TABLE OF CONTENTS

TABLE OF CONTENTS

* * * *

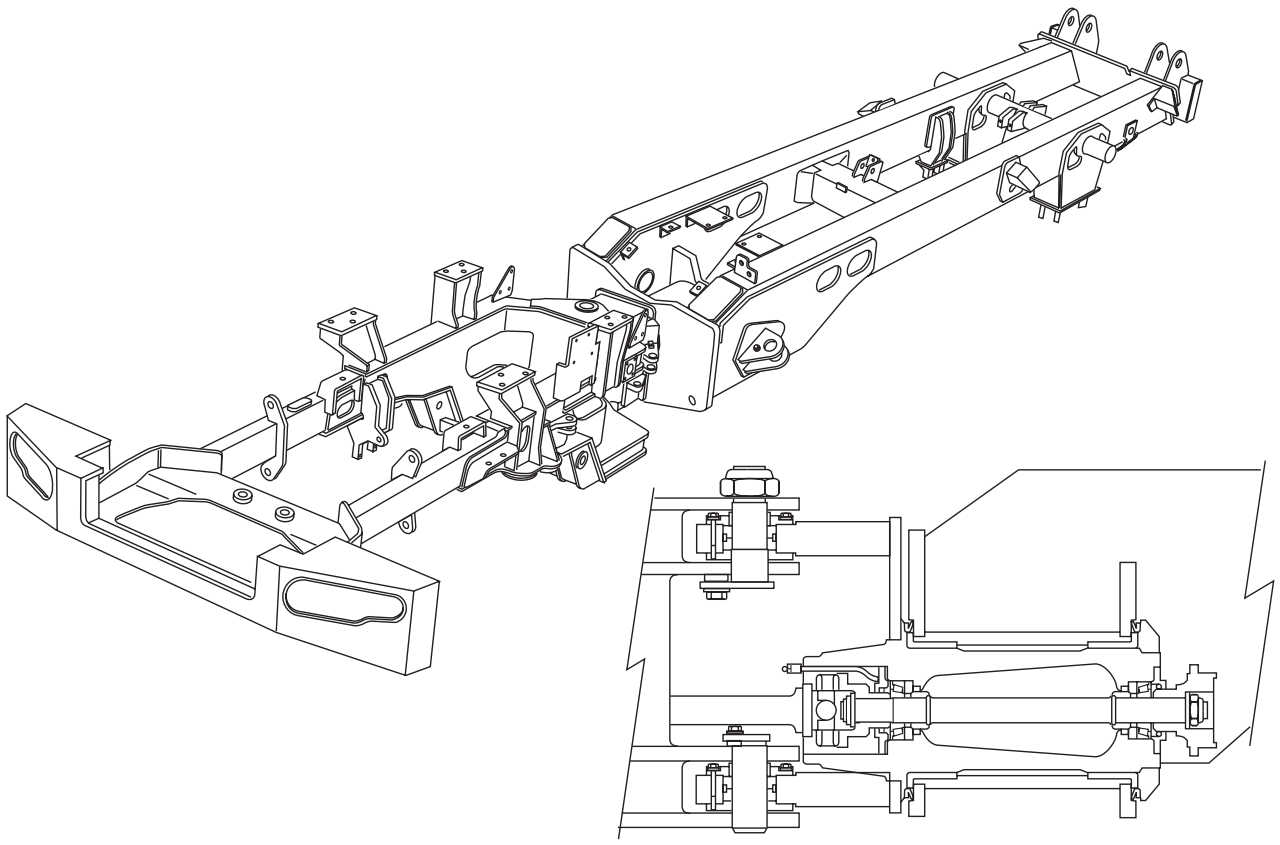


Fig. 1 - General Arrangement of Frame Assemblies

DESCRIPTION

The chassis consists of two separate frame assemblies which provide the articulation of the unit. The front and rear frames are constructed of all welded high-grade steel fabrications with rectangular box section beams forming main, side and cross members.

The front frame is fabricated to form a rigid structure which carries the cab, power train and suspension system.

The rear frame is fabricated to form a rigid structure which carries the body, body hydraulics, suspension and rear drive axles.

Steering is by frame articulation to 45° either side by two widely spaced vertical pivot pins in taper roller bearings. Oscillation between the front and rear frames is provided by a large diameter cylindrical coupling carried on nylon bushes located in the rear frame. Longitudinal shocks are absorbed by the thrust faces of the nylon bushes. A large thrust nut, which is threaded to the end of the coupling and locked to the frame, secures the coupling in position. Wear on the thrust faces of the bushes is compensated by tightening this thrust nut.

