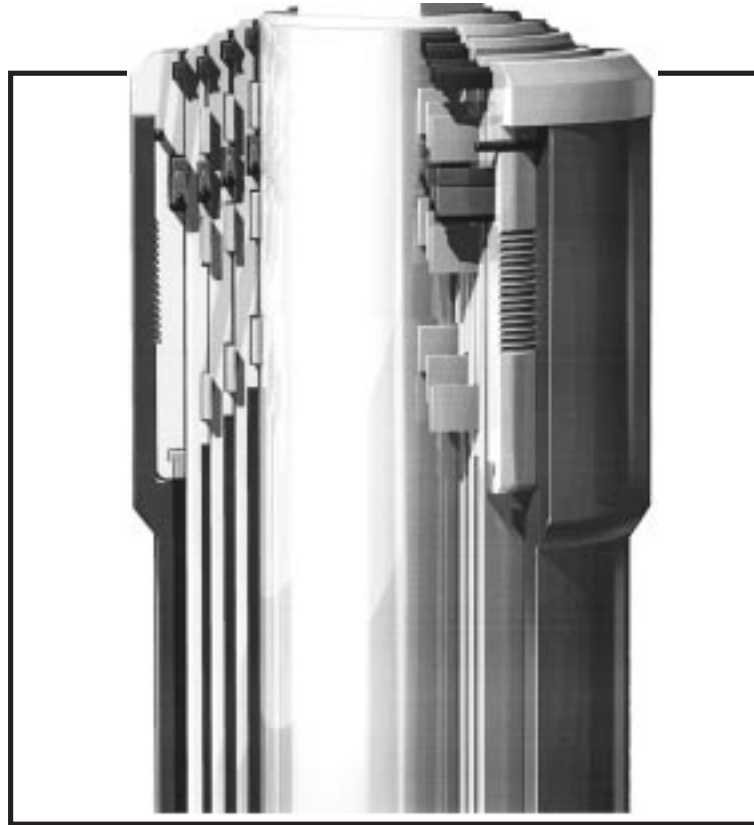


SERVICE INFORMATION



SEAL SERVICING C SERIES HOISTS (OUTER COVER & EYE MOUNTING)

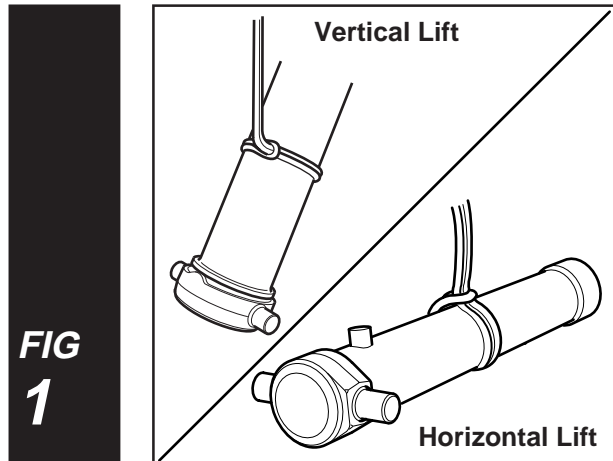


A. HEALTH AND SAFETY DURING MAINTENANCE

1 HOW TO LIFT THE CYLINDER

Requirements:

- Lifting crane (minimum rating 1000 kg)
- Lifting sling (minimum rating 1000 kg) 2 metre circle length min.



2 PROTECTIVE EQUIPMENT

Requirements:

- Suitable protective clothing
- Safety footwear (steel toe caps)
- Eye protection glasses
- Hand barrier cream

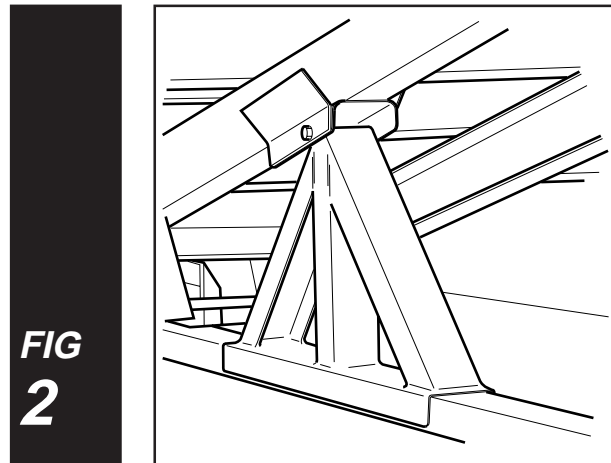
3 SERVICE EQUIPMENT

Requirements: (refer to fig.3)

