Technical Manual

DUST CONTROL SYSTEMS REPAIR	**SECTION 8**
DUST COLLECTOR	**1-1**
HYDRAULIC PUMP	
HYDRAULIC MOTOR	
PUMP PRESSURE RELIEF VALVE	
AIR PRESSURE SWITCH	
HYDRAULIC ON/OFF VALVE	
AIR FILTER	
PRESSURE REGULATOR	
DUST COLLECTOR CONTROL VALVE	
SOLENOID VALVES	
TIMER CIRCUIT BOARD	
DIAPHRAGM VALVES	
DUST CONTROL FLOW DIAGRAM	**2-1**
DETERGENT SYSTEM	**3-1**
AIR MOTOR	
DETERGENT PUMP	
GATE VALVE AND REGULATOR	
WATER ON/OFF VALVE	
WATER ADJUSTMENT VALVE	
DETERGENT SYSTEM FLOW DIAGRAM	**4-1**
TROUBLESHOOTING	**SECTION 9**
CARRIER	**1-1**
HYDRAULIC SYSTEM	**2-1**
PNEUMATIC SYSTEM	**3-1**
ELECTRICAL SYSTEM	**4-1**
VALVELESS ROCK DRILL	**5-1**
DRILL LINE OILER	**6-1**
DUST CONTROL SYSTEM	**7-1**
TECHNICAL SPECIFICATIONS	**SECTION 10**
DATA SHEET	**1-1**

INTRODUCTION

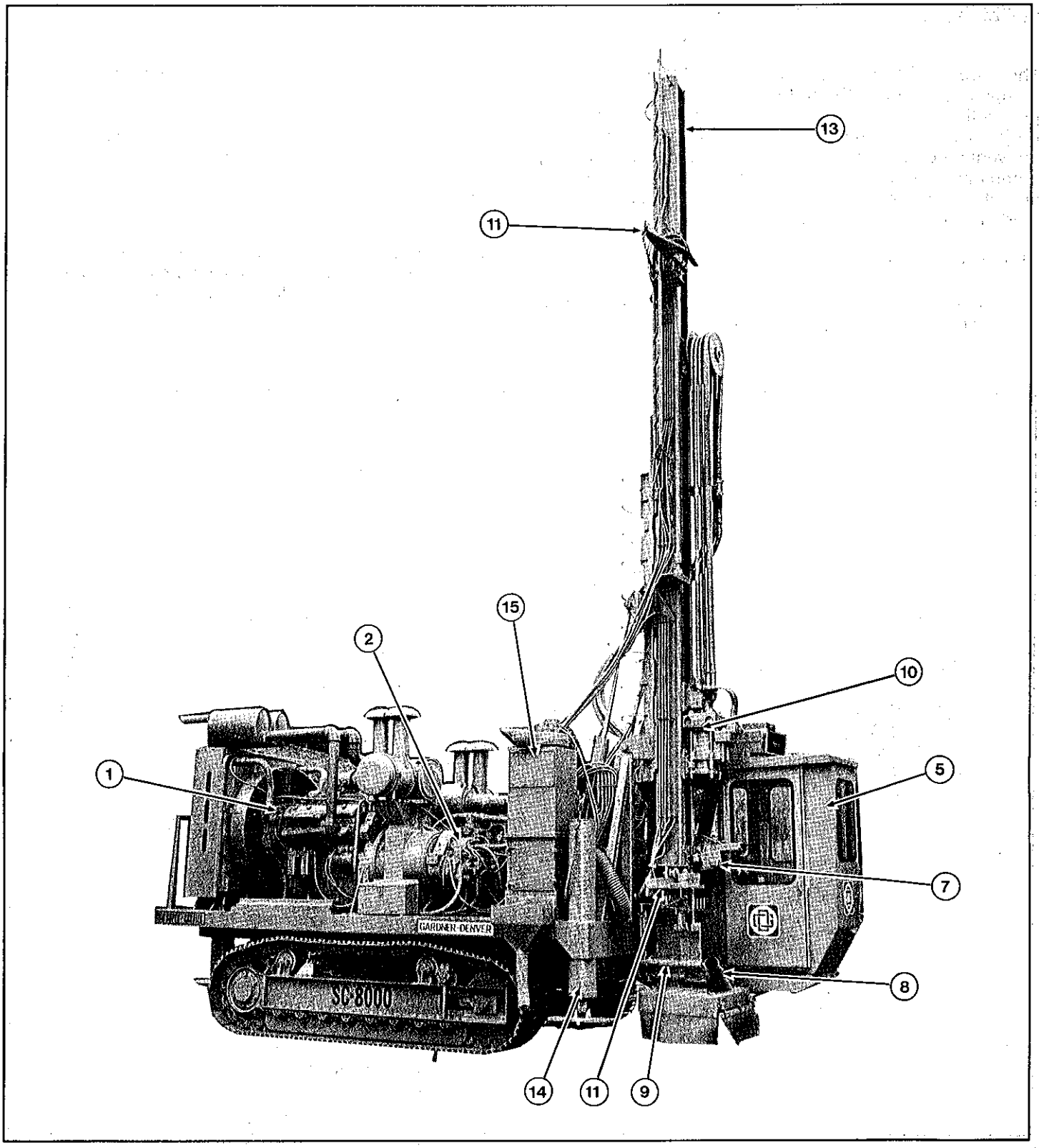


Fig. 1-1. Major components of Super Carrier SC8000 (cont).

