

# **Edbro**

SETTING THE INDUSTRY STANDARD

## **SERVICE INFORMATION**



## **New C Series Cylinders** *(outer cover & eye mounting)*

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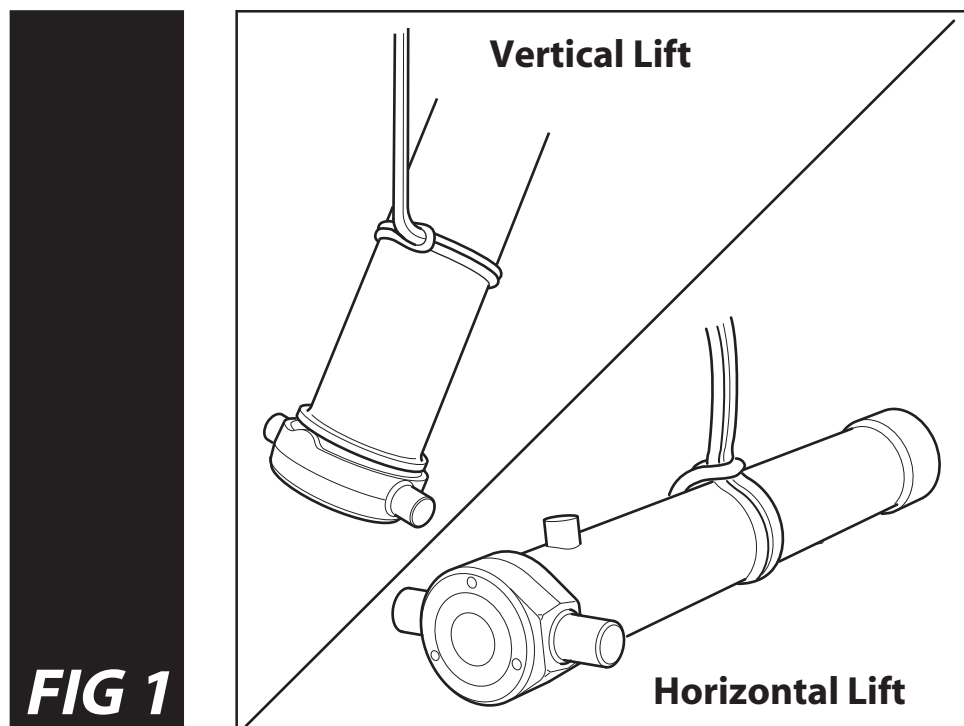
**N.B. For item numbers listed in this procedure, refer to exploded cylinder view on page 6.**

## A. HEATH 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 minimum



### 2. PROTECTIVE EQUIPMENT

Requirements:

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

### 3. SERVICE EQUIPMENT

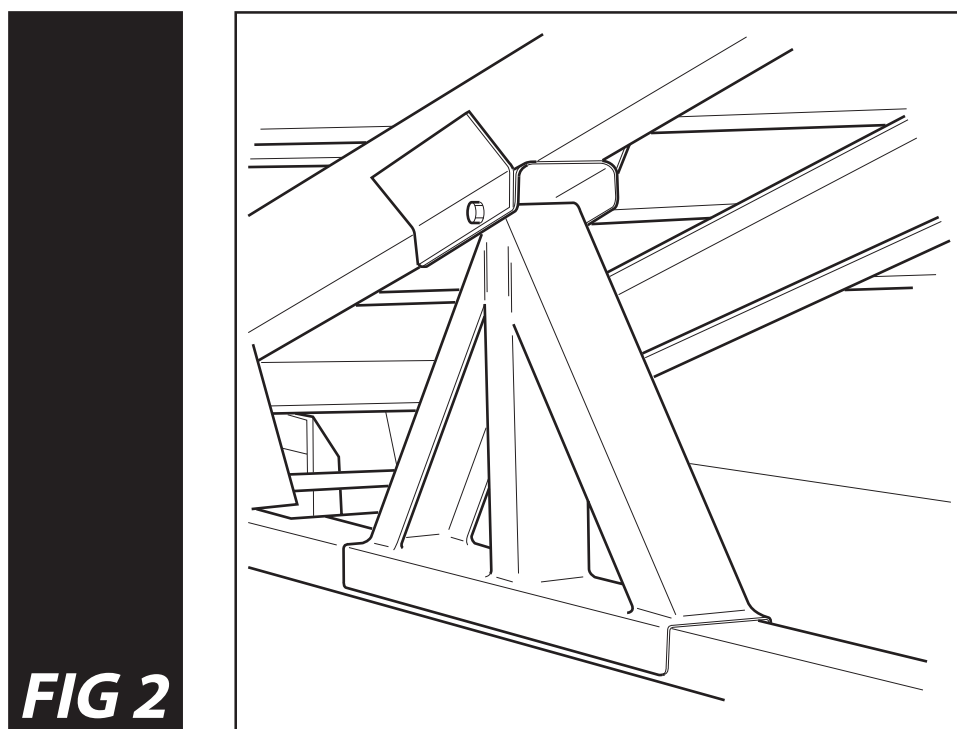
Requirements: (refer fig.3)

- \* 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)
- \* Socket to suit M6 bolt
- \* 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**.

