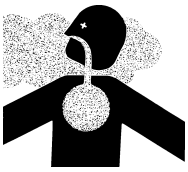
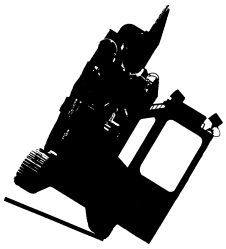
Technical Manual

Overview of Potential Hazards

The **Track Drill** is a heavy moving machine with a boom capable of extending its reach vertically and horizontally. Like all moving objects and reach extending devices, there are **potential** hazards associated with its use. These hazards will be minimized if the machine is properly inspected and maintained. The operators should read this manual and have been trained to use the machine in an appropriate and safe manner. Should any questions arise concerning the maintenance or operation of the machine contact **Terex at 1-800-258-0009**.

In this section and those that follow, the word:

DANGER - means that severe injury or death will result from failure to follow instruction.
WARNING - means that severe injury or death can result from failure to follow instruction.
CAUTION - means that minor injury or property damage can result from failure to follow instruction.
NOTE - means that special attention should be given to the instruction.

POTENTIAL HAZARD	EFFECT	PREVENTION
Electrical Contact 	**DANGER: Will** cause serious injury or death.	Maintain minimum clearance from high voltage power lines (refer to table 1-1). Do Not drill near underground power lines. Machine is NOT insulated.
Contaminated Air 	**DANGER: WILL** cause serious injury or death.	Do Not run machine in an area without good ventilation.
Silica Dust 	**WARNING: Health Hazard** **Can** cause silicosis, as serious and sometimes fatal disease.	Always use dust collector or water suppression to control dust.
Unit Overturn 	**WARNING: Can** cause serious injury or death.	Do Not travel on steep inclines or tram crosswise to grades. Do Not travel on soft or unstable ground, or close to unsupported excavations.
Moving Boom or Parts 	**WARNING: Can** cause serious injury or death.	Do Not operate machine or boom until all people are clear of the area. Do Not lubricate or service while machine is running.
High Pressure Air or Fluid 	**WARNING: Can** cause serious injury or death.	Relieve pressure on hydraulic and pneumatic systems before loosening hoses or connections.