PRECAUTIONARY NOTICES

20. BEFORE STARTING, CHECK THE MACHINE, CHAINS, BELTS, FITTINGS, HOSES, ETC. FOR LOOSE OR BROKEN PARTS.

21. CAP OR PLUG ALL HYDRAULIC OR PNEUMATIC CONNECTIONS TO PREVENT CONTAMINATION OF THE SYSTEM.

22. CLEAN THE EXTERIOR OF ALL PARTS AND HOSE CONNECTIONS BEFORE REMOVING.

23. TAG LINES OR HOSES PRIOR TO REMOVAL TO INSURE PROPER LOCATION UPON REASSEMBLY.

24. DO NOT SHARPLY BEND OR KINK THE TRAMMING CONTROL CABLE.

25. WHEN TRAMMING WITH MAST VERTICAL, MAKE SURE THERE IS SUFFICIENT GROUND CLEARANCE AT BOTTOM OF MAST.

26. MAST MUST BE EITHER VERTICAL OR HORIZONTAL FOR TRAMMING. NEVER TRAM WITH THE MAST AT AN ANGLE.

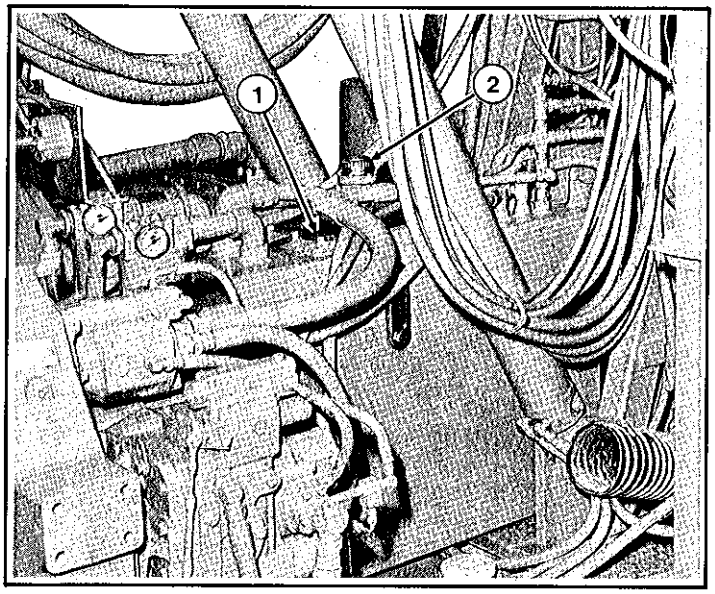
27. CHECK FOR OVERHEAD OBSTRUCTIONS DURING TRAMMING AND AFTER ARRIVING AT THE DRILLING AREA.

28. DO NOT RUN AIR CONDITIONER FAN WHEN ENGINE IS SHUT DOWN.

PREVENTIVE MAINTENANCE

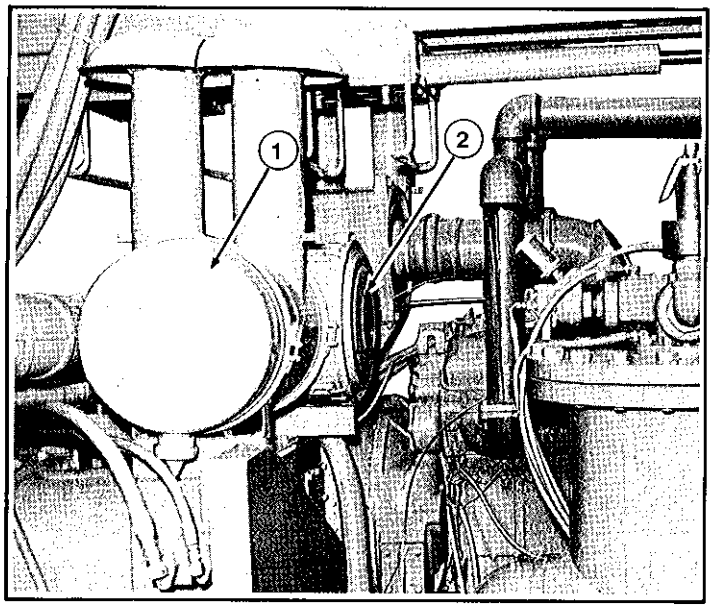
SERVICE TIMETABLE - Continued

ITEM	TIME INTERVAL (HOURS) 8	50	200	600	1200	2400	LUBRICANT	CAPACITY	FIG. AND INDEX NO.
HYDRAULIC SYSTEM All hoses and fittings	Check condition and tightness								
Hydraulic oil	Check					Replace lubricant	Donax T6 or Dextron II ATF	85 gal. (322 l.) (System) 56 gal. (212 l.) (Tank Only)	
Hydraulic reservoir inlet filter				Replace filter					4-13
Hydraulic reservoir outlet filters				Replace filter					4-14
Hydraulic reservoir sump filters						Replace filter			4-15
Pump drive gearcase oil		Check				Replace lubricant	SAE-90EP		
Hydraulic check valves	Check								
Hydraulic oil cooler	Check and/or clean								
PNEUMATIC SYSTEM All hoses, fittings and hose retainer chains	Check condition and tightness								
Compressor oil	Check			Replace lubricant			Dextron II ATF	80 gal. (303 l.) (System) 65 gal. (246 l.) (Tank Only)	



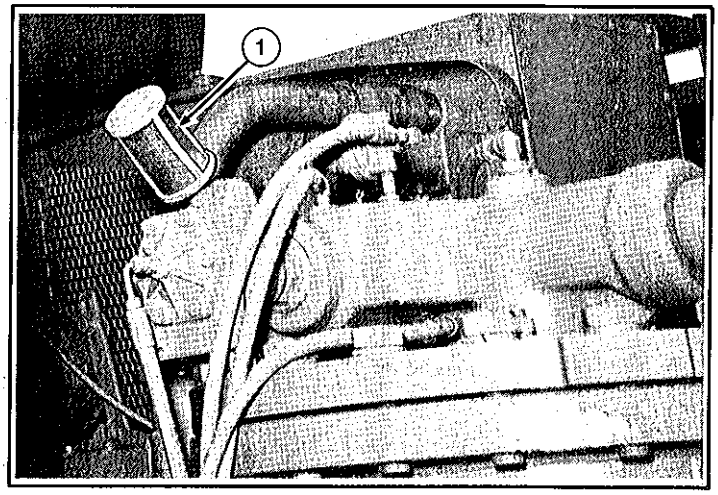
1. Top Cover Plate
2. Oil Filler Neck

Fig. 4-15. Hydraulic reservoir sump filters.



