

TRUCK, DUMP, MEDIUM, WINCH, MC2 - UNIMOG LIGHT GRADE REPAIR

This instruction is authorised for use by command of the Chief of Army. It provides direction, mandatory controls and procedures for the operation, maintenance and support of equipment. Personnel are to carry out any action required by this instruction in accordance with EMEI General A 001.

GENERAL

Introduction

1. This EMEI details procedures for removing and installing components of the Unimog truck dump system. The dump system components that can be replaced are as follows:

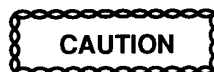
- a. the oil hoses and air lines (Para 5);
- b. the oil filter assembly (Para 6);
- c. the oil pump drive belts (Para 9);
- d. the hydraulic oil pump (Para 12);
- e. the hydraulic oil reservoir (Para 15);
- f. the hoist valve (Para 17);
- g. the tailgate cylinder (Para 19); and
- h. the air switch (Para 21).

Associated Publications

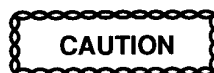
2. Reference may be required to the latest issue of the following documents:
- a. [EMEI Vehicle G 603](#) – Truck, Cargo, Medium, MC2 - Unimog – Light Grade Repair;
 - b. [EMEI Vehicle G 609](#) – Truck, Cargo, Medium, MC2 - Unimog – Servicing Instruction;
 - c. [EMEI Vehicle G 639-2](#) – Truck, Dump, Medium, Winch, MC2 - Unimog – Miscellaneous Instruction;
 - d. [EMEI Vehicle G 632](#) – Truck, Dump, Medium, Winch, MC2 - Unimog – Technical Description; and
 - e. [User Handbook](#) – Truck Medium MC2 Unimog – All Types – 7610-66-156-2407.

Safety Precautions

3. Before commencement of a task, the safety procedures and practices detailed in EMEI Vehicle G 603 must be observed.



Do not start the engine whilst replacement procedures are being carried out on any dump system component.



Before removal of the air switch, check that the body control lever is set to HOLD and the tailgate cylinder lever is in the DOWN position. Exhaust the air supply to the switch, by draining the air tanks.

NOTE

Cap all disconnected hoses and air lines to prevent the ingress of contaminants.

Special Tools and Gauges

4. A suitable puller is required to remove the pulley off the hydraulic oil pump.

REPLACEMENT PROCEDURES

Oil Hoses and Air Lines

5. The dump system components are interconnected by oil hoses and air lines. Oil hoses and air lines are connected to components by reduction bushes, elbow joints or adjustable hose clamps.

NOTE

Before removing any connection ensure that the oil is drained below the connector level and/or that air is bled from the air lines.

Oil Filter Assembly

6. The oil filter assembly comprises the filter and bowl complete with integral seals, seal rings and gasket (Figure 1). The oil filter is housed within the bowl and the whole assembly is retained in the oil reservoir by the filler cap assembly. The filler cap assembly comprises the oil return inlet, non-return valve and a notched screw type retaining ring.

7. **Removal.** Remove the oil filter as follows (Figure 1):

- a. Remove the hose clamp (Item 1) from the oil return hose (Item 2) and detach the hose from the filler cap assembly (Item 3).
- b. Unscrew and remove the filler cap assembly.
- c. Lift the filter element (Item 4) from the filter bowl (Item 5) allowing excess oil to drip back into the bowl.
- d. Remove and dispose of all seals and the gasket.
- e. Clean and inspect the bowl.

8. **Installation.** Install the oil filter as follows (Figure 1):

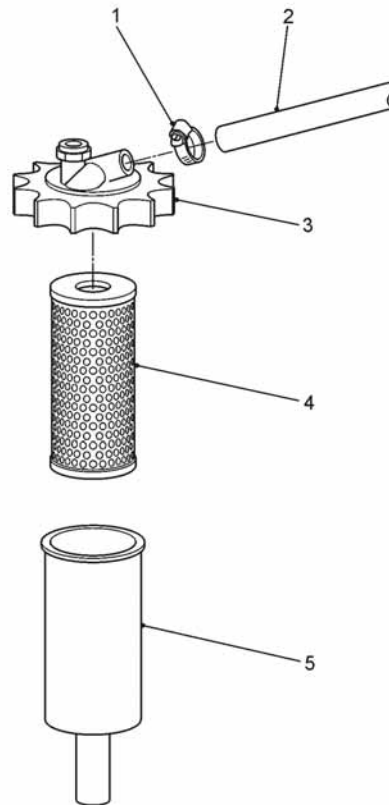
- a. Lightly lubricate the new seals and gasket with hydraulic oil Grade OM-15
- b. Fit the new seals, gasket and filter element (Item 4) into the filter bowl (Item 5).
- c. Fit the filler cap assembly (Item 3) and tighten the retaining ring.
- d. Attach the oil return hose (Item 2) to the oil inlet on the filler cap assembly and secure it with the hose clamp (Item 1).
- e. Start the engine.
- f. Allow oil pressure to build and check for oil leaks at the filler cap and return hose and rectify them if required.