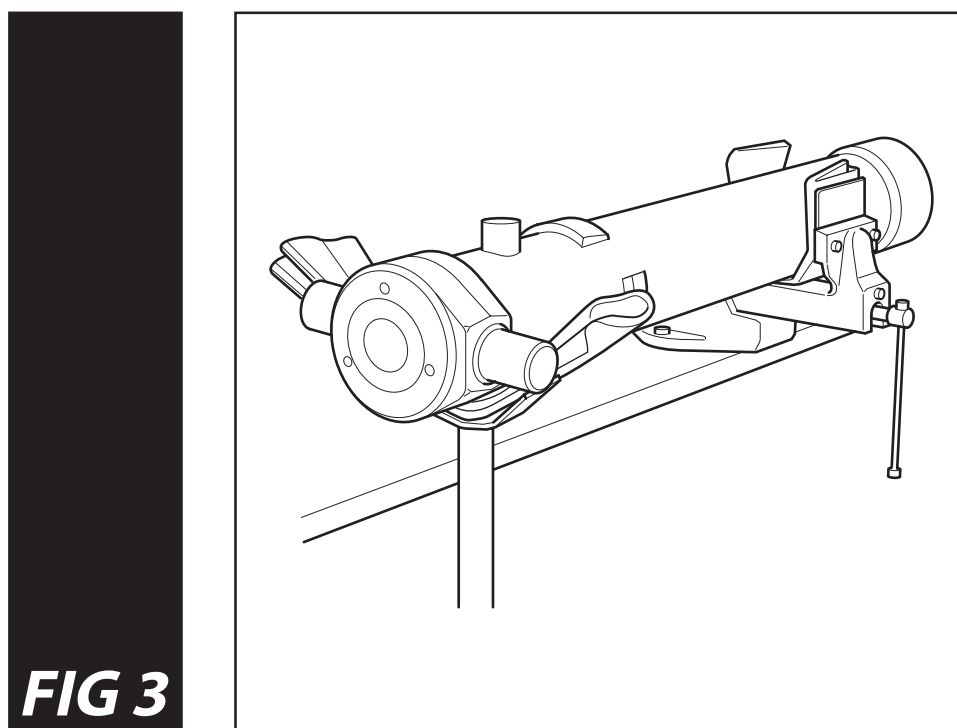
- Each prop must be substantially constructed so as to support the weight of an unladen tipper body.



- 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 UNDERSIDE OF THE BODY AND THE GROUND.**



## B. REMOVAL OF HOIST FROM VEHICLE

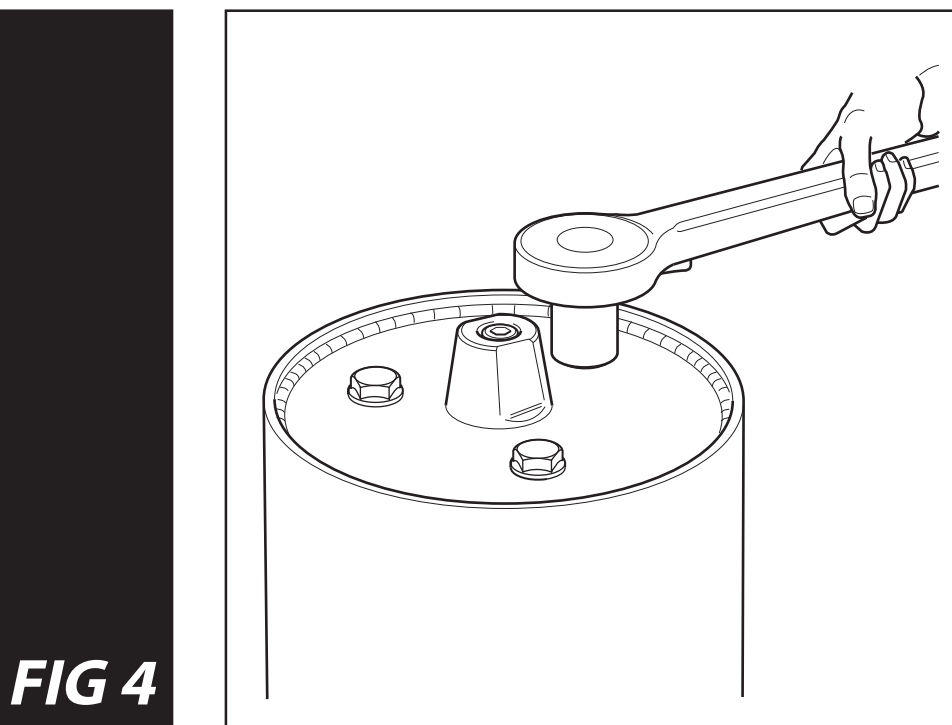
The removal of the hoist from the vehicle is as described by the body builder but can generally be undertaken as follows.

### 1. EYE ENDED HOISTS

1. Raise tipper body approximately 200mm and place both the body props in position.
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 fig.2).
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 fig.1).
7. Lift the cylinder into the bench vice supported by the adjustable pedestal (fig.3).
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 reused to top up on re-fitting.

