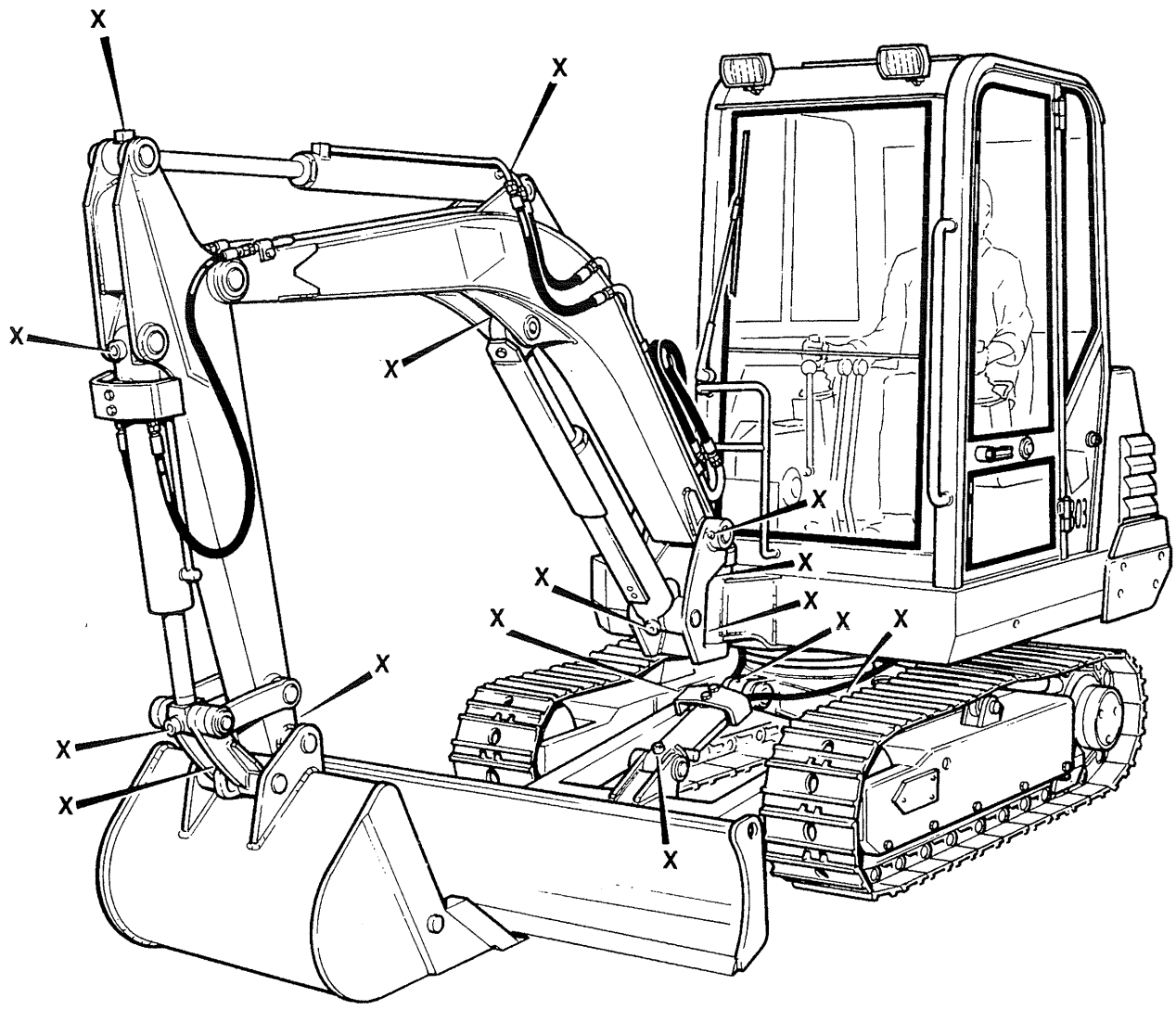
Contents

GREASING

Daily

Normally two strokes of the grease gun should be sufficient.
Stop greasing when fresh grease appears at the joint.



HYDRAULIC PUMP - OPERATION
*803 Machine

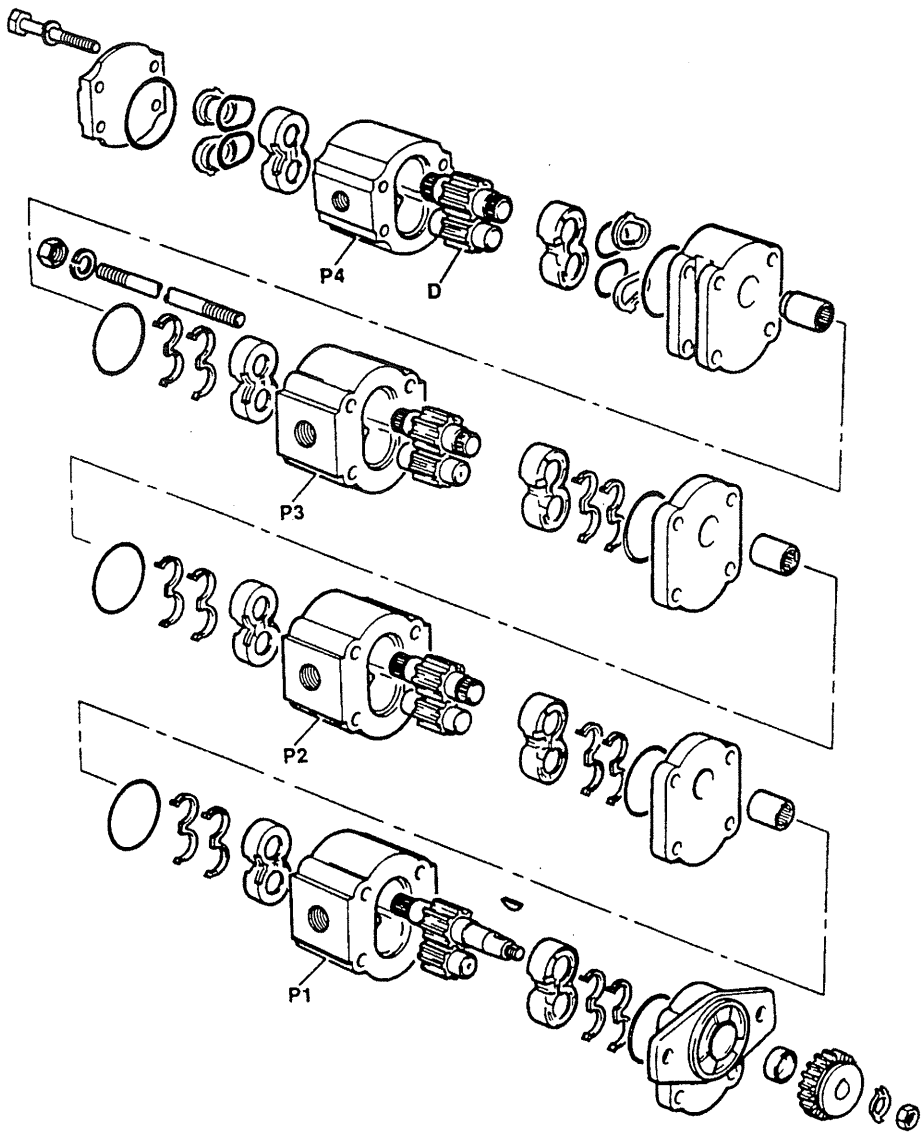
A four section gear pump is fitted to machines up to serial no. 665736.
From machine serial no. 666001 a three section gear pump is fitted.

