

Pumps

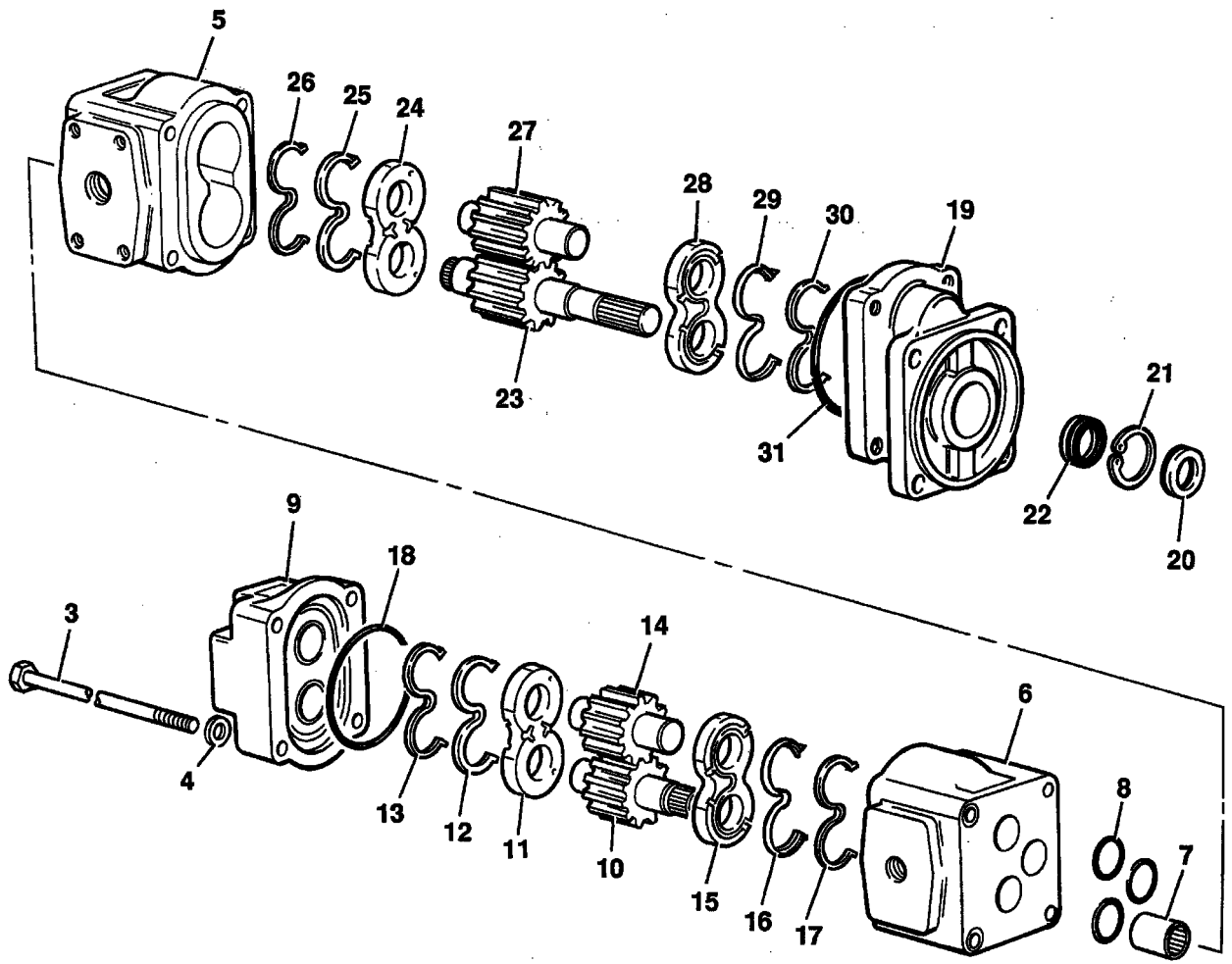
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Hydraulic Pump (Ultra-Type)

Before removing and dismantling the pump, check flow and pressure. If either of these are low the pump must be changed. Renewal of components such as gears, bearings and housing will not effect a permanent cure. If the pump output is satisfactory but there is external leakage, the

pump should be removed and dismantled for re-sealing only.

Before removing and dismantling the pump, make sure the exterior of the pump and working area is thoroughly cleaned and free of possible sources of contamination.



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Fig 76.

