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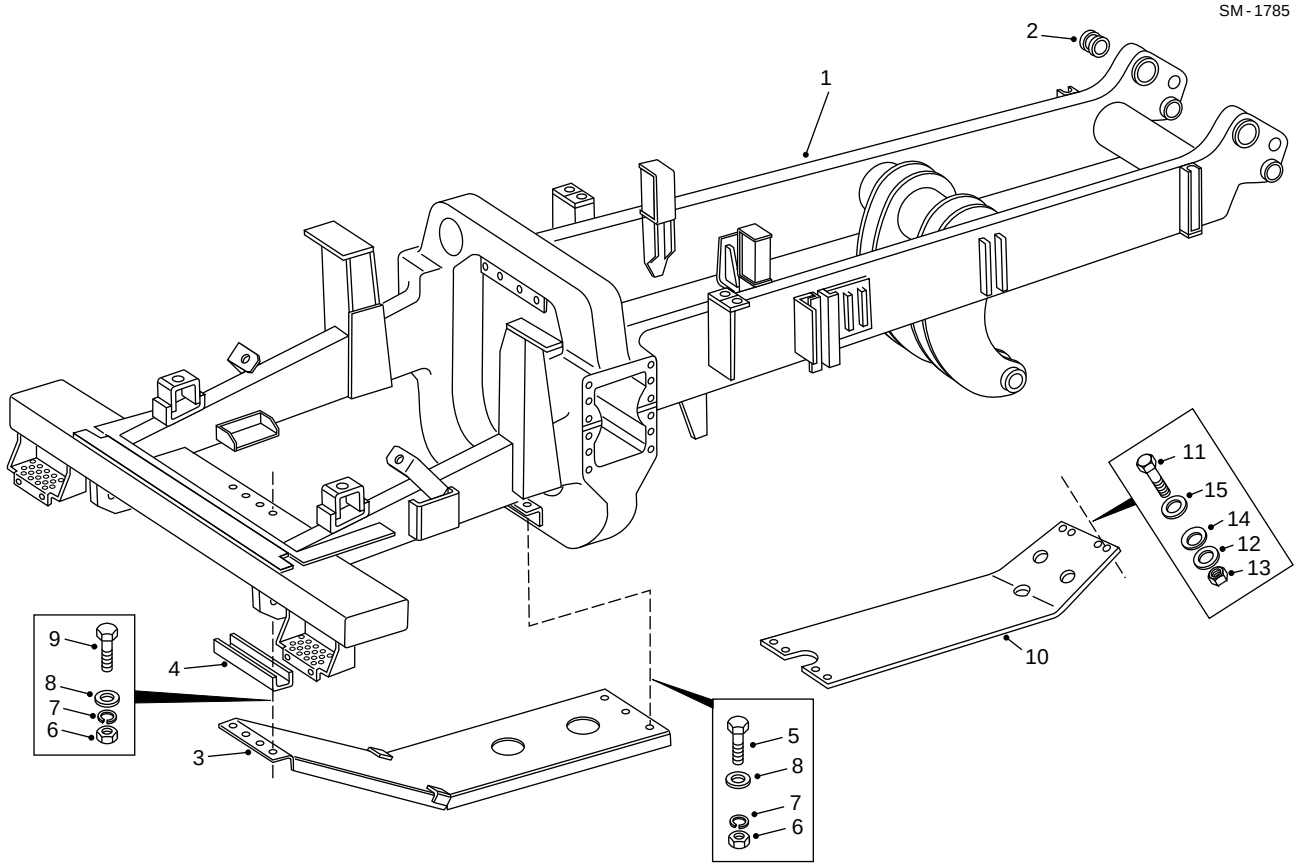



1 - Frame Assembly
2 - Bushing
3 - Engine Guard
4 - Channel
5 - Bolt
6 - Nut
7 - Lockwasher
8 - Washer
9 - Bolt
10 - Transmission Guard
11 - Bolt
12 - Hardened Washer
13 - Locknut
14 - Spring Disc
15 - Washer

*Fig. 1 - Exploded View of Chassis and Guards*

## REMOVAL

**⚠ WARNING**
**To prevent personal injury and property damage, be sure wheel chocks, blocking materials and lifting equipment are properly secured and of adequate capacity to do the job safely.**

To remove any of the components shown in Figs. 1, 2, 3, 4 or 5 (or similar components) the following procedures should be carried out.

1. Position the vehicle in a level work area, apply the parking brake and switch off the engine.

2. Turn steering wheel in both directions several times to relieve pressure in the steering circuit. Block all road wheels.

3. Attach a suitable lifting device to the component and remove mounting hardware. Remove the component from the vehicle.

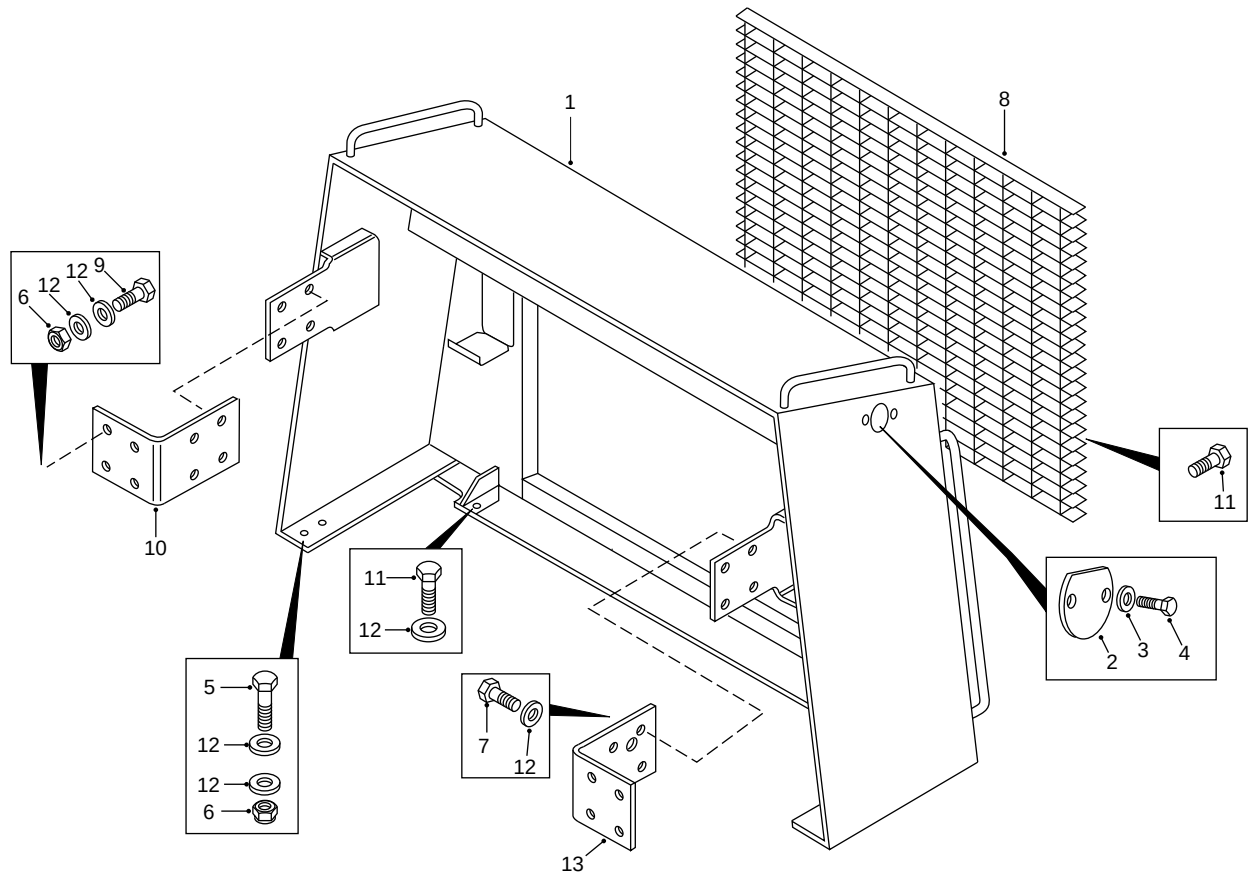
## INSTALLATION

**Note:** Tighten all fasteners to standard torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.

**⚠ WARNING**
**To prevent personal injury and property damage, be sure wheel chocks, blocking materials and lifting equipment are properly secured and of adequate capacity to do the job safely.**

Using a suitable lifting device, align the component to be installed in position on the chassis. Secure the component securely to the chassis with mounting hardware removed during removal.