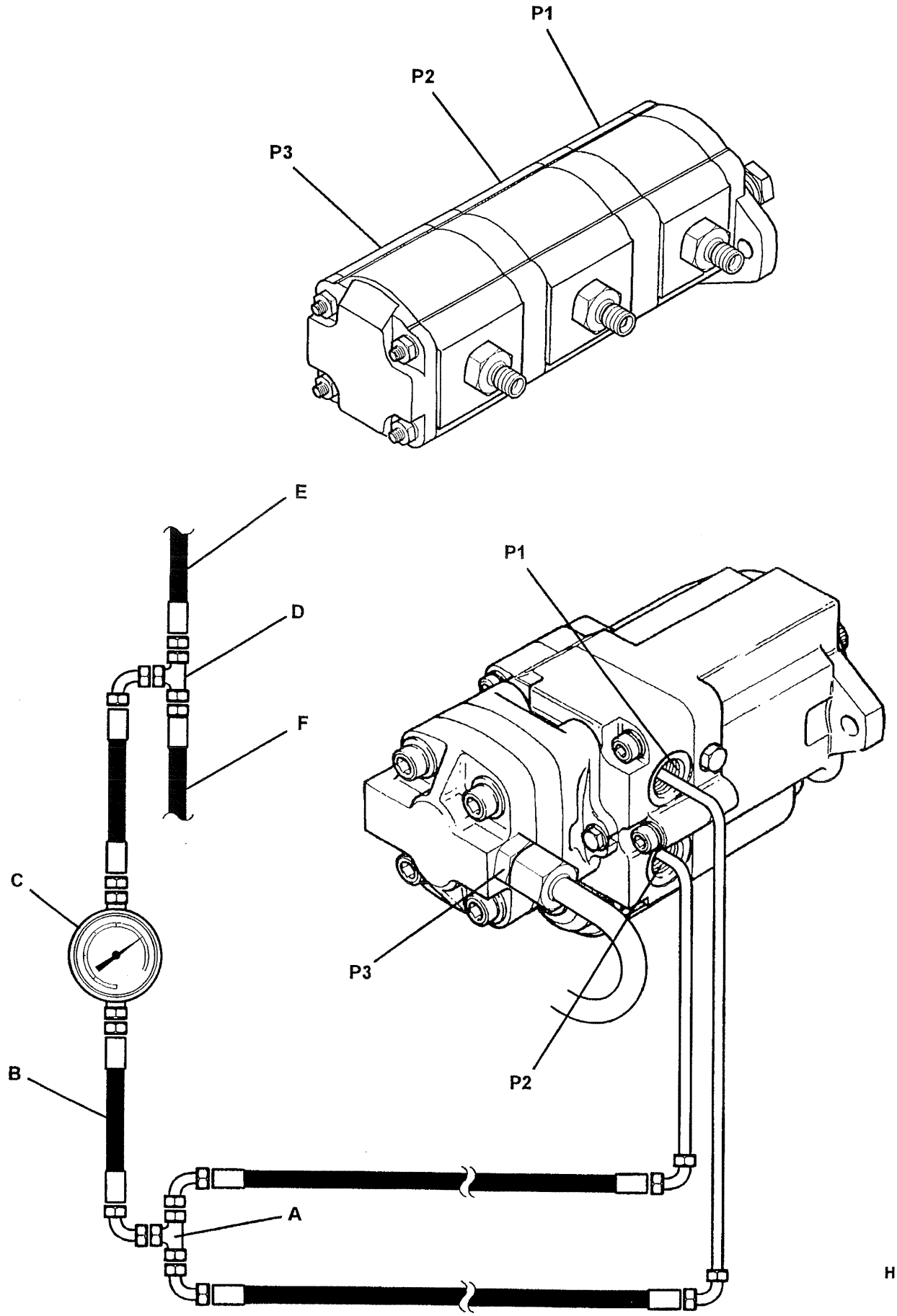
Drive is transmitted through the sections of the pump via a drive shaft, linked by splined bushes between each pump section **P1, P2, P3** (and **P4**).

In each pump section the drive shaft carries a gear wheel, which meshes with a second gear, carried below the drive shaft on an independent idler shaft **D**.

The pump is gravity fed from the hydraulic tank which is mounted higher on the machine than the pump.

Fluid is carried by the rotating gears to the outlet side of the pump. As the gear teeth 'remesh' on the outlet side, pressure increases and fluid flows from the pump into the machine service circuit and servo circuit.




P1
P2
P3
E
D
F
C
B
A
P1
P3
P2
H15770

SLEW MOTOR (cont'd)

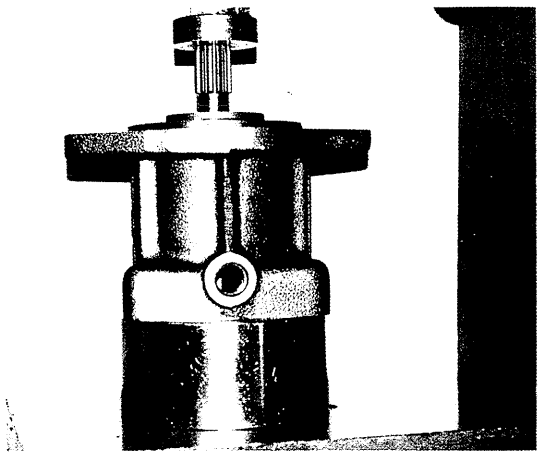
Dismantling and Assembly

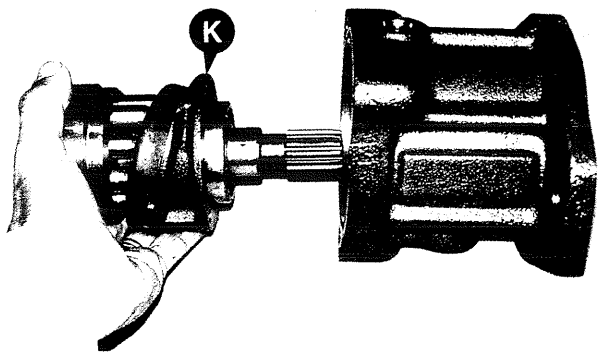
When Dismantling (cont'd)

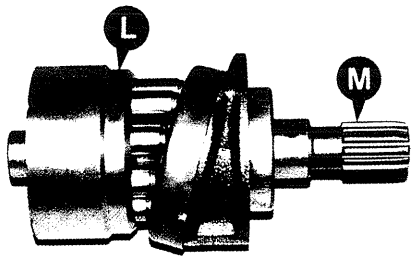
5 Arrange motor on a press as shown. Press shaft down to free from motor case.