INSPECTION AND MAINTENANCE

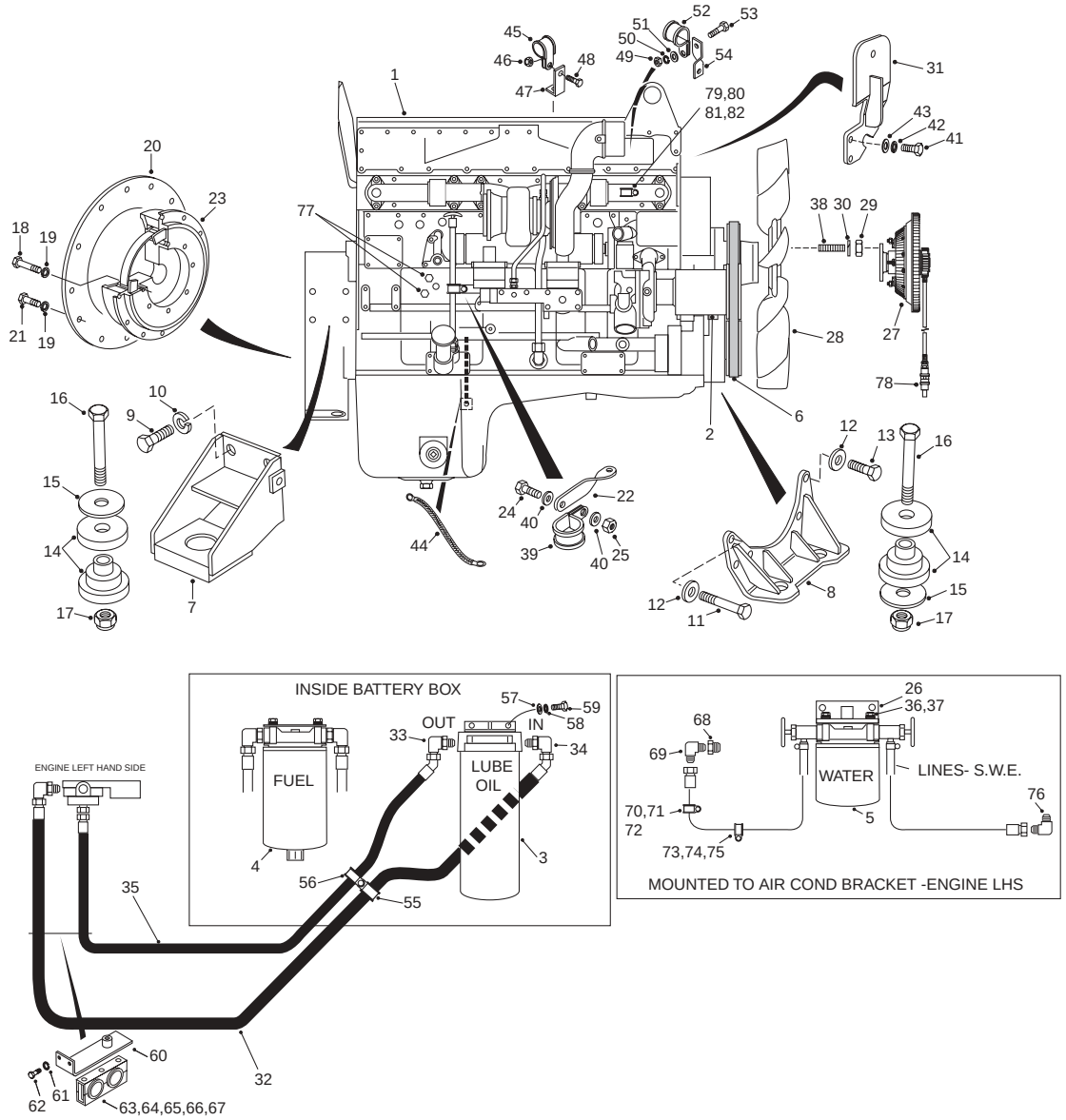
Inspection

Inspect the frames and attached parts at intervals not exceeding 250 hours for cracked or broken welds and bending of the frame. Any defects found should be repaired before they progress into major failures.

Straightening

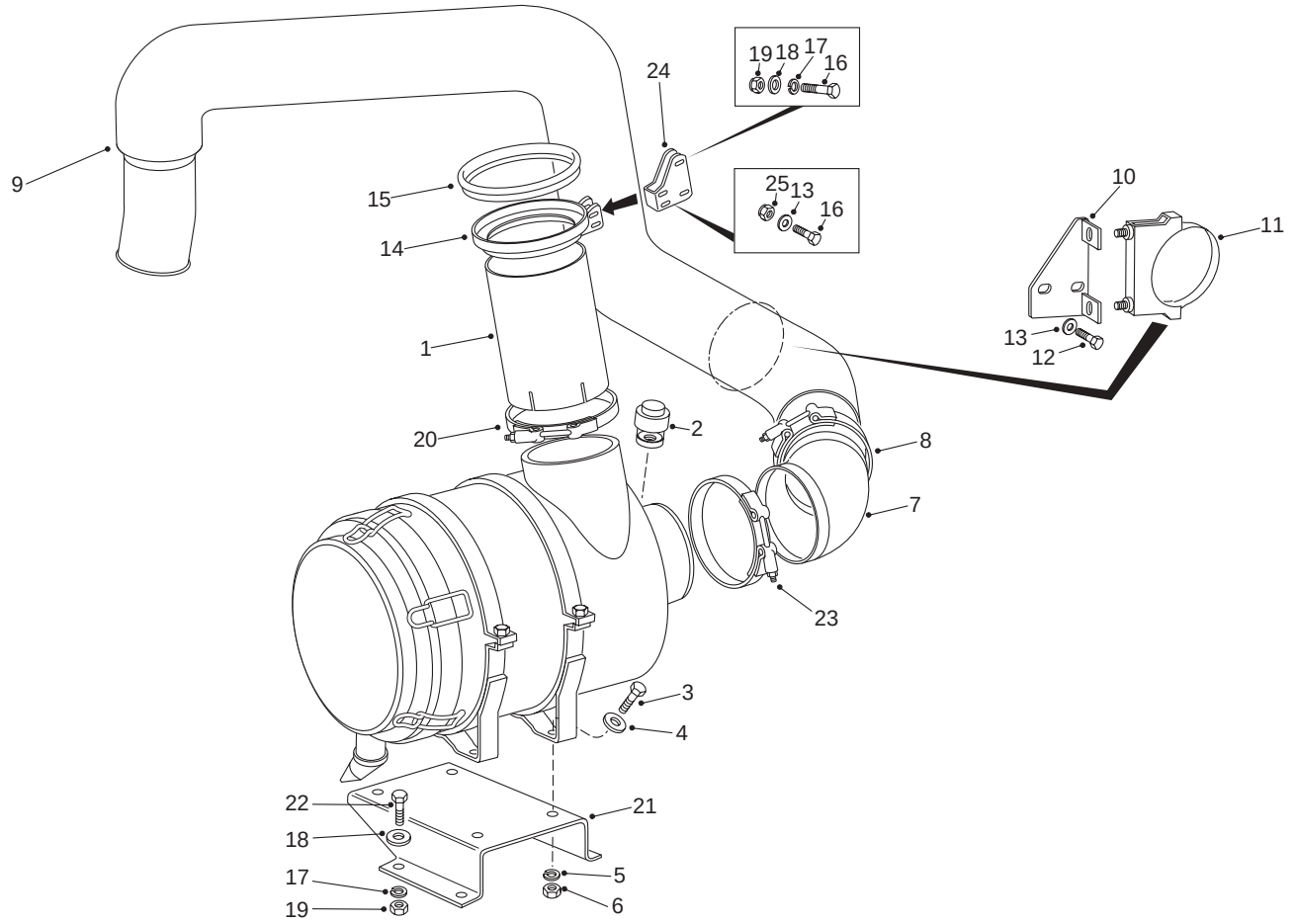
Hydraulic straightening or aligning equipment should be used to straighten bent or twisted frames whenever possible. However, if heat must be applied, never heat the metal beyond a dull, cherry red colour, as too much heat will weaken the metal. When it is necessary to heat the metal, apply heat uniformly over the area to be straightened and protect the heated surface from sudden cooling. Frame parts that cannot be straightened should be renewed.

SM - 3273



1 - Engine
2 - Alternator Belt
3 - Oil Filter
4 - Fuel Filter
5 - Coolant Filter
6 - Fan Belt
7 - Rear Mount
8 - Front Mounting Bracket
9 - Bolt
10 - Lockwasher
11 - Bolt
12 - Washer
13 - Bolt
14 - Isolation Mount
15 - Snubbing Washer
16 - Bolt
17 - Locknut
18 - Bolt
19 - Lockwasher
20 - Flywheel Guard
21 - Bolt
22 - Bracket
23 - Engine Coupling
24 - Bolt
25 - Nut
26 - Bracket Assembly
27 - Fan Clutch
28 - Fan
29 - Nut
30 - Washer
31 - Bracket
32 - Hose Assembly
33 - Elbow
34 - Elbow
35 - Hose Assembly
36 - Bolt
37 - Lockwasher
38 - Snubbing Washer
39 - P.Clip
40 - Washer
41 - Bolt
42 - Lockwasher
43 - Washer
44 - Earth Cable
45 - P.Clip
46 - Nut
47 - 'L' Bracket
48 - Bolt
49 - Nut
50 - Lockwasher
51 - Washer
52 - P.Clip
53 - Bolt
54 - Bracket
55 - Clip - Rubber
56 - Clip - Rubber
57 - Washer
58 - Lockwasher
59 - Bolt
60 - Bracket Assembly
61 - Lockwasher
62 - Bolt
63 - Bolt
64 - Nut-Stacking
65 - Bushing Split
66 - Bushing Split
67 - Clamp
68 - Reducer
69 - Elbow
70 - Bolt
71 - Locknut
72 - Clip
73 - Bolt
74 - Locknut
75 - Clip
76 - Elbow
77 - Plug
78 - Connector Kit
79 - Washer
80 - Clamp
81 - Bolt
82 - Nut