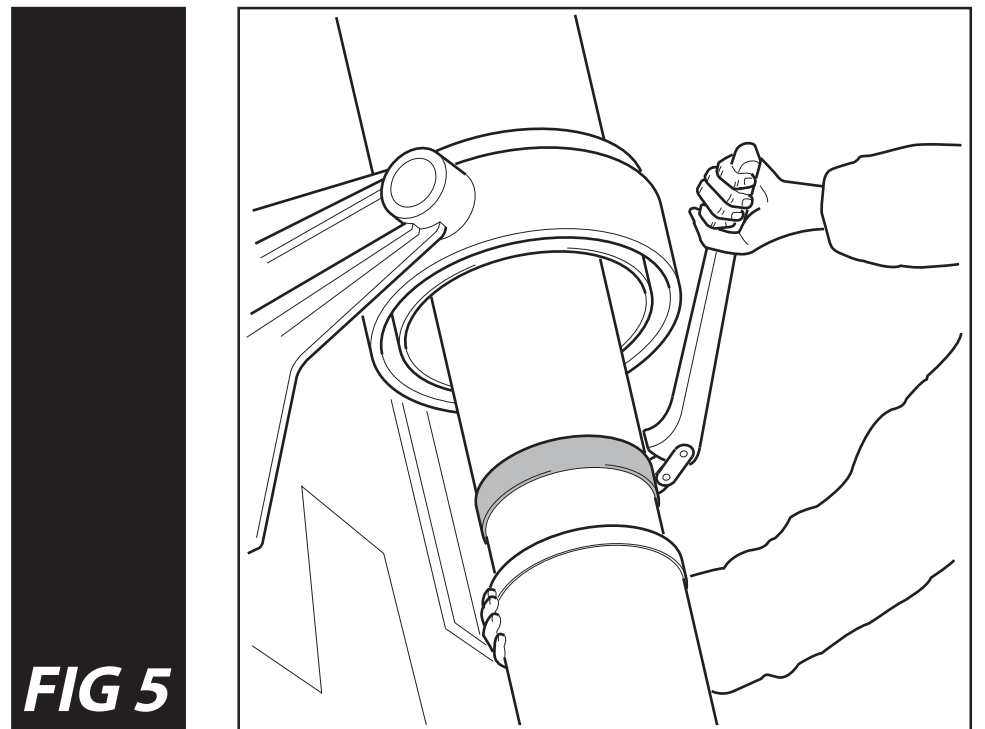
### 2. OUTER COVER HOISTS

1. Remove plastic cover cap (item 16) from outer cover tube.
2. Unscrew and remove the 3 x M16 self-locking bolts (item 22) from top of outer cover tube (refer fig.4).
3. Raise tipper body until cover tube is approximately 400mm clear of the base tube and place both body props in position.



**FIG 4**

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 fig.2).
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 (refer fig.5).



**FIG 5**

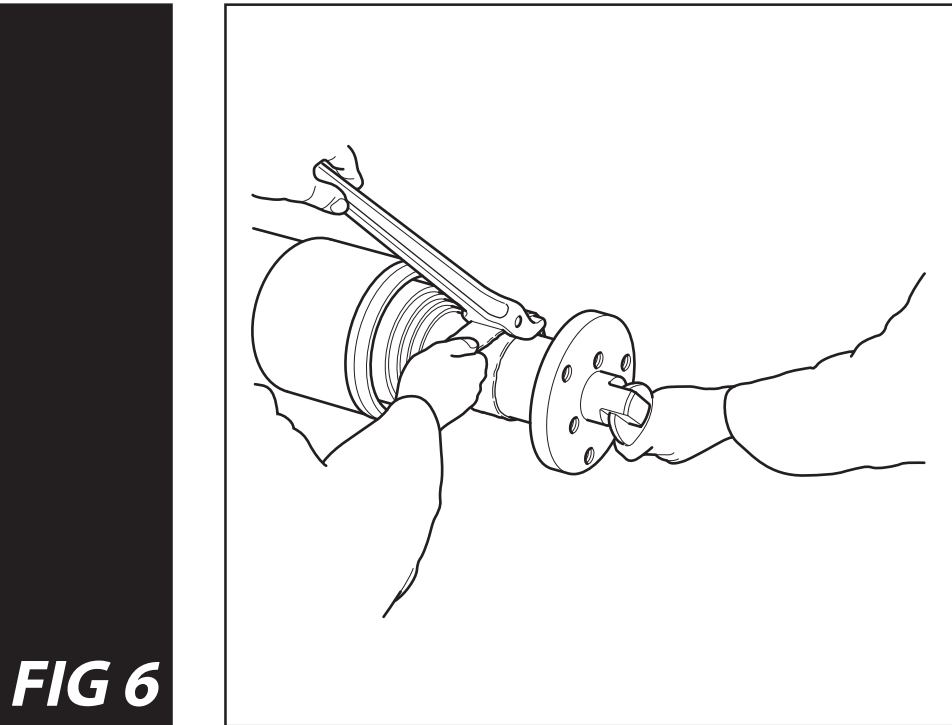
10. Move cylinder to vertical position and wedge securely.
11. Whilst supporting the cylinder via an overhead crane and sling, remove one of the cradle trunnion pivot support brackets. Then, carefully remove cylinder from its remaining support bracket (fig.3).
12. Lift cylinder into the bench vice supported 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 reused to top up on re-fitting.

## C. CYLINDER SERVICING

### 1. REMOVAL OF 3 BOLT TOP PLATE

*(Outer cover hoists only)*

1. Remove the locking set screw (item 1) from the top face of the plate casting (item 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 (item 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.