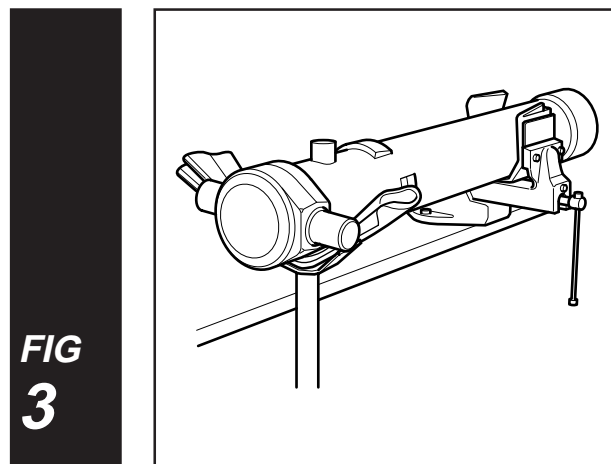
- Steel work bench adequately secured to floor
- Adjustable bench vice (minimum travel of 230mm)
- Protective shims for adjustable vice
- Extension plates for adjustable vice
- Steel support pedestal with adjustable height and 'V' head
- Protective shims for 'V' head
- Strap spanner (No.5 size)
- Adjustable 'C' spanner
- Plastic or wood drift
- Grease (Castrol LM or equivalent)
- Anti-scuffing paste (Rocol ASP or equivalent)
- Light oil
- Loctite 242 or equivalent

4 SAFE PROPPING OF TIPPER BODIES

- Before commencing work beneath any raised tipper body, it is essential that the body is securely propped.
- The body **must** be supported by installing a suitably constructed prop between the longitudinal of the body and the top flange of the chassis frame preferably **at each side**.



- Each prop must be substantially constructed so as to support the weight of an unladen tipper body.
- Prior to working beneath the body, **always** ensure that **both** props are in position and **cannot be dislodged by any sudden movement**.
- In addition to the body props it is recommended that a timber support beam be placed laterally across the chassis frame in front of the rear hinge assembly to chock the runners.
- NEVER PLACE SUPPORT PROPS BETWEEN THE UNDER SIDE OF THE BODY AND THE GROUND.**



B. REMOVAL OF HOIST FROM VEHICLE

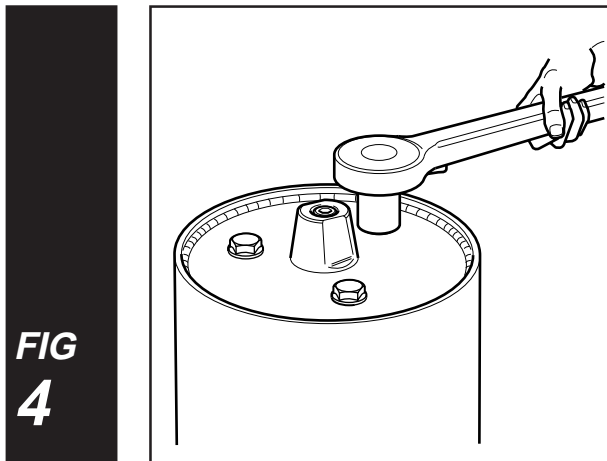
The removal of the hoist from the vehicle is as described by the body builder but can generally be undertaken as follows.