7 Remove rotating parts **K** from motor case.

8 Mark the piston positions relative to the cylinder block, **L**, from the motor shaft, **M**.







SLEW MOTOR (cont'd)

BRAKE VALVE

Dismantling and Assembly

When Dismantling

1 Remove motor and separate brake valve from motor.

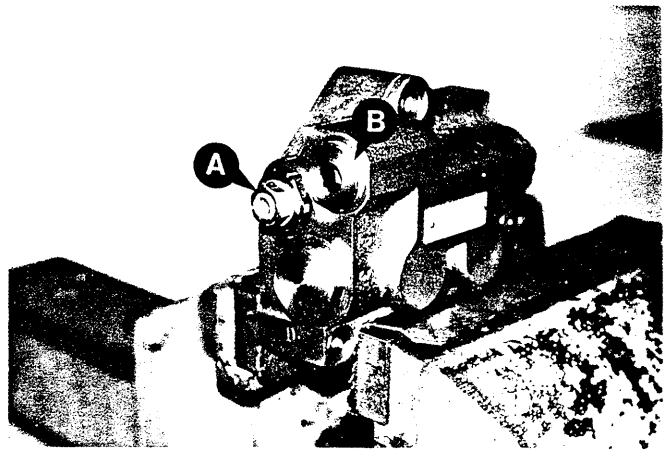
2 Clamp the brake valve assembly in a vice.

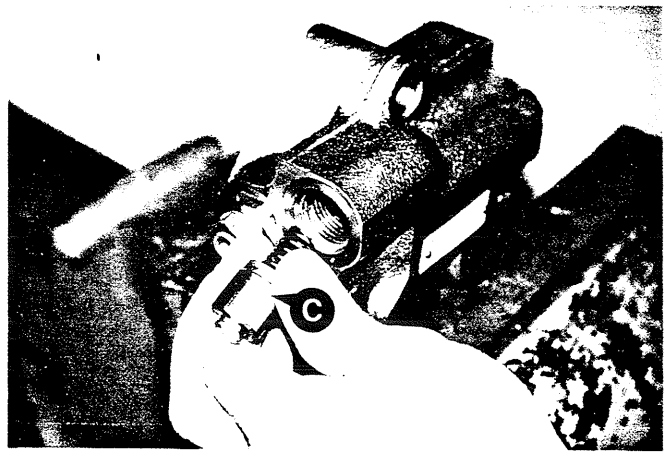
Note: Do not slaken locknut **A**.

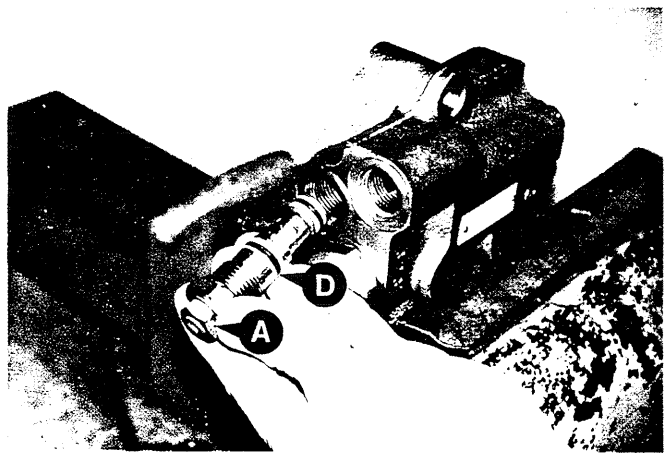
3 Slacken the plug **B** and remove from the valve body.

4 Remove the piston **C** from the valve body.

5 Slacken the relief valve by turning the relief valve body **D**. Take care not to disturb the setting of locknut **A**.







SLEW MOTOR
*802.7, 803 M666001 on, 803 M765001 to 765027 and 804

Removal and Replacement

WARNING

Fine jets of hydraulic oil at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic oil leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leak and then inspect the cardboard for signs of hydraulic oil. If hydraulic oil penetrates your skin, get medical help immediately.
HYD-001

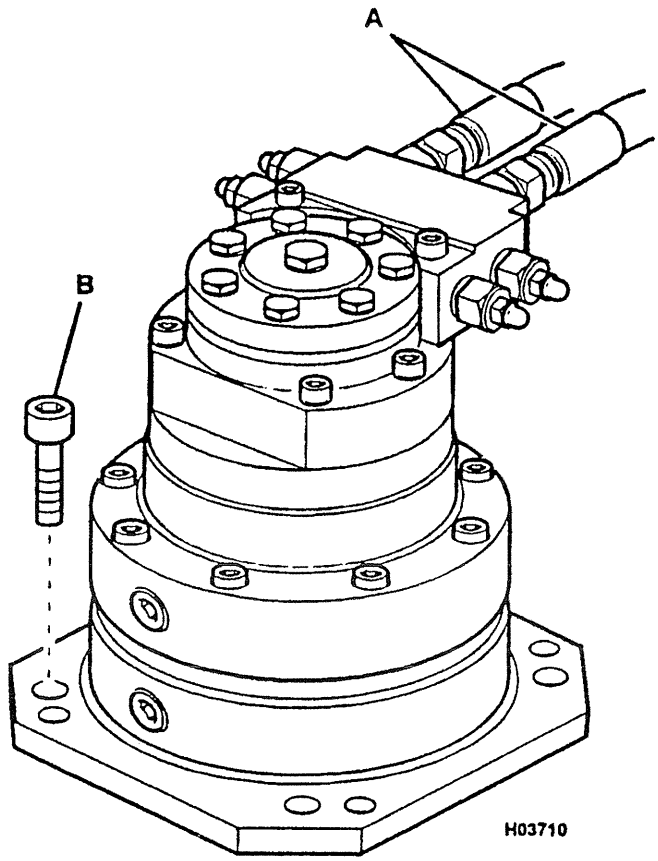
***Note:** The illustration shows an early type slew motor/ gearbox, the same sequence can be used for later types.

When Removing

1 Vent residual pressure from within the hydraulic tank by releasing the tank filler cap. Remove seat, floor matting and floor plates as required to gain access to the slew motor.

2 Remove hydraulic hoses **A** from the slew motor. Blank off the hoses and ports.

*3 Remove bolts **B** securing the slew gearbox to the slew frame. Using two M12 jacking bolts ease the gearbox with it's mounting dowels from the slew frame and lift clear of the machine.