Fig. 1 - Engine and Mounting



1 - Air Intake Tube
2 - Air Restriction Gauge
3 - Bolt
4 - Washer
5 - Lockwasher
6 - Nut
7 - Elbow
8 - Band Clamp
9 - Air Intake Tube
10 - Bracket
11 - Clamp
12 - Bolt
13 - Washer
14 - Retaining Bracket
15 - Seal
16 - Bolt
17 - Lockwasher
18 - Washer
19 - Locknut
20 - Clamp
21 - Air Cleaner Bracket
22 - Bolt
23 - Clamp
24 - Air Intake Coupling
25 - Nut

Fig. 2 - Exploded View of Typical Air Cleaner Mounting

protection of the engine from airborne dirt. It protects the engine from dirt admitted by a damaged primary element (2), or dirt that might be dropped into air cleaner assembly while changing primary element (2).

AIR CLEANER

Removal

Numbers in parentheses refer to Fig. 2.

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

2. Block all road wheels, place the steering lock bar in the 'Locked' position and the battery master switch in the 'Off' position.

3. Pull on handle to release hood catch and lift up the hood.

4. Remove bolts (16), washers (13) and nuts (25) securing coupling (24) to air intake tube (1).

5. Slacken clamps (8 & 23) securing elbow (7).

6. Remove bolts (3), washers (4), lockwashers (5) and nuts (6) securing air cleaner to bracket (21). Using suitable lifting equipment, support the air cleaner assembly and draw air cleaner assembly away from elbow (7).

Fault Code (hex)	MEANING OF CODE possible reason for fault detection	TCU reaction	Checks	Remarks
B5	SLIPPAGE AT CLUTCH KV TCU calculates a differential speed at closed clutch KV. If this calculated value is out of range, TCU interprets this as slipping clutch. *•low pressure at clutch KV* *•low main pressure* *•wrong signal at internal speed sensor* *•wrong signal at turbine speed sensor* *•wrong size of the sensor gap* *•clutch is defective*	TCU shifts to neutral OP-Mode: limp home if failure at another clutch is pending TCU shifts to neutral OP-Mode: TCU shutdown	•check pressure at clutch KV •check main press. in system •check sensor gap at internal speed sensor •check sensor gap at turbine speed sensor •check signal at internal speed sensor •check signal at turbine speed sensor •replace clutch	
B6	SLIPPAGE AT CLUTCH KR TCU calculates a differential speed at closed clutch KR. If this calculated value is out of range, TCU interprets this as slipping clutch. *•low pressure at clutch KR* *•low main pressure* *•wrong signal at internal speed sensor* *•wrong signal at turbine speed sensor* *•wrong size of the sensor gap* *•clutch is defective*	TCU shifts to neutral OP-Mode: limp home if failure at another clutch is pending TCU shifts to neutral OP-Mode: TCU shutdown	•check pressure at clutch KR •check main press. in system •check sensor gap at internal speed sensor •check sensor gap at turbine speed sensor •check signal at internal speed sensor •check signal at turbine speed sensor •replace clutch	
B7	OVERTEMP SUMP TCU measured a temperature in the oil sump that is TCU measured a temperature in the oil sump that is over the allowed threshold.	no reaction OP-Mode: normal OP-Mode: normal	•cool down machine •check oil level •check oil level •check temperature sensor	
B8	OVERTEMP RETARDER TCU measured a temperature in the retarder oil that is over the allowed threshold.	TCU disables retarder OP-Mode: normal	•cool down machine •check oil level •check temperature sensor	
B9	OVERSPEED ENGINE	retarder applies OP-Mode: normal	-	not used
BA	DIFFERENTIAL PRESSURE OIL FILTER TCU measured a voltage at differential pressure switch out of the allowed range. *•oil filter is polluted* *•cable/connector is broken or cable/connector is contacted to battery voltage or vehicle ground* *•differential pressure switch is defective*	no reaction OP-Mode: normal	•check oil filter •check wiring from TCU to differential pressure switch •check differential pressure switch (measure resistance)	
BB	SLIPPAGE AT CONVERTER LOCKUP CLUTCH TCU calculates a differential speed at closed converter lockup clutch. If this calculated value is out of range, TCU interprets this as slipping clutch. *•low pressure at converter lockup clutch* *•low main pressure* *•wrong signal at engine speed sensor* *•wrong signal at turbine speed sensor* *•wrong size of the sensor gap* *•clutch is defective*		•check pressure at converter lockup clutch •check main pressure in the system •check sensor gap at engine speed sensor •check sensor gap at turbine speed sensor •check signal at engine speed sensor •check signal at turbine speed sensor •replace clutch	
BD	S.C. TO GROUND AT ENGINE BRAKE SOLENOID TCU detected a wrong voltage at the output pin, that looks like a s.c. to vehicle ground *•cable is defective and is contacted to vehicle ground* *•engine brake solenoid has an internal defect* *•connector pin is contacted to vehicle ground*	no reaction OP-mode: normal	•check cable from TCU to engine brake solenoid •check connectors from engine brake solenoid to TCU •check the resistance [1] of engine brake solenoid	[1] see figure 10

chamfered side of splines facing upwards. Refer to Fig. 16

24. Heat countershaft case (20) bore and spur gear (25) bore and install the pre-assembled bearing retaining bush (27).

25. It is necessary to determine the thickness of spacer (23) at this stage. Taking a ring gauge and pin set, refer to Fig. 17. Install gauge on the opposite end of pinion gear (33).

26. Heat inner race of roller bearing (15) and install over end of pinion gear (33).

27. Heat inner race of roller bearing (15) and install this over the end of pinion gear (33) as well.

28. Install nut (14) screwing up until the rollers of bearing (15) make full contact with the end of the nut i.e. no endplay present.

29. Remove nut (14), bearing (15) inner race and ring gauge. Now measure the thickness of the ring gauge; dimension 'X' refer to Fig. 17. This will be the required thickness of spacing ring (23) that will be fitted.

30. Install spacing ring (23) of the correct thickness, paying attention to the orientation of the chamfer, refer to Fig. 18

31. Install bearing (15) outer race and nut (14). Torque nut (14) to a value of 750 Nm (553 Ibf ft).

32. It is now necessary to determine the rolling resistance of the pinion gear (33) bearing. Refer to Fig. 19.

Total rolling resistance of input shaft (4) and pinion gear (33)	= 5.0 Nm
Rolling resistance of input shaft (4)	= 2.5 Nm
	= 2.5 Nm

The correct rolling resistance of pinion gear (33) should be 2-3 Nm. If the measured rolling resistance is out with the designated range, the thickness of the spacer must be adjusted. Once the spacer equates to the resistance being within the correct range, nut (14) should now be secured in place, tighten nut (14) to a torque of 750 Nm (553 Ibf ft).