Oil Pump Drive Belts

9. The hydraulic oil pump is driven by dual V-belts from the engine crankshaft pulley (Figure 2).

10. **Adjustment.** Adjust the drive belts as follows (Figure 2):

- a. Lower the sump guard to gain access to the drive belts in accordance with EMEI Vehicle G 603.
- b. Loosen the oil pump mounting bracket nut (Item 1) securing the oil pump mounting bracket (Item 17).
- c. Adjust the tension screw (Item 15) and tension nut (Item 16) to attain between 5 mm and 10 mm deflection on the oil pump drive belts (Item 18).
- d. Tighten the oil pump mounting bracket nut (Item 1) to 60 N.m.
- e. Fit the sump guard in accordance with EMEI Vehicle G 603.



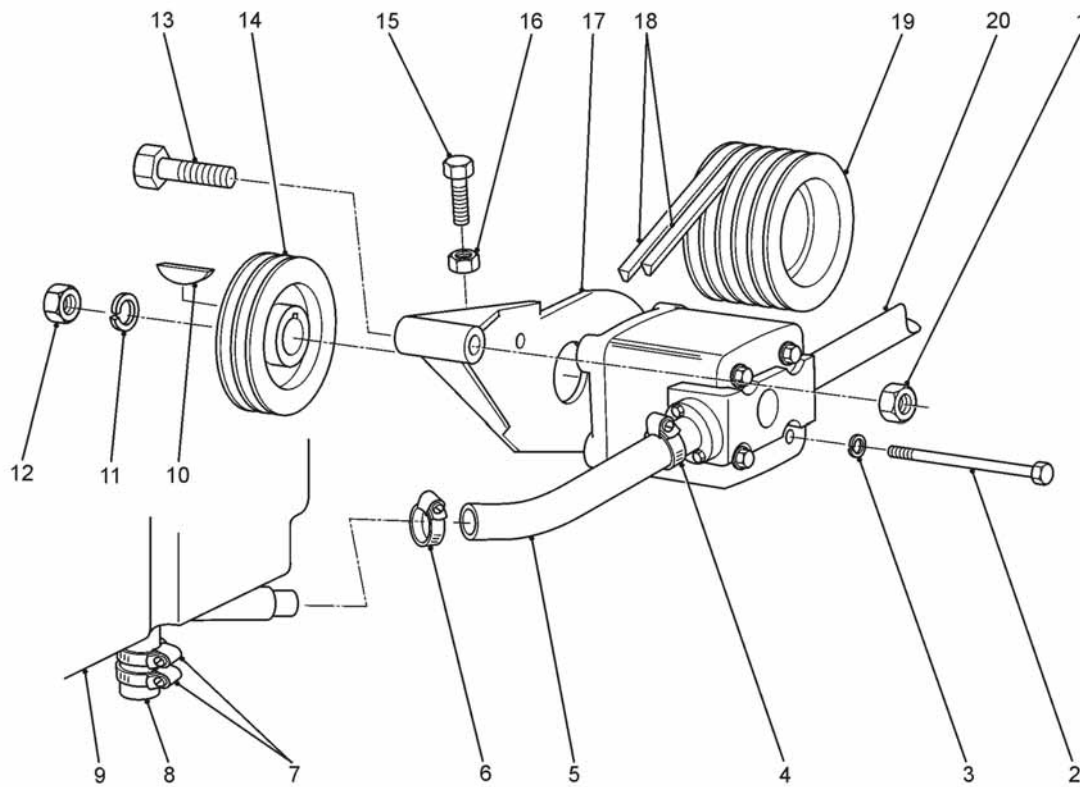
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| 1 | Hose clamp | 4 | Filter element |
| 2 | Oil return hose | 5 | Filter bowl |
| 3 | Filler cap assembly | | |