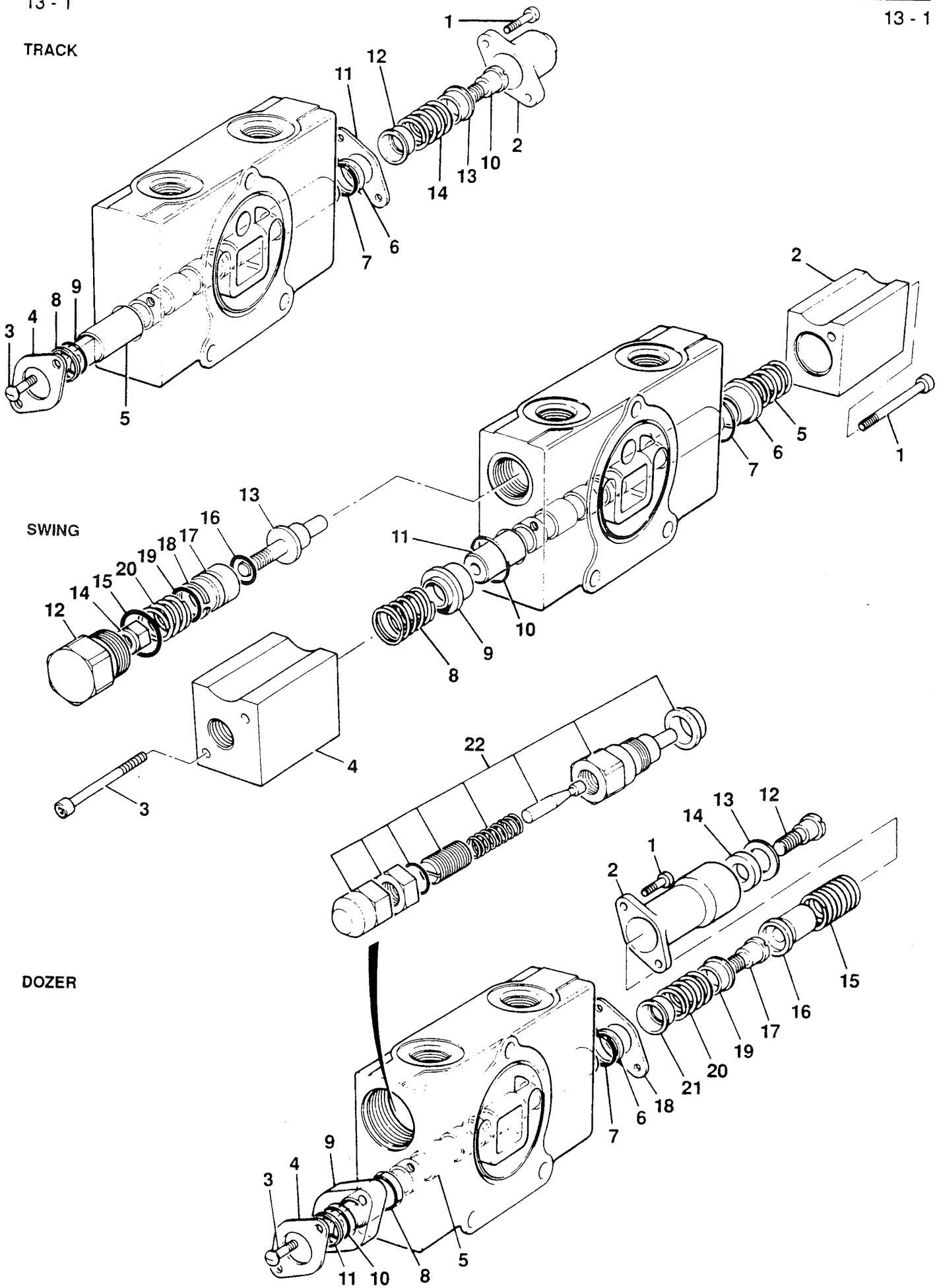


When Replacing

*1 Replace in the reverse order of removal, ensure fixing bolts are torque tightened to the required setting (see Technical Data).