SM - 1961

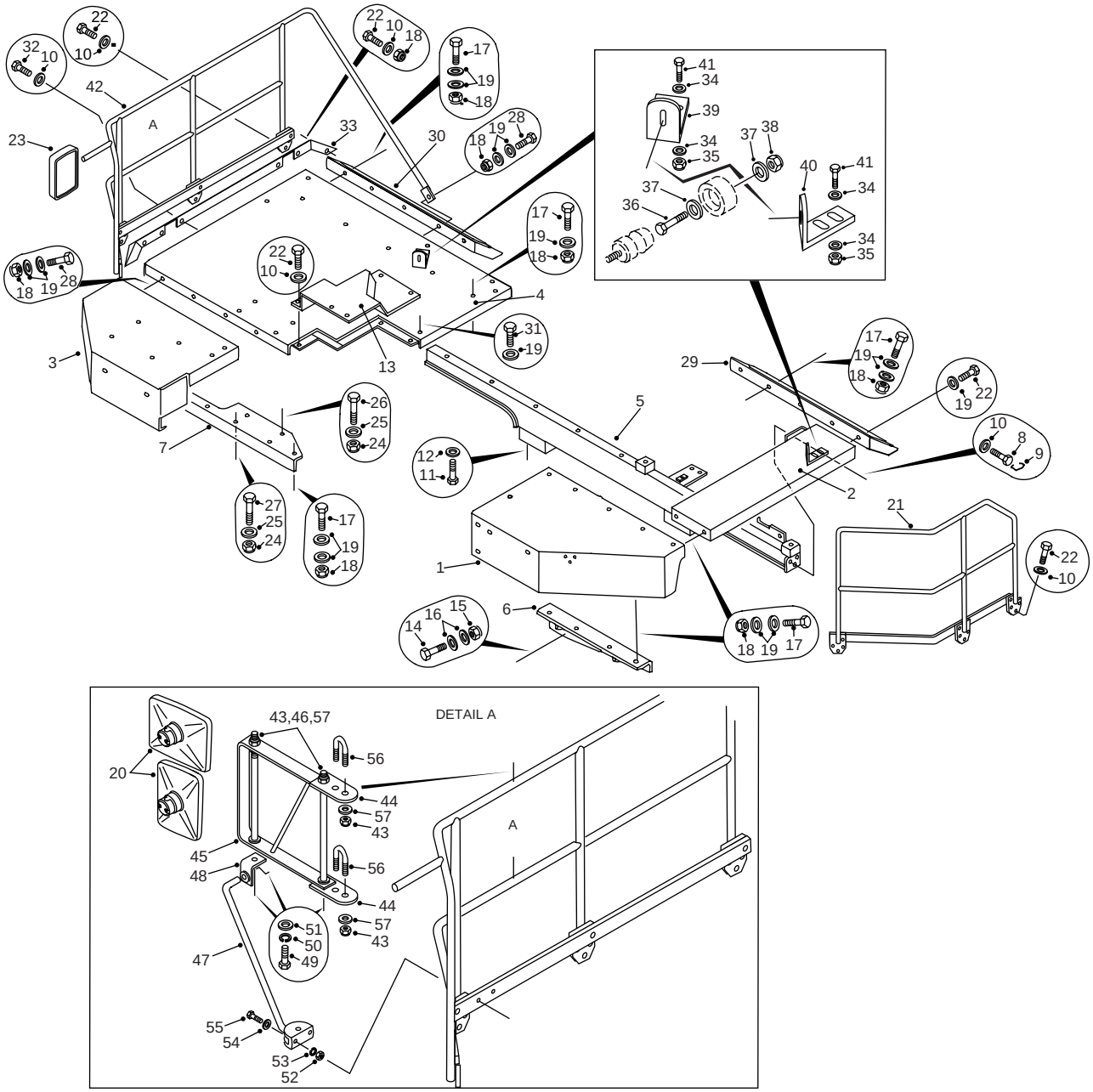



1 - Radiator Guard
2 - Cover Plate
3 - Washer
4 - Bolt
5 - Bolt
6 - Nut
7 - Bolt
8 - Grille
9 - Bolt
10 - Bracket
11 - Bolt
12 - Hardened Washer
13 - Plate