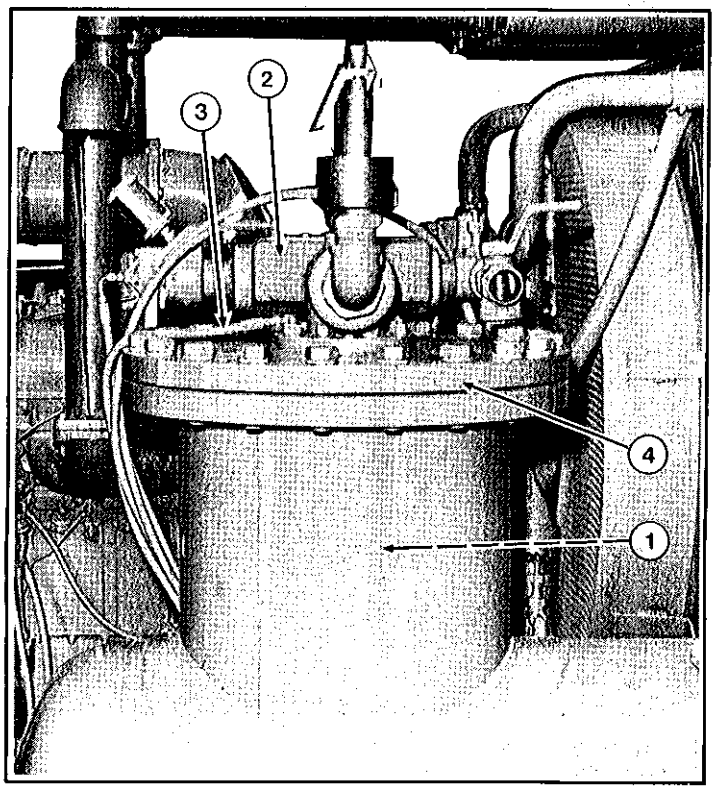
1. First Stage Filter
2. Second Stage Filter

Fig. 4-16. Compressor air cleaner filters.



1. Filter

Fig. 4-17. Compressor automatic blowdown filter.

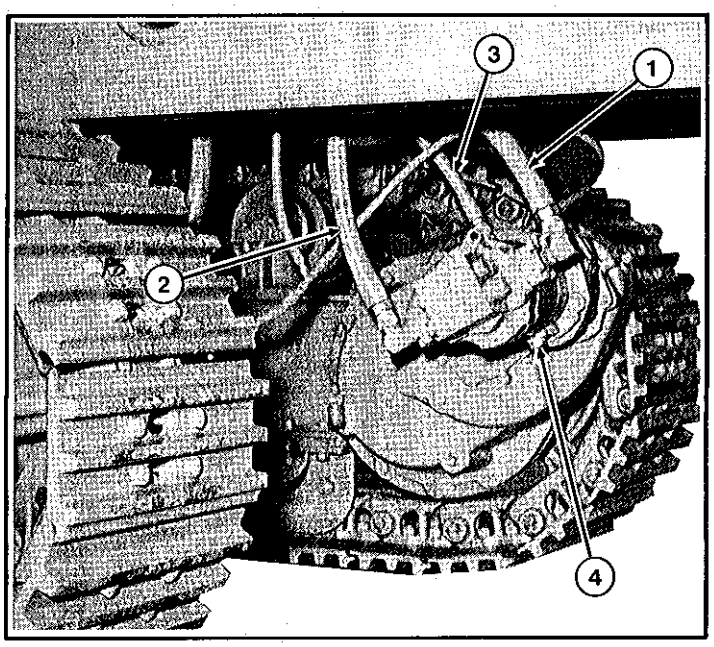


1. Separator Inside Oil Reservoir Tower
2. Discharge Manifold
3. Oil Return Line
4. Tower Cover Plate

Fig. 4-18. Compressor oil separator.

Removal

1. Remove the motor drain plug (figure 5-2) and drain.



1. 1" (25 mm) I.D. Hose
2. 1" (25 mm) I.D. Hose
3. 5/8" (16 mm) I.D. Hose
4. Drain Plug

Fig. 5-2. Tramming motor hoses.

CAUTION

- TAG LINES OR HOSES PRIOR TO REMOVAL TO INSURE PROPER LOCATION UPON RE-ASSEMBLY.

2. Tag and remove the three hydraulic hoses from the tramming motor.

CAUTION

- CAP OR PLUG ALL HYDRAULIC OR PNEUMATIC CONNECTIONS TO PREVENT CONTAMINATION OF THE SYSTEM.

3. Plug the hose ends.

4. Remove the four socket head screws from each adapter block and remove the adapter blocks with the 90° elbows and O-rings in place (Figure 5-3).

5. Remove the adapter and O-ring from the 5/8 inch (16 mm) ID hose connection.

6. Support the tramming motor so that it can not fall.

7. Remove the two diagonally opposed capscrews that attach the motor to the brake (Figure 5-4).

8. Loosen and remove the other two capscrews.

9. Slide the motor outward until the motor shaft is clear of the brake housing.

Installation

1. Position the tramming motor on the brake housing.

NOTE:

It may be necessary to rotate the motor shaft by hand to align the splines on the motor shaft with those in the brake.

2. Secure the motor to the brake housing with the four capscrews (Figure 5-4).

NOTE:

Be sure that a new O-ring is positioned on the motor face.