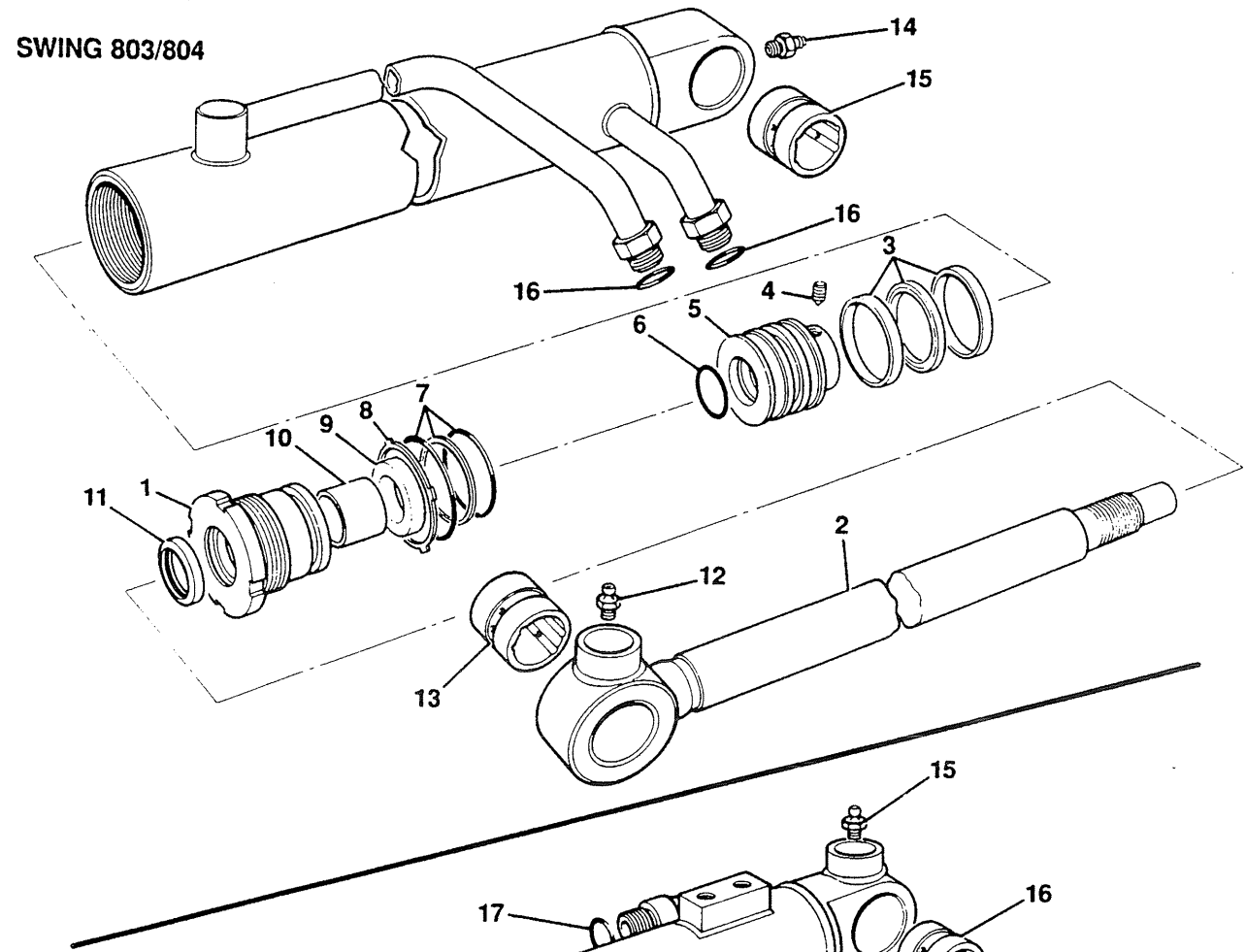
***CAUTION**

If gearbox mounting dowels have been left in slew frame, make sure the holes in the gearbox flange accurately align with the dowels on reassembly. Incorrectly aligned dowels may be pushed through the slew frame and abutt against the slew ring as the gearbox retaining bolts are tightened. If this occurs the slew frame may need separating from the undercarriage to retrieve the dowels.

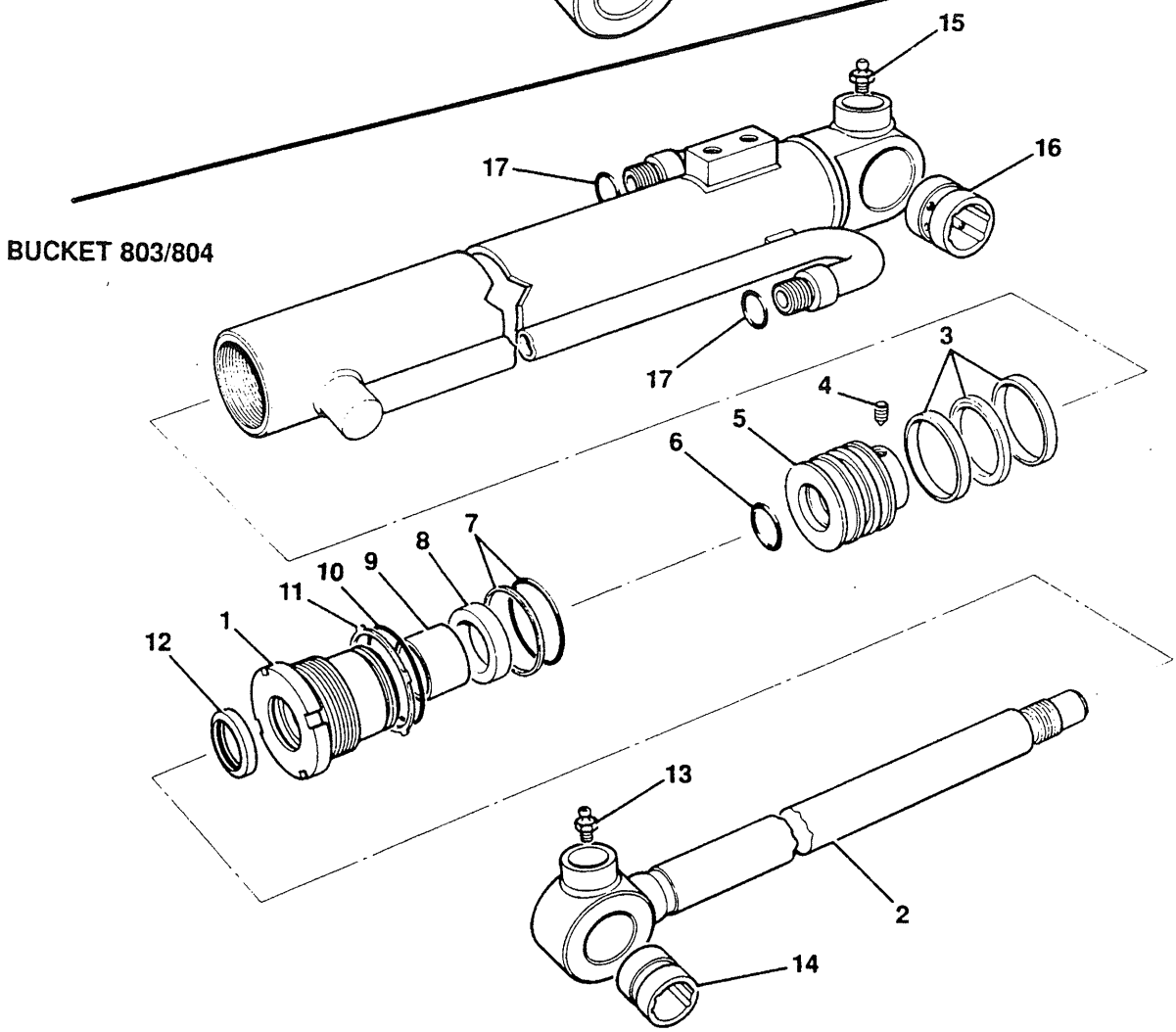

TRACK
SWING
DOZER

RAMS (cont'd)

SWING 803/804



BUCKET 803/804



PRESSURE TESTING

MAIN RELIEF VALVE(S)
802.7, 803 M666001 on, 803 M765001 on and 804

1 Always test the main relief valves in the following sequence:

- **A** Servo Relief
- **B** Servo Pressure Maintenance
- **C** Slew - Swing - Dozer (P1)
- **D** Digging and Tracking - 803 Only (P2)
- **E** Pressure Reducing - 803 Only (P2)
- **F** L.H Track, Dipper - 802.7 Only (P3), 804 Only (P2)
- **G** R.H. Track, Boom Bucket - 802.7 Only (P2), 804 Only (P1)