33. Take cover (13) and secure in place to countershaft case (20) using screws (12). **Note:** Cover threads of screws (12) with sealing compound.

34. Reassemble differential assembly, refer to Fig. 2. is the reverse of disassembly.

35. Place ring gear (39) against collar of the differential assembly (40) and fasten by means of lockscrews (41), refer to Fig. 7.

35. Heat inner race of bearings (38 & 45) and place them upon the ends of the differential assembly until full contact is obtained.

36. Install the outer races of bearings (38 & 45) into differential housing (35).

37. Install both adjusting nuts (37 & 46) into bearing caps. Place bearing cap (44) upon bearing (45) and secure with washers (43) and bolts (42) Tighten bolts (42) to a torque of 245 Nm (180 Ibf ft). Displace the differential to obtain a backlash of 0.25 - 0.35 mm (0.010 - 0.014 in). Refer to Fig. 20.

38. Bearing adjusting nuts (37 & 46) have two basic functions: Pre-loading the bearings and positioning ring gear (39) to obtain the correct backlash between the ring and pinion gear.

39. To check the backlash between ring gear (39) and pinion gear (33), mount a dial indicator gauge at a right angle on the ring gear outer diameter as shown in Fig. 21. Rock the ring gear back and forth being careful not to move the pinion.

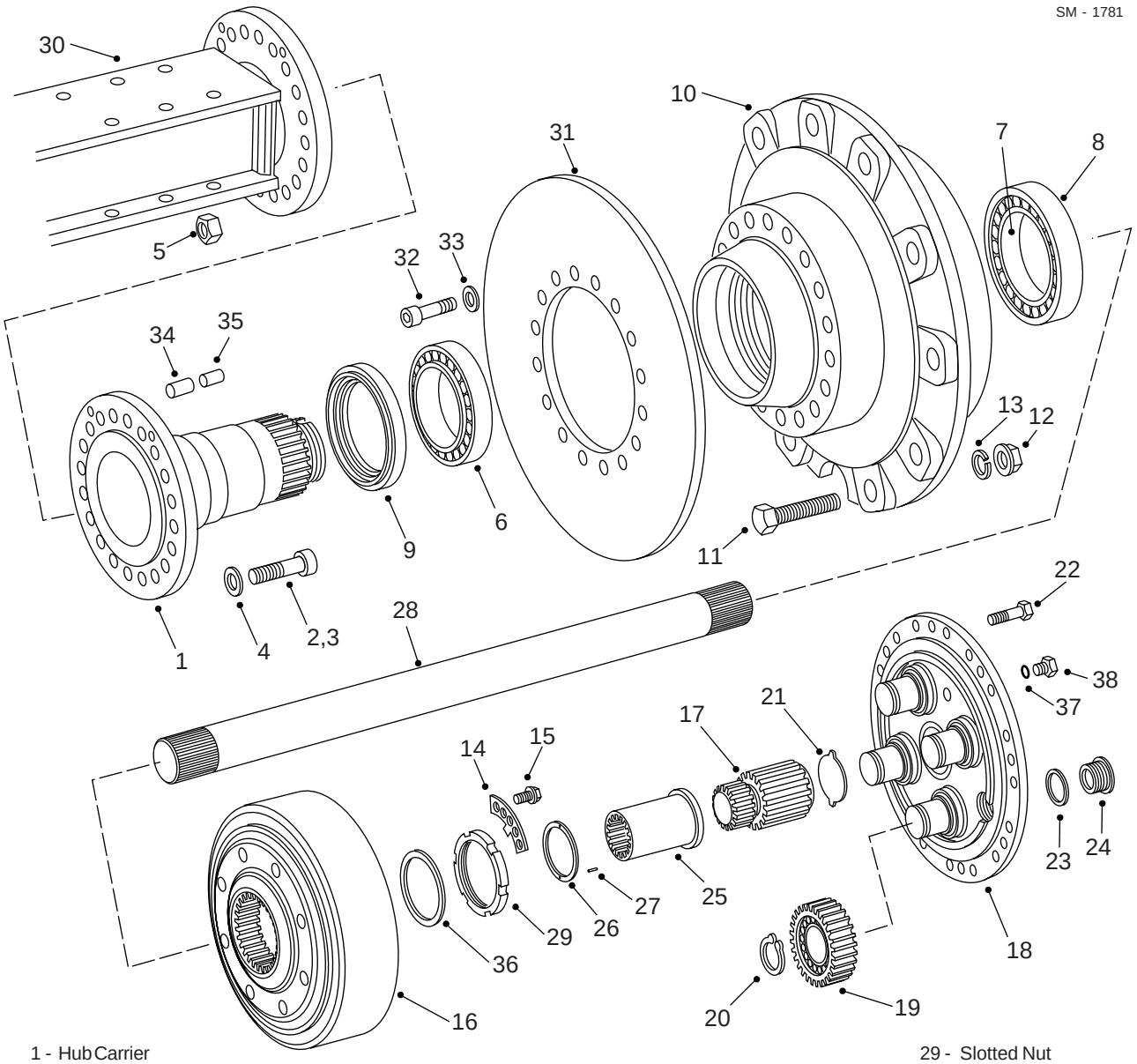
40. **Note:** Backlash can be adjusted without changing the bearing pre-load by loosening one bearing adjusting nut a certain number of notches and tightening the opposite nut the same number of notches.

41. Tighten adjusting nut (37) opposite ring gear (39) two notches in order to obtain the bearing pre-load of 3-4 Nm (115 - 155 Ibf ft), then re-check backlash.

42. Ring gear run out is measured by mounting a dial indicator gauge on the backside of ring gear. Carefully rotate the ring gear and read the dial indicator gauge. Maximum allowable run out is 0.08mm (0.003 in).

43. To check the ring gear (39) tooth pattern, coat about twelve gear teeth with Prussian blue, oiled red lead or equivalent easily removed paint or dye. When the pinion is rotated, the paint is squeezed away by the contact of the teeth, leaving bare areas the exact size, shape and location of the contacts.

Gear tooth patterns are covered under 'Gleason Gear tooth system'



