

- h. Check that dowel pins are in place in any new castings. Examine all of the dowels. Before inserting and ensure that the hole is clean and free from burrs. Gently start the pin straight into the hole and tap lightly with a soft hammer.
- i. Before inserting a new lip seal in the shaft end cover, coat the outer edge of the lip seal and its recess with Permatex Aviation Form-A-Gasket No. 3 non-hardening sealant or equivalent. With the metal side of the lip seal up, press it into the mounting flange side of the shaft end cover with an arbor press and bar. Be careful not to damage the lip of the seal. Press in until flush with the recess then wipe off any excess sealant.
- j. Install the snap ring in the groove to retain the outboard bearing.
- k. Grease the new gasket seals and insert them into the grooves in both sides of all gear housings. Position the first gear housing over the shaft end cover and dowels. Tap it with a soft hammer until it rests tightly against the shaft end cover. Be careful not to pinch the gasket seal. Also ensure that the large rounded core is on the inlet side.
- l. Assemble the channel seals into the grooves in the thrust plates with the flat side of the seal facing away from the thrust plate as shown in Figure 73.

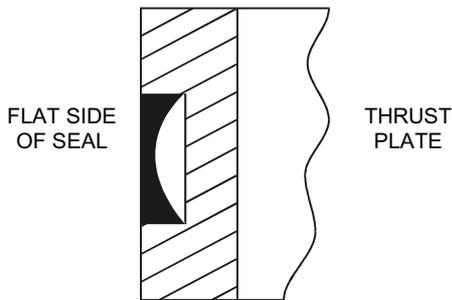


Figure 73 – Assembly of Channel Seals

- m. Gently slip the thrust plate through the gear housing and into place on the shaft end cover. The channel seal from Para 101(l) should face the shaft end cover. The relief groove in the plate should face the outlet side of the pump.
- n. Slide the driven gear through the housing and into the bushing in the shaft end cover. Coat an appropriate steel sleeve with grease. Place the lightly greased drive shaft inside the sleeve and slide both through the shaft end cover with a twisting motion, until the integral gear rests against the thrust plate. Avoid damaging the double lip seal. Remove the sleeve then coat the gears with clean oil.

- o. Slip the thrust plate with the seal over the gear journals and into the housing bore. The flat side of the seal should face up with the relief groove facing the outlet side. (For single pump assemblies go directly to Para 101t).
- p. Place the bearing carrier onto the journals of the drive and driven gears, ensuring that the dowel holes are aligned with the dowel pins. When the parts are parallel, squeeze them together or alternately tap over each dowel until the parts are together.
- q. Insert the connecting shaft into the spline of the drive gear. Position and place the second gear housing on the bearing carrier as outlined in Para 101k. (Tandem pump only.)
- r. Place the thrust plate in the gear housing per Para 101m. Insert the drive and driven gears of the second section in their respective bearings. Make certain the gears are in contact with the thrust plate face. Place the port end cover plate in the housing as per Para 101o. (Tandem pump only.)
- s. Ensure the plug/s in the port end cover are tight. Follow the procedure outlined in Para 101d for new plugs. (Tandem pump only.)
- t. Place the port end cover over the gear journals. Align the dowels with the holes in the mating casting. Being careful not to pinch the gasket-seal, tap the port end cover lightly in the centre between bearing bores to engage the dowels and to move parts together in the final seating.
- u. Thread the fasteners into the shaft end cover and tighten alternately or cross corner. Rotate the drive shaft with a 150 mm wrench to check for binding. If there is no internal binding, torque diagonally opposed fasteners to 271 N.m (200 lbf.ft).

RECOVERY PLATFORM

WARNING

TO AVOID PINCH AND CRUSH INJURIES, ENSURE THAT NO PART OF THE BODY IS POSITIONED UNDER THE SPADE ASSEMBLIES OR LIFTING EQUIPMENT AT ANY TIME. GLOVES MUST BE WORN AND EXTREME CARE USED WHEN HANDLING WIRE ROPE AND CHAINS.

- 102. **Removal.** To remove the recovery platform and crane assembly, proceed as follows (refer to Figure 74):

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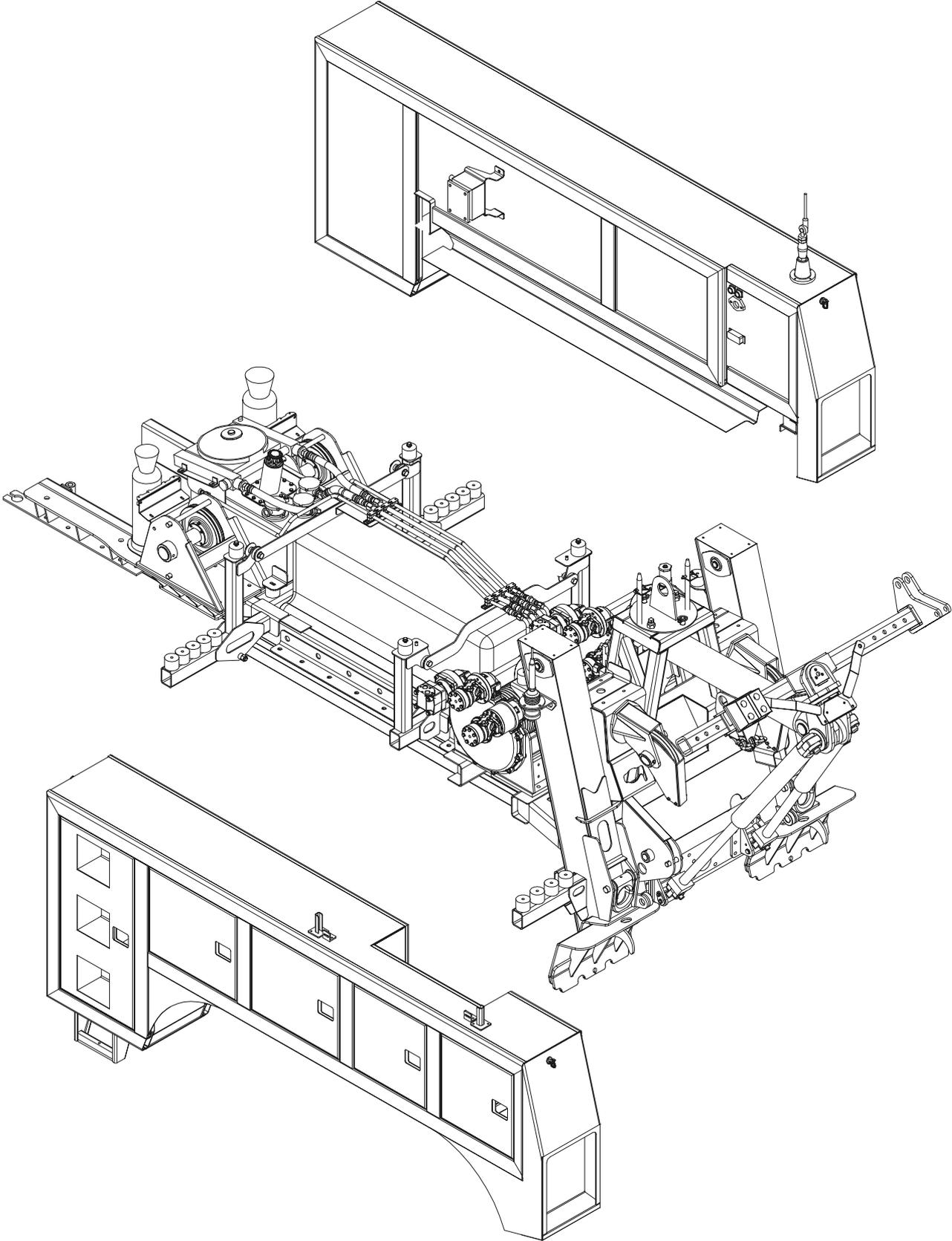


Figure 74 – Recovery Platform

NOTE

Clearly mark all wiring, air lines and hoses prior to removal to ensure correct reassembly. The crane may be removed independently of the recovery platform if necessary (refer EMEI Vehicle D 324-1).