EYE ENDED HOISTS

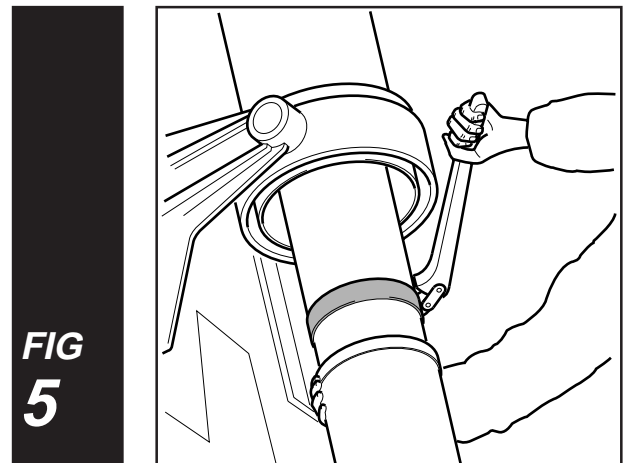
- 1 Raise tipper body approximately 200mm and place both the body props in position. (refer para. A4).
- 2 Select 'lower' on cab control valve and slowly lower body onto both props ensuring that they are correctly engaged. Slide timber support beam into position. (refer para. A4).
- 3 Remove top pivot pin from crosshead assembly and lean cylinder against body front panel.
- 4 Detach the hydraulic pipe and remove QD coupling (if fitted). Drain excess oil into a suitable container.
- 5 Place a suitable plug into feed boss to prevent:
 - a. Contamination entering cylinder
 - b. Loss of hydraulic oil
- 6 Attach the lifting sling to the cylinder using the method shown. (refer para. A1)
- 7 Lift the cylinder into the bench vice supported by the adjustable pedestal.
- 8 With the oil port facing downwards, remove the plug and allow any excess oil to drain into a clean container. (if the oil is clean it may be re-used to top up on re-fitting)

OUTER COVER HOISTS

- 1 Remove plastic cover cap (21) from outer cover tube.
- 2 Unscrew and remove the 3 x M16 self-locking bolts (22) from top of outer cover tube. (fig.4)



- 3 Raise tipper body until cover tube is approximately 400mm clear of the base tube and place both body props in position. (refer para. A4).
- 4 Select "lower" position on cab control valve and slowly lower the body onto both props, ensuring that they are correctly engaged. Leave control valve in "lower".
- 5 Slide timber support beam into position. (refer para. A4).
- 6 Wedge cylinder against chassis to prevent falling.
- 7 Detach the hydraulic pipe and remove QD coupling (if fitted). Drain excess oil into a suitable container.
- 8 Place a suitable plug into feed boss to prevent:
 - a. Contamination entering cylinder
 - b. Loss of hydraulic oil
- 9 Using a strap spanner, screw down the nest of inner tubes until free from outer cover tube. (fig.5)



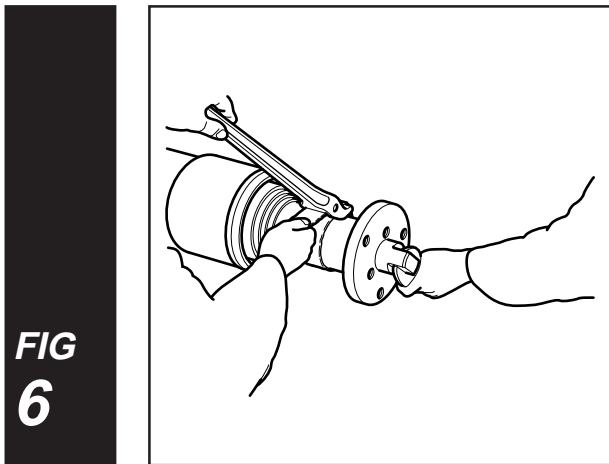
- 10 Move cylinder to vertical position and wedge securely.
- 11 Whilst supporting the cylinder via an overhead crane and sling, remove one of the cradle trunnion pivot support brackets. Then, carefully remove cylinder from its remaining support bracket.
- 12 Lift cylinder into the bench vice supported by the adjustable pedestal.
- 13 With the oil port facing downwards, remove the plug and allow any excess oil to drain into a clean container. (if the oil is clean it may be re-used to top up on re-fitting)