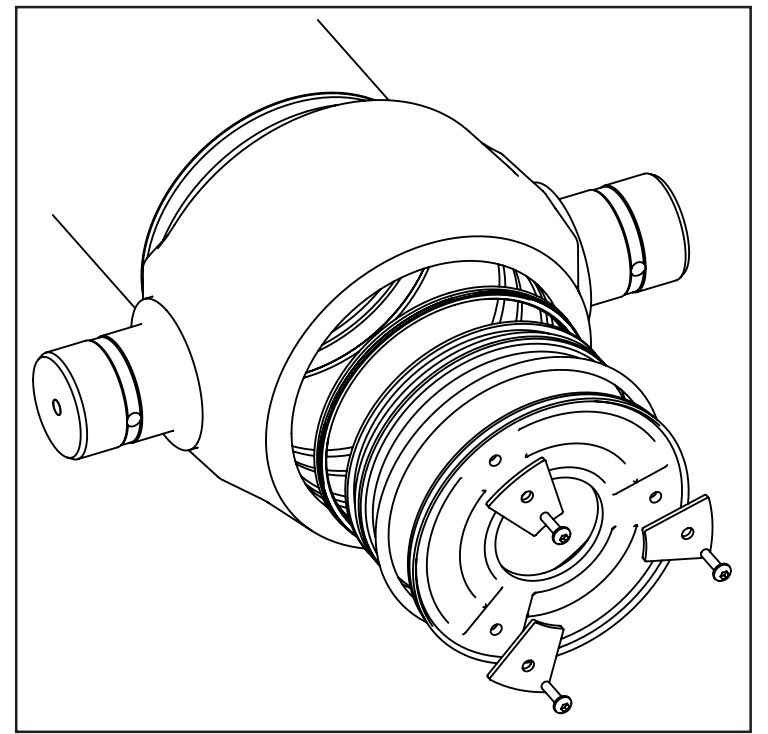
**FIG 6**

### 2. REMOVAL OF CROSSHEAD

*(Eye mounted hoists only)*

1. Remove the locking set screw (item 1) from the top face of the crosshead (item 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 (item 3) with a strap spanner and unscrew the crosshead using a support bar placed through the eye bearing (item 5).
5. If the bearing itself is damaged or worn, remove the spiral circlip (item 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.

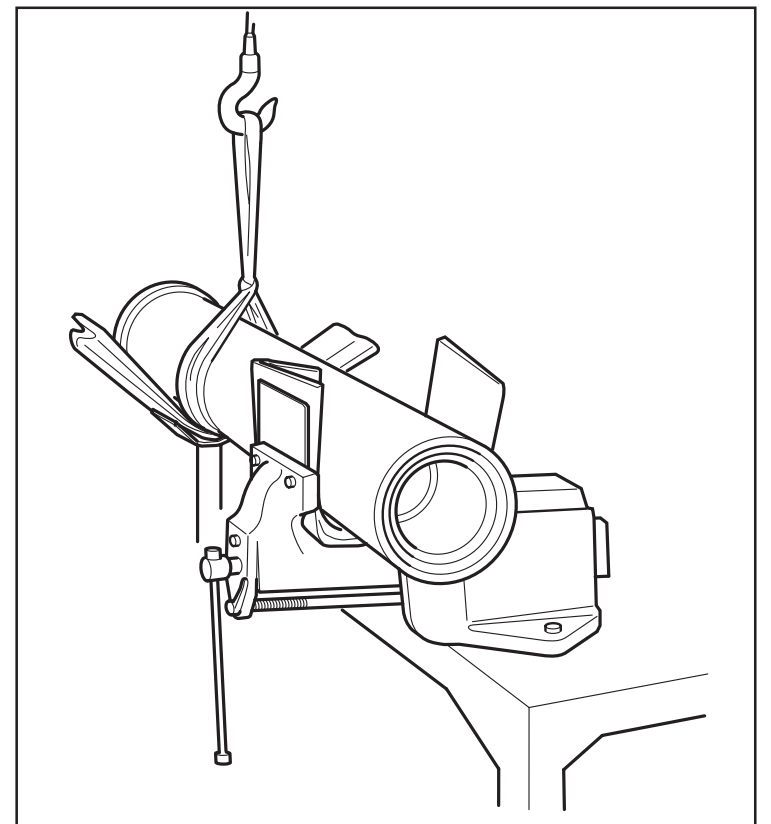
**FIG 7**



### 3. DISMANTLING THE INNER TUBES

1. Remove 3 x M6 bolts and support washers (items 21 & 22).
2. Carefully remove environmental plate (item 20) using a smooth tool.
3. Knock base pad (item 19) forward to expose stop ring (item 7).
4. Remove the stop clip using a suitable tool taking care not to damage the bore or housing.
5. Refit screws & locking tabs to base pad and carefully lever out against end face of tube.

**FIG 8**



6. Push tube nest out from opposite end of assembly. Use sling and crane, place on wooden supports to prevent damage to tube outer diameter.
7. Repeat step 6 to remove remaining tubes.