- a. Disconnect the vehicle batteries and drain the air from the brake system.
- b. Disconnect the main wiring plug between the vehicle and the recovery platform (located near the front of the left hand side cabinet).
- c. Disconnect the antenna cables from the rear mounted aerials and feed the cables down through the frame of the recovery platform.
- d. Disconnect the radio cable from the antenna tuner and feed the cable through the rear of the cabinet and down through the frame of the recovery platform.
- e. Disconnect the camera cables at the plugs located inside the rear control cabinets, feed them out through the rear of the cabinets and down through the frame of the recovery platform.
- f. Drain the hydraulic reservoir and fuel tank (if necessary) and close the hydraulic supply valves under the reservoir.
- g. Disconnect the hydraulic hoses between the pumps and the recovery platform.
- h. Disconnect the fuel lines from the fuel tank.
- i. Disconnect the air lines between the vehicle and the recovery platform (refer to Figure 95) for the recovery system pneumatic diagram.
- j. Remove the 3/4 inch, grade 8 platform mounting bolts.

WARNING

NO PART OF THE BODY IS TO BE POSITIONED UNDER THE RECOVERY PLATFORM DURING LIFTING OPERATIONS UNLESS THE PLATFORM HAS BEEN SECURELY SUPPORTED ON APPROPRIATELY RATED SAFETY STANDS.

- k. Using appropriate lifting equipment and lifting beam (refer to Para 5f) attached to the lifting points, carefully raise the recovery platform. Check that nothing gets snagged as the platform is raised.

- l. Place the recovery platform on appropriate stands or repair fixture.

103. Installation. To install the recovery platform, proceed as follows:

- a. To lift the platform use a spreader bar with lifting chains attached to the rear recovery D shackles and lifting slings around each side of the forward cross member.
- b. Position the platform on the truck, line up the bolt holes then install the hardened washers, 3/4 inch grade 8 mounting bolts and nyloc nuts. Tighten the mounting bolts to 460 N.m (340 lbf.ft).
- c. Reconnect all fuel, air, hydraulic lines and wiring in reverse order to removal.
- d. Refill the hydraulic reservoir and open the hydraulic supply valves.
- e. Refill the fuel tank and bleed the fuel system (refer to EMEI Vehicle G 703).
- f. Reconnect the batteries, start the engine and check for air and fluid leaks.
- g. Engage the PTOs, bleed and test the operation of the crane and recovery systems (refer to EMEI Vehicle D 323).

RECOVERY FRAME REPAIR

104. Welding. The recovery frame is manufactured from Domex 100 000 lb yield strength steel. All repairs can be carried out using standard welding procedures and filler materials in accordance with current standards.

HYDRAULIC SYSTEM

105. Figure 96 illustrates the recovery system hydraulic circuit.



TO PREVENT CONTAMINATION AND DAMAGE TO HYDRAULIC COMPONENTS, REPAIRS MUST BE CARRIED OUT IN A CLEAN DUST FREE ENVIRONMENT.

Tow Cylinders

106. Removal and Installation. Removal and installation of the tow cylinders is to be conducted in accordance with EMEI Vehicle D 324-1.

107. Disassembly. To disassemble the tow cylinders, proceed as follows (refer to Figure 75):

- a. Thoroughly clean the cylinder prior to disassembly and secure in a vice or jig on a clean work bench.

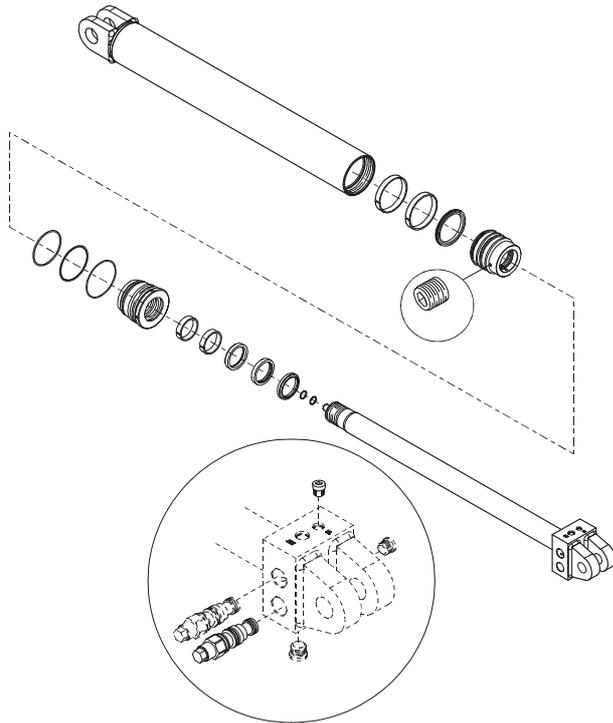


Figure 75 – Tow Cylinder

- b. Using a pin spanner, unscrew the cylinder nut and withdraw the piston and piston rod. Ensure an appropriate container is placed under the cylinder end to catch any oil.
- c. Secure the eye of the piston rod in a vice or jig, remove grub screws locking the piston to the piston rod and unscrew the piston.
- d. Slide the cylinder nut off the piston rod.
- e. Remove all seals and 'O' rings.
- f. Remove the counterbalance valve from the end of the cylinder.

108. Cleaning and Inspection. To clean and inspect the tow cylinders, proceed as follows:

- a. Clean all components in clean solvent and dry with low pressure compressed air or lint free cloth.
- b. Blow out ports and valve galleries.
- c. Inspect all components for wear and damage paying particular attention to piston, bore and piston rod surfaces. Replace damaged components as required.

109. Assembly. To assemble the tow cylinder, proceed as follows (refer to Figure 75):

- a. Lubricate all components with clean hydraulic fluid prior to assembly.
- b. Fit new seals, 'O' rings and glide rings to the piston and cylinder nut.

c. Slide the cylinder nut onto the piston rod and refit the piston. Tighten the piston to 407 to 475 N.m (300 to 350 lbf.ft) then apply Loctite 242 to the grub screw, install and tighten.

d. Continue assembly in the reverse order to disassembly.

Main Lift Cylinder

110. Removal and Installation. Removal and installation of the main lift cylinder is to be conducted in accordance with EMEI Vehicle D 324-1.

111. Disassembly. To disassemble the main lift cylinder, proceed as follows (refer to Figure 76):

- a. Thoroughly clean the cylinder prior to disassembly and secure in a vice or jig on a clean work bench.
- b. Using a pin spanner, unscrew the piston retainer and withdraw the piston. Ensure an appropriate container is placed under the cylinder end to catch any oil.
- c. Secure the eye of the piston rod in a vice or jig and remove the piston from the rod.
- d. Slide the cylinder nut off the piston rod.
- e. Remove all seals and 'O' rings.
- f. Remove the counterbalance valves from the end of the cylinder.

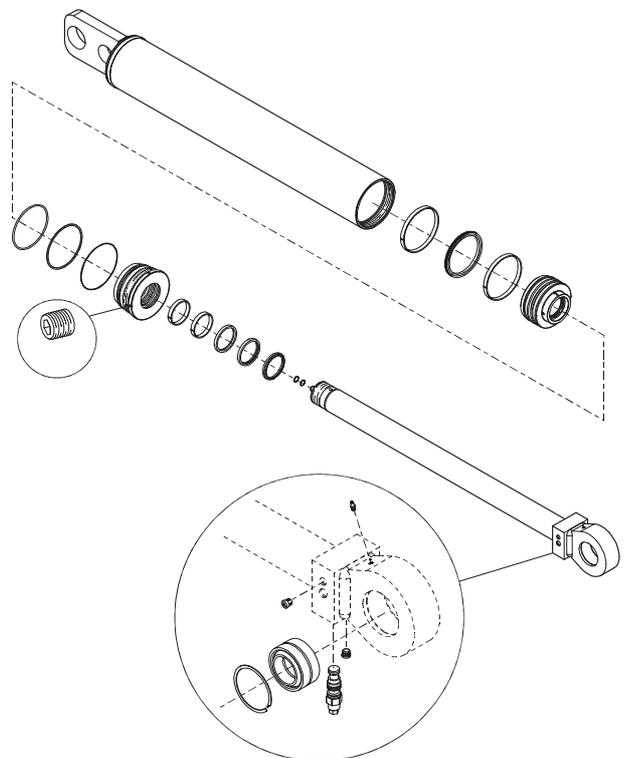


Figure 76 – Main Lift Cylinder

112. Cleaning and Inspection. To clean and inspect the main lift cylinder, proceed as follows:

- a. Clean all components in clean solvent and dry with low pressure compressed air or lint free cloth.
- b. Blow out ports and valve galleries.
- c. Inspect all components for wear and damage paying particular attention to piston, bore and piston rod surfaces. Replace damaged components as required.