Tram/Drill Positioning Controls

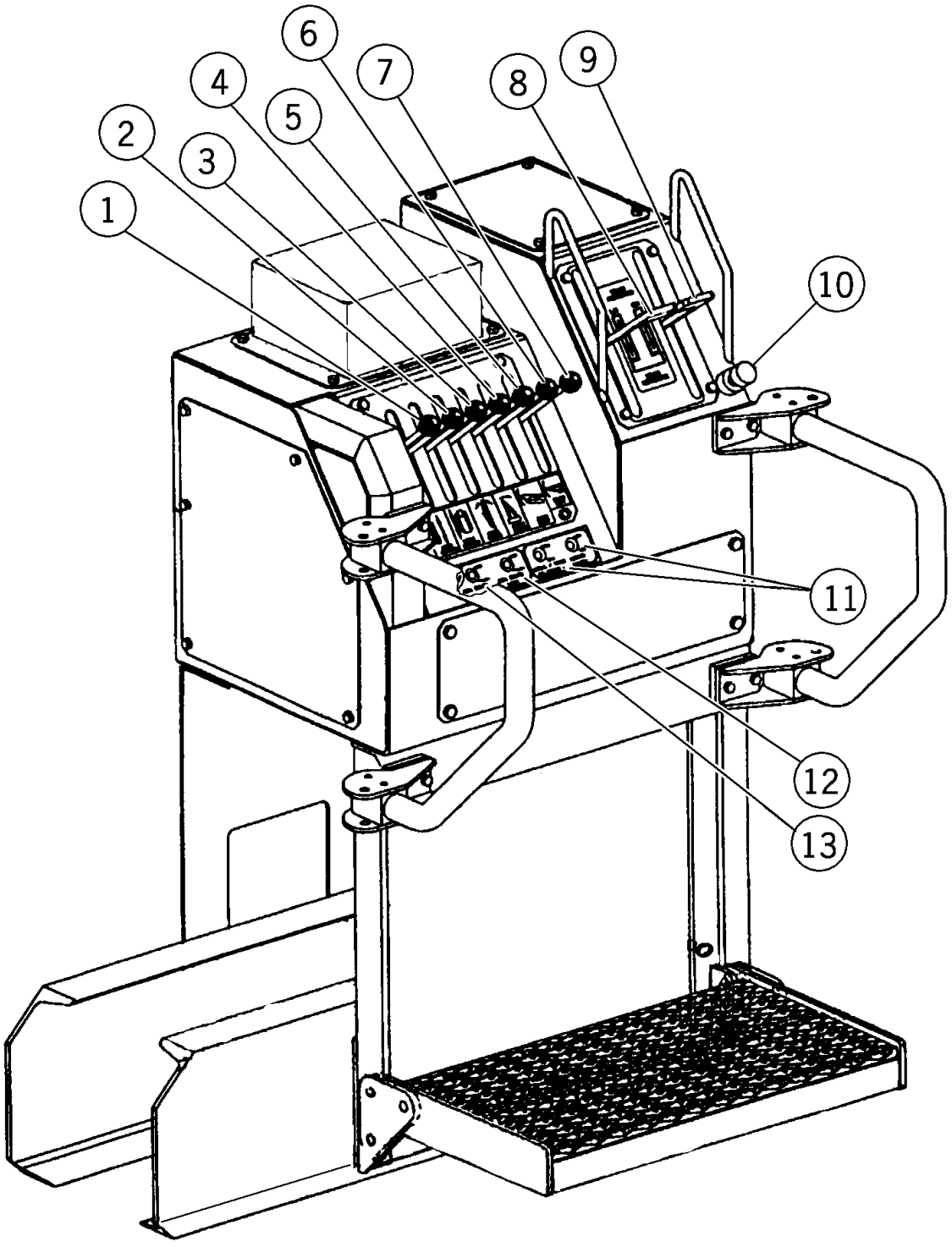


Fig. 2-1 Tram Station

Instrument Panel - Cab Machine

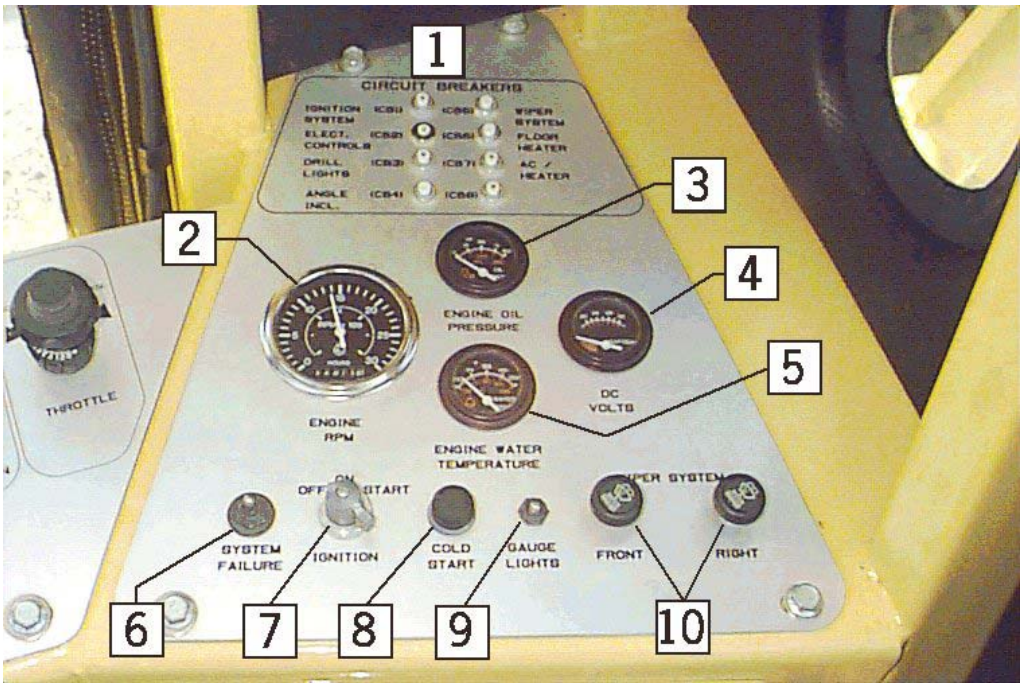


Fig. 2-4 Engine Control Panel - early models with 3306 engine.

WARNING:
Read the warnings and cautions listed in Section 1 before attempting to operate or service this machine.

1. **Circuit Breakers**
   Circuit breakers for Ignition System, Electric Controls, Drill Lights, Angle Inclinator (optional), Wiper System, Floor Heater, AC Heater, and Electric Defroster.

2. **Engine RPM**
   Indicates the engine speed and hours of operation.

3. **Engine Oil Pressure**
   Gauge indicates engine oil pressure. Normal operating pressure is 40-60 psi (2.8-4.1 bar).

NOTE **Engine oil pressure must be more than 15 psi (1 bar) for operation.**

4. **DC Volts**
   Voltmeter gauge indicates the amount of battery voltage available when the ignition switch is "ON".

5. **Engine Water Temperature**
   Gauge indicates engine water temperature. Water temperature should not exceed 205°F (96.1° C).

6. **System Failure Warning Light (early machines with 3306 engine)**
   Indicator light warns of low engine oil pressure, high engine water temperature, or high compressor air temperature.

