POWER STEERING PUMP - COMPRESSOR DRIVEN

PUMP DRIVE

The pump is located on the right hand side of the engine (viewed from driving seat of vehicle) and attached to an end plate which is mounted to the rear face of the compressor. The pump shaft and compressor shaft are connected by a circular coupling equipped with a drive key which engages with the slotted ends of both shafts.

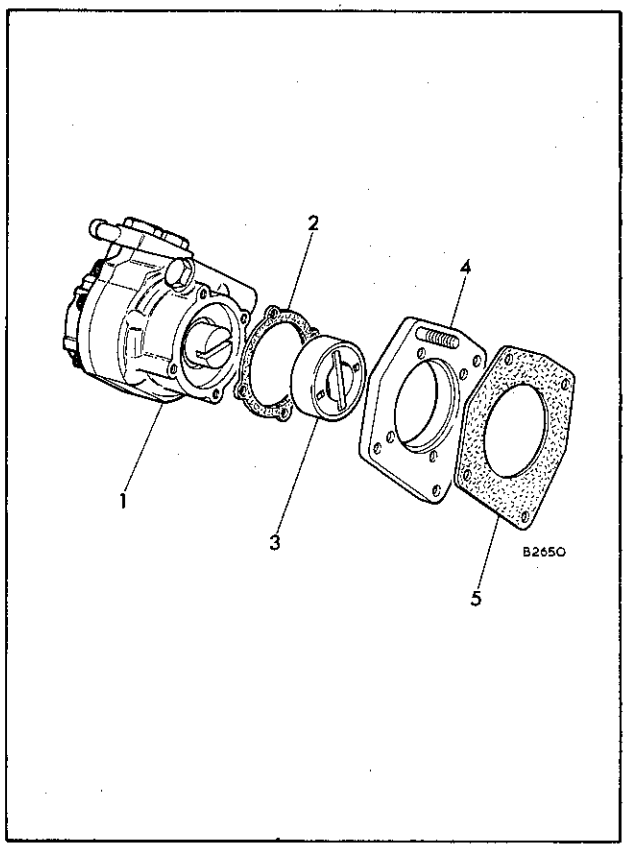


Fig. 1 *Pump drive arrangement*

POWER STEERING PUMP

To Remove

Remove the R/H front engine sound insulation panel.

Place a receptacle below the pump to catch the fluid when the fluid lines are disconnected.

Release the hose clips and disconnect the two hoses from the adaptor on top of the pump. Allow the fluid to drain into the receptacle.

Unscrew the union and disconnect the high pressure pipe/hose assembly from the side of the pump.

Disconnect the air pipe from the compressor.

Disconnect the pressure oil feed pipe from the compressor.

Remove the nuts securing the pump to the compressor.

Note: As the lower nut is removed the pump should be progressively withdrawn from the compressor flange.

Remove the pump from the vehicle. If the circular drive coupling is still attached to the pump, mark both items to ensure that they are correctly re-assembled.

If a replacement pump is to be fitted, remove the four 'Allen' screws and detach the end plate.

To Refit

Thoroughly clean the faces of the pump, end plate and compressor.

Fit a new gasket to the end plate and secure it to the pump with the 'Allen' screws.

Fit a new gasket to the remaining face of the end plate and locate the plate studs in the flange of the compressor.

The bottom securing nut should be fitted and screwed home finger tight as the pump drive coupling is progressively engaged with the slotted drive shafts of both the pump and the compressor. Fi the remaining nuts and tighten all of them including the bottom one.

Power Steering Pump — Compressor Driven

Refit the two hoses to the adaptor block and secure with hose clips.