C. CYLINDER SERVICING

REMOVAL OF 3 BOLT TOP PLATE

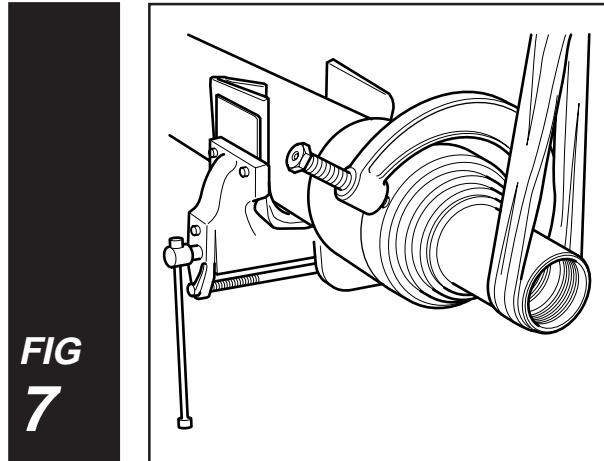
(Outer cover hoists only)

- 1 Remove the locking set screw (1) from the top face of the plate casting (2).
- 2 Place a clean container under the end of the tube to collect any oil.
- 3 Pull out the small inner tube by approximately 250mm.
- 4 Hold the tube (3) with a strap spanner and unscrew the 3 bolt top plate using a suitable spanner. Remove the plate.
- 5 Allow excess oil to drain into container.



DISMANTLING THE INNER TUBES

- 1 Locate C-spanner onto ram nut (7) and unscrew. Slide the ram nut off the tube. Use a sling and crane to take the weight of the tubes (fig.7)

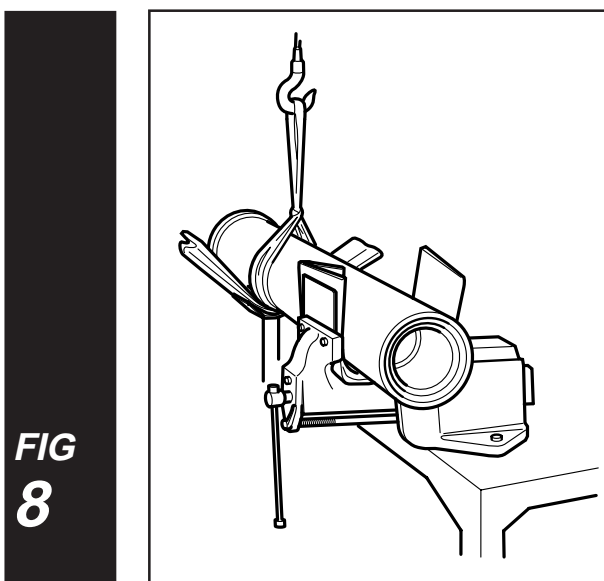


- 2 Withdraw the inner tubes slowly approximately half way, clean any hydraulic fluid from tube surface, place rope sling around assembly and take weight on a crane, withdraw assembly and place on wooden supports to prevent damage to tube outer diameter.
- 3 Remove base tube assembly (13) from vice using sling and crane.
- 4 Locate inner tubes in vice and support using protective shims to prevent damage to the tube surface.

REMOVAL OF BEARING CROSSHEAD

(Eye mounted hoists only)

- 1 Remove the locking set screw (1) from the top face of the crosshead (4).
- 2 Place a clean container under the end of the tube to collect any oil.
- 3 Pull out the small inner tube by approximately 250mm.
- 4 Hold the tube (3) with a strap spanner and unscrew the crosshead using a tommy bar placed through the eye bearing (5).
- 5 If the bearing itself is damaged or worn, remove the spiral circlip (6) using a small screwdriver as a lever.
- 6 Press out the bearing using a suitable drift and replace with a new bearing.
- 7 Fit a new circlip, checking that it is properly seated in its retaining groove.



- 5 Remove snap ring (8) securing smallest tube (9) using a small screwdriver or similar lever, push tube out from opposite end of assembly. Use sling and crane to take the weight during removal, place on wooden supports to prevent damage to tube outer diameter.
- 6 Repeat step 9 to remove remaining tubes (10, 11, 12, etc.).

NOTE: To gain access to snap rings it may be necessary to drive tube into the bore slightly. Use a plastic or wooden drift to avoid damage to the tube end.