113. Assembly. To assemble the main lift cylinder, proceed as follows (refer to Figure 76):

- a. Lubricate all components with clean hydraulic fluid prior to assembly.
- b. Fit new seals, 'O' rings and glide rings to the piston and cylinder nut.
- c. Slide the cylinder nut onto the piston rod then refit and tighten the piston to 407 to 475 N.m (300 to 350 lbf.ft).
- d. Continue assembly in the reverse order to disassembly.

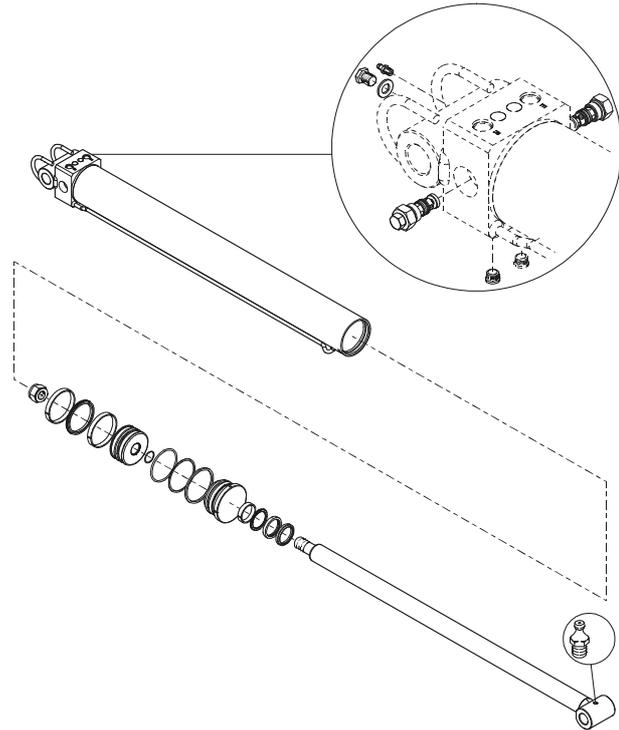


Figure 77 – Spade Cylinder

Spade Cylinders

114. Removal and Installation. Removal and installation of the spade cylinders is to be conducted in accordance with EMEI Vehicle D 324-1.

115. Disassembly. To disassemble the spade cylinder, proceed as follows (refer to Figure 77):

- a. Thoroughly clean the cylinder prior to disassembly and secure in a vice or jig on a clean work bench.
- b. Using a pin spanner, unscrew the piston retainer and withdraw the piston. Ensure an appropriate container is placed under the cylinder end to catch any oil.
- c. Secure the eye of the piston rod in a vice or jig and remove the piston from the rod.
- d. Slide the cylinder nut off the piston rod.
- e. Remove all seals and 'O' rings.
- f. Remove the load holding cartridge from the end of the cylinder.

116. Cleaning and Inspection. To clean and inspect the spade cylinder, proceed as follows:

- a. Clean all components in clean solvent and dry with low pressure compressed air or lint free cloth.
- b. Blow out ports and valve galleries.

- c. Inspect all components for wear and damage paying particular attention to piston, bore and piston rod surfaces. Replace damaged components as required.

117. Assembly. To assemble the spade cylinder, proceed as follows (refer to Figure 77):

- a. Lubricate all components with clean hydraulic fluid prior to assembly.
- b. Fit new seals and 'O' rings to the piston and cylinder nut.
- c. Slide the cylinder nut onto the piston rod and refit the piston and piston nut. Torque the piston nut to 746 to 881 N.m (550 to 650 lbf.ft).
- d. Continue assembly in the reverse order to disassembly.

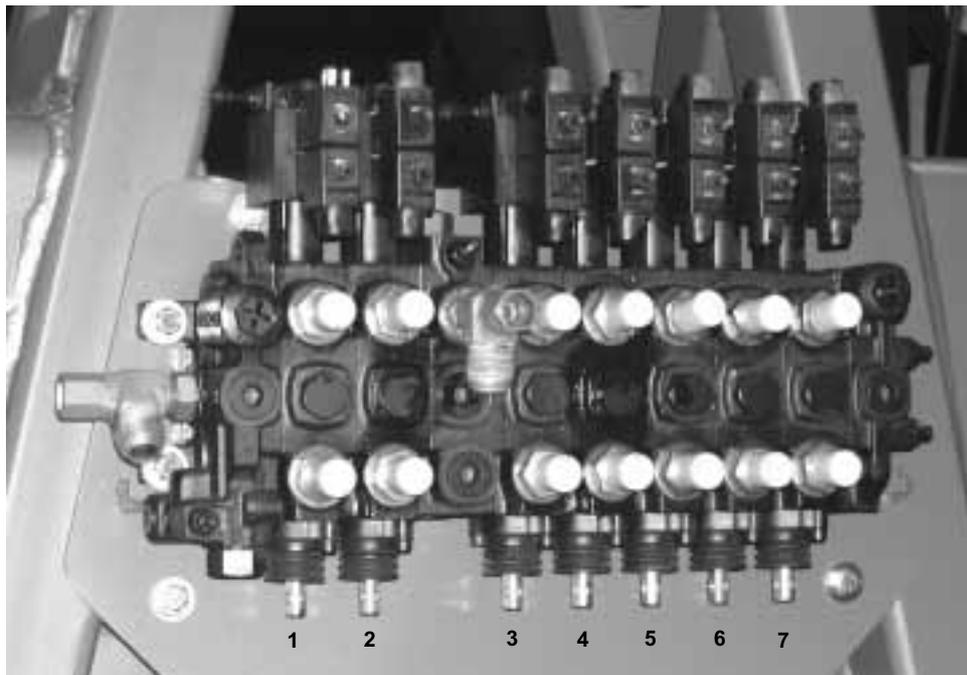
Control Valve

118. Removal and Installation. Removal and installation of the control valve is to be conducted in accordance with EMEI Vehicle D 324-1.

119. Disassembly. To disassemble the control valve, proceed as follows:



TO PREVENT CONTAMINATION AND DAMAGE TO HYDRAULIC COMPONENTS, REPAIRS MUST BE CARRIED OUT IN A CLEAN DUST FREE ENVIRONMENT.



| Spool | Function | Spool | Function |
|-------|----------------------|-------|--------------------|
| 1. | Left winch | 5. | Left tow cylinder |
| 2. | Left spade cylinder | 6. | Main lift cylinder |
| 3. | Right winch | 7. | Right tow cylinder |
| 4. | Right spade cylinder | | |

Figure 78 – Control Valve Assembly

- a. Thoroughly clean the control valve prior to disassembly and place on a clean work bench.



THE INDIVIDUAL SPOOL VALVE SECTIONS ARE CONFIGURED TO PERFORM A SPECIFIC FUNCTION. IT IS THEREFORE CRITICAL TO THE CORRECT OPERATION OF THE EQUIPMENT THAT THE SECTIONS ARE NOT MIXED UP DURING REPAIR.

- b. Remove the tie rods and separate the valve blocks. Ensure components are marked and laid out in sequence to ensure correct assembly (refer to Figure 78).
 - c. Disassemble the individual valve blocks in accordance with Figure 79 through to Figure 84.
- 120. Cleaning and Inspection.** To clean and inspect the control valve components, proceed as follows:
- a. Clean all components in clean solvent and dry with low pressure compressed air or lint free cloth.