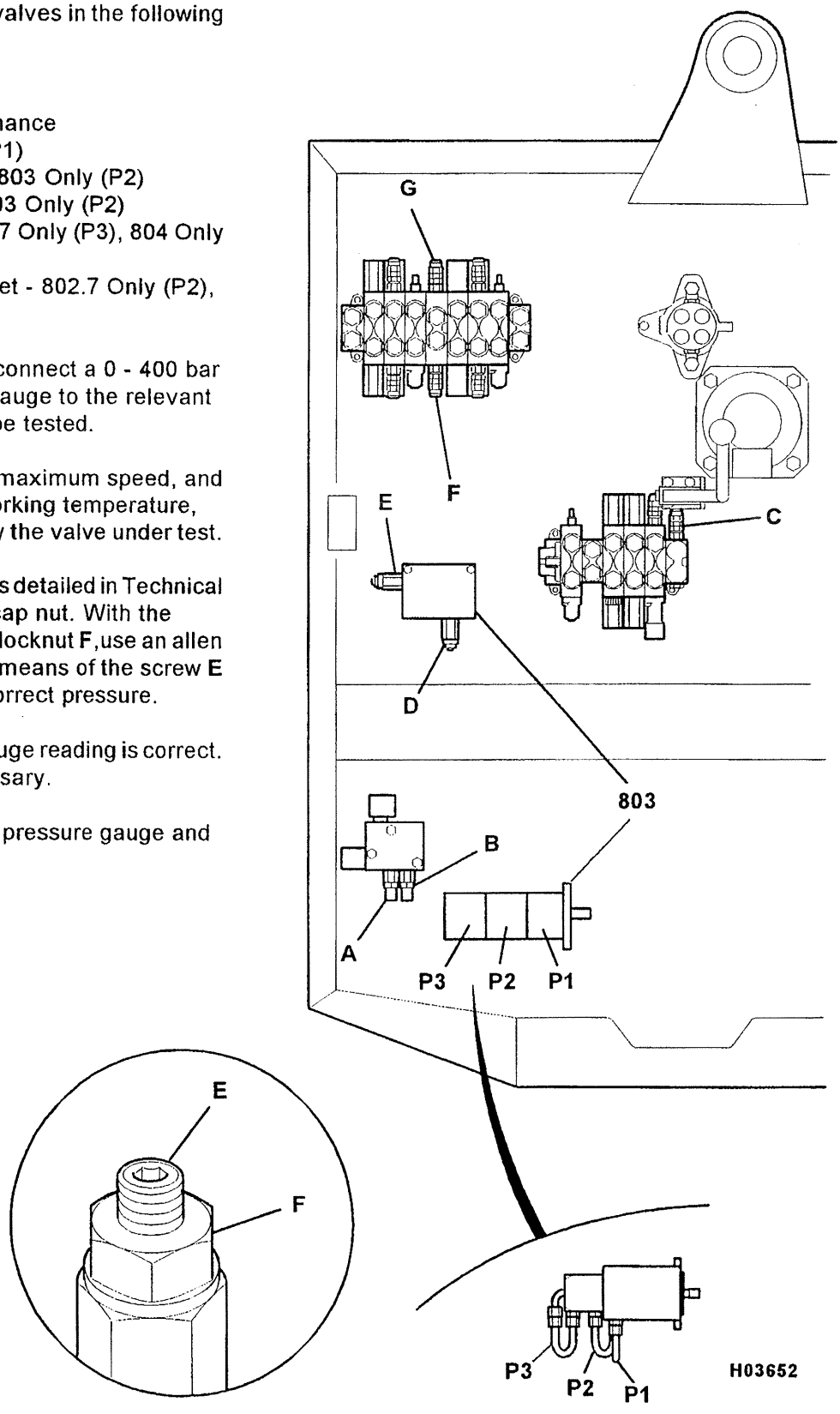
2 Remove blanking cap and connect a 0 - 400 bar (0 - 6000 lbf/in^2) pressure gauge to the relevant test point for the circuit to be tested.

3 With the engine running at maximum speed, and hydraulic fluid at normal working temperature, operate the circuit served by the valve under test.

4 Check the gauge reading is as detailed in Technical Data. If incorrect, remove cap nut. With the ram held at full travel, Undo locknut **F**,use an allen key to adjust the M.R.V. by means of the screw **E** until the gauge reads the correct pressure.

5 Tighten locknut **F**. Check gauge reading is correct. Repeat procedure as necessary.

6 Switch off engine. Remove pressure gauge and refit blanking cap.



ISO TO 3CX CONVERSION OPTION
802.7, 803 M666001 ON & M765001 ON AND 804

Machines are more commonly connected in ISO configuration with the dipper service on the LH controller and the boom service on the RH controller. It is possible however, to convert to the JCB 3CX configuration with the dipper service on the RH controller and the boom on the LH controller. The procedure for conversion is described below.

To convert from ISO to 3CX control

WARNING

Fine jets of hydraulic oil at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic oil leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic oil. If hydraulic oil penetrates your skin, get medical help immediately.

HYD1-2

1 Park the machine on level ground with the bucket on the ground and the dozer lowered.

2 Stop the engine and turn the ignition key to position 1. With the LH armrest lowered, operate both excavator controls in all directions until all stored pressure has been vented from the servo accumulator.

3 Remove the floor mat **1.**

4 Remove screws securing floor plate **2.** Guide the floor plate over the track levers lifting sufficiently to gain access to the valve block below.

Note: The linkage to the auxiliary pedal need not be disconnected as there should be sufficient slack in the cable to allow the floor plate to be lifted clear of the aperture.

5 **ISO Connections**
On the main valve block, identify dipper spool **A** and the boom boost spool **B.** ISO connections to these are as follows:

Port **3** (Dipper out)	- Hose **7** (Dark blue)
Port **4** (Dipper in)	- Hose **8** (No colour code)
Port **5** (Boom raise)	- Hose **9** (Purple)
Port **6** (Boom lower)	- Hose **10** (Orange)

6 Remove hoses **9** and **10** from boom boost spool **B.**

7 Remove hoses **7** and **8** from dipper spool **A.**

8 Check the type of adaptors **C** fitted to boom boost spool **B.** If the adaptors are restricted check valve type, they must be left in their original position and the hand controller adaptors need not be changed over *(See page 3/3-3)* If they are normal adaptors, the restrictors in the hand controllers need reposi tioning, *(See pages 3/3-2 & 3/3-4).* Use new 'O' ring seals throughout.

9 **3CX Connections**
Reconnect the hoses as follows:

Hose **7** (Dark blue)	- Port **5** (Boom raise)
Hose **8** (No colour code)	- Port **6** (Boom lower)
Hose **9** (Purple)	- Port **3** (Dipper out)
Hose **10** (Orange)	- Port **4** (Dipper in)

This has the effect of transferring the dipper service from the LH controller to the RH controller, and the boom service from the RH controller to the LH controller as per 3CX.