3. Wash the three adapters in clean hydraulic oil and install on the motor (Figure 5-3).

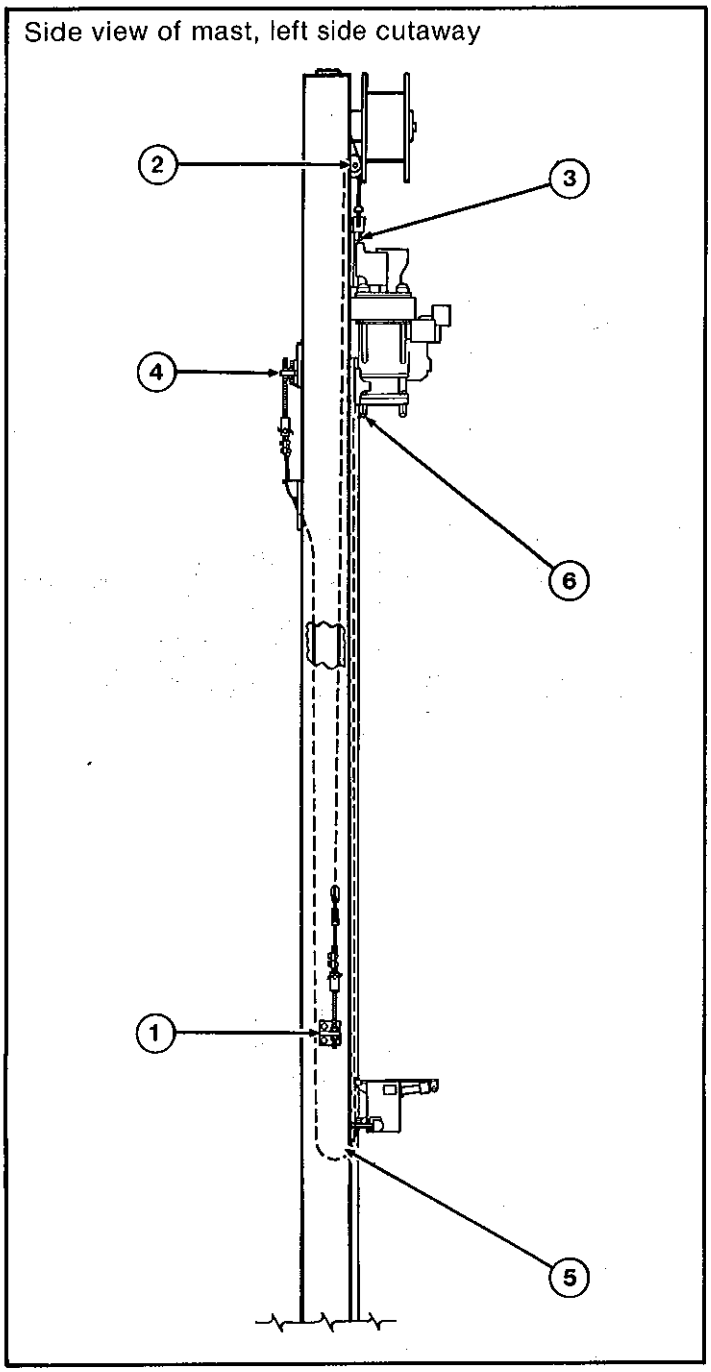
NOTE:

O-rings should be replaced.

4. Remove the plugs from the hydraulic hoses and connect the hoses to the adapters (Figure 5-2).

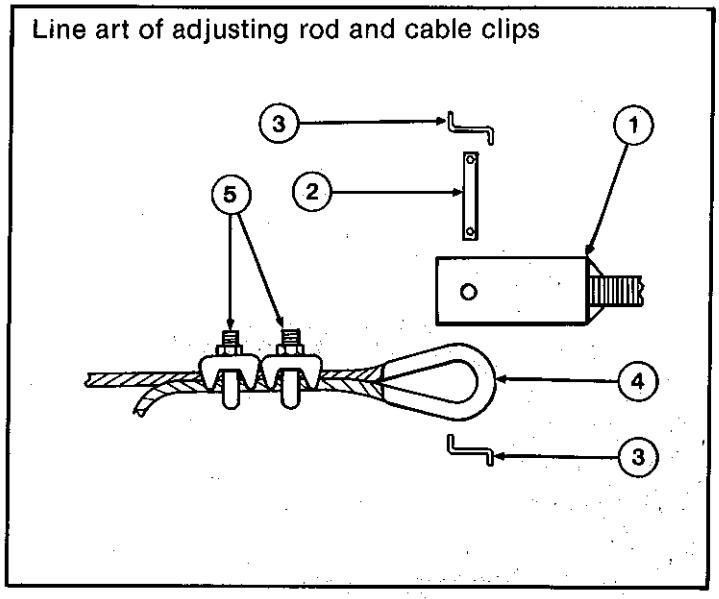
5. Wash the drain plug in hydraulic oil and install (Figure 5-2).

6. Remove the filler cap, prime the motor with clean hydraulic oil and reinstall the filler cap (Figure 5-4).



1. Upper Drill Cable Attachment and Adjusting Point
2. Hose Reel Pulley
3. Cable Attachment to Top of Drill
4. Lower Drill Cable Attachment and Adjusting Point
5. Traveling Centralizer Cable Pulley
6. Cable Attachment to Bottom of Drill

Fig. 5-16. Drill feed cable routing.



1. Adjusting Rod
2. Attaching Pin
3. Lock Rod
4. Cable Guard
5. Cable Clips

Fig. 5-17. Cable attachment at attaching rod.

8. Attach a new cable to the top of the drill and secure with the pin and lock rod.

NOTE:

If the cable was broken, slide the drill toward the top of the mast until the drill mounting plate is approximately 12 inches (305 mm) from the pulley on the hose reel.

9. Route the free end of the cable around the pulley at the hose reel.

10. Feed the cable between the mast members, over the guide block, and out the opening on the left side of the mast.

11. Position the threaded adjusting rod at its center of travel.

12. Install the cable attaching pin with lock rod on the adjusting rod collar (Figure 5-17).

13. Route the cable around the cable guard and attaching pin.

Dust Collector System Circuit

The dust collector system is energized when the DUST COLLECTOR valve is open. Opening the valve starts a hydraulic motor and closes the AIR PRESSURE switch which actuates the collector automatic filter purge system.

The automatic filter purge system is controlled by an electrical timer circuit board. The timer circuit board controls the time sequencing of four electrically actuated solenoids. When a solenoid is actuated, it opens a diaphragm valve which allows clean air to purge the filter element. This filter element purging occurs in all four filters at established intervals.

The entire dust collector electrical system is protected by a 10-ampere fuse located in the FUSE PANEL. The timer circuit board is also protected by a 2-ampere fuse located in the dust collector control box.

NOTE:

If the rig is shut down and the DUST COLLECTOR valve is left open, the automatic filter purge system will continue to operate until the air pressure is depleted and the AIR PRESSURE switch opens. This condition will discharge the batteries.

CONTINUITY TESTING

The majority of electrical circuit problems can be isolated by making continuity checks on the switches, fuses, and leads in the circuit.