Figure 1 Oil Filter Assembly

11. Replacement. Replace the V-belts as follows (Figure 2):

- a. Drain the oil from the oil reservoir (Item 9) into a suitable container (minimum 35 litres capacity) by removing the two expansion plug cover clamps (Item 7) and removing the expansion plug (Item 8).
- b. Refit the expansion plug and secure it with the expansion plug cover clamps.
- c. Loosen the hose clamps (Item 6) and detach the supply hose (Item 5) and pressure hose (Item 20) from the hydraulic oil pump (Item 4).
- d. Cap the hoses and hydraulic oil pump ports.
- e. Remove the fan drive belt, air compressor drive belt and the steering drive belt in order in accordance with EMEI Vehicle G 603.
- f. Loosen the oil pump mounting bracket nut (Item 1).
- g. Loosen the tension nut (Item 16) and tension screw (Item 15).
- h. Remove and dispose of the oil pump drive belts (Item 18).
- i. Fit new oil pump drive belts.
- j. Adjust the tension screw (Item 15) and tension nut (Item 16) to attain between 5mm and 10mm deflection on the oil pump drive belts (Item 18).
- k. Tighten the oil pump mounting bracket nut (Item 1) to 60 N.m.
- l. Fit and tension the fan drive belt, air compressor drive belt and the steering drive belt in order in accordance with EMEI Vehicle G 603.



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| 1 | Oil pump mounting bracket nut | 8 | Expansion plug | 15 | Tension screw |
| 2 | Oil pump securing bolt | 9 | Oil reservoir | 16 | Tension nut |
| 3 | Oil pump securing washer | 10 | Woodruff key | 17 | Oil pump mounting bracket |
| 4 | Hydraulic oil pump | 11 | Drive pulley securing washer | 18 | Oil pump drive belts |
| 5 | Supply hose | 12 | Drive pulley securing nut | 19 | Crankshaft drive pulley |
| 6 | Hose clamp | 13 | Oil pump mounting bracket bolt | 20 | Pressure hose |
| 7 | Expansion plug cover clamps | 14 | Oil pump drive pulley | | |

Figure 2 Hydraulic Oil Pump and V-Belt Arrangement

- m. Remove the caps from the hoses and hydraulic oil pump.
- n. Attach the supply hose (Item 5) and the pressure hose (Item 20) to the hydraulic oil pump (Item 4) and secure them with the hose clamps (Item 6).
- o. Refill the oil reservoir (Item 9) with Grade OM-33 hydraulic oil.
- p. Start the engine.
- q. Allow oil pressure to build and check for oil leaks and rectify them if required.

Hydraulic Oil Pump

12. The oil pump drive shaft is keyed to a dual drive pulley through a bracket mounted to the front engine support (Figure 2). The oil pump, drive pulley and mounting bracket must be removed as a complete unit.

13. Removal. Remove the hydraulic oil pump as follows (Figure 2):

- a. Lower the sump guard to gain access to the oil pump in accordance with EMEI Vehicle G 603.
- b. Drain the oil from the oil reservoir (Item 9) into a suitable container (minimum 35 litres capacity) by removing the two expansion plug cover clamps (Item 7) and the expansion plug (Item 8).
- c. Loosen the supply hose clamp (Item 6) and detach the supply hose (Item 5) from the hydraulic oil pump (Item 4).

- d. Loosen the pressure hose clamp and detach the pressure hose (Item 20) from the hydraulic oil pump (Item 4).
- e. Cap the hoses and hydraulic oil pump ports.
- f. Loosen the oil pump mounting bracket nut (Item 1).
- g. Loosen the tension nut (Item 16) and tension bolt (Item 15).
- h. Remove the oil pump drive belts (Item 18) from the oil pump drive pulley (Item 14).

NOTE

The drive belts may remain in place.

- i. Support the hydraulic oil pump (Item 4), and remove the oil pump mounting bracket nut (Item 1) and oil pump mounting bracket bolt (Item 13) securing the pump mounting bracket to the front engine support.
- j. Remove the hydraulic oil pump (Item 4), oil pump mounting bracket (Item 17) and oil pump drive pulley (Item 14) as a complete unit.
- k. Clamp the unit in a suitable vice.
- l. Remove the drive pulley securing nut (Item 12) and drive pulley securing washer (Item 11) securing the oil pump drive pulley (Item 14) to the hydraulic oil pump shaft.
- m. Use a puller to remove the oil pump drive pulley (Item 14) and remove the Woodruff key (Item 10) from the shaft.
- n. Remove the oil pump securing bolt (Item 2) and oil pump securing washer (Item 3) securing the oil pump flange to the oil pump mounting bracket (Item 17).
- o. Clean the engine support and inspect all parts to be used for installation and replace any damaged or worn parts.