*Fig. 5 - Radiator Guard and Mounting*

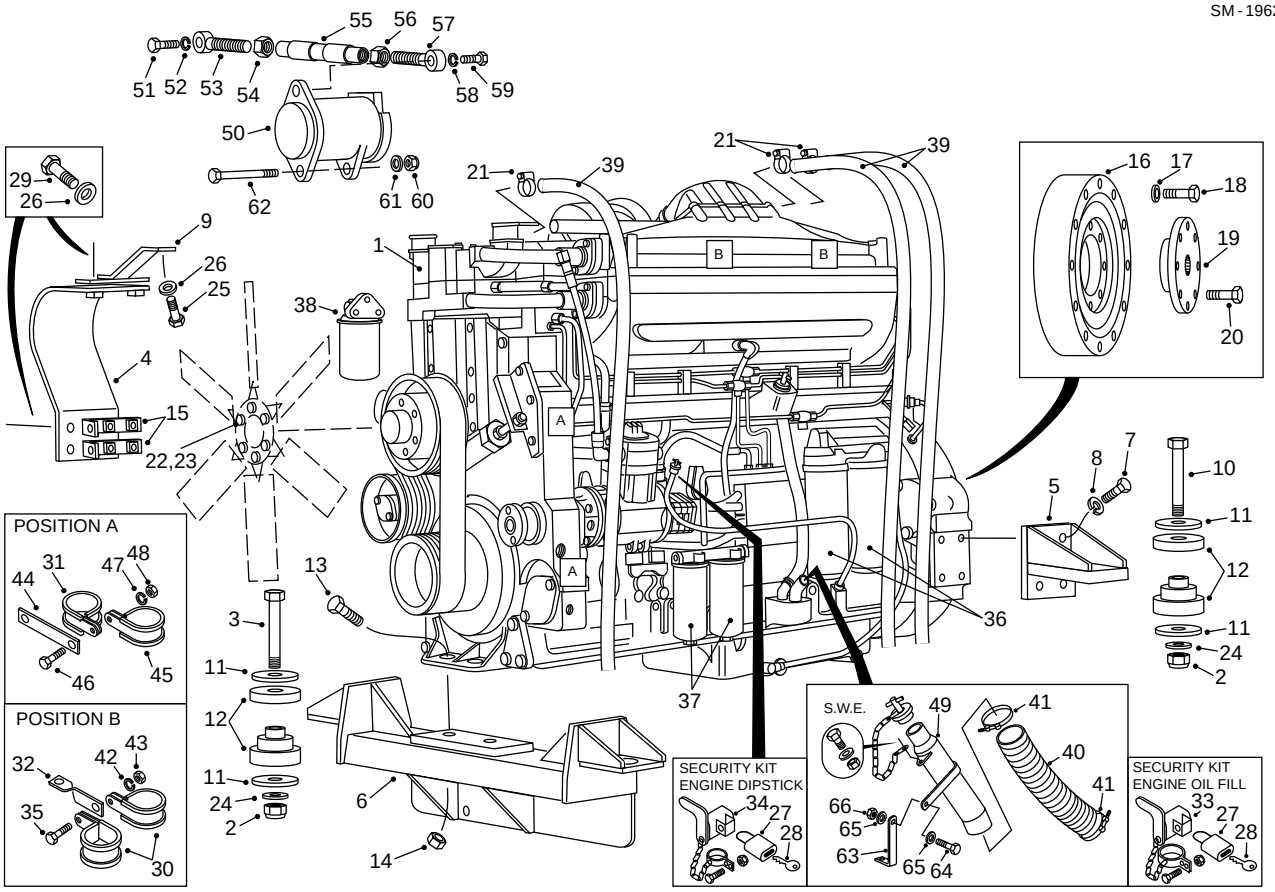
* * * *

SM - 2397




1 - LH Fender Assembly
2 - LH Platform Assembly
3 - RH Fender Assembly
4 - RH Platform Assembly
5 - Crossmember
6 - Support
7 - Support
8 - Bolt
9 - Lockwire
10 - Hardened Washer
11 - Bolt
12 - Washer
13 - Engine Access Cover
14 - Bolt
15 - Locknut
16 - Hardened Washer
17 - Bolt
18 - Locknut
19 - Hardened Washer
20 - Mirror
21 - LH Handrail
22 - Bolt
23 - Mirror Wide Angle
24 - Nut
25 - Washer
26 - Bolt
27 - Bolt
28 - Bolt
29 - Mudguard
30 - Mudguard
31 - Bolt
32 - Bolt
33 - Fender Extension RH
34 - Washer
35 - Nut
36 - Bolt
37 - Washer
38 - Nut
39 - Plate Bent
40 - Plate bent
41 - Bolt
42 - RH Handrail
43 - Nut
44 - Plate
45 - Mirror Arm Assembly
46 - Bar
47 - Rod Assembly
48 - Bracket Assembly
49 - Bolt
50 - Lockwasher
51 - Washer
52 - Nut
53 - Lockwasher
54 - Washer
55 - Bolt
56 - 'U' Bolt
57 - Hardened Washer

*Fig. 3 - Exploded View of Fenders and Mounting*




1 - Engine
2 - Locknut
3 - Bolt
4 - Alternator Guard
5 - Rear Mount
6 - Front Mount
7 - Bolt
8 - Lockwasher
9 - Support Bracket
10 - Bolt
11 - Snubbing Washer
12 - Isolation Mount
13 - Bolt
14 - Locknut
15 - Plate Support
16 - Damper
17 - Lockwasher
18 - Bolt
19 - Flange Coupling
20 - Bolt
21 - Clamp
22 - Bolt
23 - Lockwasher
24 - Washer
25 - Bolt
26 - Washer
27 - Padlock
28 - Key
29 - Bolt
30 - P-Clip
31 - P-Clip
32 - Bracket
33 - Latch Assembly
34 - Latch Assembly
35 - Bolt
36 - Oil Filter
37 - Fuel Filter
38 - Coolant Filter
39 - Breather Line
40 - Filler Hose
41 - Clamp
42 - Lockwasher
43 - Locknut
44 - Plate
45 - P-Clip
46 - Bolt
47 - Lockwasher
48 - Locknut
49 - Filler Assembly
50 - Alternator
51 - Bolt
52 - Lockwasher
53 - Eye Bolt
54 - Jam Nut
55 - Link
56 - Nut
57 - Eye Bolt
58 - Lockwasher
59 - Bolt
60 - Locknut
61 - Lockwasher
62 - Bolt
63 - Bracket
64 - Bolt
65 - Washer
66 - Locknut

*Fig. 1 - Engine and Mounting*

## DESCRIPTION

Numbers in parentheses refer to Fig. 1.

For engine make, model and specification, refer to Section 000-0000, GENERAL INFORMATION. For engine servicing and repair data refer to the engine manufacturers service manual.

The engine is mounted to the frame at three points by a mounting bracket (6) at the front of engine (1) and two rear mounts (5). Rubber isolation mounts (12) through engine mounts provide sufficient flexibility to absorb varying engine vibration and torsional loads.

There are two full-flow oil filters (36) mounted on the left hand side of engine (1) in a downward position. The filters are of the throw away, spin-on type. Oil supplied by the engine oil pump passes through oil filters (36) before reaching the various moving parts of engine (1). The oil is forced by pump pressure through a passage in the filter adaptor and into the elements. Impurities are filtered out as the oil passes through the

3. Remove cross assembly (3) from yoke by tilting slightly and lift out of yoke.

4. Repeat Steps 1 through 3 at opposite end of driveline.

## INSPECTION

1. Clean all metal parts in a suitable solvent, except bearings. Clean bearings with a brush. Dry all parts, except bearings, with compressed air. Clean grease passages in slip yoke.

2. Clean bearings in volatile mineral spirits. Place bearings on a clean surface and allow to dry. Lubricate bearings with clean transmission oil, and check for wear and roughness by spinning by hand. If bearings show excessive wear, or if operation is rough or noisy, replace both bearings and cross assemblies. Never install new bearings on used crosses.

3. Inspect splines of shaft and yoke for nicks, burrs and excessive wear. Replace if wear is excessive or splines are nicked. Burrs may be removed with a fine file or medium India stone.

## ASSEMBLY

Numbers in parentheses refer to Fig. 2.

### Universal Joint

1. Place yoke (9) or shaft (5) in a soft jawed vice.

2. With grease fitting (4) on cross assembly (3) facing toward the tube end of the joint, insert one trunnion of the cross assembly into bearing assembly (2) hole in one of the yoke lugs. Be sure grease fitting in cross assembly is in line with grease fitting in slip yoke assembly. Tilt cross assembly until opposite trunnion will enter hole in the opposite yoke lug.

3. Insert bearing assembly (2) into yoke lug hole. Press bearing assembly into place with an arbor press or tap in place with a plastic hammer. Replace locking strap (11) and bolts (1).

4. Turn yoke assembly over and replace opposite bearing assembly (2) as described in Step 3. Tighten bolts (1) on both ends of yoke to a torque of 45 Nm (33 lbf ft), and bend tabs on locking straps (11) up against flat sides of bolts to prevent bolts loosening.

5. If joint appears to bind, tap bearing assembly (2) lightly to relieve any pressure on cross assembly (3).

6. Repeat Steps 1 through 5 for opposite end of driveline.

### Slip Joint

1. Install retainer (6), washer (7) and new cork washer (8) over splines of shaft (5).

2. Lubricate the splines of the slip joint thoroughly with lubricant recommended in Section 300-0020, LUBRICATION SYSTEM.

3. Align splines of shaft (5) with yoke (9). Be sure that the arrow marks of yoke and shaft (or matching marks made in Step 1 during disassembly) are in line and slide the two together. These arrows line up the shaft for balance. Tighten retainer (6) on yoke (9) threads, and remove driveline assembly from the vice.

## INSTALLATION

Numbers in parentheses refer to Fig. 1.

**Note:** Extra care should be taken when handling drivelines since carelessness can result in premature failure of the components. Chips, dents, burrs, or any other deformity of flanges will prevent accurate mating with the crosses and bearings. This will cause misalignment, which is accompanied by vibration and excessive wear.