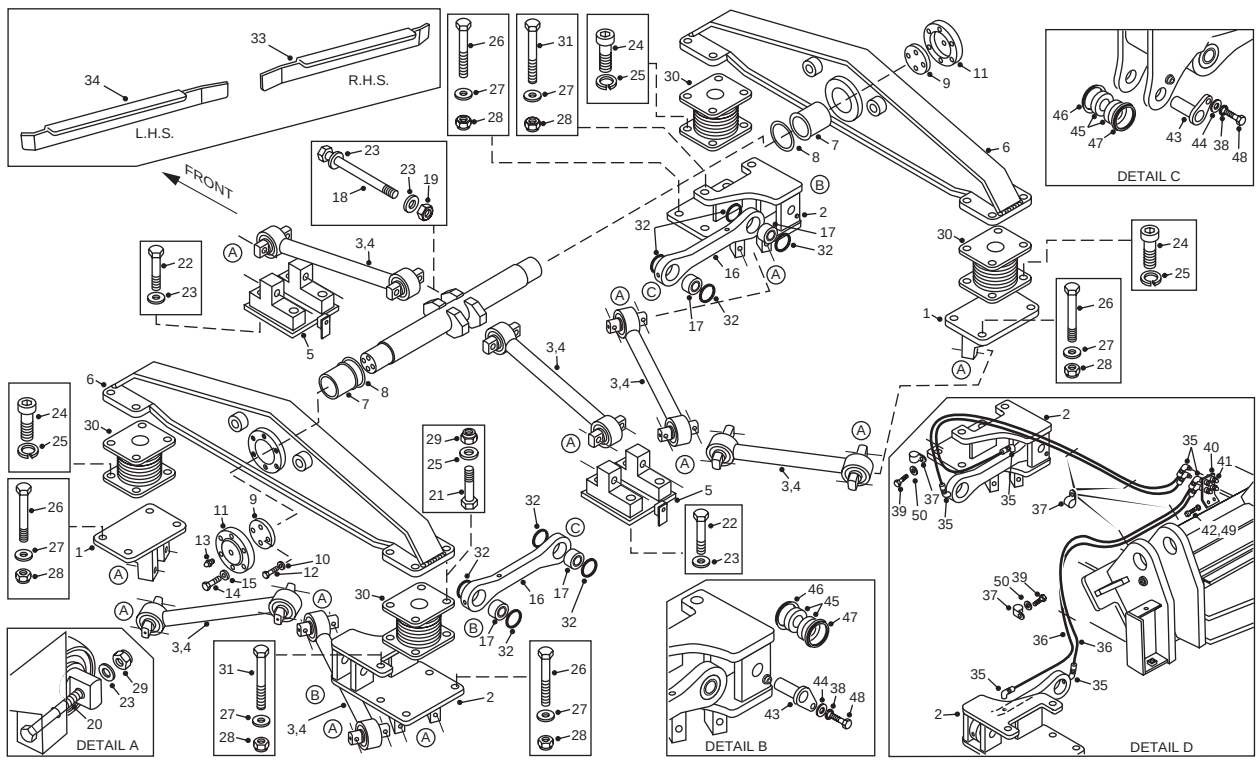
1 - Hub Carrier
2 - Capscrew
3 - Capscrew
4 - Washer
5 -Nut
6 - Roller Bearing
7 - Bearing Inner Race
8 - Bearing Outer Race
9 - Shaft Seal
10 - Hub
11 - Wheel Bolt
12 - Wheel Nut
13 - Lockwasher
14 - Locking Plate
15 - Lock Screw
16 - Ring Gear
17 - Sun Gear Shaft
18 - Planet Carrier
19 - Planet Gear
20 - Retainer Ring
21 - Thrust Washer
22 - Bolt
23 - 'O' Ring
24 - Plug Screw
25 - Driver
26 - Thrust Washer
27 - Grooved Pin
28 - Axle Shaft
29 - Slotted Nut
30 - Axle Housing
31 - Brake Disc
32 - Capscrew
33 - Washer
34 - Split Pin
35 - Split Pin
36 - Shim
37 - 'O' Ring
38 - Plug

Fig. 1 - Exploded View of Planetary and Wheel

OPERATION

Numbers and letters in parentheses refer to Fig. 1.

Power from the differential is transmitted through a fully floating axle shaft connected to sun gear shaft (17) by driver (25). As sun gear shaft (17) rotates in a clockwise direction, the four planet gears (19) meshed with sun gear shaft (17) rotate anticlockwise. Ring gear (16) is splined to hub carrier (1) and does not rotate but causes planet gears (19), which are meshed with ring gear (16), to move around it in a clockwise direction. As planet carrier (18) is bolted to wheel hub (10) the wheel then rotates in a clockwise direction.



1 - Suspension Link Brkt
2 - Suspension Link Brkt
3 - Control Link
4 - Bushing
5 - Suspension Link Brkt
6 - Equaliser Beam
7 - Bushing
8 - 'V' Seal
9 - Retainer
10 - Lockwasher
11 - End Cap
12 - Bolt
13 - Lube Fitting
14 - Bolt
15 - Lockwasher
16 - Panhard Rod
17 - Spherical Bearing
18 - Bolt
19 - Locknut
20 - Bolt
21 - Bolt
22 - Bolt
23 - Hardened Washer
24 - Bolt
25 - Lockwasher
26 - Bolt
27 - Hardened Washer
28 - Nut
29 - Locknut
30 - Interleaf Mount
31 - Bolt
32 - Retainer
33 - Brake Pipe Guard RH
34 - Brake Pipe Guard LH
35 - elbow
36 - Hose assembly
37 - P-Clip
38 - Lockwasher
39 - Bolt
40 - Manifold Bracket
41 - Lube Fitting
42 - Bolt
43 - Pin
44 - Washer
45 - Spacer
46 - V-Ring Seal
47 - V-Ring Seal
48 - Bolt
49 - Washer
50 - Washer

Fig. 1 - Exploded View of Rear Suspension

DESCRIPTION

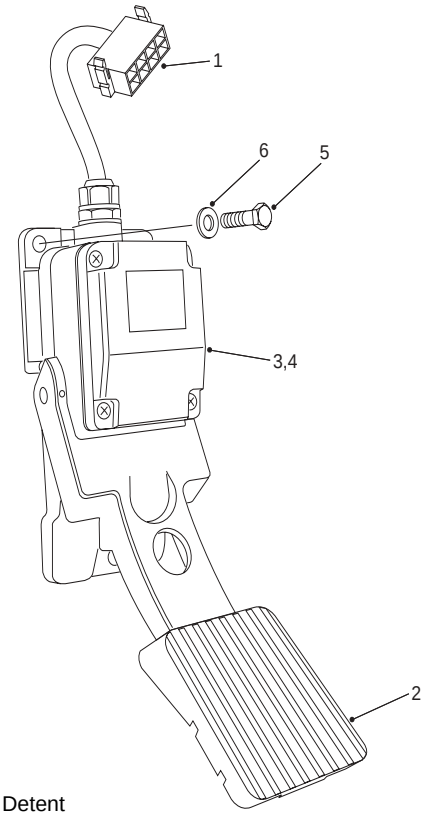
Numbers in parentheses refer to Fig. 1.

Each axle is coupled to the chassis by three rubber bushed control links (3) which provide longitudinal location and control torque reactions. Lateral location is by means of two Panhard rod links (16). The centre and rear axles are linked by longitudinal equaliser beams (6) which pivot on either side of the chassis.

Loads which act on the axles are balanced by equaliser beams (6), with bonded rubber/metal laminated interleaf mounts (30) located between the axles and beam ends providing the cushioning medium.

The rear suspension system requires minimal maintenance due to the use of rubber bushings (4) being used in control links (3). Lubrication of Spherical bearings (17) in Panhard rods (16) is through lube fittings (41), similarly lubrication of bushings (7) in equaliser beams (6) is through lube fittings (13).

SM - 2816



1 - Harness
2 - Pedal
3 - Potentiometer
4 - Switch & Detent
5 - Bolt
6 - Washer

Fig. 1 - Electronic Foot Pedal

DESCRIPTION

Numbers in parentheses refer to Fig. 1.