10 Refit floor plates and floor mat by reversing steps 3 and 4.

11 Check for correct operation of services.

FUEL INJECTION PUMP ASSEMBLY

Removing and Fitting

Removing

1 Remove fuel pipe assembly from injectors and fuel pump, see page 5/5 - 6.

2 Remove the two mounting bolts **A** and nuts **B**.

3 Carefully lift the fuel injection pump until access to the link snap pin **C** is gained.

4 Disconnect the link **D** and remove the fuel injection pump.

5 Remove the shim(s) **E**. Record the number and thickness of the shim(s) for re-assembly.

Fitting

1 Put the shim(s) **E** in position.

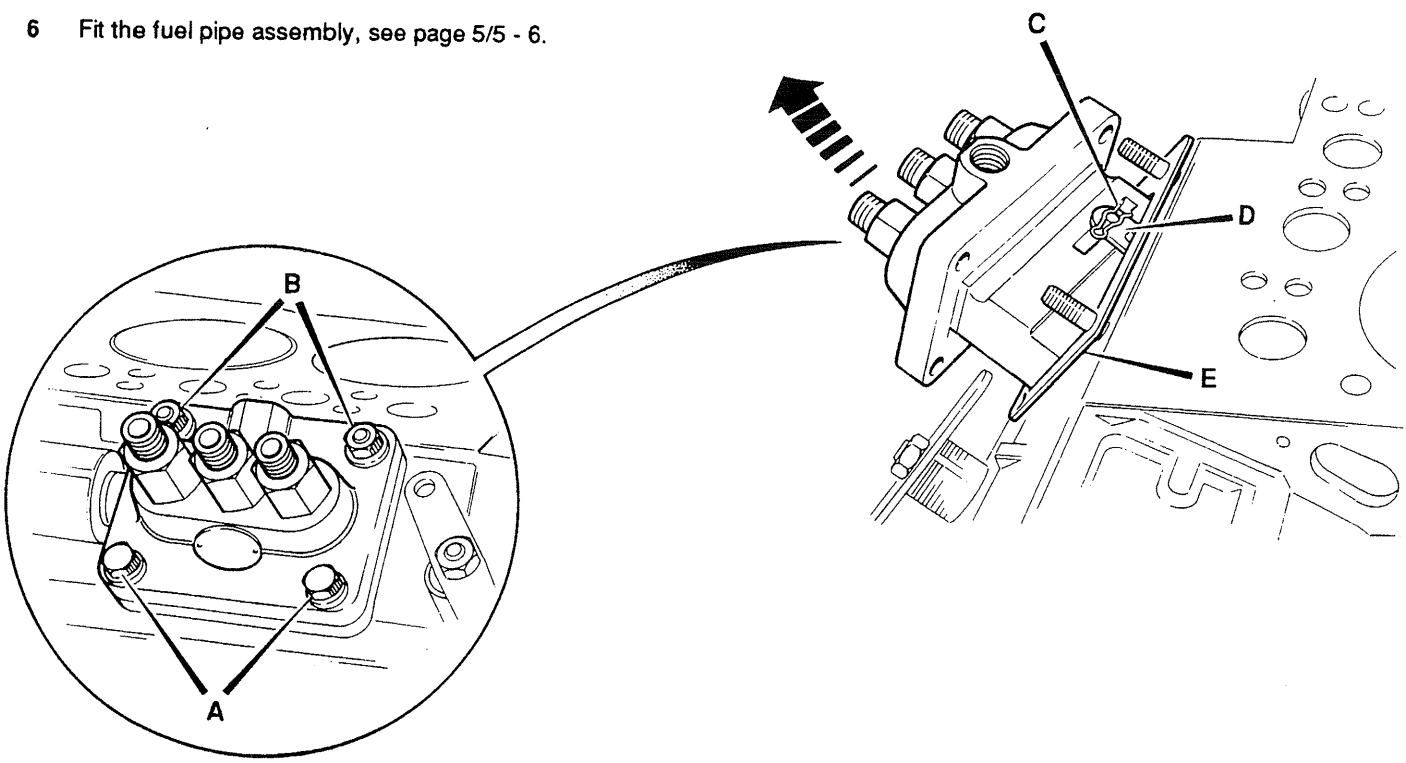
2 Position the fuel pump and connect the link **D**. Fit the snap pin **C**.

3 Install the fuel pump and fit the mounting bolts **A** and nuts **B**.

4 Tighten the mounting nuts and bolts.

5 Adjust the fuel injection timing, see page 5/5 - 5.

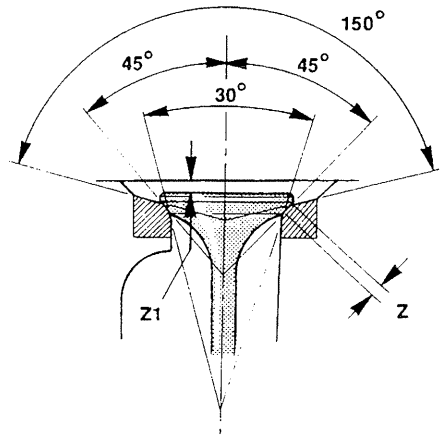
6 Fit the fuel pipe assembly, see page 5/5 - 6.



CYLINDER HEAD (cont'd)

Inspecting

9 Check the condition and width of the valve seats. If the width **Z** is more than specified in Technical Data or if the seat is excessively pitted, recut the seat as shown.



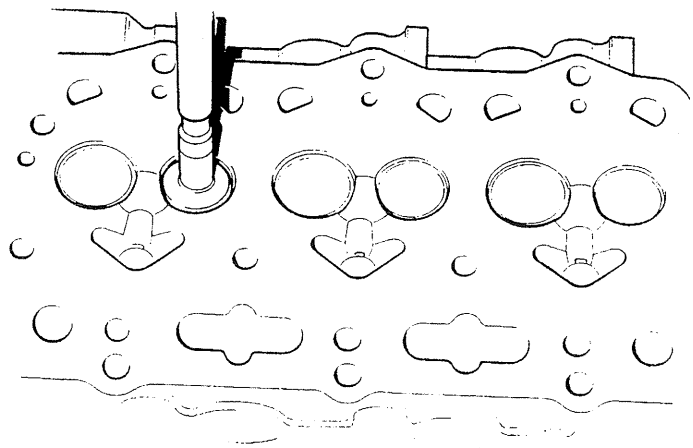
*10 Check the recess dimension of the valves **Z1**. If the recess exceeds the limit specified in Technical Data, renew the valve seat insert (if fitted).

11 Renewal of valve seat insert (where fitted):

- Either 1. Using a gas burner (700-800°C, 1292-1443°F) heat diagonally across the valve seat insert. Leave in air for 3 to 5 minutes and remove the valve seat insert by light tapping (ensuring head is not damaged).

- Or 2. Machine the insert out taking care not to damage the head.

- Clean up the insert bore and fit a new insert using a press (9800-14710N, 1000-1500 kgf, 2204-3306 lbf) and a suitably smooth surface tool. To assist the process, chill the valve seat insert with liquid nitrogen etc. or heat the head to between 60-100°C (140-212°F).



12 Correct the valve seat contact using a valve lapper and lapping compound. When using a new cylinder head, obtain correct seat contact width and seat recess using the seat cutter. Then carry out lapping.

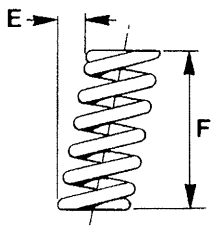
13 Check the valve springs as follows and renew if outside the limits specified in Technical Data:

- measure the free length.