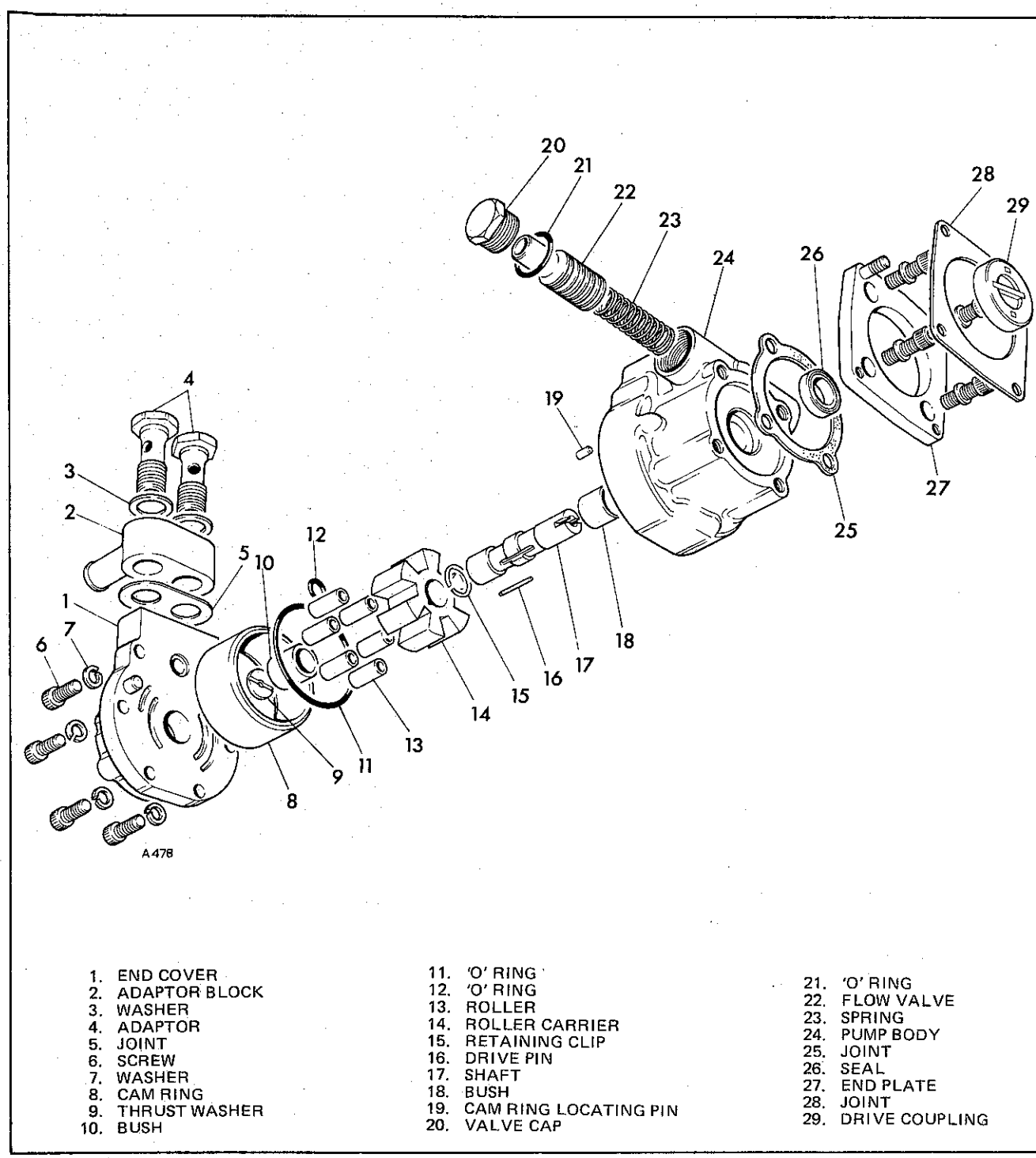
Locate and tighten the union of the high pressure pipe at the side of the pump.

Reconnect the air pipe to the compressor.

Reconnect the pressure oil feed pipe to the compressor.

Fill the reservoir with the recommended grade of fluid.

Bleed the system (Refer to Sub-section L330).



1. END COVER
2. ADAPTOR BLOCK
3. WASHER
4. ADAPTOR
5. JOINT
6. SCREW
7. WASHER
8. CAM RING
9. THRUST WASHER
10. BUSH
11. 'O' RING
12. 'O' RING
13. ROLLER
14. ROLLER CARRIER
15. RETAINING CLIP
16. DRIVE PIN
17. SHAFT
18. BUSH
19. CAM RING LOCATING PIN
20. VALVE CAP
21. 'O' RING
22. FLOW VALVE
23. SPRING
24. PUMP BODY
25. JOINT
26. SEAL
27. END PLATE
28. JOINT
29. DRIVE COUPLING

Fig. 2 *Exploded view of power steering pump*

To Dismantle

If it is necessary to dismantle the pump for inspection or overhaul, proceed as follows:

Plug all the pump orifices to prevent the ingress of foreign matter.