- b. Inspect all components for wear and damage paying particular attention to the surfaces of the valve bores and spool valves. Replace damaged components as required.

NOTE

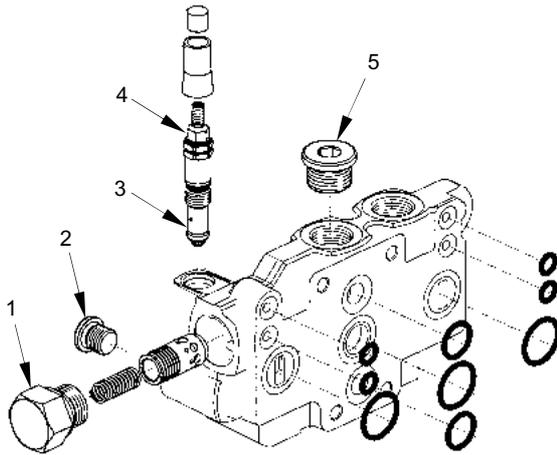
Valve blocks contain matching parts and must be replaced as an assembly.

- 121. Assembly.** To assemble the control valve, proceed as follows:

NOTE

Lubricate all components with a film of clean hydraulic oil prior to assembly and fit new seals and 'O' rings.

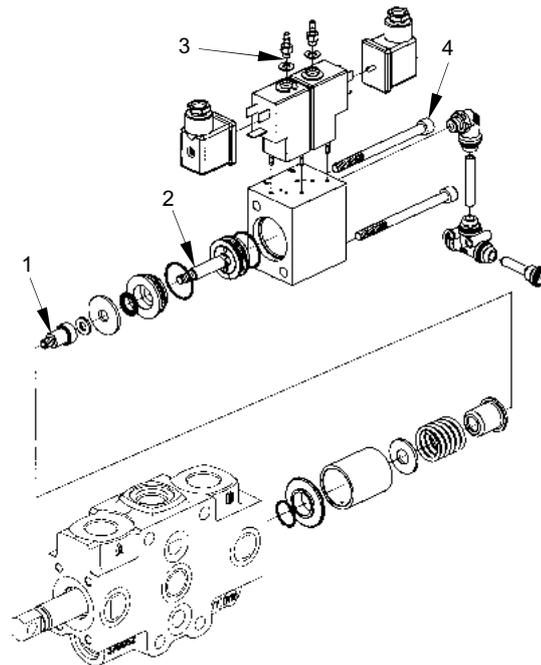
- a. Assemble the outer inlet valve block and tension the fittings in accordance with Figure 79.
- b. Assemble the mid inlet valve block and tension the fittings in accordance with Figure 82.
- c. Assemble the outlet valve block and tension the fittings in accordance with Figure 84.



| Item | Torque | Item | Torque |
|------|--------|------|--------|
| 1. | 60 N.m | 4. | 10 N.m |
| 2. | 30 N.m | 5. | 60 N.m |
| 3. | 10 N.m | | |

Figure 79 – Outer Inlet Valve Block

- d. Insert the tie rods through the outlet valve block then using new ‘O’ rings assemble the valve blocks in the correct sequence as detailed in Figure 78.
- e. Assemble the spool valve block and tension the fittings in accordance with Figure 80 and Figure 81.



| Item | Torque | Item | Torque |
|------|--------|------|---------|
| 1. | 10 N.m | 3. | 1.2 N.m |
| 2. | 10 N.m | 4. | 10 N.m |

Figure 81 – Spool Valve Block

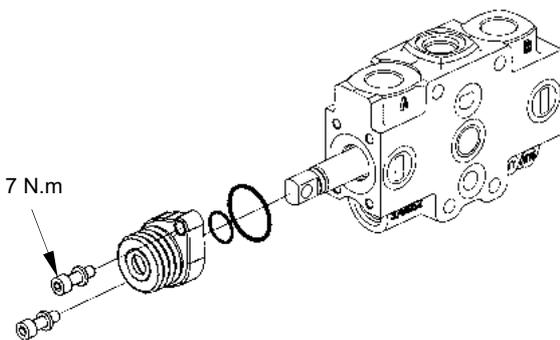
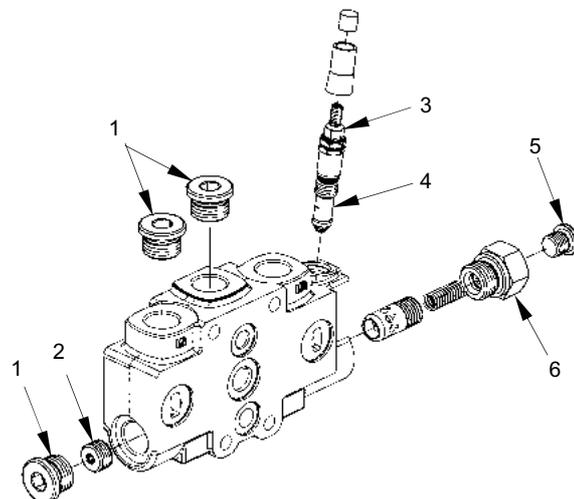


Figure 80 – Spool Cover

- f. When all the valve blocks have been assembled, finger-tighten the nuts on the tie rods and ensure all the valve blocks are correctly aligned.
- g. When the valve blocks are correctly aligned, tension the tie rod nuts evenly to 25 N.m.
- h. Cap all ports to prevent contamination of the assembly during transit and storage.



| Item | Torque | Item | Torque |
|------|--------|------|--------|
| 1. | 60 N.m | 4. | 10 N.m |
| 2. | 10 N.m | 5. | 30 N.m |
| 3. | 10 N.m | 6. | 60 N.m |

Figure 82 – Mid Inlet Valve Block

WINCHES

IDENTIFICATION OF WINCH COMPONENTS

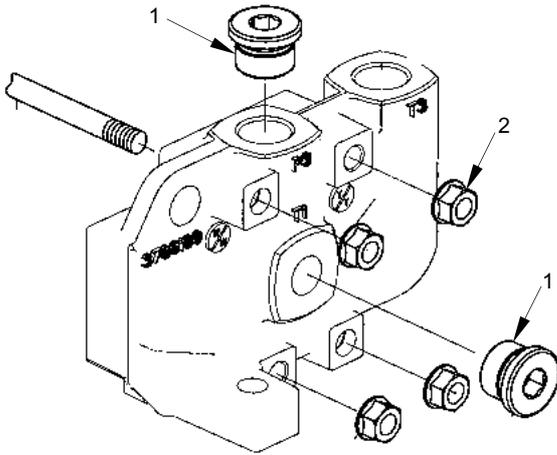
122. Figure 83 identifies and shows the location of the main winch components. Figure 85 illustrates the winch hydraulic circuit.

WINCH FASTENER TORQUE SETTINGS

123. Table 4 provides a list of torque settings for the fasteners used on the winch assemblies. Refer to the RPS for information on screw and bolt grades.