The electronic foot pedal assembly provides an electrical signal to the engine's fuel control system in proportion to the degree of pedal actuation. Maximum and minimum stops are built into the pedal assembly during manufacture. The pedal assembly comes preset and therefore no adjustment is necessary.

The pedal incorporates an idle validation switch which informs the engine ECM that the pedal is in the idle position. Kickdown switch, which can be used when automatic range is selected, allows for the possibility of selecting a lower gear by pressing down fully on pedal (2) and holding (see Fig. 2). This can be used to provide a downshift on demand provided that the vehicle speed is within the range allowable. That is, the vehicle is not travelling at a speed that would result in the engine overspeeding in the lower gear. To disengage the transmission kickdown, release the pedal (2) and allow it to return to a light throttle position. Refer to Section 120-0010, TRANSMISSION AND MOUNTING.

REMOVAL

Numbers in parentheses refer to Fig. 1.

⚠ WARNING
To prevent personal injury and property damage, be sure wheel blocks are properly secured and of adequate capacity to do the job safely.

1. Position the vehicle in a level work area, ensure the body is fully lowered, apply the parking brake and switch off the engine.

2. Block all road wheels and place the battery master switch in the 'Off' position.

3. Disconnect electrical harness (1) from dash harness.

4. Remove bolts (5) and washers (6) securing pedal assembly to cab wall. Remove pedal assembly.

valve (21). The priority valve (15) will close & the main pump will increase its displacement to make sure there is enough flow & pressure available to meet that demanded by the steering.

The steering load sense orifice (20) feeds oil from the main pump supply, to boost the load sense pressure back to the main pump during the steering operation. This is to make sure an adequate flow is always available from the main pump (4) to meet that demanded by the steering. This is commonly known as a dynamic load sense system.

Note: The maximum steer pressure is set by the pressure cut off (compensator) on the main hydraulic pump (240 bar (3500 lbf/in^2)). Refer to Section 230-0050 MAIN HYDRAULIC PUMP.

EMERGENCY STEERING

The emergency steering ground driven pump (3) provides flow to the steering circuit in the event that the main pump (4) can no longer function effectively.

Engine failure, transmission failure or internal failure of the main pump (4) could cause ineffective performance.

The emergency steering pump (3) will also assist with flow from the main pump to articulate the vehicle if the main pump cannot deliver the flow required by the steering circuit. This can happen at low engine speed when the vehicle is moving and the operator attempts to articulate the vehicle rapidly.

To protect the ground driven emergency steering pump (3) the maximum pressure at the pump is set by the relief valve (27) to 179 bar (2600 lbf/in^2).

The emergency steering valve (19) is sensing the main pump (4) pressure and the load sense pressure at the spring end of the valve (19). During normal operation the differential pressure between the main pump (4) outlet and the load sense line will be approximately 25 bar (360 lbf/in^2) and the emergency steering valve (19) will stroke against its spring dumping the emergency steer pump (3) flow to tank.

In the event of the main pump (4) not been able to supply sufficient flow for the steering, the differential pressure between the main pump (4) outlet and the load sense line will be reduced. As soon as the differential pressure drops below 8.5 bar (125 lbf/in^2) the emergency steering valve (19) will close and the ground driven pump (3) flow will be diverted across check valve (23) and supply the steering system.

Check valve (24) prevents the emergency steer flow going towards the main pump (4), which may already have failed.

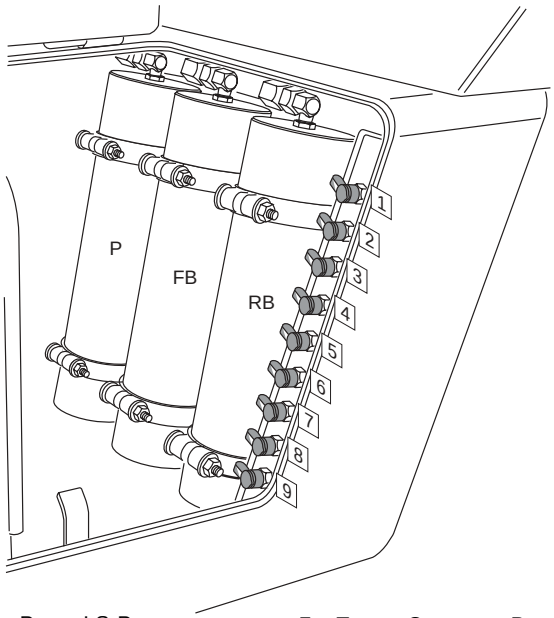
STEERING PRESSURE SETTING

⚠ WARNING
Machine has to fully articulate to set steering pressure, therefore steering lock bar cannot be 'Locked'. To prevent personal injury and property damage, exercise extreme caution while working around articulation and oscillation pivot area.

The maximum steer pressure is set by the pressure cut off (compensator) on the main pump (240 bar (3500 lbf/in^2)). Refer to Section 230-0050, MAIN HYDRAULIC PUMP.

Steering pressure can be checked at the diagnostic check point located inside the battery box (refer to Fig. 2). Install pressure gauge capable of reading at least 240 bar (3500 lbf/in^2) to correct diagnostic check point.

Steer truck over relief (against steering stops) to observe maximum cut-off pressure of 240 bar (3500 lbf/in^2). Adjust pressure cut-off screw on main pump (4) if necessary. Refer to Section 230-0050, MAIN HYDRAULIC PUMP.



1 - Pump LS Pressure
2 - Front Brake Pressure
3 - Rear Brake Pressure
4 - Park Brake Pressure
5 - Steering Pressure
6 - Trans. Retarder Press.
7 - Trans. Converter Press.
8 - Body System Press.
9 - Trans. System Pressure
P - Primary Accumulator
FB - Front Brake Accumulator
RB - Rear Brake Accumulator

Fig. 2 - Diagnostic Pressure Check Points (Battery Box)

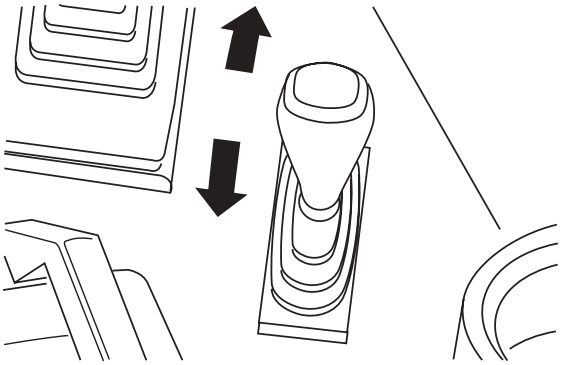


Fig. 2 - Body Control Lever (Operators Cab)