Thoroughly clean the pump exterior.

Clamp the pump in a vice with the shaft uppermost.

Remove the six 'Allen' screws and washers which secure the end cover to the pump body.

Lift the end cover vertically from the body. This will prevent other parts from falling out.

Withdraw the shaft and roller carrier assembly. Recover the six rollers from the body.

Slide the roller carrier from the shaft and remove the drive pin and retaining clip.

Remove the 'O' ring seals from the grooves in the pump body.

Lift out the cam ring and locating peg from the body.

Remove the shaft seal from the end cover.

Remove the shaft bushes from the end cover and pump body unless they are considered fit for further service.

Inspection

Wash all components in a suitable solvent. Air dry or wipe clean with lint free cloth.

Check the pump body, end cover, shaft and bushes and renew any component showing signs of excessive wear. Check that the thrust washer is in a serviceable condition.

Inspect the cam ring, roller carrier and rollers and renew if worn, scored or otherwise damaged. When inspecting the rollers pay particular attention to the finish on their ends. They must also be perfectly round. If any of the above components require renewal a complete assembly must be fitted. **Do not attempt to replace individual parts.**

To Reassemble

If the shaft bushes have been removed, press new bushes into position until they are 2,03 mm to 2,29 mm (0.080 in to 0.090 in) below the working faces of the body and end cover.

Press a new seal into the end cover with the lip facing the roller carrier.

Insert the cam ring locating peg into the body. Fit the cam ring ensuring that the slot is over the locating peg and that it is correctly seated in the pump body.

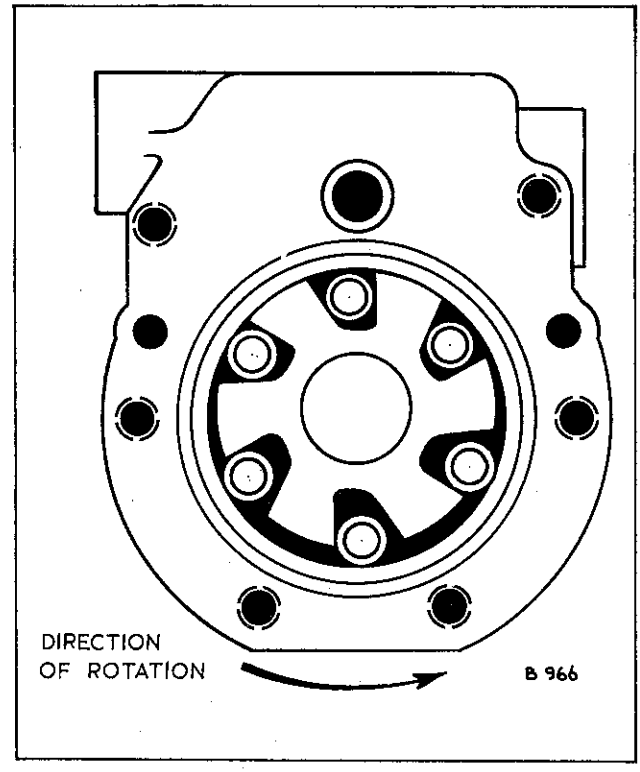


Fig. 3 *Roller and carrier installation*

Fit the retaining clip to the shaft, place the drive pin in the slot and slide the roller carrier into position over the pin.

Insert the shaft and carrier into the pump body and place the six rollers in position in the carrier.

Before fitting the large 'O' ring, place a straight edge across the cam ring and face of the pump body. Using feeler gauges, check the end clearance of the carrier and rollers. If the end clearance exceeds 0,05 mm (0.002 in) the cam ring, rollers and roller carrier must be renewed as a matched set.