Table 4 – Winch Fastener Torques

| Thread | Torque N.m | | |
|--------|----------------|------|------|
| | Fastener Grade | | |
| | 8.8 | 10.9 | 12.9 |
| M6 | 9.5 | 12 | 18.2 |
| M8 | 24 | 30 | 43 |
| M10 | 47 | 59 | 84.5 |
| M12 | 84 | 105 | 146 |
| M16 | 210 | - | 356 |



| Item | Torque | Item | Torque |
|------|--------|------|--------|
| 1. | 60 N.m | 2. | 25 N.m |

Figure 84 – Outlet Valve Block

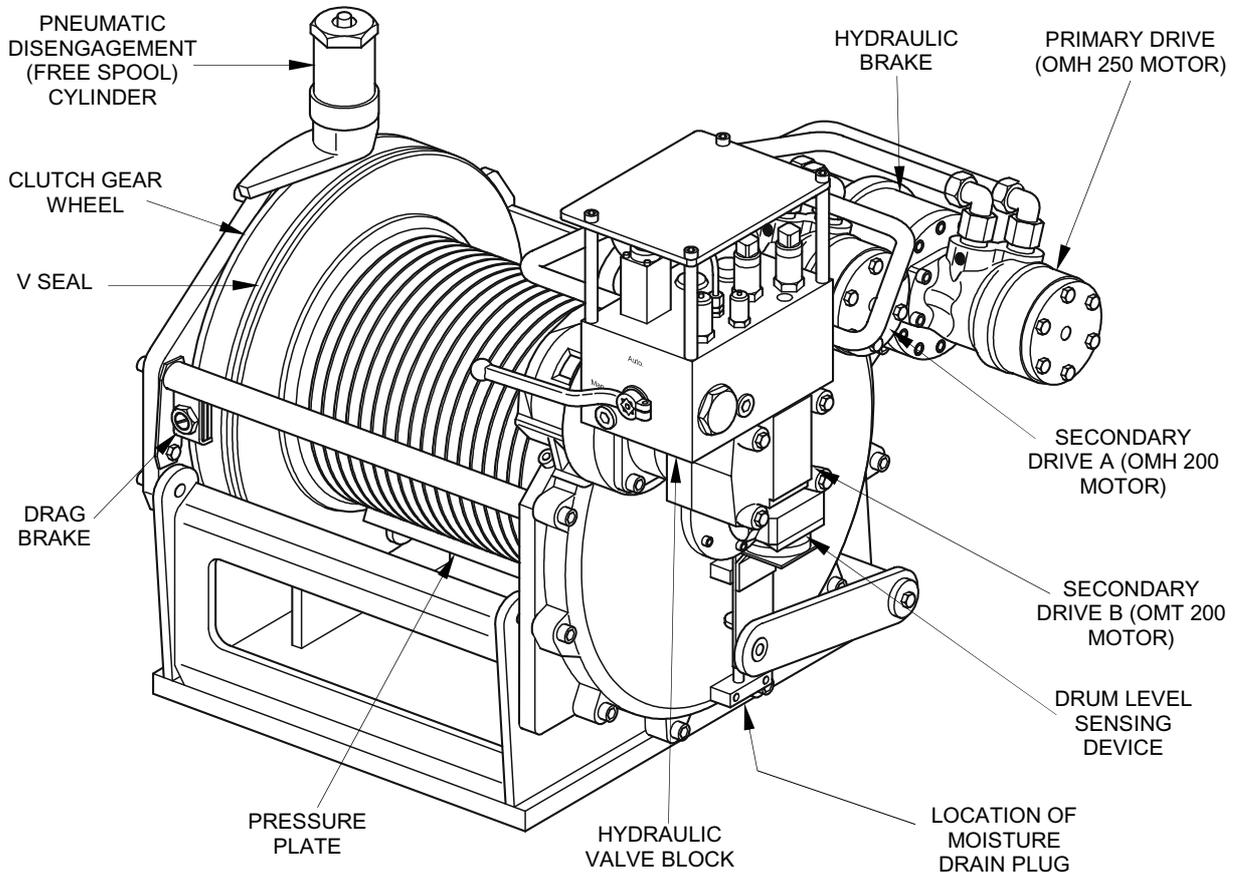
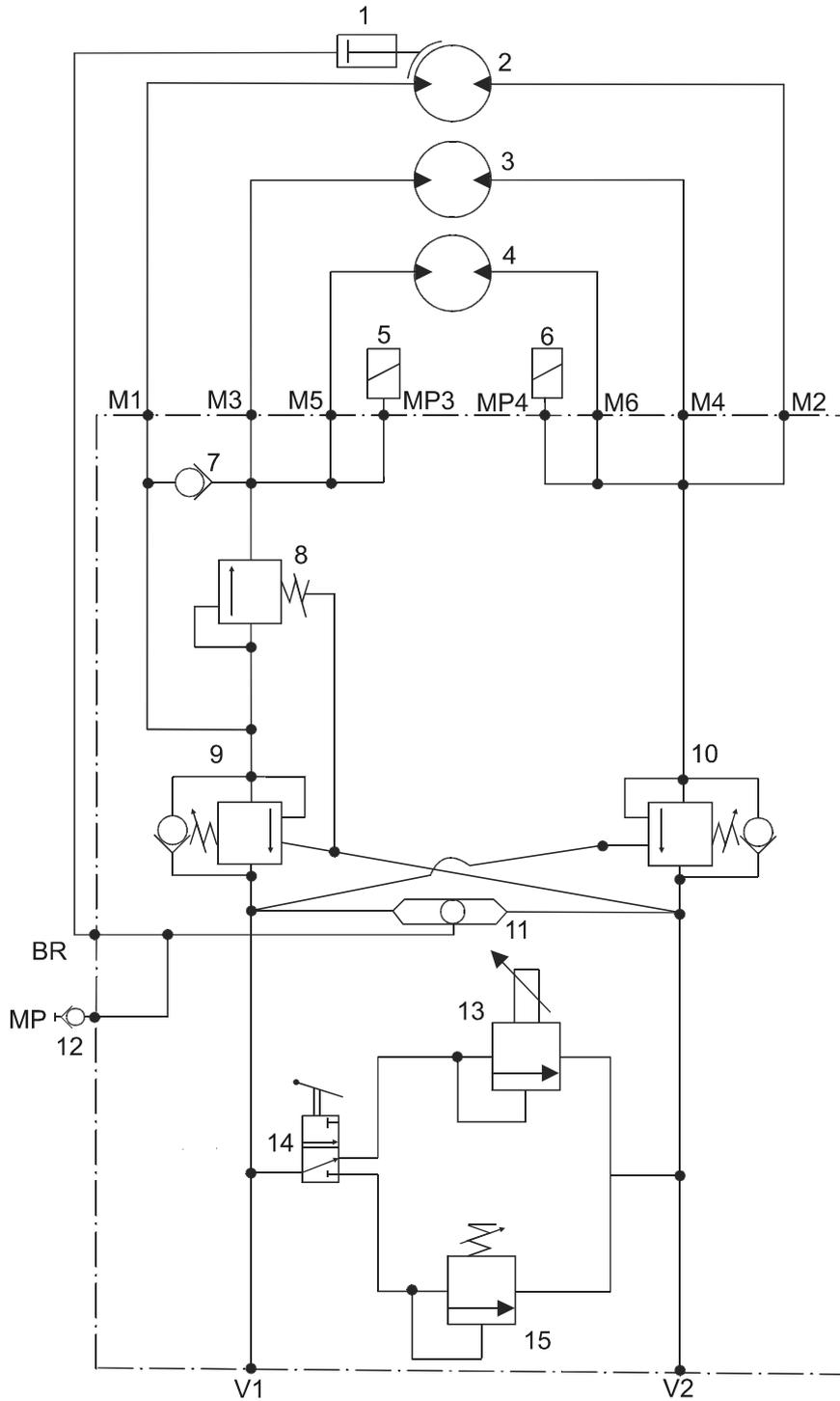


Figure 83 – Right Winch

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| Item | Description | Item | Description | Item | Description |
|------|---------------------|------|----------------------------------|------|---|
| 1. | Hydraulic brake | 6. | Pressure sensor PG2 | 11. | Shuttle valve |
| 2. | OMH 250 motor | 7. | Check valve | 12. | Test point |
| 3. | OMT 200 motor | 8. | Sequence valve | 13. | Electrically controlled pressure reducing valve |
| 4. | OMH 200 motor | 9. | Counterbalance valve (winch out) | 14. | Ball valve (manual) |
| 5. | Pressure sensor PG1 | 10. | Counterbalance valves (winch in) | 15. | Pilot controlled pressure reducing valve |

Figure 85 – Winch Hydraulic Circuit

PROGRAMMABLE LOGIC CONTROLLER (PLC)

124. Removal and Installation. Removal and installation of PLC's is to be conducted in accordance with EMEI Vehicle D 324-1.

WINCH DISPLAY MONITORS

125. Removal and Installation. Removal and installation of the winch display monitors is to be conducted in accordance with EMEI Vehicle D 324-1.