**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.**

8. Remove and discard wiper seal (item 13), 2 piece fluid seal (item 15), and bearing rings (item 14) from tube bores.

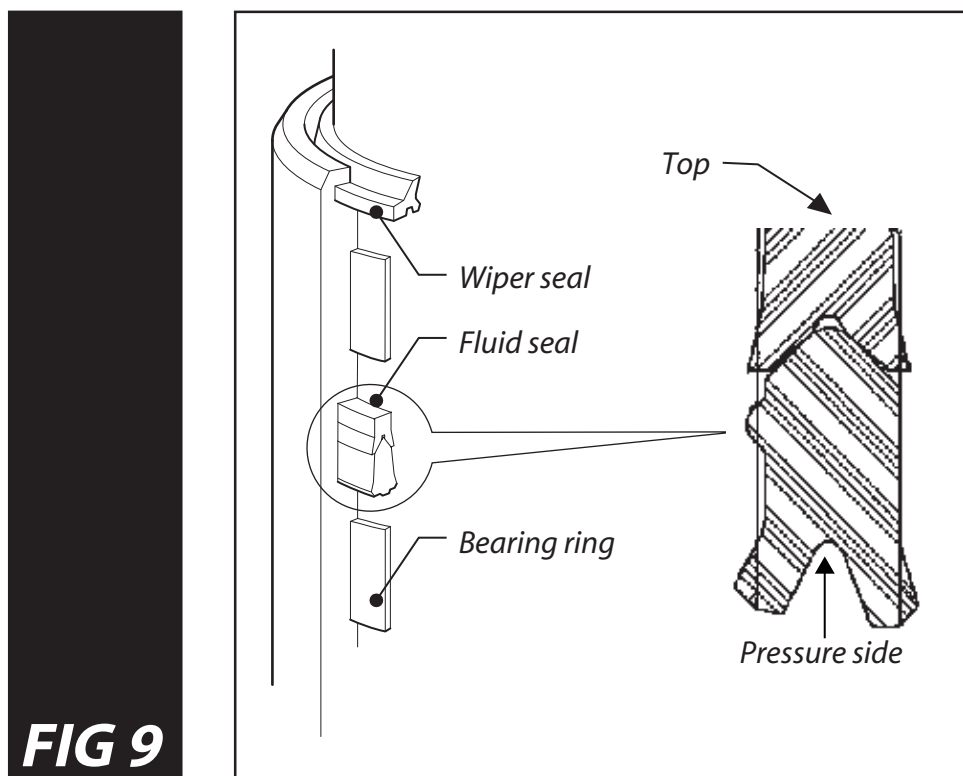


#### 4. PREPARATION FOR REASSEMBLY

1. Light rust on the upper surface of the tube, in the seal or bearing grooves can be removed by gently polishing with fine abrasive cloth.
2. Inspect all tubes for external damage. Scored, dented or heavily marked tubes must be replaced.
3. Inspect the bronze 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 polishing with abrasive cloth.
4. Finally, all components must be thoroughly cleaned and degreased.

#### 5. RENEW SEALS

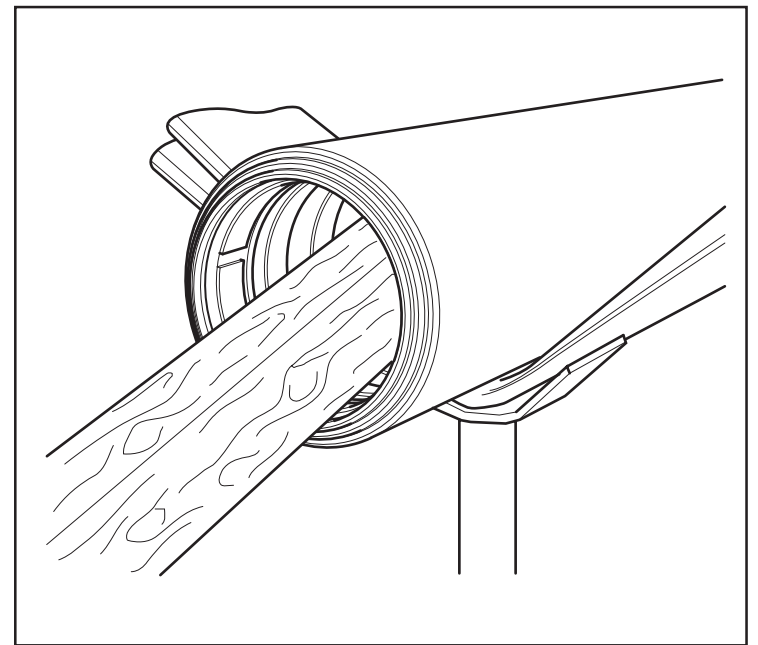
1. Apply grease to tube bore above the main seal groove.
2. Locate new bearing ring(s) in their grooves, new fluid seal and backing ring (refer fig.9 for correct positioning) and new wiper seal.



#### 6. ASSEMBLING THE INNER TUBES

1. Lift the base tube assembly onto the bench with the trunnion end in the vice and the head end on the stand.
2. Lightly oil the cylinder bores and fluid seals with oil.
3. Use a plastic bar or suitable clean piece of wood to centralise inner tube into outer tube bearing ring (refer fig.10). Push tube through the seals and bearings taking care not to damage the seals or the slider bearing stop face.
4. Push tube nest forward to expose clip groove.
5. Insert snap ring (item 8) in outer tube then seat tube against the rings.
6. Repeat steps 2 - 5 for the other tubes.