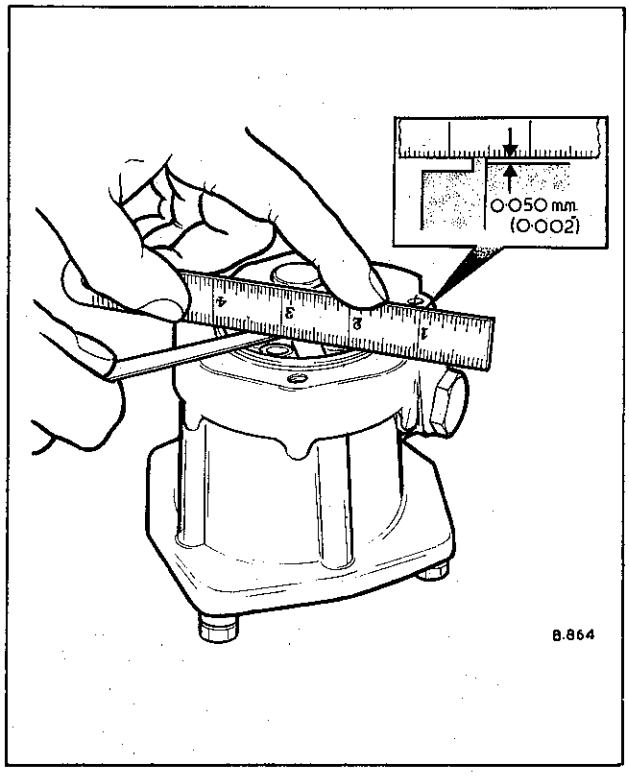


Fig. 4 *Carrier end clearance check*

Note: The cam ring, rollers and roller carrier must be renewed as a complete matched assembly. **Individual new parts must not be fitted.**

Fit new 'O' rings between face of the end cover and pump body.

Grease the end cover seal and carefully fit the end cover. Take care not to damage the seal during fitting.

Tighten the six 'Allen' bolts securing the cover to a torque of 20 Nm (15 lbf ft).

Check the shaft for free rotation following the tightening of the cover screws. There should be just perceptible end float without any sign of binding. If binding occurs with zero end float, the thrust washer is tight against the end of the shaft. Rectify before proceeding further.

Check the flow control valve spring for the correct length which should be 20,8 mm (0.82 in) with an applied load of 4,6 kg (9 lb). If it has shortened or distorted, a new spring must be fitted.

Fit the flow control valve spring into its bore in the body of the pump.

Insert the valve, largest end first, into the bore and check that it responds to the spring pressure. Correct insertion and freedom of operation of the valve is essential for the functioning of the system.

Fit a new 'O' ring seal to the valve cap and tighten to a torque of 44 Nm (33 lbf ft).

FLOW CONTROL VALVE

The flow control valve is incorporated in the pump unit and operates on the following principle.

As the fluid flow commences, a pressure drop occurs across orifice A (Fig. 5). The higher pressure tends to move the valve inwards towards the lower pressure applied through orifice B, together with the force exerted by valve spring D. This pressure difference increases with the fluid flow until the valve has moved to uncover the by-pass port C. An increase in flow results in further valve movement allowing a greater by-pass. Thus a maximum flow is maintained depending on the rate of the valve spring D.

The delivery pressure is also applied to the pilot relief valve through orifice B. When this is sufficient to lift the ball from its seat, fluid will flow from the spring chamber F. Due to the action of orifice B, an additional pressure drop will occur in the spring chamber, which will result in the valve moving to the by-pass position. As the delivery pressure drops, the pilot relief valve closes and the main valve resumes its flow control function.

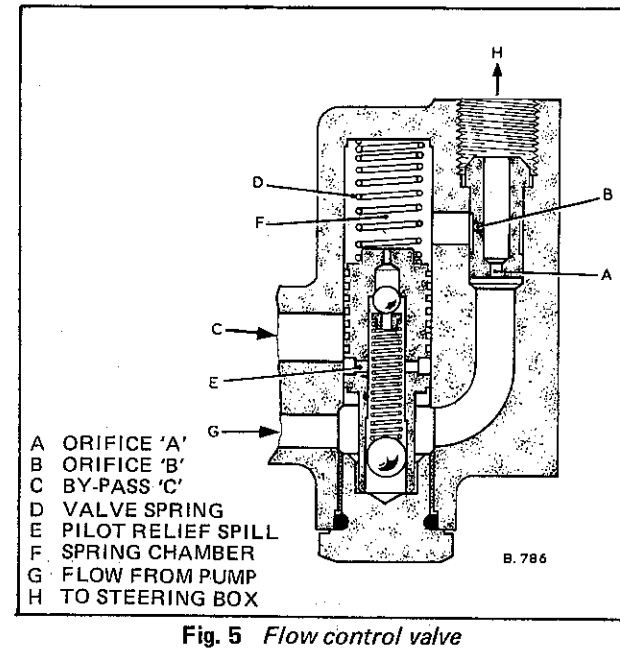


Fig. 5 *Flow control valve*

DESCRIPTION AND MODIFICATIONS

This may seem a little out of place but I have heard about problems with people stealing work and selling it - for example on eBay.