- 7 Remove and discard wiper seal (blue) (17), fluid seal backing ring (red) and seal (black) (18) from ram nut bore and O-ring (19) from outer diameter. Remove nylon pellet (20) from location in threads with a small screwdriver or similar tool.
- 8 Remove and discard wiper seal (blue) (14), bearing rings (blue) (15), fluid seal backing ring (red) and seal (black) (16) from inner cylinder bore. Repeat for the other tubes.

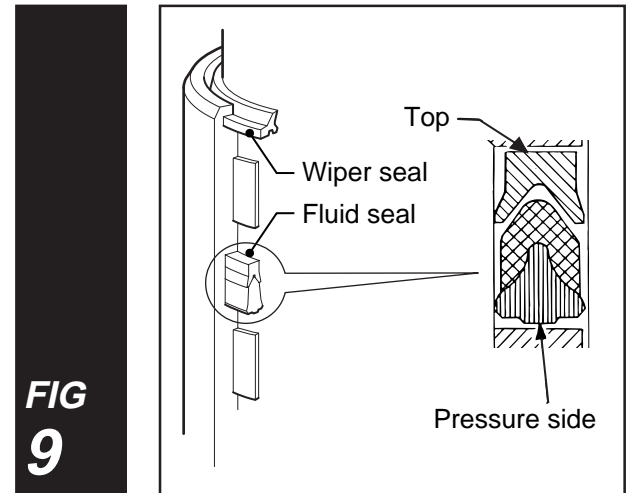
PREPARATION FOR REASSEMBLY

- 1 Light rust on the upper surface of the tube can be removed by gently finishing with emery cloth.
- 2 Any rust in the seal groove or top bearing groove can also be removed with emery cloth.
- 3 Inspect all tubes for external damage. Scored, dented or heavily marked tubes must be replaced .
- 4 Inspect the bronzed faced slider for excessive wear or damage. If the bronze is worn away the tube must be replaced. Minor damage marks may be rectified by locally filing and finishing with emery cloth.
- 5 Finally, all components must be thoroughly cleaned and degreased.

RENEW SEALS

- 1 Apply grease to tube bore above the main seal groove.
- 2 Locate new bearing ring(s) in their grooves, new fluid seal and backing ring (see Fig.9 for correct positioning) and new wiper seal.

- 3 Locate new fluid seal and backing ring (see Fig.9 for correct positioning) and new wiper seal in ram nut bore. Fit new O-ring to outer diameter. Fit new nylon pellet to location in threads, ensure pellet

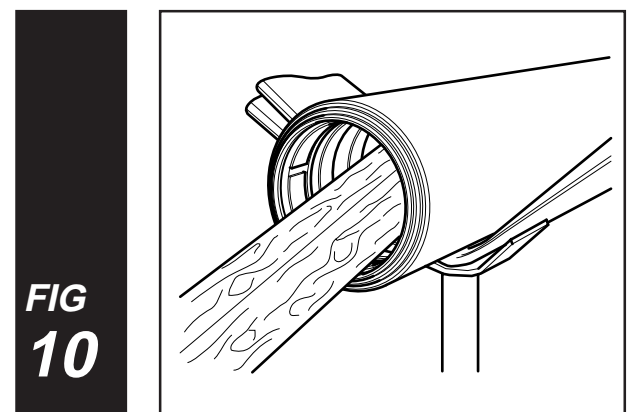


**FIG
9**

stands level with the top of the threads.

ASSEMBLING THE INNER TUBES

- 1 Lightly oil the cylinder bores and fluid seals with oil .
- 2 Take the weight of the second stage (11) with a sling and hoist. Insert tube, seal end first, into bore of larger tube (12), remove the sling when fully entered. Take care not to damage the outside diameter of the smaller tube.
- 3 Use a plastic bar or suitable clean piece of



**FIG
10**

wood to centralise inner tube into outer tube bearing ring (fig. 10). Push tube through the seals and bearings taking care not to damage the seals.