14. Installation. Install the hydraulic oil pump as follows (Figure 2):

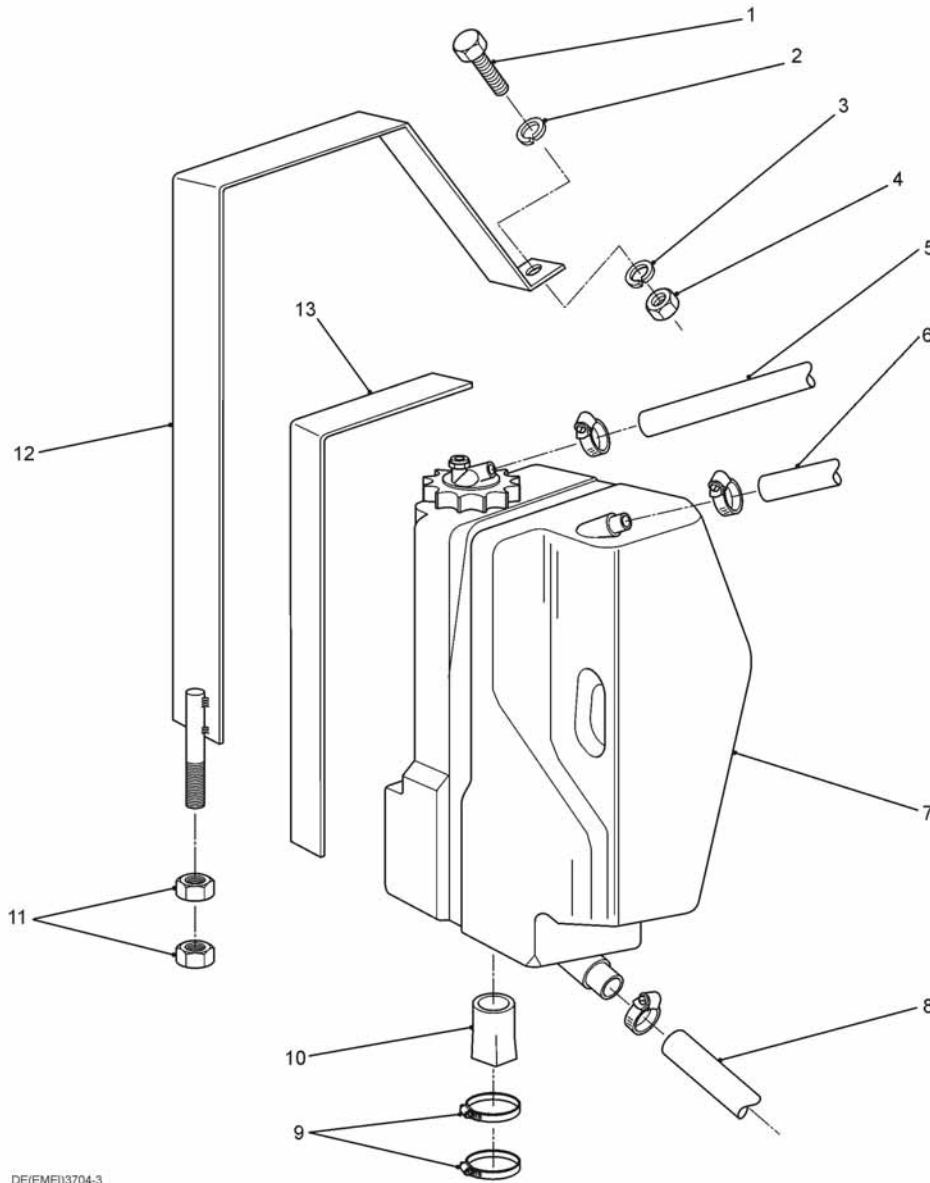
- a. Fit the oil pump flange to the oil pump mounting bracket (Item 17).
- b. Install the oil pump securing washer (Item 3) and oil pump securing bolt (Item 4) and tighten it.
- c. Clamp the oil pump drive pulley (Item 14) in a vice to enable the hydraulic oil pump to be fitted to the pulley.
- d. Fit the Woodruff key (Item 10) into the oil pump shaft and fit the oil pump drive pulley to the shaft.
- e. Fit a new drive pulley securing washer (Item 11) and drive pulley securing nut (Item 12) to secure the drive pulley and tighten it to 60 N.m.
- f. Align the oil pump mounting bracket (Item 17) to the front engine support.
- g. Install and hand tighten the oil pump mounting bracket bolt (Item 13) and oil pump mounting bracket nut (Item 1).
- h. Fit the oil pump drive belts and adjust them (Para 10.c and Para 10.d).
- i. Uncap and fit the supply hose (Item 5) and pressure hose (Item 20) to the hydraulic oil pump (Item 4) and secure them with the hose clamps.
- j. Refill the reservoir with hydraulic oil Grade OM-33.
- k. Start the engine and allow the oil pressure to build up.
- l. Operate the dump system in accordance with the instruction plate in the cabin.
- m. Inspect the pump and connections for leaks and rectify them if necessary.