- Check the squareness by placing the spring against a set square positioned on a surface plate and rotating to obtain maximum dimension **E**. Measure dimension **E** and express as a percentage of free length **F**.

  i.e. squareness = $\frac{E}{F}$ x 100%.

- check the spring tension by measuring the load required to compress the spring to its fitted length.



CRANKSHAFT (cont'd)

Assembling

4 With the bearing holders and thrust washers assembled, insert the crankshaft in the bush at the front end of the cylinder block.

5 Align the bolt holes in the cylinder block with the bearing holders on the crankshaft.

6 Install the bolts **H**, including the two recessed bolts at the flywheel end.

7 Torque the bolts **H** to 49-54 Nm (5.0-5.5 kgf m, 36-40 lbf ft), torque the two recessed bolts to 25-30 Nm (2.5-3.0 kgf m, 18-22 lbf ft).

8 Measure the crankshaft end float.

Standard play	**Allowable limit**
0.1 - 0.4mm	0.5 mm
(0.004 - 0.016in)	(0.02 in)

9 Install the press-fit rear oil seal **G** in the rear of the cylinder block.

10 Install the back plate on the rear of the cylinder block.
- **a** Coat the area around the M8 threaded holes with liquid packing (solvent based sealant) and fix the back plate with bolts.
- **b** Torque the bolts to 14-17 Nm (1.3-1.7 kgf m, 10-13 lbf ft).

11 Install the flywheel **F** noting the location of the locating spring pin and retain with the bolts **E**. Torque the bolts to 58-68 Nm (6.0-7.0 kgf m, 43-50 lbf ft).

12 Install the flywheel housing on the backplate with the bolts. Torque the bolts to 24-28 Nm (2.4-2.9 kgf m, 18-21 lbf ft)

13 Locate the front plate **B** with gasket **D** on the dowels **C** and install the bolts **A**. Torque the bolts to 9-14 Nm (0.9-1.3 kgf m, 6.5-10 lbf ft).

14 Install the camshaft assembly and tachometer assembly, see page 5/14 - 1.

15 Install the timing gear case, see page 5/12 - 1.

16 Install the fuel injection pump, see page 5/5 - 4.

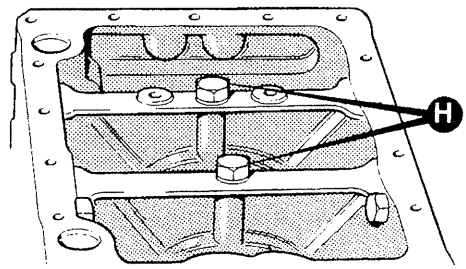
17 Install the fuel lift pump, see page 5/5 - 3.

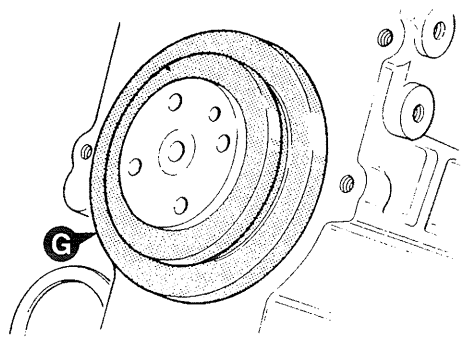
18 Install the pushrods with followers and the cylinder head, see page 5/10 - 4.

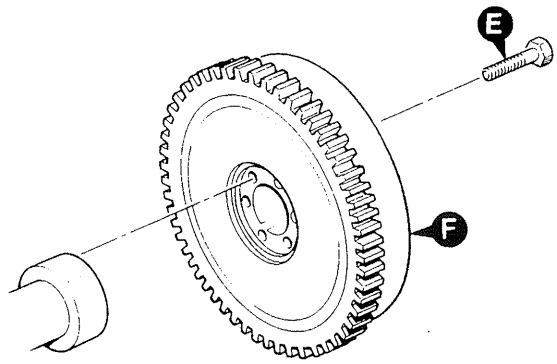
19 Install the oil pump, see page 5/13 - 1.

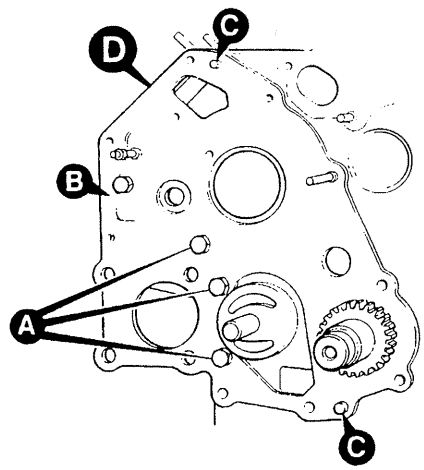
20 Install the suction pipe and strainer and the oil sump, see page 5/4 - 1.

21 Install the starter and then install the engine, see page 5/9 - 2.









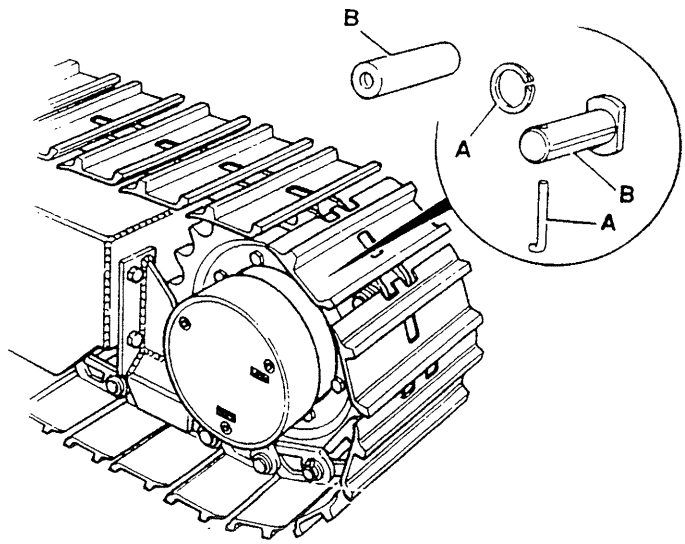
TRACKS (cont'd)

Removal & Replacement

Steel Track

1 Position the machine so that the master pin **B** is at the front of the track, as shown.

2 Remove the fastener **A** and drive out the master pin **B**.



⚠ WARNING

Ensure that all persons are clear of the track and especially of the driven sprocket during the following operations.

TRACK 1-6

3 Slowly reverse the machine until the track is laid on the ground.

⚠ WARNING

The following operations must only be undertaken by persons familiar with track changing operations and who are qualified to perform the operations. All persons must keep clear of the driven sprocket.

TRACK 1-7

4 Lay out the replacement track **C**, behind the machine. Drive the machine onto the new track, guiding the track over the idler wheel **D** and roller **E**, until the ends can be joined.

5 Fit the master pin **B** and lock using a new fastener **A**.

6 Refer to 'Track Tensioning'.