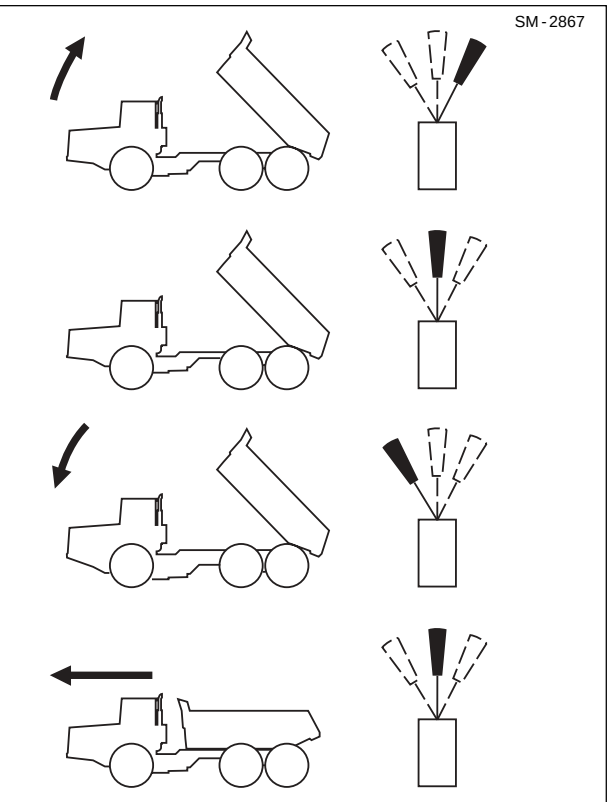


Fig. 3 - Body Control Lever Positions

(360 lbf/in^2) stand by pressure of the main pump. Refer to Section 230-0050, MAIN HYDRAULIC PUMP.

Body relief valve (47) is located on the raise side of the circuit and prevents pressure spikes at maximum extension of the cylinders when the body is raised at maximum engine speed. Relief valve (47) is set at 230 bar (3 335 lbf/in^2).

LOWERING THE BODY

When the operator pushes forward on the body control lever a voltage between 0 and 5 volts is sent to the hydraulic ECU, Pin C1:12. The hydraulic ECU converts this signal to an output current at Pin C1:31 between 250 and 800 mA dependent upon how far the lever is selected. This current is seen at the Electro-Hydraulic Proportional Pressure Control Valve (29) that converts this current into a pilot pressure.

The pilot control pressure of 35 bar (508 lbf/in^2), created by pressure reducing valve (9) is reduced by the proportional pressure control valve (29) to between 4 bar (58 lbf/in^2) & 25 bar (363 lbf/in^2), depending on the current output from the hydraulic ECU. This pilot pressure selects the main spool (30) in the lift valve section of the main hydraulic valve assembly to the lower position.

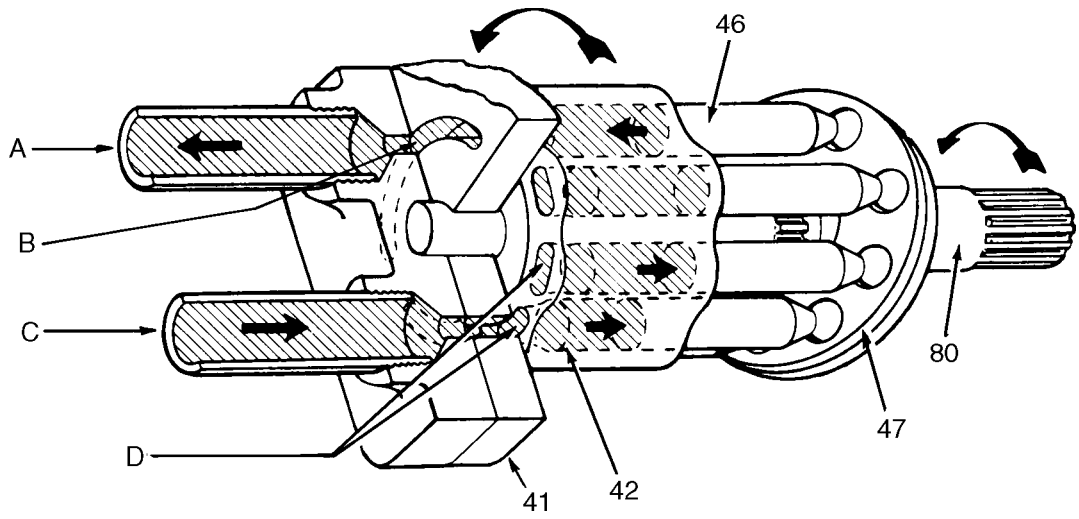
When the main spool (30) has been stroked to the lower position, oil from the main pump flows through the control spool (30) out of port 'B' on the main hydraulic valve, onto the tip cylinders (1).

When oil from the main pump flows through control spool (30), a pressure is created at the head of copy spool (31). The copy spool (31) strokes down allowing a load sense pressure to be fed back to the load sense port of the main pump via shuttle valves (22 & 25). The main pump then increases its displacement and flow passes to port 'B' lowering the body. Returning flow from the tipping cylinders (1) passes to Port 'A', through the control spool (30) back to tank.

During lowering the operator can fully select the body control lever onto an electric detent within the lever base which is connected to the hydraulic ECU pin C1:35, This detent holds the lever in the power down position allowing the operator to drive the vehicle whilst the body is still lowering.

Located on the chassis is a proximity switch which supplies a 24 Volt signal to the hydraulic ECU pin C1:6. When the body reaches the proximity switch the 24 Volt signal is switched off, this tells the hydraulic ECU to de-energise the electric detent allowing the lever to spring back to the mid position. At the same time the hydraulic ECU ramps back the current to proportional pressure control valve (29) to de-select the main spool (30) and energises the coil on the float solenoid valve (13) allowing the body to float down to the chassis over the last few centimeters of travel.

To prevent damage to the body hinge points or the tip cylinders (1) the float solenoid valve (13), which is connected to Pin C1:23 on the hydraulic ECU is energised all the time the body is on the chassis and the engine is running. This ensures that the head side of the tip cylinders (1) is always vented to tank and the body is sitting firmly on the chassis.

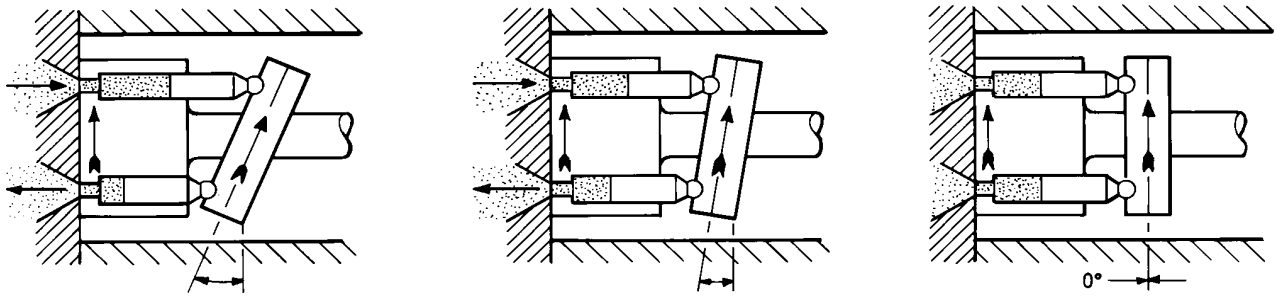


A - Outlet Port
B - Outlet Kidney Slot
C - Inlet Port
D - Inlet Kidney Slot

41 - Valve Plate
42 - Cylinder Block
46 - Piston & Shoe

47 - Shoe Plate
80 - Driveshaft

Fig. 2 - Pump Rotation and Oil Flow



MAXIMUM SHOE PLATE ANGLE (MAXIMUM DISPLACEMENT)
VIEW A

DECREASED SHOE PLATE ANGLE (PARTIAL DISPLACEMENT)
VIEW B

ZERO SHOE PLATE ANGLE (MINIMUM DISPLACEMENT)
VIEW C

Fig. 3 - Variable Displacement Action

rate. Consists of swash plate (49), shoe plate (47), swash plate support (50), tilting bush (48), tilting pin (66), servo piston (61) and servo assist springs (70 & 71).