Hydraulic Oil Reservoir

15. Removal. Remove the hydraulic oil reservoir as follows (Figure 3):

- a. Raise the bonnet and remove the grille in accordance with EMEI Vehicle G 603.

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|---|-----------------|----|-------------------------|----|-------------|
| 1 | Screw | 6 | Vent tube | 11 | Nut |
| 2 | Cone washer | 7 | Hydraulic oil reservoir | 12 | Clamp strap |
| 3 | Lock washer | 8 | Oil supply hose | 13 | Pad |
| 4 | Clamp nut | 9 | Hose clamps | | |
| 5 | Oil return hose | 10 | Expansion plug | | |

Figure 3 Hydraulic Oil Reservoir

- b.** Drain the oil from the hydraulic oil reservoir (Item 7) into a suitable container by removing the two hose clamps (Item 9) and the expansion plug (Item 10). Replace the expansion plug cover and clamps.
- c.** Loosen the hose clamps and detach the oil return hose (Item 5), the vent tube (Item 6) and the oil supply hose (Item 8) from the hydraulic oil reservoir (Item 7). Cap the hoses and reservoir to prevent entry of dirt.
- d.** Remove the clamp nut (Item 4), lock washer (Item 3), cone washer (Item 2), screw (Item 1) and nuts (Item 11) securing the clamp strap (Item 12) to the chassis bracket and mud apron respectively.
- e.** Remove the clamp strap (Item 12) and pad (Item 13).
- f.** Lift the reservoir clear of the engine compartment.
- g.** Remove the oil filter assembly (Para 7).

- 16. Installation.** Install the hydraulic reservoir as follows (Figure 3):
- a.** Fit the reservoir in position on the right-hand side of the engine compartment.
 - b.** Align the pad (Item 13) and clamp strap (Item 12) to the reservoir.
 - c.** Secure the clamp strap to the mud apron with the screw (Item 1), cone washer (Item 2), lock-washer (Item 3) and clamp nut (Item 4) and to the chassis bracket with clamp nuts (Item 11).
 - d.** Install the oil filter assembly (Para 8).
 - e.** Remove the caps and attach the oil supply hose (Item 8), the oil return hose (Item 5) and the vent tube (Item 6) and secure them with the hose clamps.
 - f.** Refill the reservoir with hydraulic oil Grade OM-33.
 - g.** Fit the grille in accordance with EMEI Vehicle G 603 and close the bonnet.
 - h.** Run the engine and allow the oil pressure to build up.
 - i.** Inspect the hose connections for leaks and rectify them if required.