Personal Safety

WARNING:
Wear an approved protective helmet, safety boots, hearing, and eye protection when on or near the machine.
BE SURE all personnel are clear of the machine before moving.
DO NOT attempt lubrication or service while the machine is running.
Inspect hose retainers and hoses for indication of wear, looseness, cracking or fraying at regular intervals.
CHECK all bolts, nuts, and adjustments for proper tension.
Keep the tracks clear of rocks and other objects.

- **Your personal safety and the safety of others around you must be your first priority.**
- **Always wear personal safety equipment when working on or near the machine, this includes:**
  - **Safety Helmet (Hard Hat)**
  - **Safety Glasses**
  - **Hearing Protection**
  - **Safety shoes (steel toed)**
  - **Leather work gloves**
- **DO NOT wear loose clothing or jewelry that could get caught in rotating machinery. Keep long hair tied up to prevent getting caught in rotating machinery.**
- **Remember, SAFETY is up to YOU. You can prevent serious injury or death.**

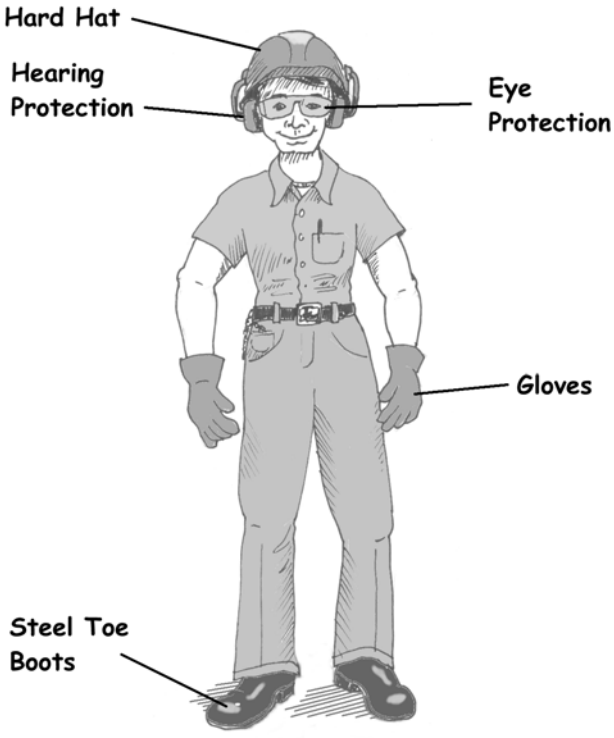


Fig. 3-1 Wear Your Personal Safety Equipment

Tramming-Preliminary Checks and Warnings

WARNING:

DO NOT operate the machine unless thoroughly familiar with controls and functions.

ALWAYS wear an approved protective helmet, safety boots, and eye protection when on or near the machine.

BE SURE all personnel are clear of the machine before moving.

ALWAYS wear noise reducing ear protectors when near the machine for extended periods while the machine is running.

ALWAYS check operation of the brakes before tramming. (Brakes are automatically set while tram valve is in the neutral position. The brakes release when the tram valve is actuated either in forward or reverse position.)

SECURE the drill steels in the rod changer rack by actuating the rod lock device. Secure the drill steel in the feed by clamping the rod wrench on the lower position of the steel and close the centralizer before tramming over rough terrain.

BE SURE the feed is high enough to clear ground obstacles, and low enough to clear overhead obstacles when tramming.

DO NOT attempt to move the machine in a potentially unstable condition or when visibility is obstructed.

Tram carefully with steel in the steel rack.

Keep the tracks clear of rocks and other objects.

Fig. 3-11 Tram Control Panel in Cab

1. Left Track Control
2. Right Track Control
3. Track Oscillation Control
4. Throttle Switch
5. Right Track Oscillation Switch
6. Left Track Oscillation Switch
7. Tram Speed Switch
8. Tram Motor Speed
9. Tram/Drill Selector Switch

Drill Positioning Procedure

Drill Positioning Procedure

Fig. 4-2 Boom/Cab Proximity Switches
1. Cab Collision Switch
2. Cab Boom Collision Switch

Clearances from High Voltage Lines	
Voltage	**Minimum Clearance**
0 to 50 kv	10 ft. (3 m)
50 to 200 kv	15 ft. (4.6 m)
200 to 350 kv	20 ft. (6.1 m)
350 to 500 kv	25 ft. (7.6 m)
500 to 750 kv	35 ft. (5.2 m)
750 to 1000 kv	45 ft. (13.7 m)

Table 4-1 Minimum safe distances from high voltage lines.

Drilling Practices

Here are some tips for top drilling performance.

Collaring

The collar of the drill hole will directly determine the quality of the hole.

Hole Deviation

The major cause of drill steel breakage is deviation of the drill hole. There is very little tolerance in the drill string for any deviation, due to the high energy output of the HPR2 rock drill.

Feed Pressure

"Under-feeding" is a particularly common and bad practice. Feed pressure must be kept to the bit at all times while drilling. "Free-hammering" (hammering with no load on the bit) and "under-feeding" will shorten the drill string life and the hammer seals.

Drill Pressures

Feed and hammer pressures and rotation flow can and should be adjusted to suit different rock conditions. Optimum settings are reached when the maximum penetration rate is achieved with minimal heat and vibration being generated through the drill string. Incorrect drill pressure settings can be directly related to hole deviation and drill string damage and breakage.

Adjusting Drill Pressure and Monitoring the Machine

The operator should attempt to maintain a minimum amount of feed pressure, just enough to keep the drill steel couplings tight. The reason for this is to ensure smooth drilling and maximize penetration rate by:

- Minimizing heat in the drill string
- Eliminating "under and over feeding"
- Minimizing rotation pressure

Rotation flow should be increased in softer rock and decreased in harder rock as indicated by the penetration rate.

Monitoring of the machine is critical at all times. Monitoring of the machine gauges is especially critical for those unfamiliar with the drill. Increases in air and /or rotation pressures indicate developing blockage and / or jamming situations.