⚠ WARNINGS

DO NOT LUBRICATE OR SERVICE THE MACHINE WHILE IT IS RUNNING.

ALWAYS DISCONNECT THE BATTERY BEFORE ATTEMPTING ANY MAINTENANCE ON OR NEAR THE ELECTRICAL SYSTEM.

If an electrical problem cannot be resolved by making continuity checks, further in-shop testing will be required or the suspect components can be replaced in the field until the problem is eliminted.

On/Off Switches and Pushbuttons

Disconnect the lead(s) from the terminal on one side of the switch or pushbutton. Connect an electrical continuity tester between the switch or pushbutton terminals (the one side with lead(s) removed and the other side with lead(s) connected). The SC8000 switches or pushbuttons should react as follows:

1. The START pushbutton indicates continuity (lamp glows) when the button is pressed and no continuity (lamp off) when released.

2. The BYPASS pushbutton indicates no continuity when the button is pressed and continuity when released.

3. The cab HEATER and air conditiner ON/OFF switches indicate no continuity in the OFF position and continuity in the ON position.

Replace any switch or pushbutton which does not function properly. Disconnect the tester and reconnect the switch or pushbutton lead(s) after each test is completed.

Leads and Electrical Connections

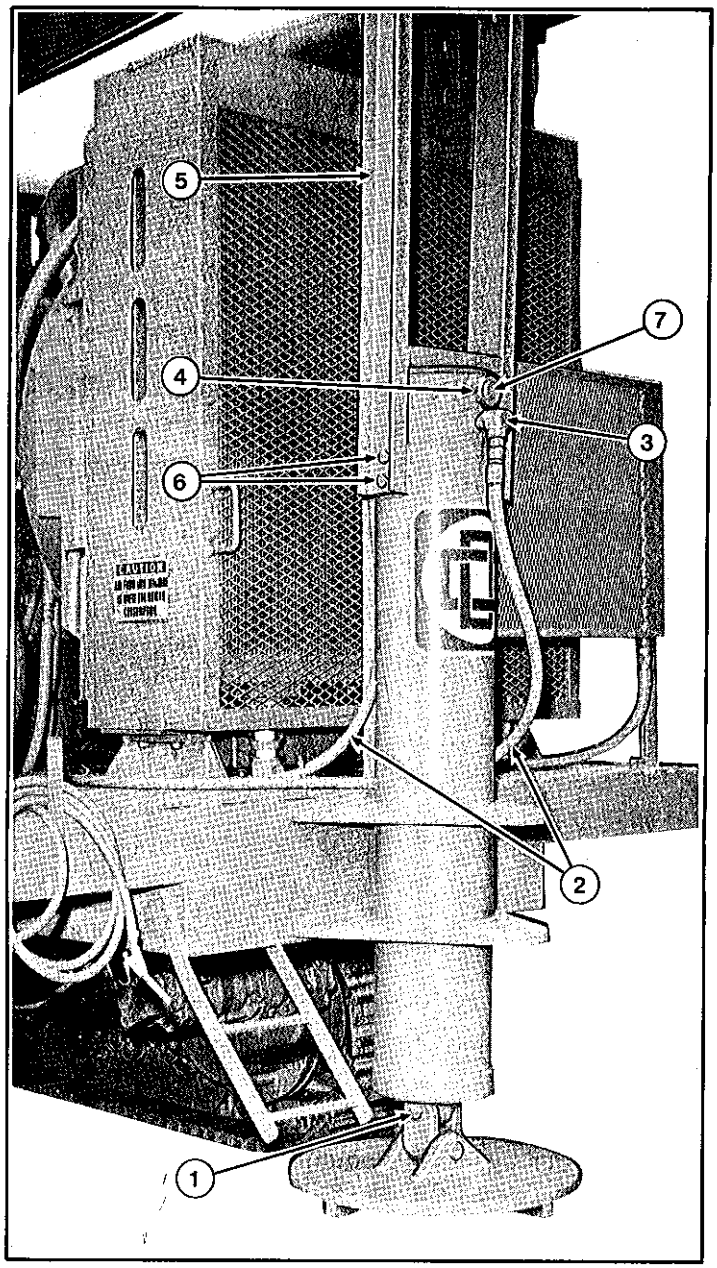
Electrical connections must be clean and making good electrical (metal to metal) contact.

Leads can be checked with a continuity tester by disconnecting both ends of the lead from the terminal or switch connection and then connecting the tester between the lead ends. If the tester indicates no continuity (lamp off), replace the lead.

Fuses

A visual inspection of a fuse does not always indicate its true condition. A continuity test of a suspected bad fuse and the new replacement fuse can eliminate a lot of unnecessary troubleshooting.

With the fuse removed, connect a continuity tester between the two fuse end caps. The tester will indicate continuity (lamp glows) if the fuse is good.



1. Rod End Pivot Pin
2. Hydraulic Hoses (2)
3. Elbows and Pipe Fittings (2)
4. Lock Bolt and Nut
5. Mast Cradle
6. Capscrews and Washers (4)
7. Top Pivot Pin

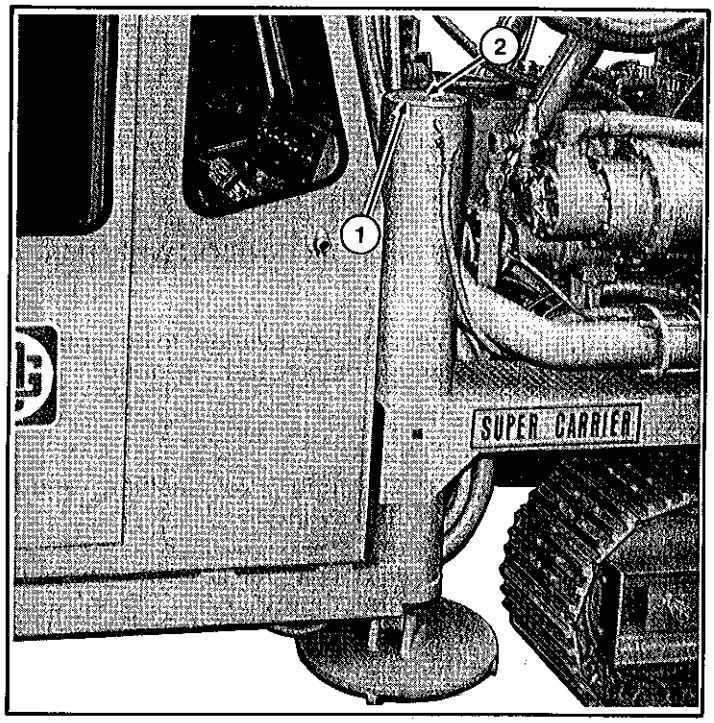
Fig. 6-6. Jack cylinder.