Dismantling

See → [Fig 76.](#) ([□ E-83](#))

- 1 Remove the four bolts **3** and serrated washers **4** which clamp the units together.
- 2 Use a soft faced hammer to separate front body **5** and rear body **6** after first marking them to ensure correct assembly.
- 3 Remove splined coupling **7** and O-rings **8**. Discard the O-rings.
- 4 Use a soft faced hammer to separate end cover **9** from rear body **6**, after first marking them to ensure correct assembly.
- 5 Remove drive gear **10** from its bore. Pushing it out of the rear body will also remove balance plate **11** complete with seal **12** and seal energiser **13**. Discard the seal and seal energiser. Note the position of the driveshaft and the balance plate to ensure correct assembly.
- 6 Remove driven gear **14**, followed by balance plate **15** complete with seal **16** and seal energiser **17**. Discard the seal and seal energiser.
- 7 Discard O-ring **18**.
- 8 Use a soft hammer to separate mounting flange **19** from front body **5**, after first marking them to ensure correct assembly.
- 9 Remove outer shaft seal **20**, circlip **21** and inner shaft seal **22**.
- 10 Remove driveshaft **23** from front body **5**. Removal will also remove balance plate **28** complete with seal **29** and seal energiser **30**. Discard the seal and seal energiser.
- 11 Remove driven gear **27** followed by balance plate **24**, seal **25** and seal energiser **26**. Discard the seal and seal energiser.
- 12 Discard O-ring **31**.
- 13 Remove all sealant from the contact faces of the mounting flange/front body and end cover/rear body interfaces.

- 14 Wash all components and immediately apply a coating of hydraulic oil to prevent corrosion.

Inspection

- 1 Generally check all pump parts for damage and/or wear. The O-ring grooves, the seal recess in the mounting flange and all sealing faces must be free of burrs and scores which could result in seal damage and hence hydraulic oil leakage.
- 2 Renew the pump if any of the following symptoms exist:
 - a The PTFE coated bearings in the pump bodies, the mounting flange and the end cover are worn through to reveal the bronze backing.
 - b The gear side faces are scored. Often contaminated fluid results in a distinct wear step coincident with the gear root diameter. This can normally be felt by drawing a sharp point across the gear side face from the journal towards the tip of the gear.
 - c There is a noticeable wear groove on driveshaft **23** where seals **20** and **22** run.
 - d The balance plate faces are scored, particularly in the area adjacent to the gear root diameter.
 - e The driveshaft splines are worn or severely fretted.
 - f The gear "cut-in" area in the low pressure side of the pump body is deeper than 0.15 mm (0.006 in) or has a torn or pitted appearance.

Assembling

See → [Fig 76.](#) (□ [E-83](#))

When carrying out the following procedure, renew all seals and O-rings. Lubricate using JCB Special Hydraulic Fluid.

- 1 Fit inner shaft seal **22** into mounting flange **19** with its garter spring facing into the pump. Fit circlip **21** into its groove in the flange. Fit outer shaft seal **20** with its garter spring outermost. Coat the seal lips with high melting point grease.
- Note: If the seal recess is scored, it is permissible to seal outside diameters with Loctite hydraulic sealant to prevent leakage.*
- 2 Stand front body **5** on its rear face. Fit seal **25** and seal energiser **26** into balance plate **24**.
 - 3 Ensuring that the seals do not fall out, carefully feed the balance plate into the bores of the front body **5** with the two small holes through the balance plate to the low pressure side of the body (i.e. side with the large 4-bolt port pattern).
 - 4 Insert driveshaft **23** and driven gear **27** into the original bores.
 - 5 Fit balance plate **28** over the driveshaft and gear stub. Insert seal **29** and seal energiser **30** into the balance plate.
 - 6 Fit O-ring **31** into the groove on mounting flange **19**.
 - 7 Apply a small amount of Loctite sealant to the face of front body **5** which seals with mounting flange **19** (i.e. the face containing the clamping bolt holes).
 - 8 Carefully feed mounting flange **19** over driveshaft **23** in its original position, as marked earlier. Use a soft faced hammer to tap the flange onto its location spigot.
 - 9 Support the front pump assembly on the mounting flange (but not the driveshaft). Fit O-rings **8** into the grooves on the rear face of the front body **5**. Install splined coupling **7**.
 - 10 Fit rear body **6** onto front body **5** in its original position, as marked earlier, ensuring that it locates on the dowels and that the clamping bolt holes line up.
- 11 Fit seal **16** and seal energiser **17** into balance plate **15**. Ensuring that the seals do not fall out, carefully feed the balance plate into rear body **6** with the two small holes through the balance plate to the low pressure side (i.e. side without a port).
 - 12 Fit drive gear **10** so that it locates with splined coupling **7**. Fit driven gear **14**.
 - 13 Fit balance plate **11** in its original position (i.e. with the two small holes to the low pressure side). Fit seal **12** and seal energiser **13** into the balance plate.
 - 14 Fit O-ring **18** into end cover **9**.
 - 15 Apply a small amount of Loctite sealant to the exposed face of rear body **6** (i.e. the face containing the clamping bolt holes).
 - 16 Fit end cover **9** in its original position, as marked earlier.
 - 17 Install the four bolts **3**, each with a serrated washer **4**, and tighten evenly and progressively to a torque of 90 - 100 Nm (66 - 74 lbf ft).
 - 18 Pour a small amount of clean JCB Special Hydraulic Fluid into the ports. Check that driveshaft **23** rotates without undue force. If excessive force is required it is possible that one or more of the balance plate seals are trapped, in which case it will be necessary to dismantle and assemble the pump again.