Hoist Valve

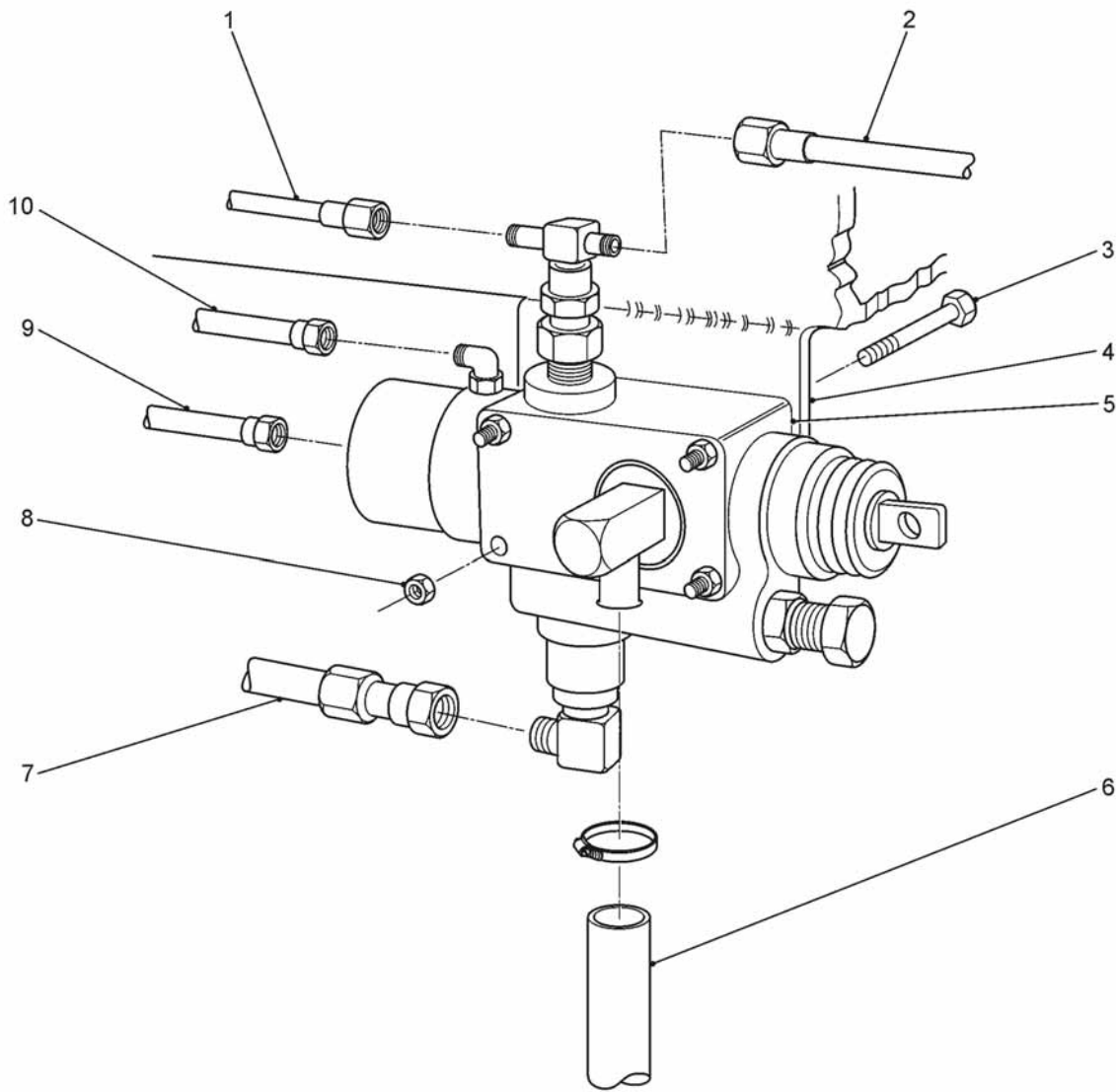
- 17. Removal.** Remove the hoist valve as follows (Figure 4):

NOTE

Tag all oil and air lines to assist with installation.

- a.** Disconnect the four oil hoses (Item 1, Item 2, Item 6 and Item 7) from the hoist valve (Item 5) and cap the hoses and hoist valve ports.
 - b.** Disconnect the two air lines (Item 9 and Item 10) from the hoist valve (Item 5) and cap the lines and hoist valve ports.
 - c.** Remove the four valve retaining nuts (Item 8) and remove the valve cover.
 - d.** Support the hoist valve and remove the four valve mounting bolts (Item 3) from the valve mounting bracket (Item 4).
 - e.** Remove the hoist valve.
- 18. Installation.** Install the hoist valve as follows (Figure 4):
- a.** With the hoist valve cover removed, align the hoist valve (Item 5) to the valve mounting bracket.
 - b.** Install the four valve mounting bolts (Item 3) through the valve mounting bracket (Item 4) and then the hoist valve body (Item 5).
 - c.** Fit the valve cover over the bolts and secure it with the four valve retaining nuts (Item 8).
 - d.** Connect and tighten the air lines (Item 9 and Item 10) and oil hoses (Item 1, Item 2, Item 6 and Item 7) to the hoist valve.
 - e.** Run the engine.
 - f.** Operate the dump system in accordance with the instruction plate in the cabin. Check for oil and air leaks at the hoist valve and rectify them if required.