**FIG 10**



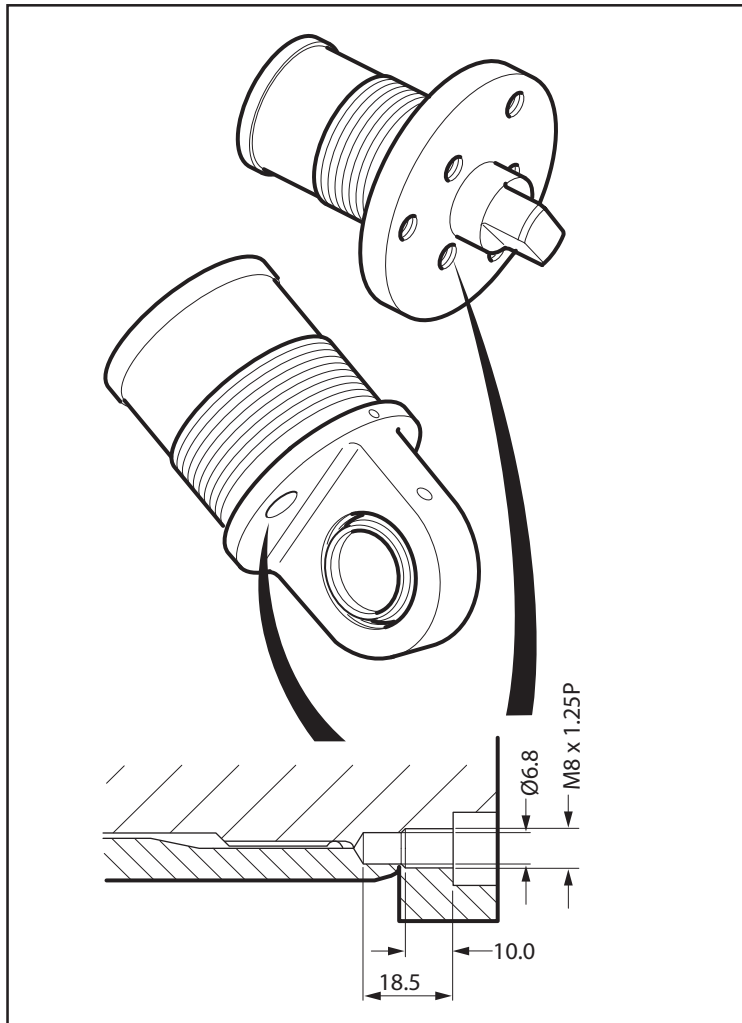
**NOTE: To expose the snap ring groove it is necessary to use a soft drift to move tube a short distance into the bore.**

7. Fit seal (item 15) to base pad (item 19) and lubricate liberally then assemble base pad to bore of tube pushing it forward enough to expose the clip groove.
8. Fit stop clip and push tube nest back to locate base pad against stop ring ensuring the stop ring is fully seated in its groove.
9. Fit environmental cap (item 20) and secure base with 3 x M6 bolts (item 21), seal support lugs (item 22) and washers. Tighten to 6Nm torque.

#### 7. 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 support 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 the pre-drilled hole to an overall depth of 18.5mm (refer fig.11). This dimension **MUST NOT** be exceeded.
4. Tap hole M8 x 1.25p 10mm deep ensure hole is free of swarf.
5. Use Loctite 242 or equivalent on the setscrew thread.
6. Screw locking setscrew into position and tighten.



**FIG 11**

## D. REFITTING OF HOIST TO VEHICLE

### 1. EYE END HOISTS

1. Clean and grease both the crosshead bearing (item 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. Engage the PTO, 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.

### 2. OUTER COVER HOISTS

1. Clean and grease both the crosshead bearing (item 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. 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.

## 3. 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.

## 4. 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 in "tip". After a few seconds any air will have escaped and the connections can be tightened.

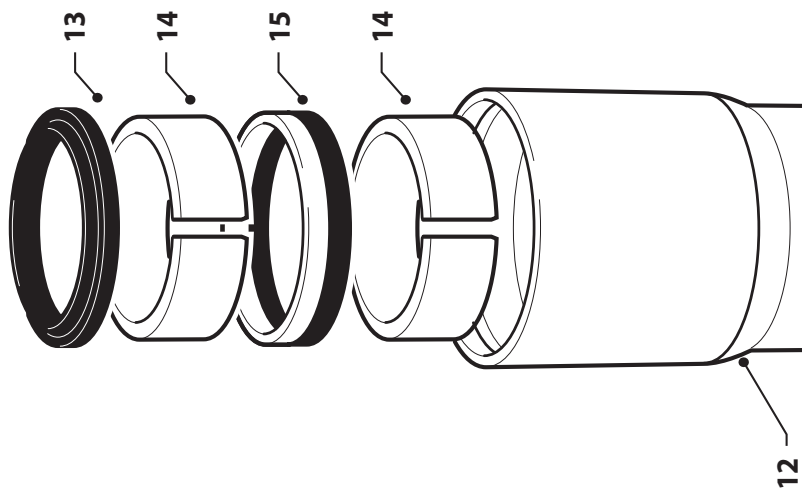
### ⚠ Warning: Take care to guard against the escape of high pressure oil.

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.