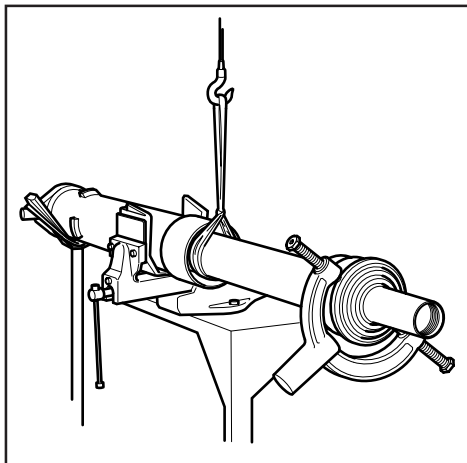
- 4 Insert snap ring (8) in outer tube then seat tube

against ring.

NOTE: to gain access to snap ring location it may be necessary to use a soft drift to hammer tube a short distance into the bore.

- 5 Repeat steps 2, 3 and 4 for the other tubes.
- 6 Use oil to lubricate the seals of the ram nut (7). Locate ram nut on top of the tube nest and push on about 300mm.
- 7 Lift the tube nest out of the vice using the sling and crane and rest carefully on wooden blocks on the floor.
- 8 Lift the base tube assembly onto the bench with the open end in the vice and the closed end on the stand.
- 9 Apply grease to the tube bore above the threads.
- 10 Taking the weight of the tube nest with a sling and crane enter the tubes into the base tube as far as possible. Support the tubes on a stand, and move the sling to the end and slide the tubes fully home until the ram nut enters the base tube (fig.11)
- 11 Fit "C" spanner to ram nut (7). Oil the ram nut O-ring liberally.
- 12 Temporarily fit the eye end or 3 bolt plate and pull the smallest tube (9) out approximately 250mm. Take the weight of the tube assembly with rope sling and crane (fig.7).

**FIG
11**



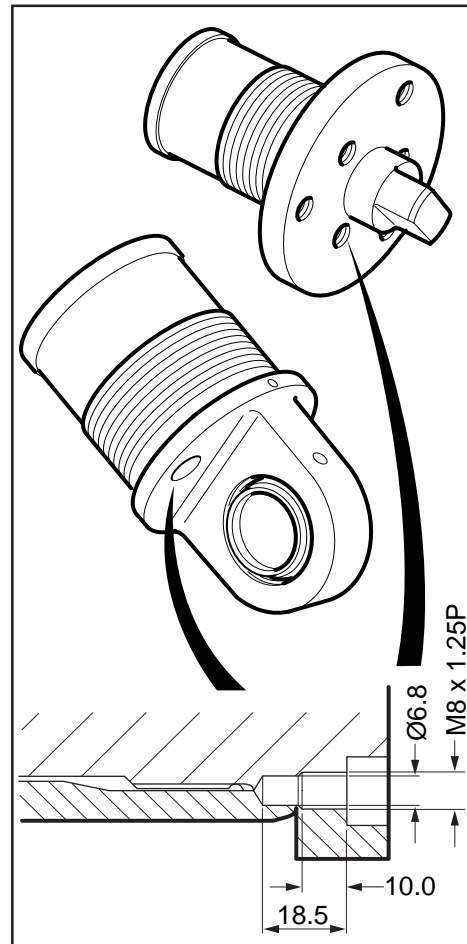
- 13 Push the ram nut firmly into the base tube and carefully turn it to engage with the base tube threads.
- 14 Fully tighten the ram nut to 500Nm minimum.

REPLACING 3 BOLT TOP PLATE OR BEARING CROSSHEAD

- 1 Liberally smear the threads of the top fixing with anti-scuffing paste. Position top fixing into small inner and with appropriate spanner on top plate spigot, or with a tommy bar through the eye end, screw into position, and strike a sharp blow with a hammer to ensure the fixing is tight.
- 2 It is not practical to assume that the original locking screw holes will re-align. To refit the setscrew use one of the alternative holes which for ease of identification have been partially pre-drilled.
- 3 Using a 6.8mm diameter drill proceed to further drill the selected hole to an overall depth of 18.5mm. (see fig.12)

*This dimension **MUST NOT** be exceeded
- 4 Hole to be tapped M8 x 1.25p to a depth of 10mm and made free from swarf.