126. Disassembly. To disassemble a winch display monitor, proceed as follows:

- a. Disconnect the wiring plug and earth wire from the rear of the monitor.
- b. Remove the perspex cover from the front of the cover.
- c. Remove the screws securing the control unit to the cover and remove the monitor.

127. Assembly. Assemble the winch display monitor in reverse order to disassembly.

WINCH ASSEMBLY

128. Removal and Installation. Removal and installation of the winches is to be conducted in accordance with EMEI Vehicle D 324-1.

129. Disassembly. To disassemble the winches, proceed as follows (refer to Figure 87 and Table 5):

- a. Remove the three drive motors, hydraulic brake, valve block and drive gear assemblies in accordance with EMEI Vehicle D 323 and 324-1.
- b. Unbolt and remove the gear unit assembly from the stand using appropriate lifting equipment and lower it onto a clean work surface on the floor.
- c. If necessary remove and disassemble the pressure plate assembly (refer to Figure 86).
- d. Remove the bearing housing cover (25), cap screw and washer (24).
- e. Stand the assembly on the gear box end and remove the bearing housing cover (1) and ring (2) from the gear unit end plate.
- f. Remove the gear unit end plate, cap screw and washer (13).
- g. Remove bearing (4) using bearing pullers then lift the clutch gear wheel off and remove the 'V' ring.
- h. Press the two bearings (5 and 6) out of the clutch gear wheel and remove the spacer.
- i. Remove the sun wheel from the shaft then remove the planet wheels from the rope drum.

j. Screw an M8 eyebolt into the shaft and lift it out of the rope drum and press off the roller bearing.

k. Lift the rope drum off the gear box assembly.

l. Remove the cap screws securing the gear box to the gear box end plate then, carefully drive the roll pins out of the end plate leaving them in the gear box. Remove the end plate from the gear box.

m. Remove bearing (21) from the gear wheel using bearing pullers. Press bearing (23) out of the gear box.

n. Remove the planet wheel disc (15) from the rope drum and remove the planet wheels.

o. Disassemble the planet wheels by removing one bearing (17) followed by the lock ring then press out the second bearing.

p. Remove bearing (4) from the rope drum.

130. Cleaning and Inspection. To clean and inspect the winch main assembly, proceed as follows:

a. Clean all components with clean solvent and dry with low pressure compressed air.

b. Inspect all components for wear and damage, paying particular attention to 'V' ring, gear teeth and bearings. Replace parts as required.

131. Assembly. To assemble the winch main assembly, proceed as follows:

a. Pack all bearings with grease (Castrol LMX or equivalent) prior to assembly.

b. Fit the lock rings into the planet wheels and install the bearings into the rope drum side of the wheel.

NOTE

The rope drum side of the planet wheel is the side which has the locking ring located closest to the edge of the wheel allowing the bearing to protrude. This is to keep the planet wheel from abutting against the rope drum.

c. Fit the planet wheel shafts into the rope drum, install the planet wheels then fit the outer bearing into the planet wheel.

d. Fit the planet wheel disc and tighten the cap screws in accordance with Table 4.

e. Fit bearing (21) into the gear box end plate then, grease the teeth of the gear wheel and install onto the end plate, inserting it into the bearing (21).

f. Install bearing (23) into the gear box.

- g. Apply Sabesto sealant to the mating surfaces of the gear box and end plate then aligning the gear box with the end plate and drive the roll pins back through the gear box so that they engage into the end plate. Install and tighten the cap screws in accordance with Table 4.
- h. Temporarily refit the bearing housing cover (25) using two cap screws then lay the gear box assembly on the ground with the bearing housing cover down.
- i. Press bearing (4) into the rope drum then lift the drum onto the gear box assembly. Ensure that the bearing is correctly positioned.
- j. Insert the shaft aligning the splines with gear wheel.
- k. Install bearing (11) onto the shaft using a hollow drift then fit the sun wheel. Thoroughly grease the teeth of the sun wheel after installation.
- l. Lightly oil a new 'V' ring and fit it to the clutch gear wheel.
- m. Thoroughly grease the teeth of the ring gear and position the clutch gear wheel onto the rope drum.
- n. Install the spacer (7) followed by roller bearing (6) and ball bearing (5). Seat the bearings using a hollow drift.
- o. Install bearing (4) onto the clutch gear wheel then fit ring (2) and washer (13) tightening the cap screws in accordance with Table 4.
- p. Position the gear unit end plate (3) into place and reposition the winch so that the rope drum is horizontal.

- q. Remove the bearing housing cover from the gear box and fit the washer (24) and cap screw. Tighten the cap screw in accordance with Table 4.
- r. Apply Sabesto sealant to the mating surfaces of the bearing housing covers, install the covers and tighten the cap screws.
- s. Assemble and install the pressure plate assembly if removed.
- t. Refit the winch assembly into the stand and tighten the cap screws in accordance with Table 4.
- u. Install the three drive motors, hydraulic brake, valve block and drive gear assemblies in accordance with EMEI Vehicle D 323 and 324-1.

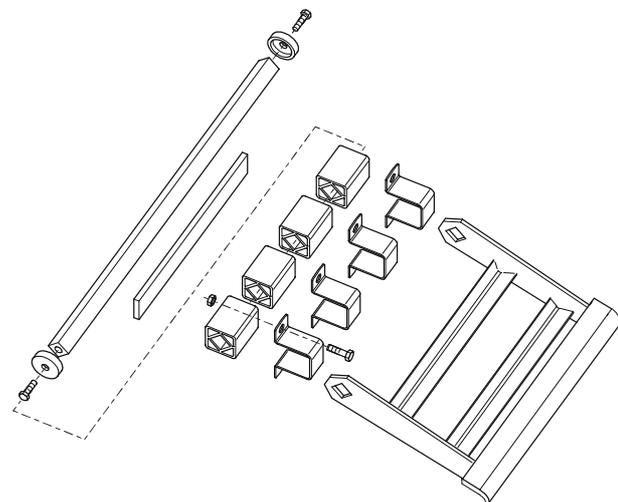


Figure 86 – Winch Pressure Plate

Table 5 – Winch Gear Unit Components

| Item | Description | Item | Description | Item | Description |
|------|-----------------------|------|-----------------------|------|-----------------------|
| 1. | Bearing housing cover | 11. | Bearing, roller | 21. | Bearing, annular ball |
| 2. | Ring | 12. | Shaft | 22. | Gear wheel |
| 3. | Gear unit end plate | 13. | Washer | 23. | Bearing, annular ball |
| 4. | Bearing, annular ball | 14. | Roll pin | 24. | Washer |
| 5. | Bearing, annular ball | 15. | Planet wheel disc | 25. | Bearing housing cover |
| 6. | Bearing, roller | 16. | Planet wheel shaft | 26. | Drain plug |
| 7. | Spacer | 17. | Bearing, annular ball | 27. | Bearing unit |
| 8. | Clutch gear wheel | 18. | Lock ring | 28. | Gear box |
| 9. | 'V' ring | 19. | Planet wheel | 29. | Gear box end plate |
| 10. | Sun wheel | 20. | Rope drum | 30. | Connection bar |