**⚠ WARNINGS**
**To prevent personnel injury and property damage, be sure wheel blocks, blocking materials and lifting equipment are properly secured and of adequate capacity to do the job safely.**

**⚠ Rotating shafts can be dangerous. You can snag clothes, skin, hair, hands, etc. This can cause serious injury or death. Do not go under a vehicle when the engine is running.**

**Note:** Make sure driveline is assembled with alignment arrows and grease fittings properly aligned.

1. Using suitable lifting equipment, raise driveline (4) into position on the vehicle.

2. Install bearing assembly (3) in flange yoke over the end of the cross and secure with locking strap (2) and bolts (1). Tighten bolts (1) to a torque of 45 Nm (33 lbf ft), and bend tabs of locking strap (2) up against flat sides of bolts to prevent bolts loosening.

3. Repeat Step 2 on opposite side of flange yoke.

4. Repeat Steps 2 and 3 at opposite end of driveline.

special tool as an aid in determining the required thickness of shims (18).

a. Install a shim pack (18) of approximately 1.5 mm (0.060 in), measure and record the actual thickness as Dimension 'X', and the loosely fitting bearing cup (17) (see previous note) in the pinion gear shaft bore of carrier housing (19).

b. Install bearing cone (16) and bearing cone (14) on pinion gear (15). Install cup (13) into retainer (9) until it bottoms against the retainer shoulder. Install pinion gear assembly (14, 15 & 16) and retainer (9) into carrier housing (19). Secure retainer (9) with eight bolts (10) equally spaced.

c. Rotate pinion gear (15) and tighten bolts (10) until the pinion gear cannot be rotated by hand to seat the bearing rollers firmly.

d. Place a flat plate approximately 450 mm (18 in) long across the two bearing cap (22) mounting surfaces in carrier housing (19) as shown in Fig. 7. The plate must lie perfectly flat between the bearing cap mounting surfaces and must be clean and free of burrs.

e. Measure the distance from the end of pinion gear (15) shaft to the plate (axle centre line). See Fig. 7. Record this distance as Dimension 'A'.

f. Record the dimension etched on the end of pinion gear (15) as Dimension 'B'.

g. The correct thickness of shims (18) to be used is: Dimension 'X' + Dimension 'B' - Dimension 'A'.

2. Determine shim pack (11) thickness so as to allow pinion gear (15) 0.025 - 0.08 mm (0.001 - 0.003 in) axial end play as follows:

a. With pinion gear (15) installed as previously described in Steps 1a through 1f, rotate pinion gear (15) and tighten the eight bolts (10) evenly spaced, to 110 Nm (80 lbf ft) torque to seat the bearing rollers firmly.

b. Remove bolts (10) and reinstall two of them 180° apart. Tighten the two bolts alternately in 30 Nm (20 lbf ft) increments to a final torque of 110 Nm (80 lbf ft).

c. Measure the gap between retainer (9) and carrier housing (19) adjacent to the two installed bolts and record the average measurement as Dimension 'C'.

d. The correct thickness of shim pack (11) is:

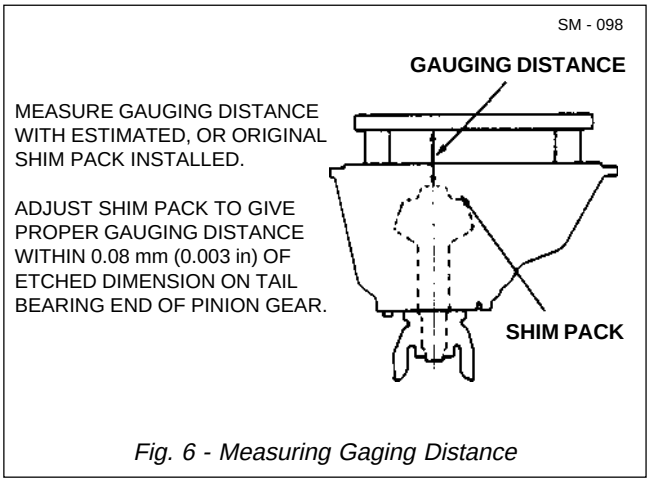



*Fig. 6 - Measuring Gaging Distance*

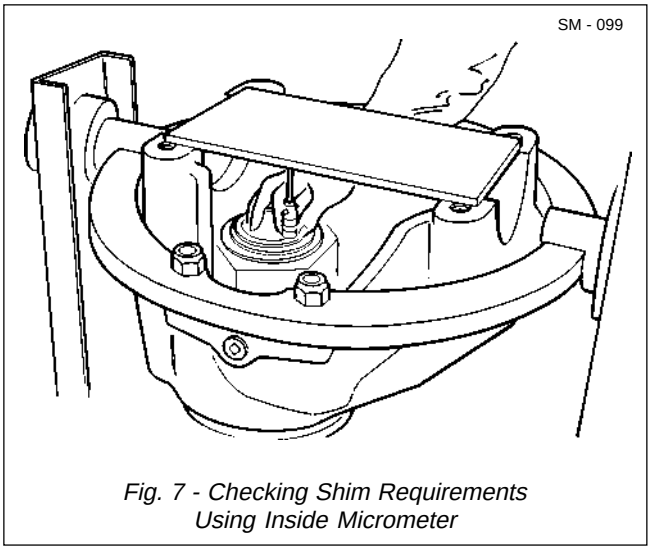



*Fig. 7 - Checking Shim Requirements Using Inside Micrometer*

0.48 mm (0.019 in) + Dimension 'C' - Dimension 'B' (Step 1f) - Dimension 'A' (Step 1e). This shim pack thickness should provide 0.05 mm (0.002 in) axial end play of pinion gear (15).

3. Remove bolts (10) and remove retainer (9) from carrier housing (19). Adjust shim pack (18) to the required thickness as calculated in Step 1g and replace the ground bearing cup (17) with bearing cup (17) to be installed permanently.

4. Install pinion gear assembly (14, 15 & 16) in carrier housing (19) as previously described in Steps 1 and 2.

5. Install oil seal (12) into retainer (9) flush with the retainer surface at the top of the seal bore.

6. Install measured shim pack (11) as calculated in Step 2d on retainer (9) and install the assembly on carrier housing (19). Align slot in retainer (9) with the lubrication holes in shims (11) and carrier housing (19) and install retainer assembly in carrier housing.