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Removal and Replacement

The numerical sequence shown on the illustration is intended as a guide to removal.

For replacement the sequence should be reversed.

WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

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When Removing

Release the hydraulic tank cap to vent system pressure before removing the pump.

Blank off all hoses to prevent ingress of dirt.

With the pump adequately supported and the two mounting bolts **5** removed, manoeuvre the pump so that the splined drive shaft is clear of the engine gearbox housing. Once the pump is clear carefully lower it to the ground.

See [⇒ Fig 80. \(□ E-90\)](#) for pump dismantling and assembling procedures.

When Replacing

Before refitting ensure that the pump casing has been filled with the specified quantity of hydraulic oil.

Renew all 'O' rings.

Apply JCB Lock & Seal to the threads of bolts **77-5** (two off). With the pump adequately supported engage the pump and the splined drive shaft with the engine gearbox housing. Fit and torque tighten bolts **77-5**. Ensure an exact alignment between the pump and gearbox drive.

When all hose connections have been made run the pump without load and allow it to deliver without pressure for a few seconds to ensure adequate lubrication.

Run the pump to check for fluid leakage at connections. If the pump is not delivering without air bubbles after

approximately one minute, a pipe connection leakage is indicated.

Table 7. Torque Settings

Item	Nm	kgf m	lbf ft
5	244	25	180

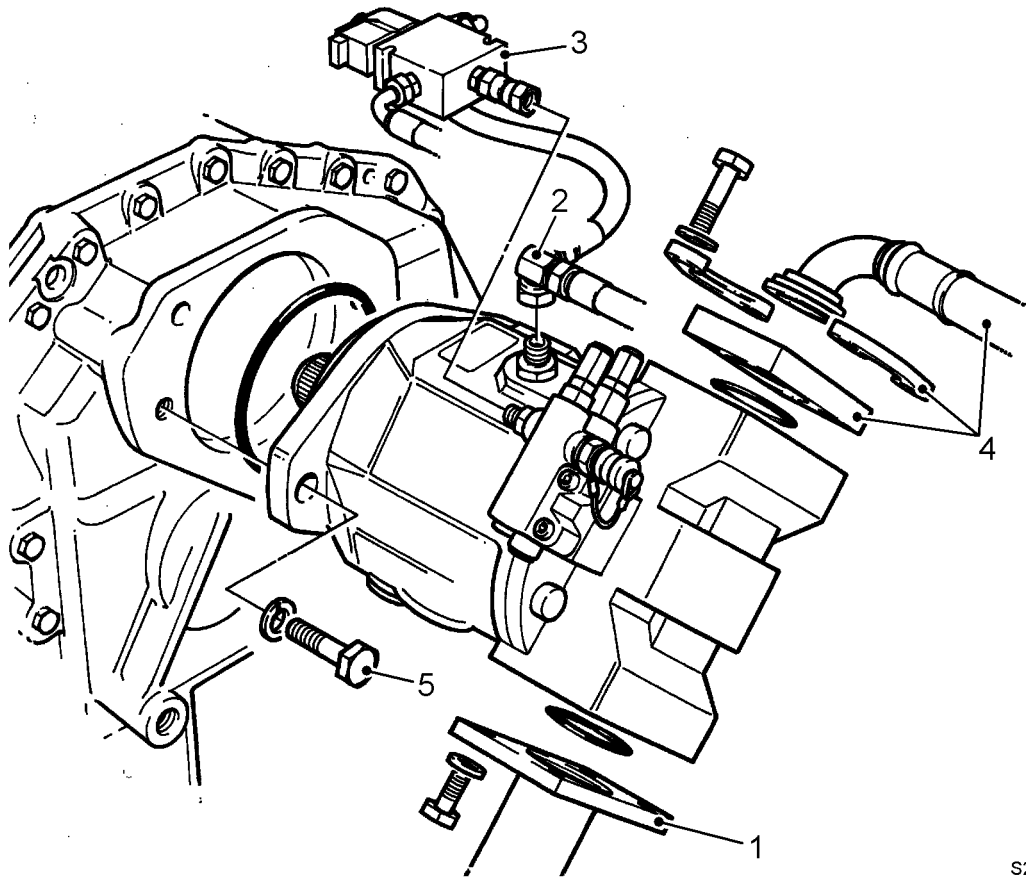


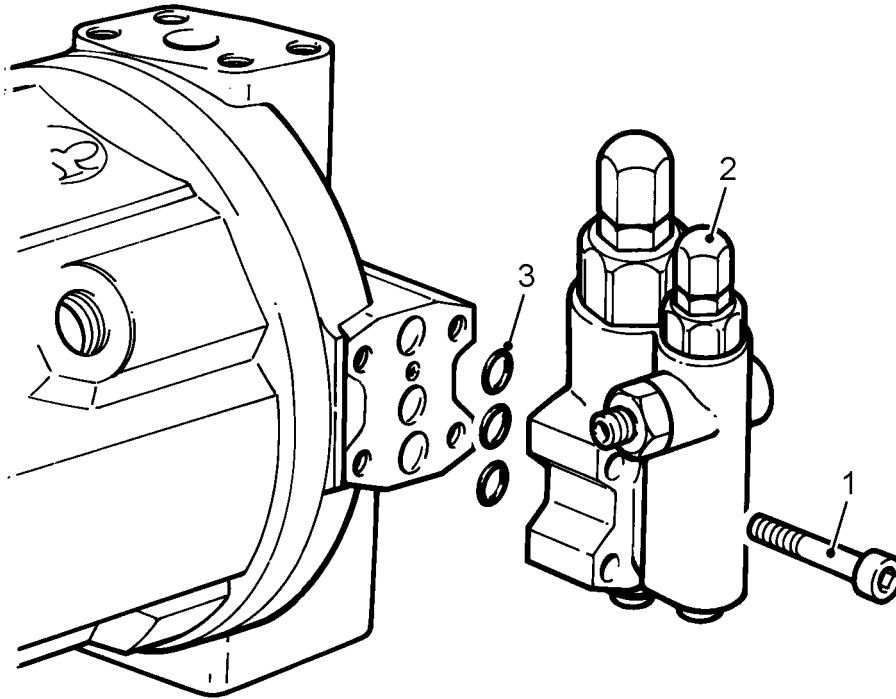
Fig 77.

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Replacing the Pressure/Flow Regulator

Remove the capscrews **78-1** (four off) and detach the regulator **78-2** from the pump housing. An unserviceable

regulator must be replaced with a new item. Ensure new 'O' rings **78-3** are fitted in the regulator body before assembly to the pump.



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Fig 78.

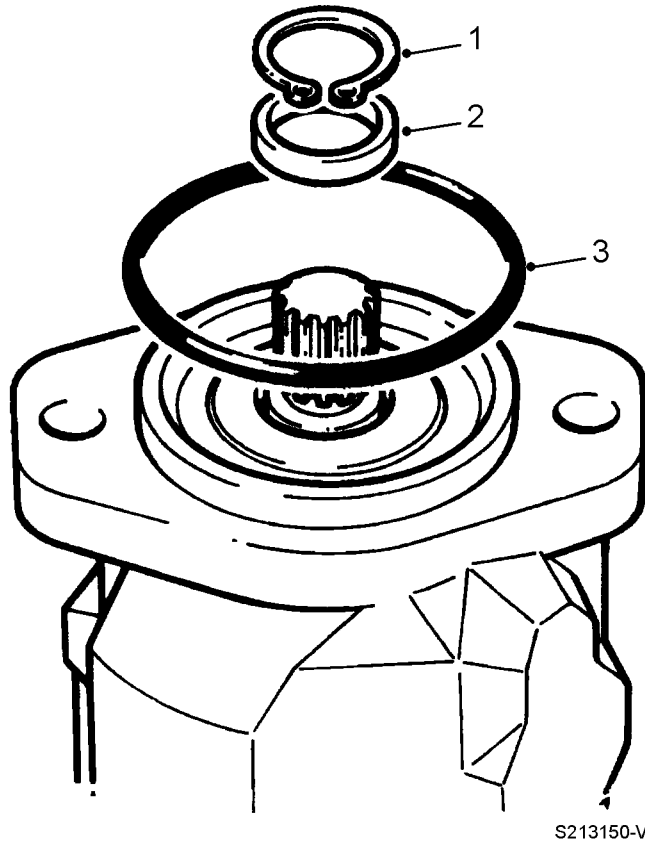
Renewing Drive Shaft Seal

Remove the retaining ring **79-1**. Remove the shaft seal **79-2**, (note positioning of seal grooved face as an aid to refitting). Remove the 'O' ring **79-3** from pump housing.

Examine the seal running area (drive shaft and housing) for wear or damage. Damage in these areas will require

the pump to be further dismantled as shown on [→ Fig 80. \(□ E-90\)](#).

Lubricate a new seal with Mobilplex or equivalent grease containing Molybdenum Disulphide. Fit new seal ensuring it enters the housing evenly and with the grooved face correctly positioned. Position a new 'O' ring on the pump housing.



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Fig 79.