**FIG
12**



- 5 Put Loctite 242 or equivalent on the setscrew thread .
- 6 Screw locking setscrew into position and tighten.

REPLACING A SINGLE SEAL

If a full stripdown is not required, a single seal can be replaced as follows:

- 1 Remove the ram nut and full nest of tubes as described earlier.
- 2 With the nest in a vice (as Fig. 8), remove the snap ring from the tube that requires a new seal.

Note: To gain access to the snap ring it will be necessary to drive the smaller tubes into the bore. Use a plastic or wooden drift to avoid damage to the tube end.

- 3 With the snap ring removed, push the inner tubes past the snap ring groove taking care not to damage the tube surface. Remove the inner tubes completely using a sling and crane.
- 4 Remove the affected main seal, wiper seal and bearing rings.
- 5 Prepare for re-assembly as described earlier.

IMPORTANT: All of the seals and bearing rings in the affected tube must be replaced. The ram nut O-ring seal (23) must also be replaced.


D. REFITTING OF HOIST TO VEHICLE

EYE ENDED HOISTS

- 1 Clean and grease both the crosshead bearing (5) and the trunnion pivot arms then proceed to refit the hoist to the vehicle.
- 2 Reconnect hydraulic hose and check oil level in tank. Replenish if necessary.
- 3 Place the PTO in mesh, select 'tip' on the control valve and slowly elevate the tube to enable the top pivot pin to be re-fitted. When fitted remove body props.
- 4 Fully tip body two or three times. Visually check for any oil leakage.

OUTER COVER HOISTS

- 1 Clean and grease the lower trunnion arms and proceed to refit the hoist to the vehicle.
- 2 Re-connect hydraulic pipes and check oil level in tank. Replenish if necessary.

- 3  With cylinder supported in line with outer cover, engage PTO and move hoist control to 'tip'. Carefully guide extending inner ram tubes back into the outer cover and when body just begins to lift, move control handle into 'hold' position.

Take care to avoid injury

- 4 Remove body props and for safety reasons lower body to approximately 100mm from chassis.
- 5 Align the three holes in the outer cover top plate, by using a spanner on the projecting flats of the spigot. Insert the M16 x 3 self locking bolts and tighten to a torque of 270Nm (200lb ft).
- 6 Refit the plastic top cap.
- 7 Fully tip body two or three times. Visually check for any oil leakage.


TESTING

- 1 Check the oil level in the tank with the body lowered and top-up as necessary.
- 2 Exercise the hoist to full stroke several times to flush any air out.
- 3 Look for any signs of oil leakage.
- 4 Fully grease all mounting points.
- 5 Finally, check the oil level again when the hoist has been standing for several minutes.

