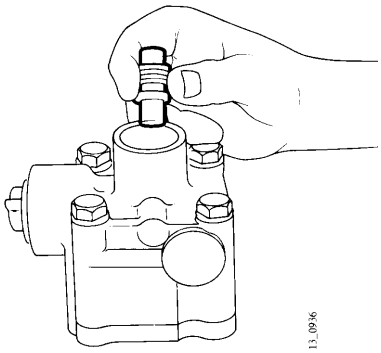


13 Assemble the housing and the end plate. Make sure that the oil channels and the O-rings are lined up. Insert the four bolts 2 and tighten them to 45 Nm.



14 Renew the O-ring 7 on the hexagonal plug. Fit the valve unit and the spring and tighten the plug to 50 Nm.

Note: Make sure control valve 9 is turned as illustrated.

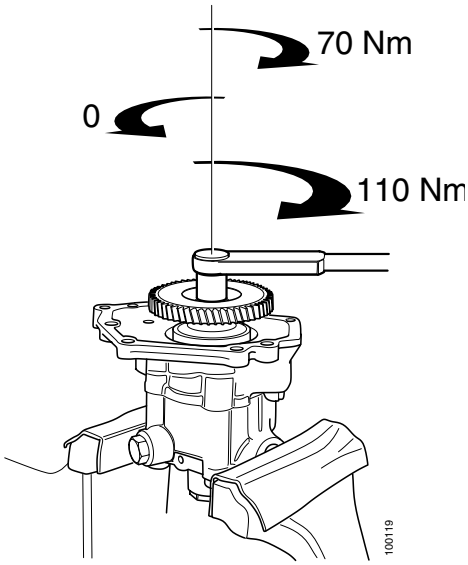


IMPORTANT! The shaft end and the gear must be degreased and free of oil and grease before fitting.

15 Press on gear 26 and fit nut 27 in the following way:

- Torque tighten the nut to 70 Nm.
- Undo it.
- Torque tighten the nut to 110 Nm.

16 Check the pressure and flow after assembly and fitting. See Workshop Manual main group 13 Steering - Testing the hydraulic system.



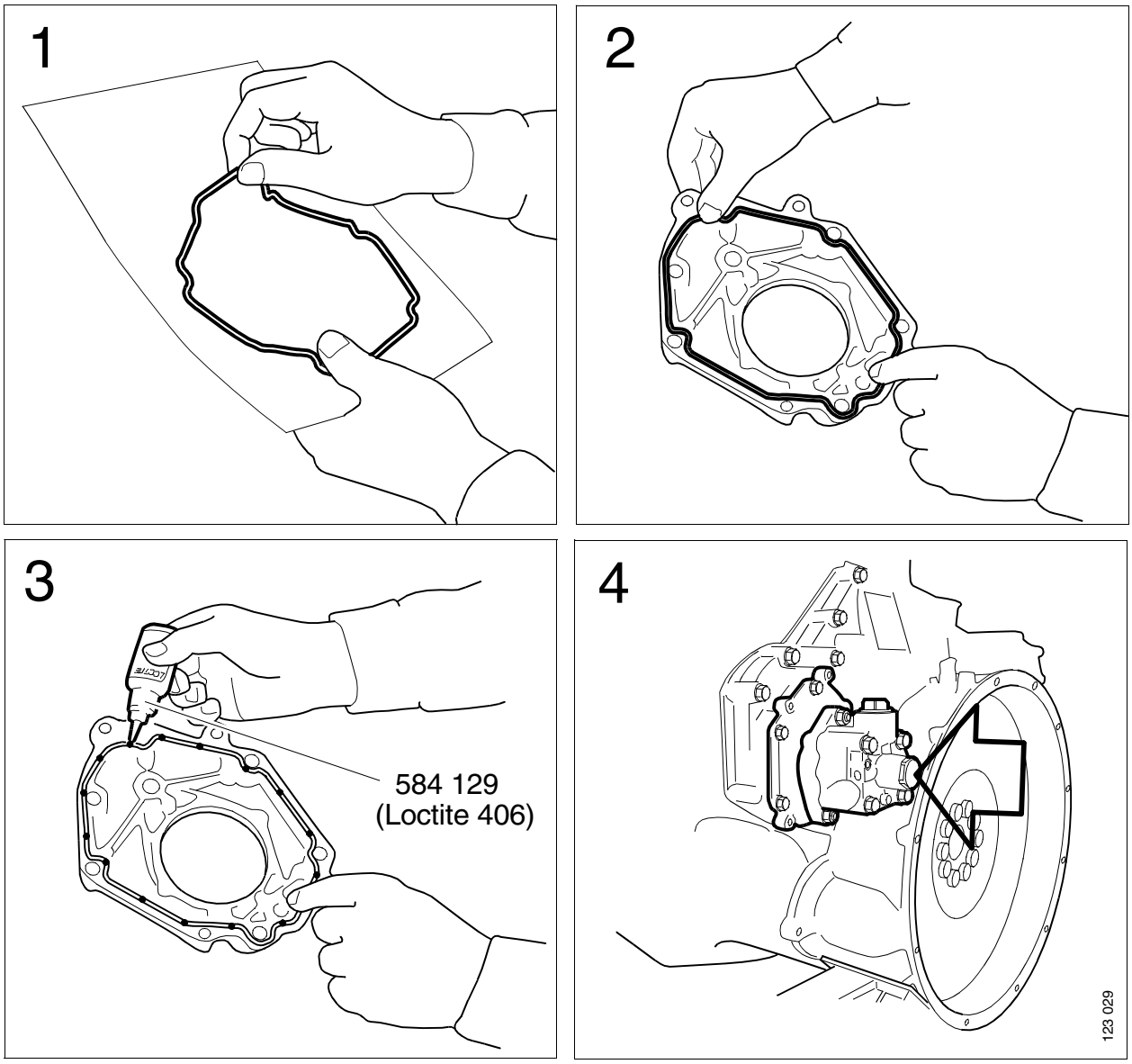
Renewing the gasket between the flange and the flywheel housing

Applies to the newer gasket and flange introduced from the following chassis numbers:

SSS	1 272 522
SNL	4 455 051
SAN	9 062 838
SBK	1 840 169
SLA (SSB)	3 527 565

IMPORTANT! Use **only** Loctite 406 (part. no. 584 129) when fitting the gasket 29. Loctite 406 does not contain any solvents that will damage the gasket.

Note: Cleanliness when fitting the gasket is essential for the flange to be tight. Keep the surfaces around an on the flange clean and free from dirt.



1 Remove the gasket from the paper.

2 Fit the gasket on the flange.

3 Apply a thin layer (drops) of Loctite 406 (part no. 584 129) as illustrated.

4 Refit the flange. Use existing bolts with sealing agent 561 019 or new bolts coated with sealing agent.