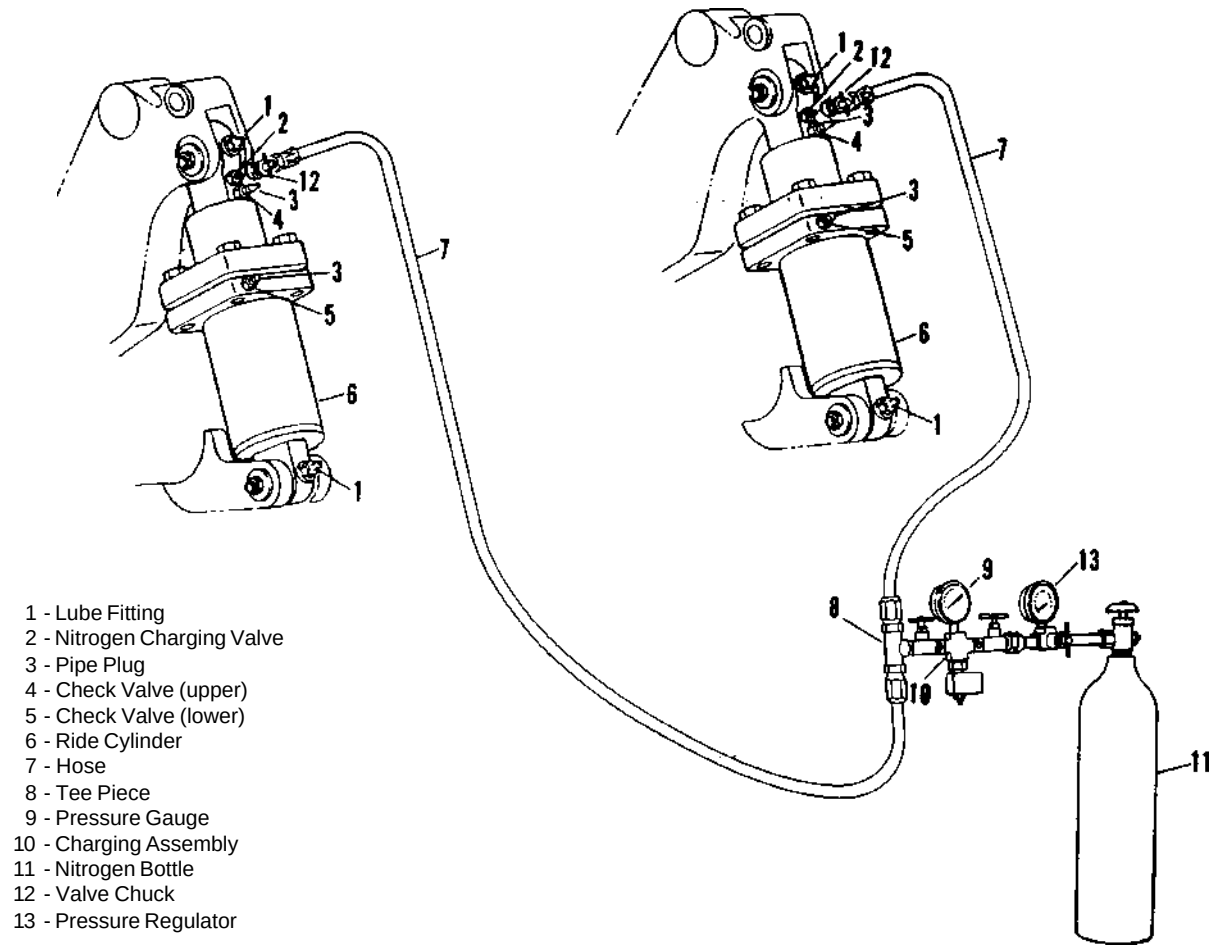



*Fig. 6 - Charging Two Ride Cylinders Simultaneously*

foaming of the oil. If the truck cannot be left idle for 10 hours, oil should be completely drained by removing top pin assembly (7, Fig. 2) and, using suitable lifting equipment, lower the cylinder until oil can be drained out of check valve (4 & 5) ports and nitrogen charging valve (2) port. Reinstall ride cylinder and secure with top pin assembly (7, Fig. 2).

2. With cylinder rod in its retracted position (except for the spacers on oscillation stops as shown in Fig. 5), fill the cylinder until oil flows free of air bubbles from check valve (4) port. It may be necessary to wait 30 or more minutes after nitrogen pressure has been released to clear the foam which has formed inside the cylinder. Screw in check valve (4) and close bleed valve with pipe plug (3). Remove nitrogen charging valve (2) from cylinder rod. Continue filling the cylinder with oil through check valve (5) port until it flows free of air bubbles, from nitrogen charging valve (2) port.

3. Remove oil fill equipment, reinstall plug (3) in check valve (5) and reinstall nitrogen charging valve (2) in its port.

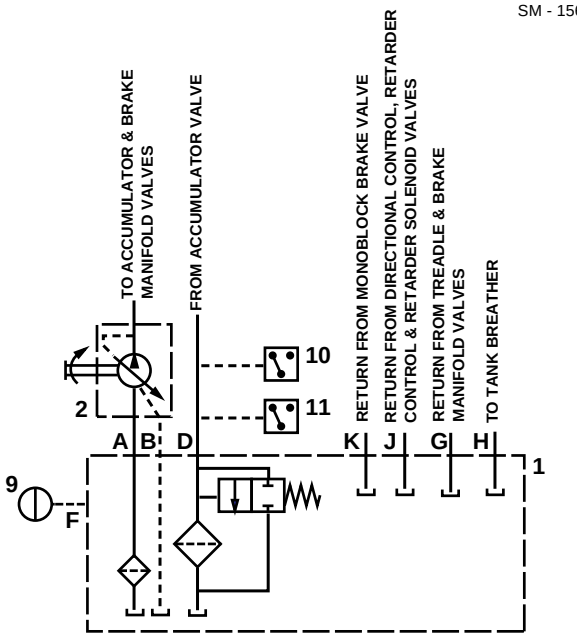
**⚠ WARNING**
**Use dry nitrogen to charge cylinder. Do not use a gas such as oxygen which, if used by mistake for pressurizing, will explode violently when coming into contact with oil or grease, possibly causing personal injury and property damage.**

To charge both cylinders simultaneously with nitrogen, a tee piece (8), hose (1, Fig. 7), valve chuck (2, Fig. 7) and valve extension (3, Fig. 7) can be added to the charging assembly (See Fig. 7). Assembly of this kit is described under 'Special Tools'.

4. Attach the charging assembly kit to nitrogen bottle (11) by turning down on gland nut (8, Fig. 7).

5. Install valve chucks (12) to nitrogen charging valves (2) as follows:

a. Rotate 'T' handle of valve chucks (12) anticlockwise until they stop.




1 - Tank
2 - Steering Pump
9 - Oil Level Switch
10 - Oil Pressure Switch
11 - Oil Temperature Switch

*Fig. 2 - Hydraulic Schematic*

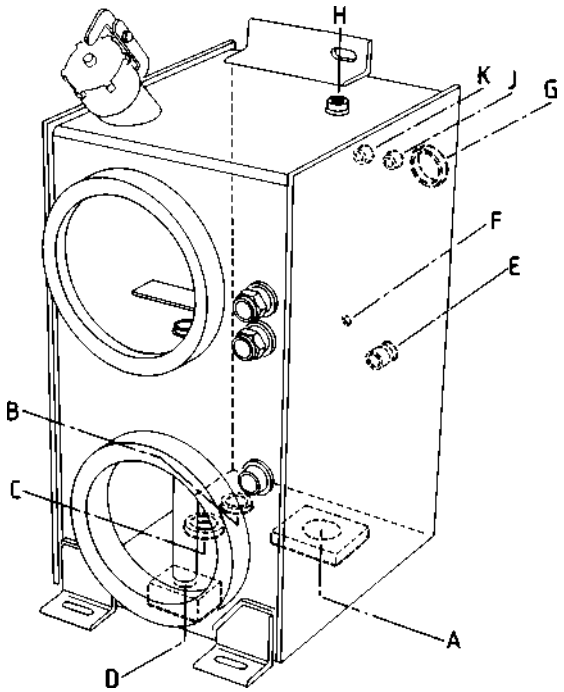



*Fig. 3 - Port Locations*

Return oil from the steering circuit enters the tank at port 'D' from the accumulator valve. The oil enters filter assembly (10) chamber and flows through a centre tube and filter element to tank (1) body.

Should filter assembly (10) become blocked, oil restriction pressure will increase and oil pressure switch (10, Fig. 2) will close sending a signal to the steering filter restriction warning light on the right hand dash panel, indicating that a filter change is required.

**Note:** Temperature switch (11, Fig. 2) opens when a temperature of 50° C (122° F) is reached. Temperature switch (11, Fig. 2) is connected in series with pressure switch (10, Fig. 2), therefore, steering filter restriction warning light will not illuminate until the oil reaches normal operating temperature.

Port 'E' is plugged.

A float oil level switch (23) is located in port 'F' and sends an electrical signal to a warning light on the RH dash panel to indicate when the oil level falls below the safe operating level.

Return oil from the brake treadle valve and brake manifold valve enters tank (1) at port 'G'.

A breather line at port 'H' is connected to a common tank breather mounted on top of the body and disc brake cooling tank. This allows any air entering tank (1) to be released to atmosphere, preventing a pressure build up in tank (1) assembly. Refer to Section 230-0040, BODY AND DISC BRAKE COOLING TANK.

Return oil from the directional control valve, retarder control valve and retarder solenoid valve enters tank (1) at port 'J'.