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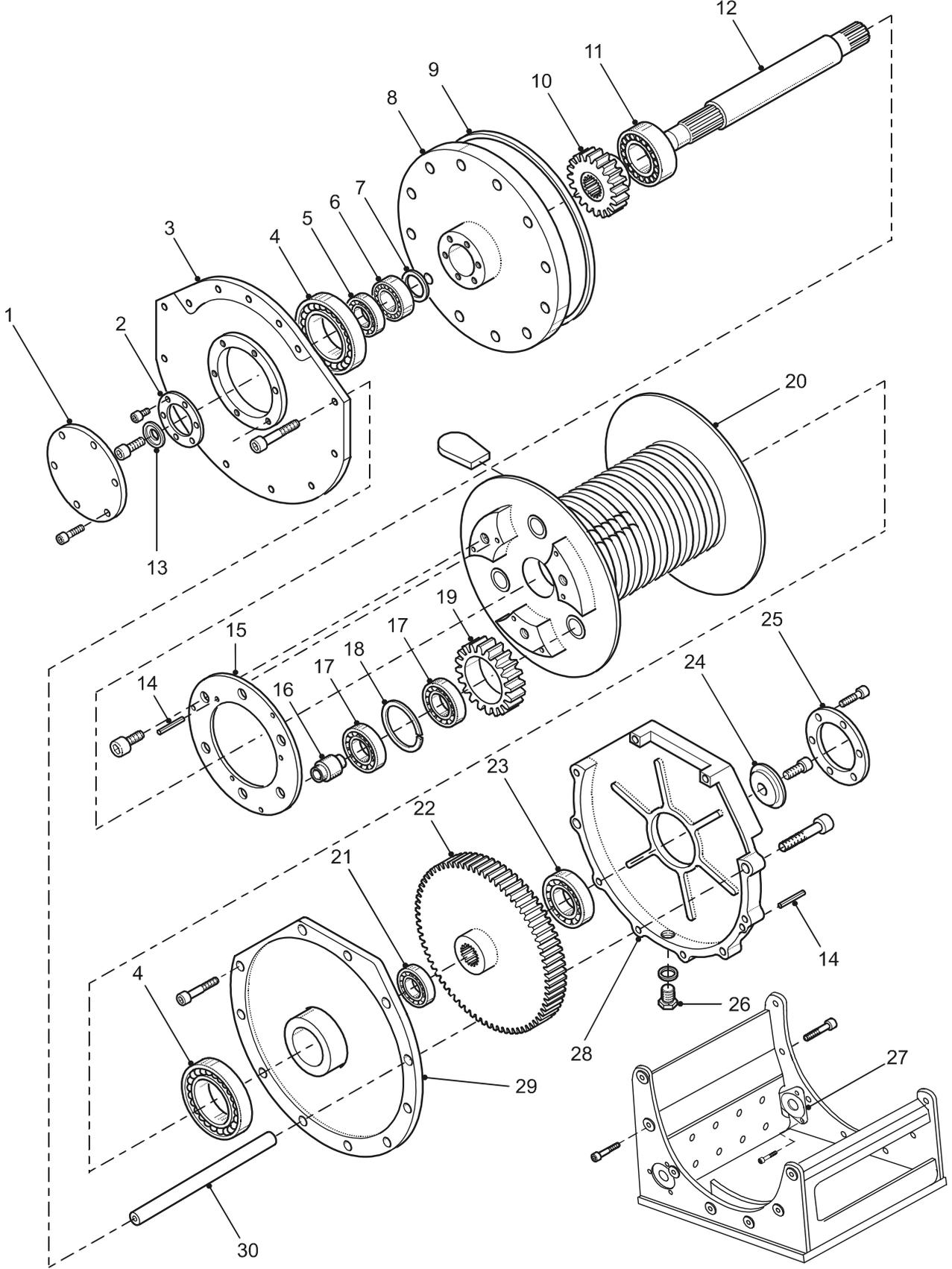


Figure 87 – Winch Gear Unit

PALFINGER CRANE PK-9501

WARNING

THE CRANE SERIAL NUMBER MUST BE SUPPLIED WHEN ORDERING ANY CRANE COMPONENTS TO ENSURE COMPATIBILITY AND SAFE CRANE OPERATION.

132. Table 6 provides torque settings for fasteners used on the crane.

Table 6 – Crane Fastener Torque Settings

| Thread Diameter | Property Class | |
|------------------------|-----------------------------|----------|
| | 8.8 | 10.9 |
| M8 | 23 N.m. | 34 N.m. |
| M10 | 46 N.m. | 68 N.m. |
| M12 | 79 N.m. | 117 N.m. |
| M14 | 125 N.m. | 185 N.m. |
| M16 | 195 N.m. | 280 N.m. |
| M18 | 280 N.m. | 390 N.m. |
| M20 | 390 N.m. | 560 N.m. |
| Mounting Shackle Bolts | | |
| Thread Size | Thread Material 42 Cr Mo 4v | |
| M24 × 1.5 | 600 N.m. | |

HYDRAULICS

133. Figure 99 and Figure 100 illustrate the crane hydraulic circuits.

WARNING

PRIOR TO COMMENCING REPAIRS TO THE HYDRAULIC SYSTEM RELIEVE HYDRAULIC PRESSURE BY VENTING THE RESERVOIR AND CYCLING ALL CONTROL VALVES WITH THE ENGINE SHUT DOWN. ENSURE HYDRAULIC FLUID HAS REACHED A SAFE HANDLING TEMPERATURE.

HYDRAULIC CYLINDERS

134. Refer to EMEI Vehicle D 323 or 324-1 for removal and installation of hydraulic cylinders.

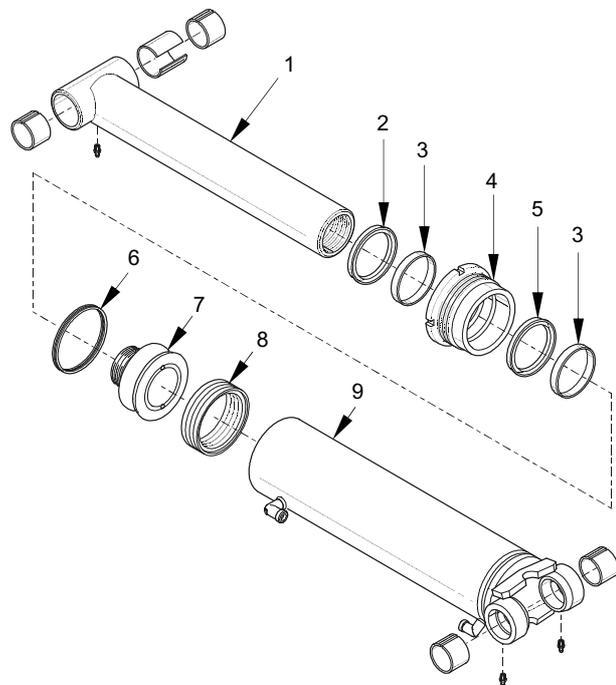
CAUTION

IF POSSIBLE, USE A CHAIN VICE TO HOLD HYDRAULIC CYLINDERS DURING REPAIR PROCEDURES. IF USING A CONVENTIONAL VICE, TAKE CARE NOT TO CRUSH THE CYLINDER.

Inner and Outer Boom Cylinders

135. *Disassembly.* To disassemble the inner and outer boom cylinders, proceed as follows (refer to Figure 88):

- a. Place a suitable container under the rod end of the cylinder to catch the oil as the rod and piston are withdrawn.
- b. Remove the load holding valve and pipes from the cylinder.



| Item | Description | Item | Description |
|------|--------------|------|-------------|
| 1. | Piston rod | 6. | Seal |
| 2. | Wiper seal | 7. | Piston |
| 3. | Glide ring | 8. | Piston seal |
| 4. | Cylinder nut | 9. | Cylinder |
| 5. | Seal | | |

Figure 88 – Inner and Outer Boom Cylinder

- c. Secure the outer end of the cylinder then remove the cylinder nut and withdraw the piston rod and piston.
- d. Secure the outer end of the piston rod and remove the piston.

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NOTE

Heat may be used on the piston to assist the release of thread locking compound, provided that it is not heated beyond gold in colour. Pins can be inserted into the holes in the piston to aid removal.

- e. Slide the cylinder nut off the piston, remove the seals from the piston and cylinder nut.

136. Cleaning and Inspection. To clean and inspect the inner and outer boom cylinders, proceed as follows:

- a. Thoroughly clean all components and check for corrosion, pitting, nicks, burrs, scratches, excessive wear and bending. Replace worn or damaged components as necessary.
- b. Inspect the condition of the hydraulic pipes for cracking and fatigue. Replace if necessary.
- c. Check the condition of the bushes at each end of the cylinder. Replace worn bushes using a hammer and drift.