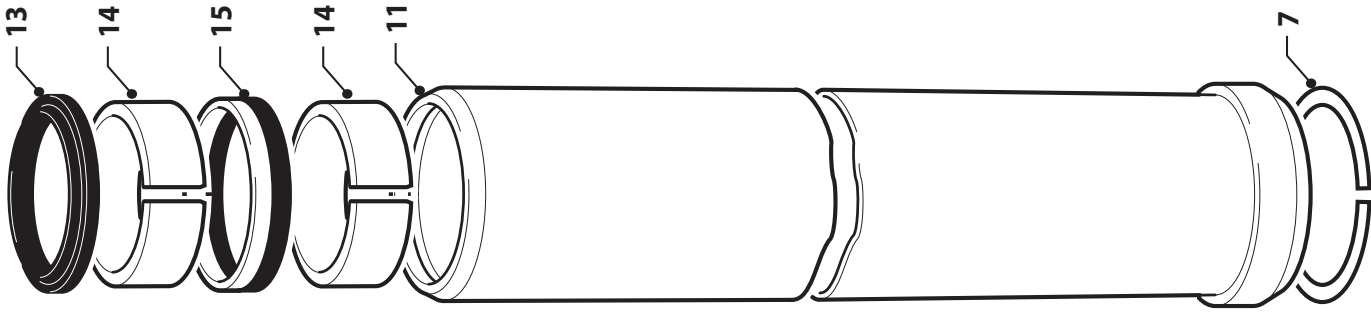
**TYPICAL NEW C SERIES CYLINDER ASSEMBLY**

(For a specific spare parts drawing, contact your Edbro distributor)