Return oil from the monoblock brake valve enters tank (1) at port 'K'.

An inter-connecting hose assembly (3, Fig. 4) links the steering and brake control tank and the body and disc brake cooling tank. Refer to Section 230-0040, BODY AND DISC BRAKE COOLING TANK.

## MAINTENANCE

Numbers in parentheses refer to Fig. 1.

**Note:** Tighten all fasteners to torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.

### Checking Oil Level

**Cold check:** With the engine off, operate the steering left and right to discharge the steering accumulator.

SM - 288

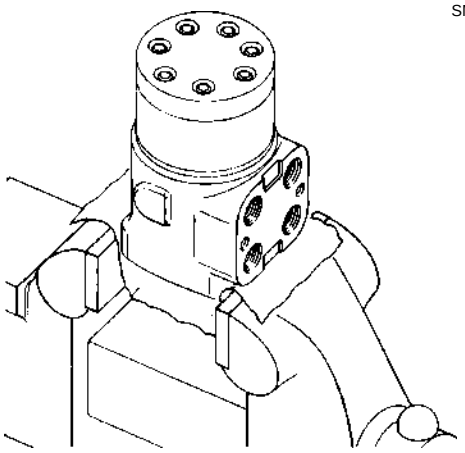
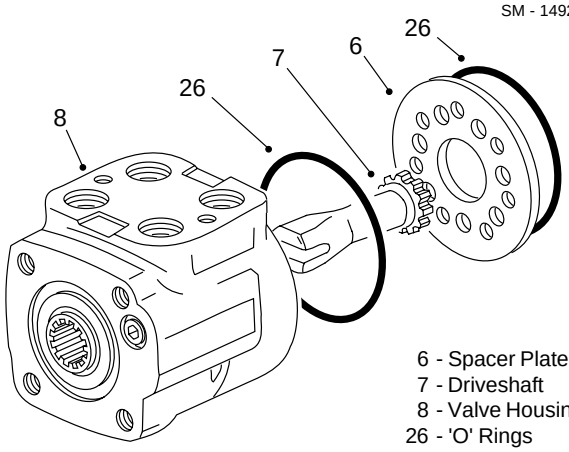


*Fig. 10 - Valve Clamped in Vice*

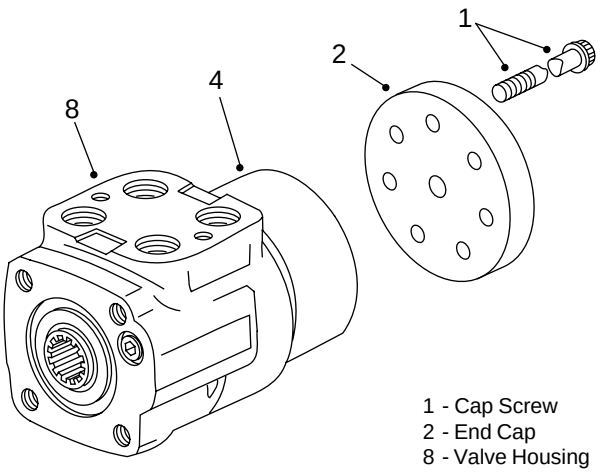
SM - 1492




6 - Spacer Plate
7 - Driveshaft
8 - Valve Housing
26 - 'O' Rings

*Fig. 13 - Removing Driveshaft*

SM - 1490




1 - Cap Screw
2 - End Cap
8 - Valve Housing

*Fig. 11 - Removing End Cap*

SM - 292

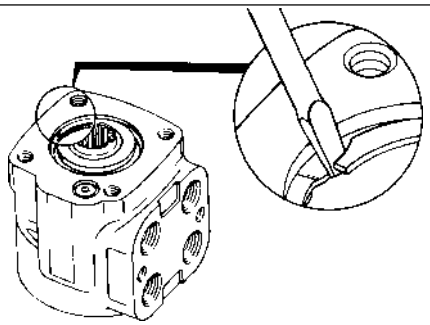
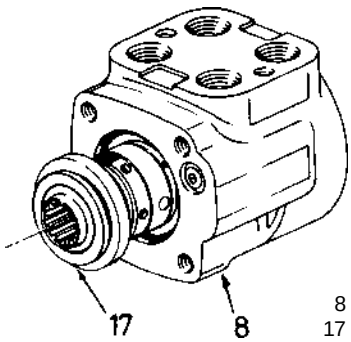