Valving Cover Group - Provides the switching of oil between suction and delivery ports. Consists of valve cover (1), valve plate (41) and valve plate pin (65).

OPERATION

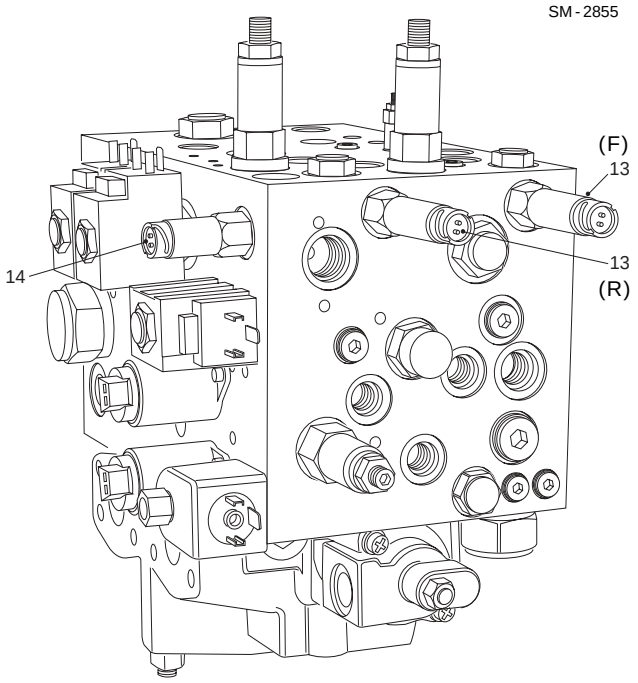
Numbers in parentheses refer to Figs. 1, 2 & 7. Refer to Figs. 4 - 6 for hydraulic schematics of pump.

When the pump's driveshaft (80) rotates, the cylinder block (42) being spline coupled to the shaft will also rotate. If the swash plate (49) has been tilted, the pistons and shoes (46) arranged in the cylinder block (42) due to the shoes being retained on the shoe plate (47) will both rotate with the cylinder block and reciprocate once per revolution.

Paying attention to one such piston, then it will move away from the valve plate (41) for half a rotation (suction stroke), and move towards the valve plate (41) for the second half of rotation (delivery stroke). The larger the tilt angle of the swash plate (49), the longer the piston (46) stroke and the higher the pump's displacement. As the swash plate (49) tilting angle approaches zero, the piston (46) does not stroke and

the body pilot pressure system. All three accumulators are of the piston type and are precharged with nitrogen to 95 bar (1 380 lbf/in²). It consists of a charging valve assembly, cylinder assembly and piston. The charging valve is equipped with a locking feature which, when opened, will allow precharge to be checked or accumulator charged.

The piston acts as a separator dividing the cylinder assembly into two sections. The bottom section nearest the charging valve contains the nitrogen precharge. Hydraulic oil from the main hydraulic pump flows through check valves in the main hydraulic valve and into the top section of the accumulators. Accumulator pressure is monitored by pressure switches (13) in the brake lines.



13 - Service Brake Circuit Pressure Switches
14 - Park Brake Pressure Switch

Fig. 2 - Brake System Pressure Switch Locations

Brake Treadle Valve (9)

Refer to Section 250-0070, TREADLE VALVE.

The treadle valve controls the level of hydraulic fluid 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 park brake solenoid valve (6) on the main hydraulic valve.

Advanced Retarder Braking

Mounted on the brake treadle valve is a potentiometer and brake pedal interface module.

The first 5° movement of the brake pedal engages the transmission retarder, providing that the transmission 'Stop' warning light is OUT, the transmission is in 'lockup' and the oil temperature is within safe operating range. Further movement of the brake pedal applies the service brakes in addition to the transmission retarder. The transmission retarder will disengage when the brake pedal is released, or when any of the operating conditions become out of range.

Valves 1, 2, 3, 4, 6, 7, 8, 10, 11, 12, 15, 16, 21 & 25

These valves form part of the brake cuircuit and are an intregal part of the main hydraulic valve assembly, mounted on the left hand side of the tractor frame. Ref. Section 215-0050, MAIN HYDRAULIC VALVE ASSEMBLY.

OPERATION

Numbers in parentheses refer to Figs. 1, 2 and 9.

Brake Charging

The valves integral of the main hydraulic valve assembly automatically maintain the brake accumulator pressures between a lower and upper limit.

Accumulators (17) are charged from accumulator (18) via brake system relief valve (7), to limit the pressure in these accumulators to 155 bar (2248 lbf/in²) and then via check valves (3 & 4) respectively.

If the pressure in accumulator (18) is below the lower charge limit of 165 bar (2390 lbf/in²) the brake system charge valve (8) spring closes the brake system charge valve (8). The pressure then builds up in the load sense line from brake system charge valve (8) to the shuttle valve (21) and onto the priority valve (15) spring chamber where it helps this valve to close, ensuring flow priority is to the brake charging. At the same time it also acts upon the main hydraulic pump load sense line via shuttle valve (25) to supply enough flow to charge the accumulators.

As soon as the pressure in accumulator (18) reaches the upper charge limit of 185 bar (2680 lbf/in²) the brake system charge valve (8) opens and unloads the load sense line to tank. This action unloads the main hydraulic pump back to its standby pressure of 25 bar

Braking System - Accumulator

Section 250-0060

SPECIAL TORQUE SPECIFICATIONS					
FIG. NO.	ITEM NO.	ITEM NAME			
			Nm	lbf ft	lbf in
1		Locknut	11	-	100

AMBIENT TEMPERATURE - NITROGEN PRE-CHARGE PRESSURE			
AMBIENT TEMPERATURE		NITROGEN PRE-CHARGE PRESSURE	
°C	°F	bar	lbf/in^2
-20	-4	81.9	1188
-10	14	85.6	1241
0	32	88.8	1288
10	50	91.3	1324
20	68	95	1380
30	86	97.9	1420
40	104	101	1465
50	122	104.4	1514
60	140	107.9	1565
70	158	111.8	1621
80	176	114.5	1661
90	194	117.3	1701
100	212	120.2	1743
110	230	123.4	1789
120	248	126.6	1836

⚠ WARNING

This vehicle is equipped with precharged nitrogen gas cylinders of more than 2.8 bar (40 lbf/in^2). Special permits may be required when transporting the vehicle or cylinders by any method while cylinders are charged. For shipment, contact the appropriate agency in the country involved. Consult your dealer for further permit information.

* * * *