BLEEDING

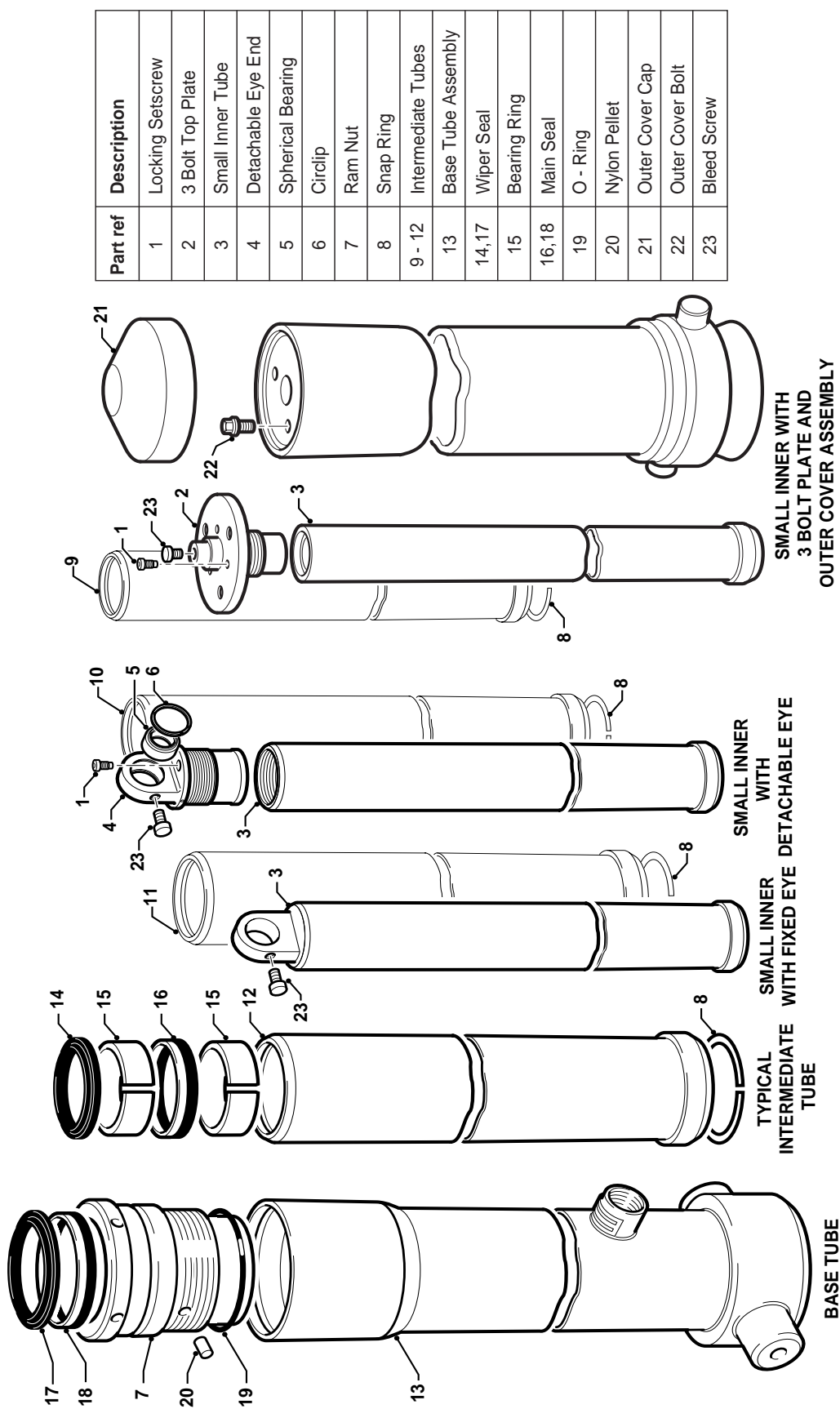
If the hoist judders in 'LOWER' or the tubes operate out of sequence when lowering, there may be air in the system.

To bleed air throughout the circuit:

- 1 Loosen the pressure outlet hose from the pump a little.
- 2 Loosen the hose connection at the cylinder.
- 3  Then with the pump running at low speed, put the control valve into 'TIP'. After a few seconds any air will have escaped and the connections can be tightened.

Warning: Take care to guard against the escape of high pressure oil

- 4 Tip the hoist to full stroke and leave the pump running on engine tick-over with the control in 'TIP' for approx. 5 minutes. This will purge the cylinder of air through the oil into the tank and filler/breather.
- 5 If the hoist still shows signs of trapped air, tip the body to full stroke a further 10 times, and at the end of each stroke leave the cab control in 'TIP' for about 30 seconds before lowering.
- 6 Finally, re-check the oil level.



Part ref	Description
1	Locking Setscrew
2	3 Bolt Top Plate
3	Small Inner Tube
4	Detachable Eye End
5	Spherical Bearing
6	Circlip
7	Ram Nut
8	Snap Ring
9 - 12	Intermediate Tubes
13	Base Tube Assembly
14,17	Wiper Seal
15	Bearing Ring
16,18	Main Seal
19	O - Ring
20	Nylon Pellet
21	Outer Cover Cap
22	Outer Cover Bolt
23	Bleed Screw

TYPICAL CS CYLINDER ASSEMBLY
 (FOR A SPARE PARTS DRAWING OF YOUR CYLINDER CALL YOUR EDBRO DISTRIBUTOR)



Nelson Street, Bolton, Lancs BL3 2JJ
 Telephone: 01204 528888
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 Spares Fax: 01204 393561