10. Remove the lock bolt and nut from the pivot pin at the top of the cylinder housing (Figure 6-6).

11. Insert a lifting eye into the top plate of the cylinder housing and attach a suitable lifting device to the eye (Figure 6-7).

12. Remove the top pivot pin and vertically lift the cylinder from the housing.

13. Once the cylinder is removed, remove the top plate from the cylinder.



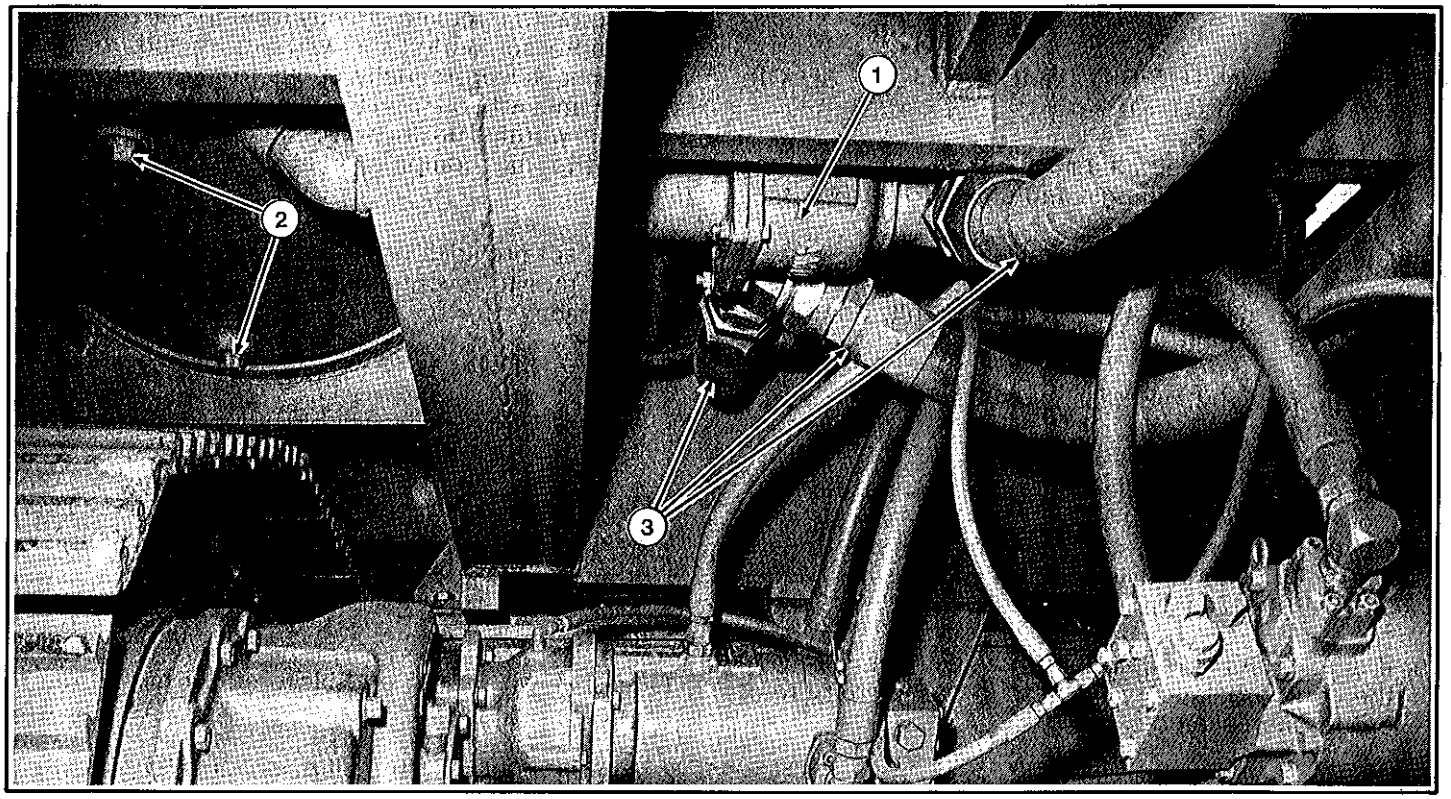
1. Top Plate
2. Lifting Eye Attaching Point

Fig. 6-7. Jack cylinder - top plate.

Installation

1. Mount the top plate on the jack cylinder and, using a suitable lifting device, position the cylinder in the cylinder housing (Figure 6-7).

2. Install the top pivot pin and secure with the lock bolt and nut (Figure 6-6).



1. Mixing Valve
2. Oil Reservoir Drain Plugs (2)
3. Hoses (3) and Fittings

Fig. 6-16. Thermostatic oil mixing valve.

3. Install the oil reservoir drain plug(s) and fill the reservoir with clean oil.

4. Start the rig and operate the compressor for a few minutes.

5. Check the reservoir oil level; shut down the rig, bleed all pressure and add oil if necessary.

TRAVELING CENTRALIZER CONTROL VALVE

The traveling centralizer control valve controls the flow of hydraulic oil to and from the traveling centralizer cylinder. The valve is actuated by an air pilot.

△ WARNINGS

DO NOT LUBRICATE OR SERVICE THE MACHINE WHILE IT IS RUNNING.

BE SURE THE HYDRAULIC AND PNEUMATIC SYSTEMS ARE NOT PRESSURIZED BEFORE LOOSENING ANY CONNECTIONS OR PARTS.