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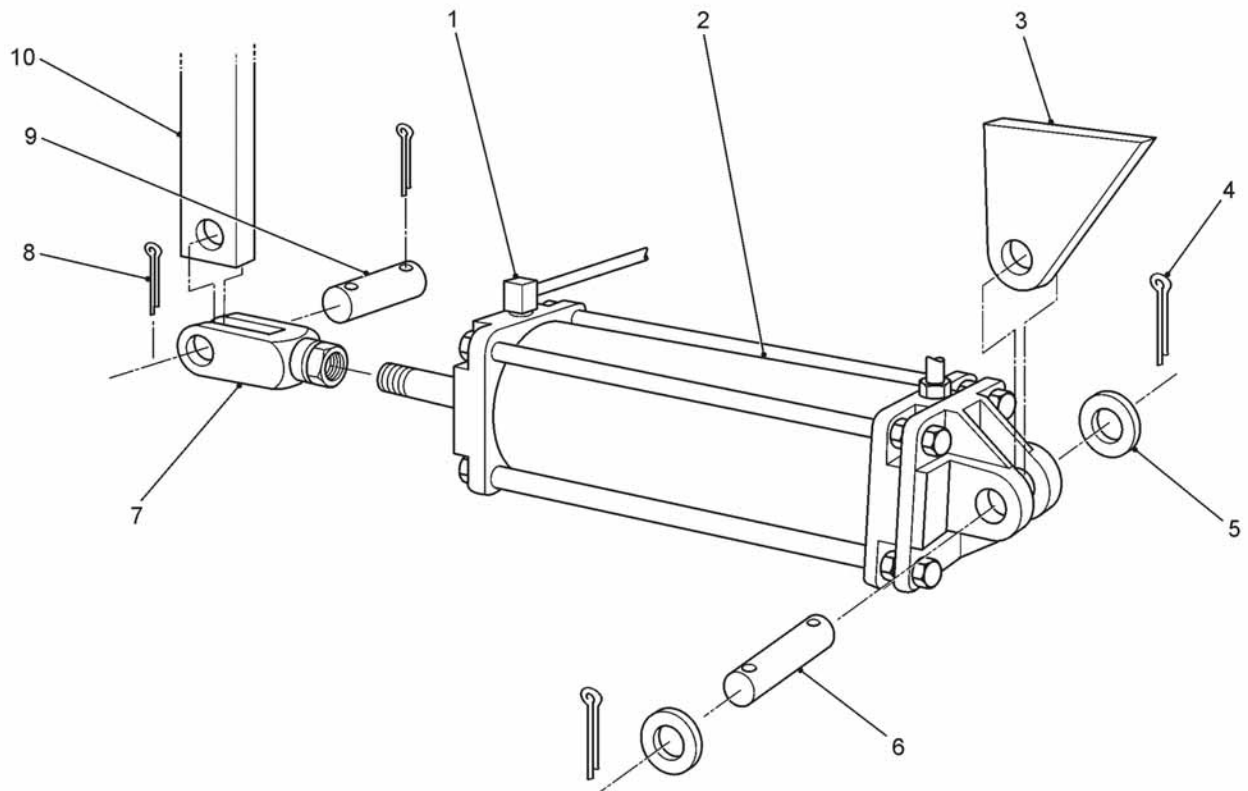
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|---|----------------------------------|----|------------------------------------|
| 1 | Valve to hoist oil hose assembly | 6 | Return oil hose assembly |
| 2 | Valve to gauge oil hose assembly | 7 | Valve to pump oil pressure hose |
| 3 | Valve mounting bolt | 8 | Valve retaining nut |
| 4 | Valve mounting bracket | 9 | Valve to air switch top air line |
| 5 | Hoist valve | 10 | Valve to air switch lower air line |

Figure 4 Hoist Valve

Tailgate Cylinder

19. **Removal.** Remove the tailgate cylinder as follows (Figure 5):

- a. Operate the tailgate lock lever to the up position which will mechanically retract the cylinder piston.
- b. Disconnect the air line (Item 1) from the tailgate cylinder (Item 2).
- c. Supporting the tailgate cylinder, remove the split pins (Item 4), washers (Item 5) and withdraw the cotter pin (Item 6) attaching the tailgate cylinder to the cylinder mounting bracket (Item 3).
- d. Remove the split pins (Item 8) and withdraw the cotter pin (Item 9) attaching the clevvis (Item 7) to the tailgate lock lever arm (Item 10).



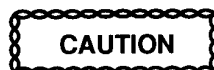
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|---|---------------------------|----|-------------------------|
| 1 | Air line connection | 6 | Cotter pin |
| 2 | Tailgate cylinder | 7 | Clevis |
| 3 | Cylinder mounting bracket | 8 | Split pin |
| 4 | Split pin | 9 | Cotter pin |
| 5 | Washer | 10 | Tailgate lock lever arm |

Figure 5 Tailgate Cylinder

- 20. Installation.** Install the tailgate cylinder as follows (Figure 5):
- Align the tailgate cylinder (Item 2) to the cylinder mounting bracket (Item 3) and insert the cotter pin (Item 6). Secure the cotter pin with the washers (Item 5) and split pins (Item 4).
 - Align the clevis (Item 7) to the tailgate lock lever arm (Item 10). Insert the cotter pin (Item 9). Secure the cotter pin with the split pins (Item 8).
 - Connect the air line (Item 1) to the tailgate cylinder.
 - Run the engine and test the tailgate locking mechanism in accordance with the instruction plate in the cabin. Check for air leaks at the cylinder and rectify them if required.