*Fig. 14 - Removing Retaining Ring*

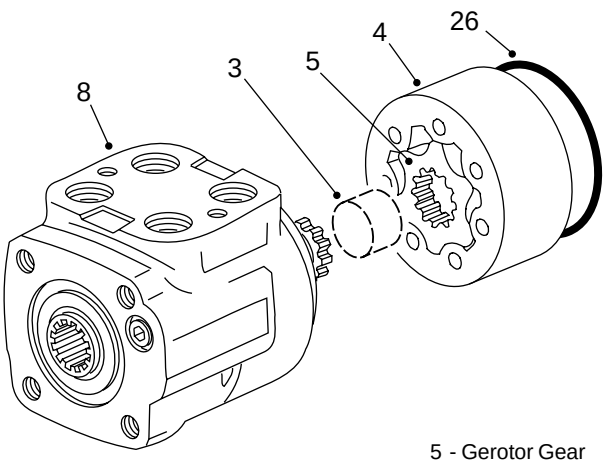
SM - 293




8 - Valve Housing
17 - Seal Gland Bushing

*Fig. 15 - Removing Seal Gland Bushing*

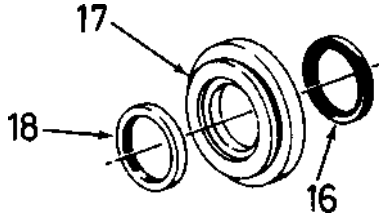
SM - 1491




5 - Gerotor Gear
3 - Spacer
8 - Valve Housing
4 - Gerotor Housing
26 - 'O' Ring

*Fig. 12 - Removing Gerotor Assembly*

SM - 294




16 - Quad Ring Seal
17 - Seal Gland Bushing
18 - Oil Seal

*Fig. 16 - Removing Seals*

SM - 1324

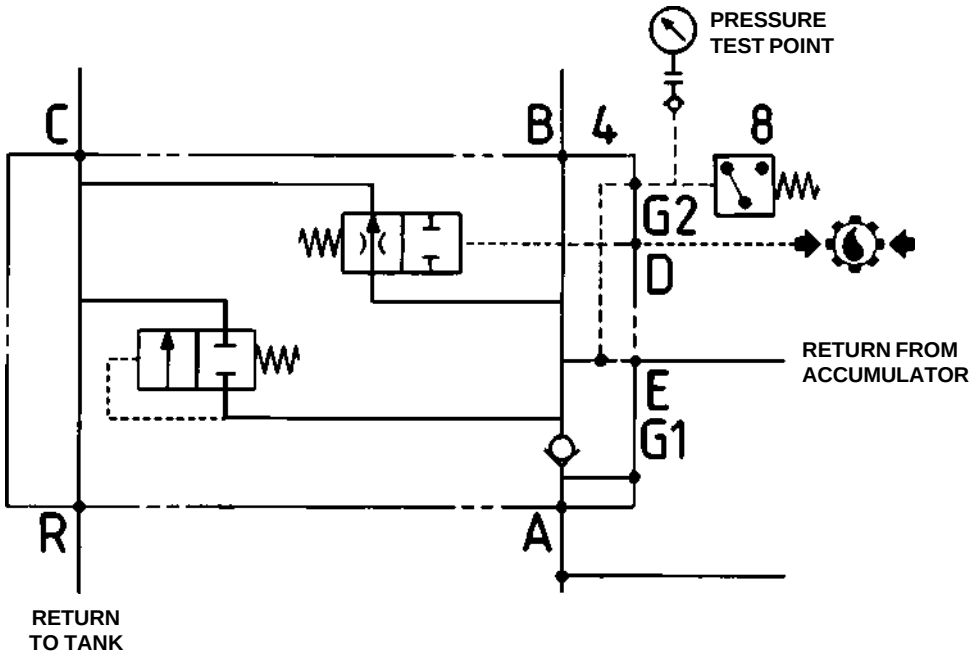



*Fig. 3 - Two-way Valve De-energized*

SM - 1325

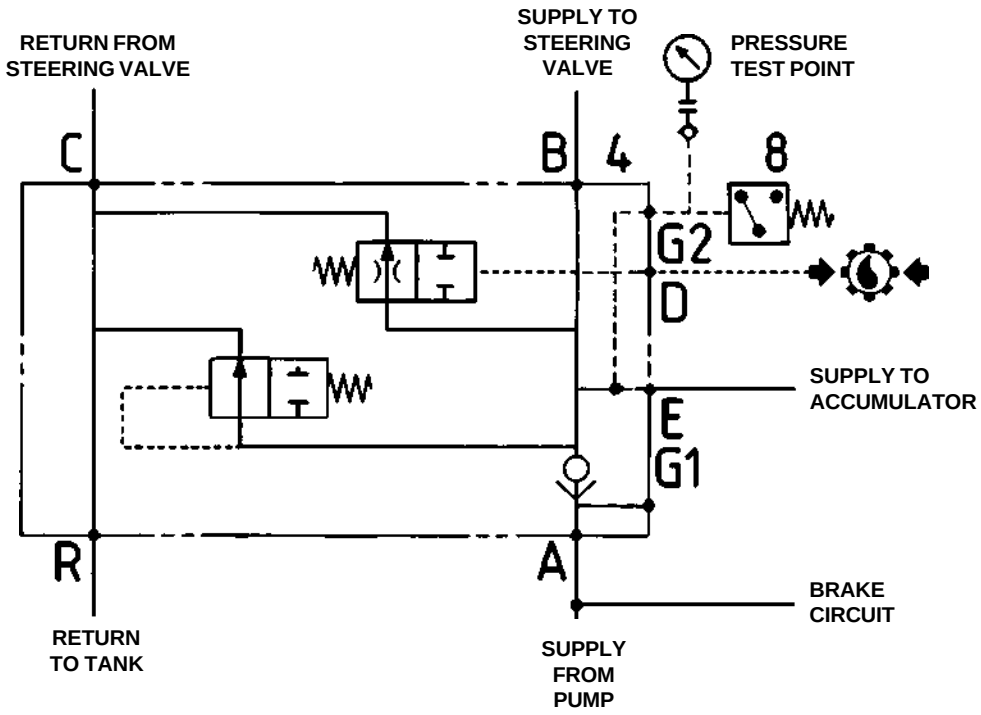



*Fig. 4 - Relief Valve Open*

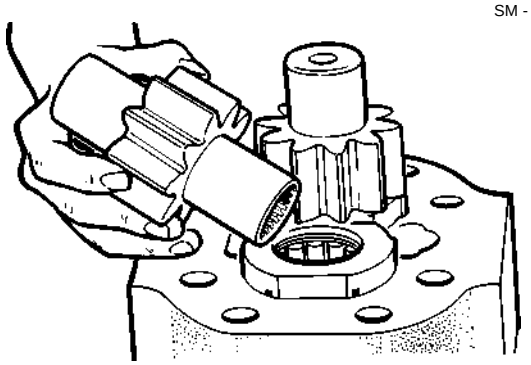



*Fig. 31 - Installing Gears*

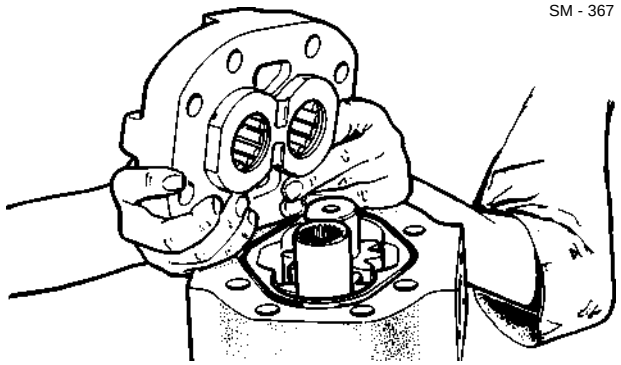



*Fig. 32 - Installing End Cover*

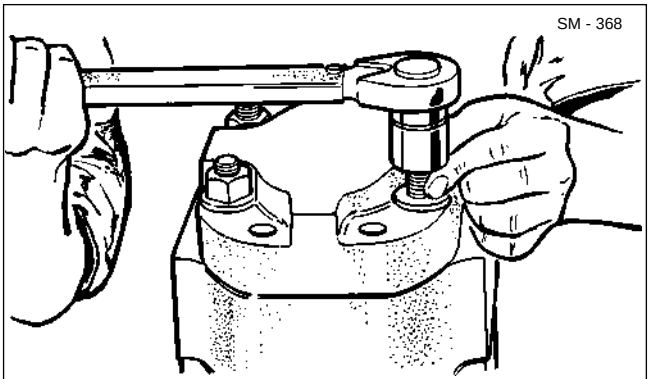



*Fig. 33 - Installing Stud Nuts*

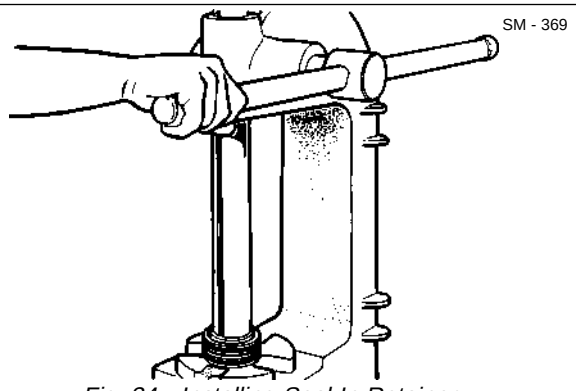



*Fig. 34 - Installing Seal In Retainer*

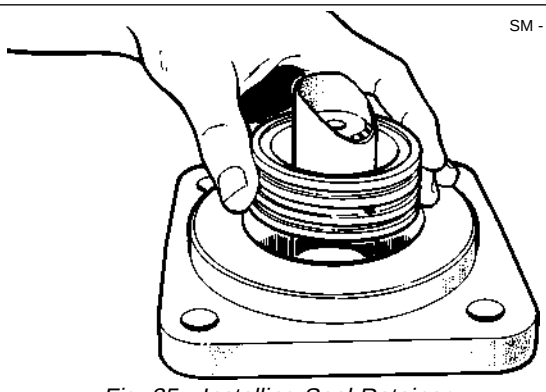



*Fig. 35 - Installing Seal Retainer*

gear housing (22) with a soft hammer until it rests snugly against bearing carrier (18). Refer to Fig. 28. If a new housing is used, make sure the large oil port will be toward the inlet, and the small port toward the outlet side of the pump assembly. Be sure seal (14) is not pinched or dislodged. Coat gears (20 & 21) with hydraulic fluid for initial lubrication when pump is started.

14. With match marks aligned, position end cover (23) over gear (20 & 21) journals. Tap end cover (23) lightly with a soft hammer to seat on gear housing (22). See Fig. 32. Be careful not to pinch seal (16).

15. Insert eight studs (27) through the pump assembly and thread into shaft end cover (6). Install washers (26) and nuts (28). Tighten opposite nuts alternately until snug. See Fig. 33. Rotate driveshaft (12) with a 150 mm (6 in) wrench and check carefully for pump binding. If the pump rotates freely, torque tighten alternate nuts (28) to 271 Nm (200 lbf ft). If the pump binds, the cause should be determined and corrected before completing the assembly. Check for burrs on shafts, housings, bearings, etc., or similar causes.