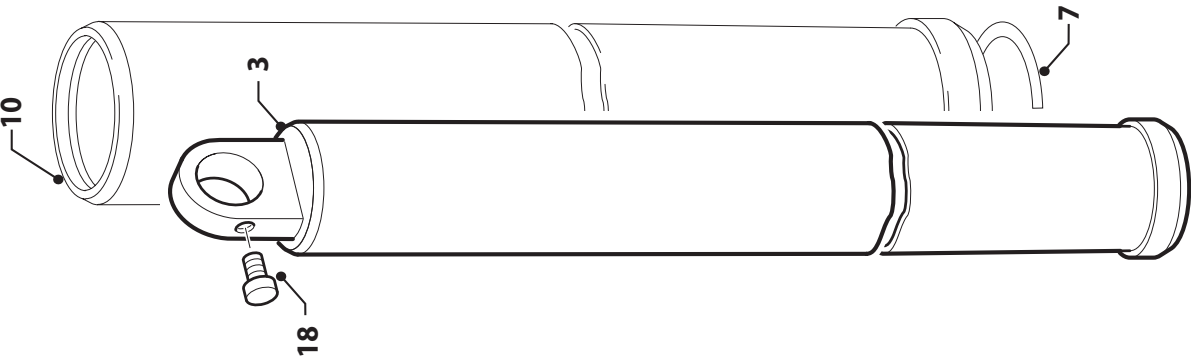
**BASE TUBE**



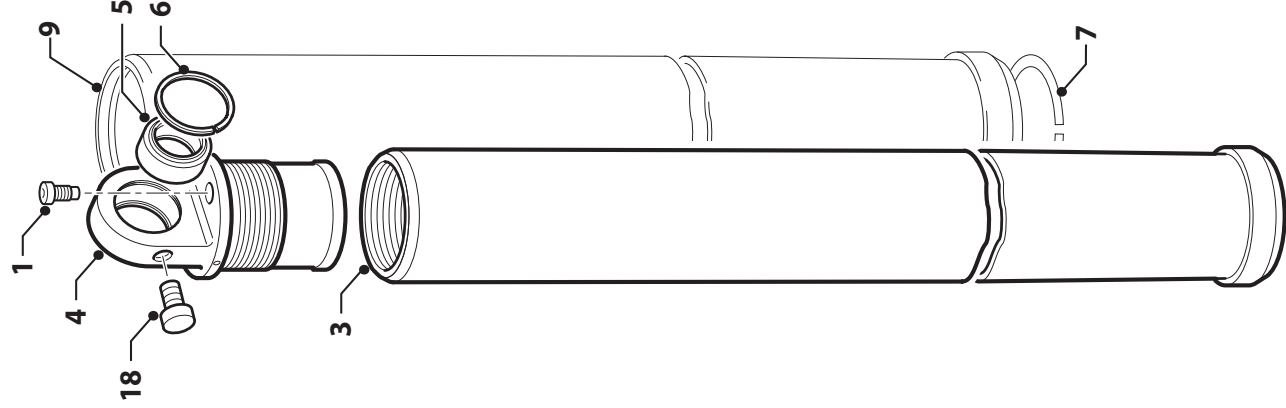
**TYPICAL INTERMEDIATE TUBE**



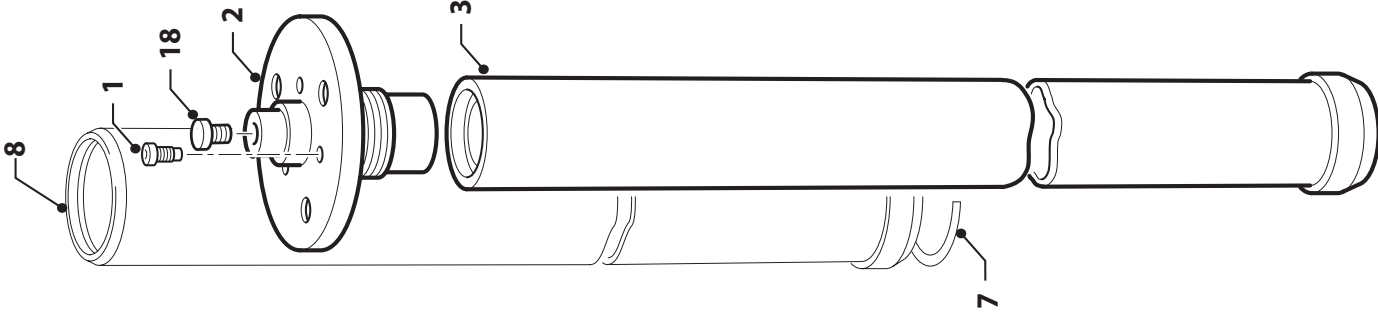
**SMALL INNER WITH FIXED EYE**



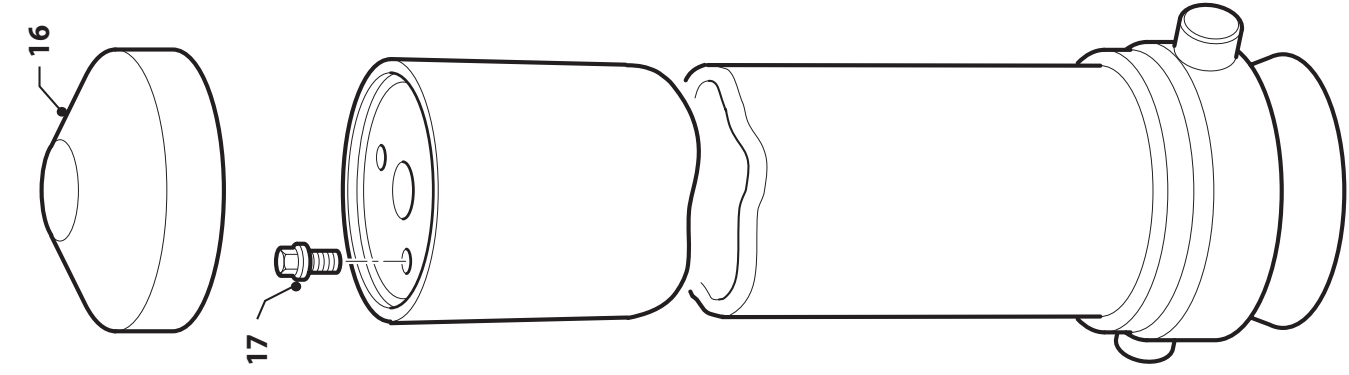
**SMALL INNER WITH DETACHABLE EYE**



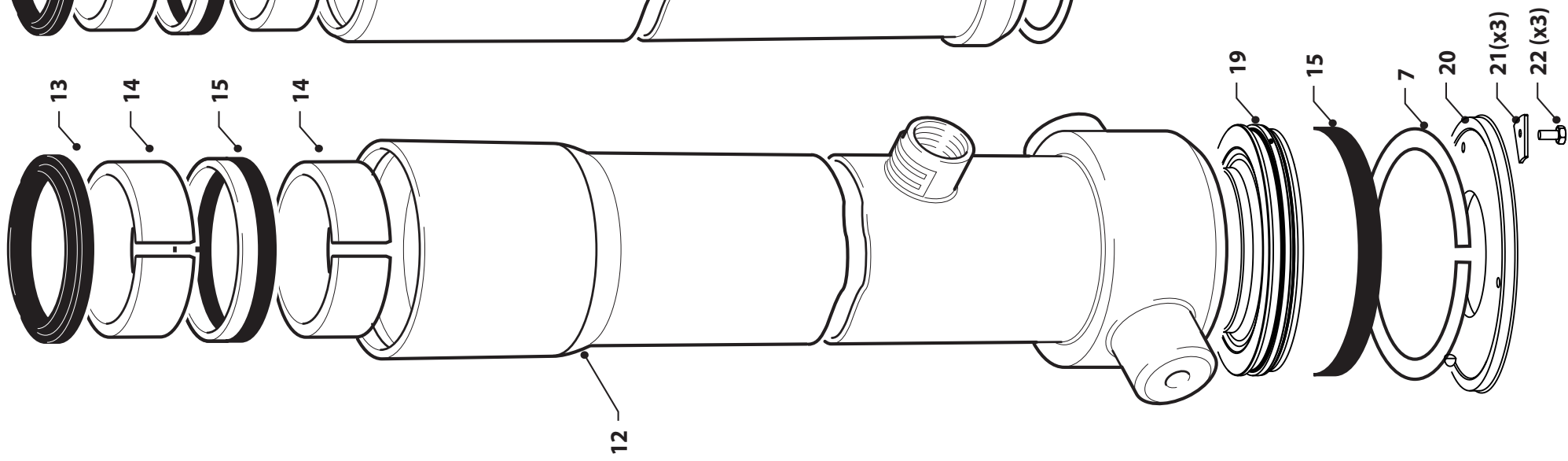
**SMALL INNER WITH 3 BOLT PLATE**



**OUTER COVER ASSEMBLY**



**BASE TUBE**



Part ref	Description
1	Locking screwset
2	3 bolt top plate
3	Small inner tube
4	Detachable eye end
5	Spherical bearing
6	Circlip
7	Snap ring
8-11	Intermediate tubes
12	Base tube assembly
13	Wiper seal

Part ref	Description
14	Bearing ring
15	Main seal
16	Outer cover cap
17	Outer cover bolt
18	Bleed screw
19	Base pad
20	Environmental plate
21	Washer
22	Nut



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