Air Switch



Before removal of the air switch, check that body control lever (Figure 6, Item 6) is set to HOLD and the tailgate cylinder lever (Figure 6, Item 7) is in the DOWN position. Exhaust the air supply to the switch by draining the air tanks.

- 21. Removal.** Remove the air switch as follows (Figure 6):

NOTE

Tag all air lines to assist with installation.

- a. Disconnect the four air lines (Item 3) with the gland nut and seal from their associated piston assembly (Item 4).
- b. Remove the two mounting bracket screws (Item 8) attaching the mounting bracket (Item 9) to the steering shaft cover.
- c. Lower the mounting bracket with the air switch (Item 5) attached.
- d. Remove the countersunk screws (Item 1) and nuts (Item 2) attaching the switch to the bracket. Detach the air switch.

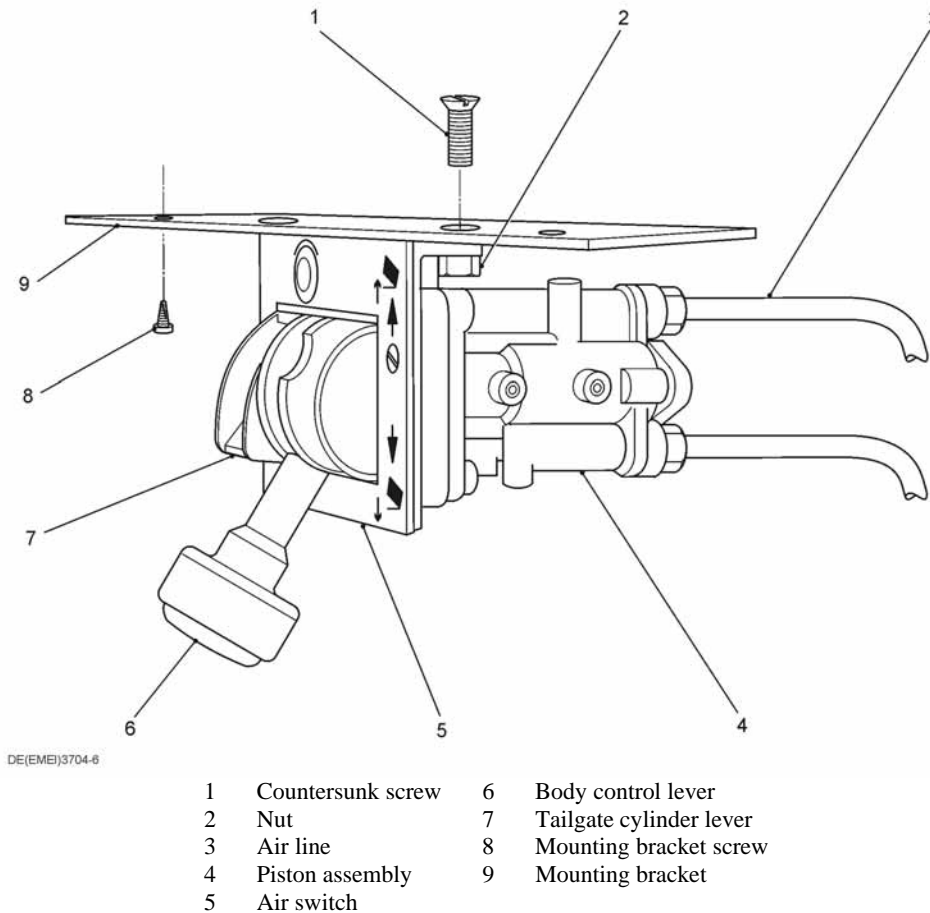


Figure 6 Air Switch

22. Installation. Install the air switch as follows (Figure 6):

- a. Align the air switch (Item 5) to the mounting bracket (Item 9) and attach it with the countersunk screws (Item 1) and nuts (Item 2) to the mounting bracket. Tighten the nuts.
- b. Secure the bracket to the steering shaft cover with the two mounting bracket screws (Item 8).
- c. Connect the four air lines (Item 3) with a gland nut and seal to their associated piston assembly.
- d. Run the engine and test the dump system in accordance with the instruction plate in the cabin. Check for air leaks at the switch and rectify them if necessary.

END

Distribution List: **VEH G 33.0 – Code 2** (Maint Level)
(Sponsor: LV SPO, Mdm/Hvy B Vehicles)
(Authority: ECO LVSP0 031/08)