If you're reading this and you bought this manual anywhere then you have been ripped off.

Please contact me via my email mikejamson@hotmail.com Otherwise I can be found on the dodge50 facebook page, if not then get in contact with Greg and he can pass the message on to me.

I have note done this pdf manual for my own personal gain and wish to see the community of 50 series owners benefit from the information here, and I do not want to see the community get taken advantage of and somebody else gain from it unfairly.

The information in pdf format will hopefully allow more of these wonderful trucks to stay on the road by providing information to everybody.

This has been quite a long and involved process to scan the manual and to convert it into a pdf format. I do aplogise as I have used several different scanners and several different computers to do it, so there are no doubt some errors hidden throughout, as well as some editing errors.

I have aimed to balance quality and file size and hope that this balance meets to everybody's approval.

If you see an error please let me know and I will fix it as soon as I can.

To Remove

Unscrew and remove the valve cap from the pump unit.

Remove the flow control valve and valve spring from their housing.

Inspection

Inspect the control valve for scoring or any other damage. If found to be unsatisfactory the complete valve must be renewed. It is not possible to dismantle the valve to enable individual parts to be renewed.

Check the flow control valve spring for the correct length. This should be 20,8 mm (0.82 in) with an applied load of 4,6 kg (9 lb). If it has shortened or distorted, a new spring must be fitted. Never attempt to obtain further service from the spring by stretching it to the specified length.

Check the bore in which the flow control valve operates. It should show uniform wear throughout its length and be free from scoring.

To Refit

Insert the control valve spring into its bore in the pump body.

Fit the valve, largest end first, into the bore and check that it responds to the pressure of the spring. Correct insertion and freedom of operation of the valve is essential for the functioning of the system.

Fit a new 'O' ring to the valve cap and tighten to a torque of 44 Nm (33 lbf ft).

PUMP PRESSURE CHECK

With the vehicle moving slowly, turn the steering onto full right lock (left lock on L.H.D. vehicles). Stop vehicle.

Apply parking brake, select neutral gear position and stop engine (select 'Park' position on automatic transmission vehicles).

Remove engine sound insulation board if necessary to gain access to the union of the high pressure fluid supply pipe at the point where it is fitted to the steering box.

Position a suitable container to catch the fluid when the supply pipe is disconnected.

Attach a suitable hose clamp to the lower end of the return line hose from the steering box to the reservoir. This will prevent some of the fluid draining from the reservoir and through the steering box when the high pressure supply pipe is disconnected.

Unscrew the small union of the high pressure supply pipe from the rear of the steering box and allow the fluid to drain into the container.

Displace the pipe sufficiently to allow adaptor to be screwed into the union.

Screw the union of Tool HY23A (pressure gauge and hose assembly) onto the adaptor. Tighten both unions.

Top-up the reservoir with the correct grade of fluid.

Start the engine and note the pressure registered on the gauge. This should be between 55 and 69 Bars (800 and 1,000 lbs.sq.in.) at or slightly above engine idling speed.

Power Steering Pump — Compressor Driven

Note: The **MAXIMUM** engine running time allowed for this test is **10 SECONDS.** Stop the engine as soon as a reading has been obtained.

If this time is exceeded the pump may be permanently damaged.

If the pressure is not within the prescribed limits the pump must be suspect and lack of pressure could be due to a faulty flow control valve.

Check the valve by unscrewing the valve cap from the pump body and ensure that the valve responds to its spring loading. It must not stick in its bore or be excessively sluggish in its response. Ensure that the orifices of the valve and pump body are not blocked by foreign matter.

Check the valve spring length as detailed under FLOW CONTROL VALVE — this section.

Refit the spring, valve and cap and repeat the pressure check. If the pressure is still outside the prescribed limits, the pump must be removed and overhauled or a replacement unit fitted.

On completion of a satisfactory test remove the gauge assembly and adaptor.

Refit the fluid supply pipe to the steering box.

If the engine sound insulation board was previously removed, refit it;

Remove the hose clamp from the return line.

Top-up the reservoir with the correct grade of fluid.

Bleed the system (Refer to Sub-section L330).