137. Assembly. To assemble the inner and outer boom cylinders, proceed as follows:

- a. Replace all cylinder nut seals and glide rings then lubricate the cylinder nut seals with clean hydraulic fluid (OM-68).
- b. Slide the cylinder nut onto the piston rod, apply Loctite 242 to the threads of the piston rod and install the piston and tighten.
- c. Lubricate the piston seals using clean hydraulic fluid (OM-68), install the piston seals then insert the piston and rod into the cylinder.
- d. Lubricate the threaded section of the cylinder tube with anti-seize compound.
- e. Screw the cylinder nut into the cylinder and tighten with a C spanner.
- f. Refit the load holding valve and piping.

Boom Extension Cylinder

138. Disassembly. To disassemble the boom extension cylinder, proceed as follows (refer to Figure 89):

- a. Secure the cylinder in a vice and place suitable containers under the outlets to catch any oil.
- b. Remove the cylinder nut and withdraw the piston rod.
- c. Remove the seals from the piston and cylinder nut.

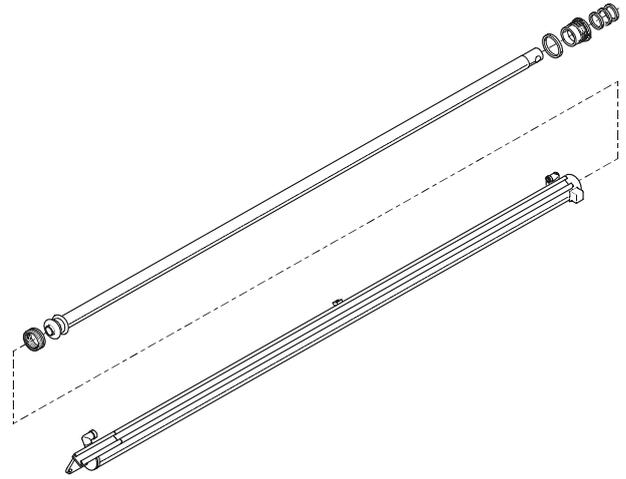


Figure 89 – Boom Extension Cylinder

139. Cleaning and Inspection. To clean and inspect the boom extension cylinder, proceed as follows:

- a. Thoroughly clean all components and check for corrosion, pitting, nicks, burrs, scratches, excessive wear and bending. Replace worn or damaged components as necessary.
- b. Inspect the condition of the hydraulic pipes for cracking and fatigue. Replace if necessary.

140. Assembly. To assemble the boom extension cylinder, proceed as follows:

- a. Lubricate all the new seals with hydraulic oil (OM-68).
- b. Assemble the cylinder in the reverse order to disassembly.
- c. Apply anti-seize compound to the threads of the cylinder nut and tighten.

Stabiliser Leg Cylinder

141. Disassembly. To disassemble the stabiliser leg cylinder, proceed as follows (refer to Figure 90):

- a. Secure the cylinder in a vice. Remove the ball from the end of the piston rod and thoroughly clean the end of the rod to prevent seal damage. Pay particular attention to ensure there are no sharp edges around the bolt hole.
- b. Place a suitable container under the cylinder to catch the oil.
- c. Undo the cylinder nut and slide the piston rod out of the cylinder.
- d. Remove the seals, 'O' rings and glide rings from the piston and cylinder nut.

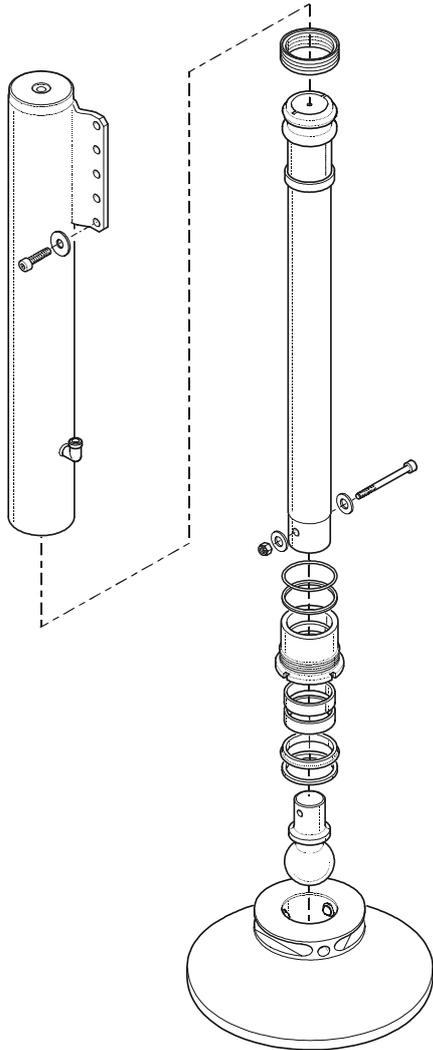


Figure 90 – Stabiliser Leg Cylinder

142. **Cleaning and Inspection.** To clean and inspect the stabiliser leg cylinder, proceed as follows:

- a. Thoroughly clean all components and check surfaces for corrosion, pitting, nicks, burrs, scratches and excessive wear. Replace worn or damaged components as necessary.
- b. Inspect the condition of the hydraulic pipes for cracking and fatigue. Replace if necessary.
- c. Check attachment of mounting plates for cracked welds.
- d. Check that the cylinder rod and tube are straight prior to assembly.

143. **Assembly.** To assemble the stabiliser leg cylinder, proceed as follows (refer to Figure 90):

- a. Lubricate all the new seals with hydraulic oil (OM-68).
- b. Assemble the cylinder in the reverse order to disassembly.

- c. Apply anti-seize compound to the threads of the cylinder nut and tighten.
- d. Refit the ball to the end of the rod.

Slew Mechanism

144. **Disassembly.** To disassemble the slew mechanism, proceed as follows (refer to Figure 91):

- a. Slew the crane to the left as far as it will travel. Disengage the PTO, shut down the engine and relieve hydraulic pressure in accordance with EMEI Vehicle D 324-1.
- b. Place a suitable container under the left hand slew cylinder and to catch fluid spills as the cylinder is removed.
- c. Unscrew and remove the left-hand cylinder tube from the slew housing.
- d. Slew the crane to the right as far as possible by hand.
- e. Crack loose the pipe connection on the right-hand slew cylinder and disconnect the fitting. Use a suitable container to catch any oil spillage.
- f. Unscrew and remove the right hand cylinder tube from the slew housing.
- g. Remove the piston from the right hand end of the rack.

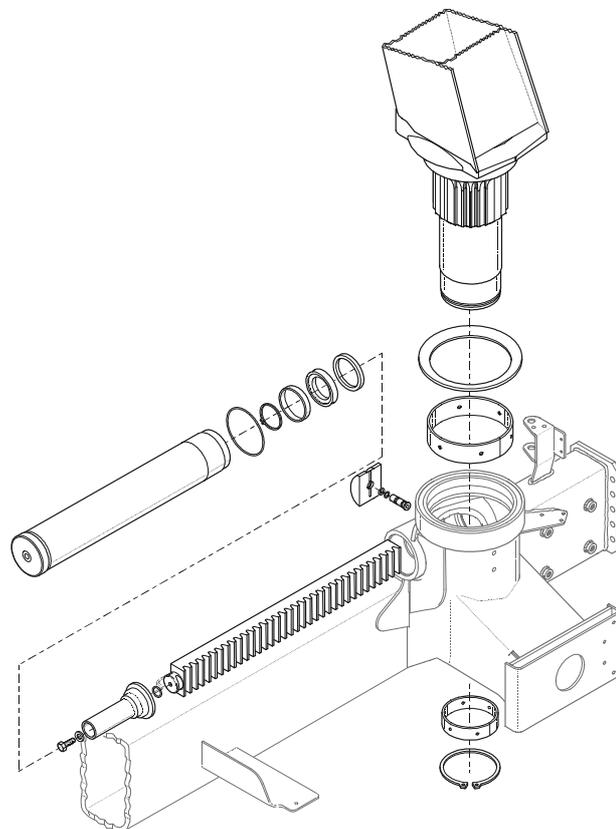


Figure 91 – Slew Mechanism and Column Mounting

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