CAUTIONS

WHEN RAISING AND LOWERING THE MAST, MAKE SURE THE BOTTOM OF THE MAST CLEARS THE GROUND. THE PADS ON THE SUB-MAST SHOULD BE SEATED GENTLY AGAINST THE STOPS ON THE SUPPORT CRADLE.

HYDRAULIC SYSTEM REPAIR

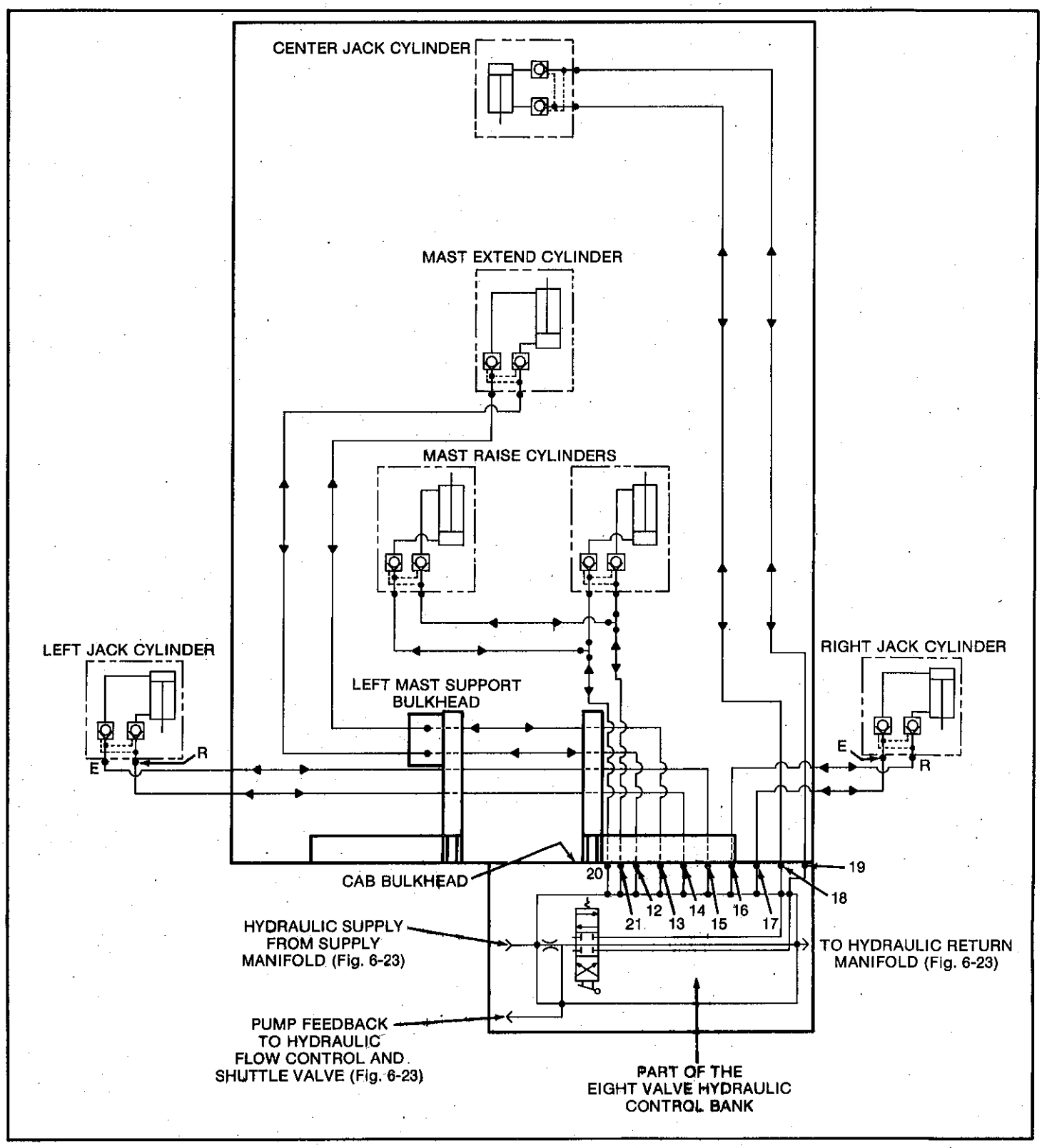


Fig. 6-25. Main frame system.

5. Tag and remove the 10 pneumatic hoses from the valve bank (Figure 7-5).

6. Plug the hose ends.

7. Remove the knobs from the valve bank levers.

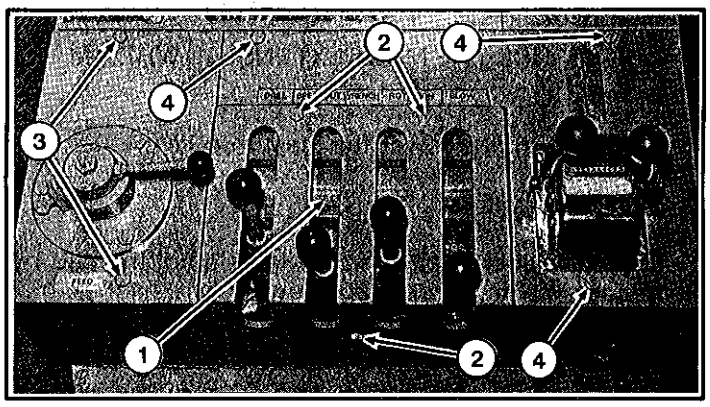
8. Remove the valve bank cover plate by removing the three capscrews.

9. Remove the two capscrews which secure the feed valve panel to the console and move the panel toward the left side of the cab.

NOTE:

The panel cannot be lifted completely out unless the feed valve hoses are disconnected.

10. Remove the three capscrews which secure the tram control panel to the console and pivot the panel toward the right side of the cab.



1. Valve Bank
2. Capscrews (3) - Cover Plate Attaching
3. Capscrews (2) - Feed Valve Panel Attaching
4. Capscrews (3) - Tram Control Panel Attaching

Fig. 7-5. Drill controls - four valve bank.

NOTE:

The panel cannot be lifted completely out unless the tramming control cables are disconnected.

11. Remove the eight capscrews and washers (four on top of the valve bank and two on each side of the valve bank) which secure the valve bank to the support member.