16. Coat the OD of seal (5) with Loctite Seal retainer or equivalent. Press seal (5), metal side down, into seal retainer (3) on an arbor press using a 70 mm (2.75 in) diameter bar. See Fig. 34. Be careful not to damage the lip of seal (5).

17. Clamp pump assembly in a soft-jawed vice, driveshaft (12) up.

18. Coat a new 'O' ring (4) with grease and install on seal retainer (3). Oil a seal installation sleeve and twist into the seal ID carefully. Slide the sleeve and seal over driveshaft (12) and seat seal (5) and seal retainer (3) assembly firmly in shaft end cover (6) bore. Remove seal installation sleeve. See Fig. 35.

19. Insert spacer (2) over driveshaft (12) and install

## DESCRIPTION

Numbers in parentheses refer to Figs. 2 through 7.

The hydraulic braking system is of closed centre design wherein constant pressure is stored in accumulators and is regulated, as required, to retard or stop the machine.

A brief description of the individual components used in the braking system are listed below. Detailed service and operating instructions for the individual components can be found in their relative component sections in this manual.

### Steering and Brake Control Tank

Refer to Section 220-0040, STEERING AND BRAKE CONTROL TANK.

The steering and brake control tank is the common oil reservoir for the steering system and the brake control system. It is mounted off the left hand frame rail beside the body and disc brake cooling tank.

### Steering Pump (1)

Refer to Section 220-0050, STEERING PUMP.

The steering pump is an axial piston, variable displacement (adjustable) pump, capable of high pressure operation. It is the common pressure supply to both the steering and brake control systems. Output is controlled to meet system requirements at any given time.

A compensator valve assembly regulates system pressure at 159 bar (2 300 lbf/in²).

The steering pump is assembled for right hand (clockwise) rotation, as viewed from the driveshaft end.

**Note:** Never drive a pump in the wrong direction of rotation, as pump seizure may result.

### Accumulator (2)

Refer to Section 220-0130, ACCUMULATOR.

There are two brake accumulators mounted at the rear of the cab. One for the rear brake circuit and the other for the front brake circuit. The rear brake circuit accumulator also maintains a constant pressure in the parking brake circuit, to hold the parking brake off, when the truck is operating.

The accumulator is of the piston type and is precharged with nitrogen to 55 bar (800 lbf/in²). It consists of a charging valve assembly, cylinder assembly and a piston. The charging valve is equipped with a locking feature which, when opened, will allow the precharge to be checked or the accumulator charged. The piston acts as a separator dividing the cylinder assembly into two sections. The section nearest the charging valve contains the nitrogen precharge. The other section receives the hydraulic oil from the pump, via the brake manifold valve.

### Brake Manifold Valve (3)

Refer to Section 250-0050, BRAKE MANIFOLD VALVE.

The brake manifold valve is mounted off the cab mounting crossmember and distributes hydraulic oil flow from the pump, to the treadle valve, front and rear brake circuit accumulators and parking brake at the rear wheels. It also provides appropriate returns to tank for the hydraulic oil.

**Rear Brake Accumulator Pressure Switch (14) -** The normally closed (NC) pressure switch, located in port 'PS2', senses the pressure in the rear brake accumulator. The pressure switch sends a signal to a warning light on the dash panel when pressure drops below 131 bar (1 900 lbf/in²).

**Front Brake Accumulator Pressure Switch (15) -** The normally closed (NC) pressure switch, located in port 'PS1', senses the pressure in the front brake accumulator, and sends a signal to a warning light on the dash panel when pressure drops below 131 bar (1 900 lbf/in²).

**Parking Brake Pressure Switch (16) -** The normally closed (NC) pressure switch, located in port 'PS3', senses pressure in the parking brake line, and sends a signal to a warning light on the dash panel when pressure drops below 65 bar (940 lbf/in²).

### Treadle Valve (4)

Refer to Section 250-0070, TREADLE VALVE.

The treadle valve controls the level of hydraulic oil pressure applied to front and rear brakes and the maximum pressure available to these circuits. It is operated by a foot pedal in the operators cab and, with the engine running, is automatically applied by the brake manifold valve.

5. Remove pedal (50) from actuator cam (36) by loosening two capscrews (51) at the pedal heel. Note that capscrews (51) need not be removed.

6. Loosen but do not remove nuts (30) from U bolts (32) securing actuator pivot pin (38).

7. Remove pivot pin (38) from actuator base (46) with a punch and hammer. Remove actuator cam (36) assembly.

8. Remove screws (43) securing retainer plate (44) to actuator base (46).

9. Remove retainer plate (44), boot (42) and cap (41) as an assembly by grasping boot (42) and gently lifting from actuator base (46).

10. Slacken capscrews in adjustment collars (1).

11. Install pivot pin (38) in actuator base (46) and by taking a screw driver or pry bar and placing it under pivot pin (38) and on top of actuator plunger (2), you will be able to actuate each circuit individually.

12. Start engine to ensure full hydraulic pressure.

13. Test front 'B1' and rear 'B2' brake circuit actuating pressures at diagnostic test points and adjust if necessary. Pressures should be 159 bar (2 300 lbf/in²) for front 'B1' circuit and, 52 bar (750 lbf/in²) for rear 'B2' circuit.

**Note:** Turning adjustment collar (1) up (anticlockwise) will increase the pressure while turning it down (clockwise) will decrease the pressure. Fine adjustment will require only turning the collar in 1/8 turn increments.

14. When pressure is set correctly, tighten the capscrews in adjustment collars (1) to 3 - 3.5 Nm (25 - 30 lbf in).

15. Check pressures again after tightening the capscrews. If the pressures have altered, loosen the appropriate capscrew and readjust. Shut down the engine.

16. Remove pivot pin (38) from actuator base (46).

17. Assemble actuator cap (41), boot (42) and retainer plate (44) to actuator base (46) and secure with capscrews (43).

18. Insert pivot pin (38) through the hole in actuator base (46), through the holes in 'U' bolts (32), and through the pivot pin hole in the other side of actuator base (46). As pivot pin (38) is being inserted, install pedal return springs (39 & 40).

19. Centre pivot pin (38) and secure with nuts (30) and washers (31) on 'U' bolts (32). Tighten nuts (30) to a torque of 16 - 17 Nm (140 - 150 lbf in).

20. Install pedal (50) assembly on actuator cam (36) and secure with capscrews (51), washers (49) and nuts (48).

## Stop Light Pressure Switch

Stop light pressure switch (55) is a normally open switch. Attach a continuity tester to terminals on stop light pressure switch (55). The circuit should be open.

As brake pressure increases to 2.7 bar (39 lbf/in²) and above, the circuit should close and send a signal to illuminate the brake lights. As pressure drops below 2.7 bar (39 lbf/in²) the circuit should open and brake lights go out.

## Lockup Drop Out Pressure Switch

Lockup drop out pressure switch (54) is a normally open switch. Attach a continuity tester to terminals on lockup drop out pressure switch (54). The circuit should be open.

As brake pressure increases to 20 bar (290 lbf/in²) and above, the circuit should close and send a signal to the lockup drop out solenoid, which in turn drops the transmission out of lockup. As pressure drops below 20 bar (290 lbf/in²) the circuit should open and lockup can be engaged.

# MAINTENANCE

## General

Check all hydraulic brake lines and fittings at treadle valve for leaks and damage. Tighten/replace as required.

## Every 1 000 Hours

Check front and rear brake pressures at diagnostic test points. If the pressures are outwith the specified pressure range, inspect the valve and take relevant action (adjust pressures, strip down and repair or replace valve).