12. Remove the valve bank and plug the valve hose connections.

Installation

1. Unplug the valve hose connections and mount the drill control valve bank onto the support member with the eight capscrews and washers (Figure 7-5).

2. Attach the feed valve panel, the tram control panel, and the valve bank cover plate to the console with capscrews.

3. Attach the knobs to the valve bank levers.

4. Remove the plugs from the pneumatic hoses and connect the hoses to the valve bank.

5. Reconnect the battery connections.

6. Start the rig, check for leaks and then shut down the rig.

7. Close the cab access panels and secure each with the three capscrews.

CAB SERVICE HOSE ON/OFF VALVE

△ WARNINGS

DO NOT LUBRICATE OR SERVICE THE MACHINE WHILE IT IS RUNNING.

BE SURE THE HYDRAULIC AND PNEUMATIC SYSTEMS ARE NOT PRESSURIZED BEFORE LOOSENING ANY CONNECTIONS OR PARTS.

Removal

CAUTIONS

- WHEN RAISING AND LOWERING THE MAST, MAKE SURE THE BOTTOM OF THE MAST CLEARS THE GROUND. THE PADS ON THE SUB-MAST SHOULD BE SEATED GENTLY AGAINST THE STOPS ON THE SUPPORT CRADLE.

- DO NOT USE THE MAST EXTENSION WHEN MAST IS IN THE CRADLE.

TIMER CIRCUIT BOARD

The timer circuit board is mounted inside the dust collector control box. The circuit controls the actuation of the solenoids at preset time intervals.

⚠ WARNINGS

DO NOT LUBRICATE OR SERVICE THE MACHINE WHILE IT IS RUNNING.

BE SURE THE HYDRAULIC AND PNEUMATIC SYSTEMS ARE NOT PRESSURIZED BEFORE LOOSENING ANY CONNECTIONS OR PARTS.

ALWAYS DISCONNECT THE BATTERY BEFORE ATTEMPTING ANY MAINTENANCE ON OR NEAR THE ELECTRICAL SYSTEM.

To replace the circuit board; disconnect the electrical wires from the board connector strip and unscrew the four screws which attach the board to the control box.

DIAPHRAGM VALVES

There are four diaphragm valves attached to the air accumulator inside the dust collector. Each valve is controlled by an air pilot from the solenoid valve. When actuated, the diaphragm valve allows a burst of clean air from the accumulator to flow down thru the dust filter. This burst of air cleans the filter with a reverse flushing action.

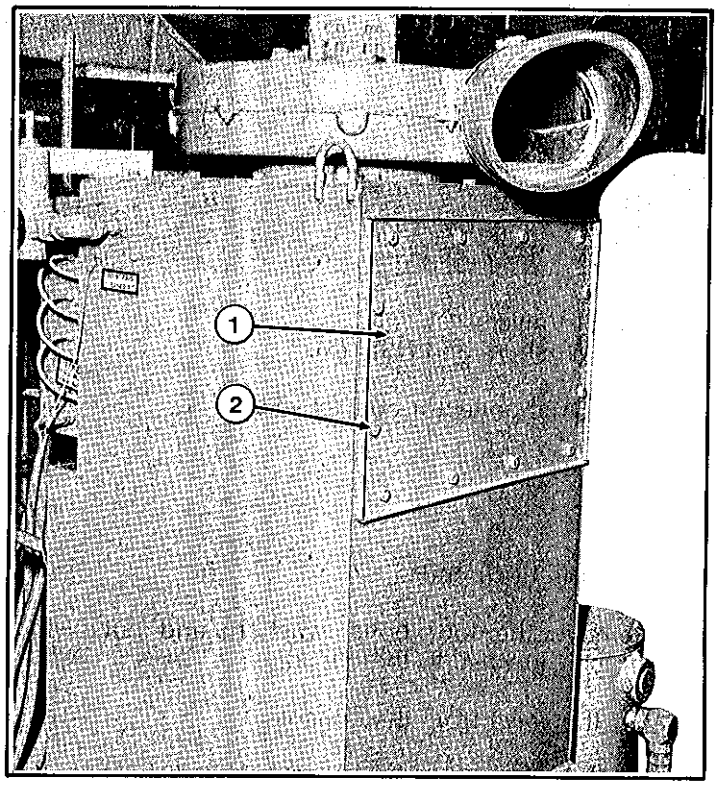
⚠ WARNINGS

DO NOT LUBRICATE OR SERVICE THE MACHINE WHILE IT IS RUNNING.

BE SURE THE HYDRAULIC AND PNEUMATIC SYSTEMS ARE NOT PRESSURIZED BEFORE LOOSENING ANY CONNECTIONS OR PARTS.

ALWAYS DISCONNECT THE BATTERY BEFORE ATTEMPTING ANY MAINTENANCE ON OR NEAR THE ELECTRICAL SYSTEM.

To replace a diaphragm valve, remove the dust collector access plate (Figure 8-9), the pneumatic hose from the valve, and unscrew the valve from the accumulator.



1. Access Plate
2. Capscrews and Washers (12)

Fig. 8-9. Dust collector access plate.

TROUBLESHOOTING

Pneumatic System Troubleshooting - Continued

Problem	Possible Cause	Solution
E. Excessive discharge air temperature - (continued)	Damaged or worn internal compressor parts	Shop service required
	Thermostatic oil mixing valve closed	Replace
	Compressor oil pump inoperative	Shop service required
F. Breakout wrench does not function properly	Cylinder damaged or worn	Replace
	Control valve dirty or worn	Replace
	Connections or hoses loose or damaged	Tighten or replace
G. No or insufficient blowing air	Control valve in OFF position	Open
	Control valve dirty or worn	Replace
	Core hole thru drill steel plugged	Clean
H. Excessive air pressure	Compressor subtractive pilot setting too high	Adjust; control pressure should be 10 psi @ 100 psi (69 kPa @ 689 kPa) in air receiver
	Pressure relief valve malfunctioning	SHUTDOWN ENGINE IMMEDIATELY; replace valve
	Inlet valve open	Check for proper operation of air inlet valve controls