Plugged Bit and Stuck Drill Steel

Always be alert of air and cuttings coming out of the hole, if not STOP DRILLING. If bit becomes plugged. When blowing air is stopped by a plugged bit, the drill string can become stuck quickly. Work the bit up and down the hole with hammer and rotation on until air and cuttings can be seen coming out of the hole. If bit remains plugged, raise bit out of hole and place bit against solid rock or hard wood and turn hammer on in short bursts with air on to dislodge obstruction. If bit still remains plugged, shut down machine and relieve all air pressure before removing bit. Clear bit manually and reinstall.

If drill steel becomes stuck, use the reverse percussion option (if equipped) to "hammer out" of the hole. If machine is not equipped with this option, use the feed override lever to apply extra reverse feed pressure. Work the drill string up and down using slow rotation speed with blowing air on until it is free.

Using the anti-jam option (if equipped) will help prevent stuck steel due to bad ground. The following pages describe the anti-jam system.

Indexing the Swing Cylinder

Fig. 4-17 Position of feed and boom when indexing swing cylinder.
Note, upper end of feed is not yet secured to prevent the feed from pivoting when feed swing cylinder pin is removed.

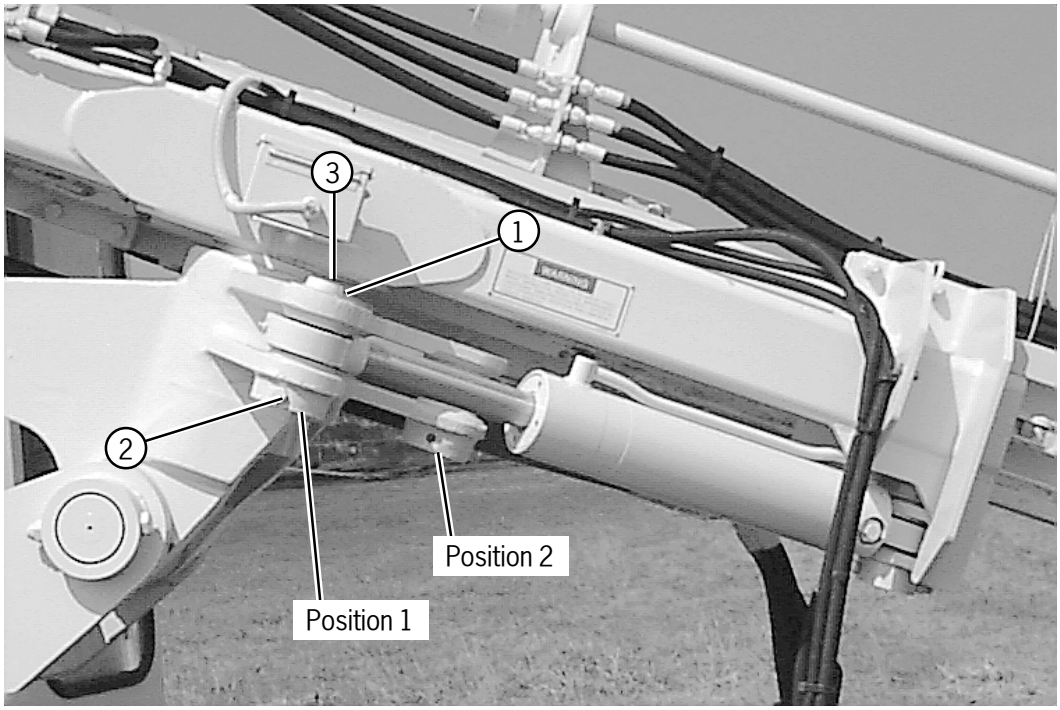


Fig. 4-18 Feed Swing Cylinder
1. Retaining Ring and Thrust Washer
2. Bolt and Locknut
3. Pin

SCH5000 Grease Points

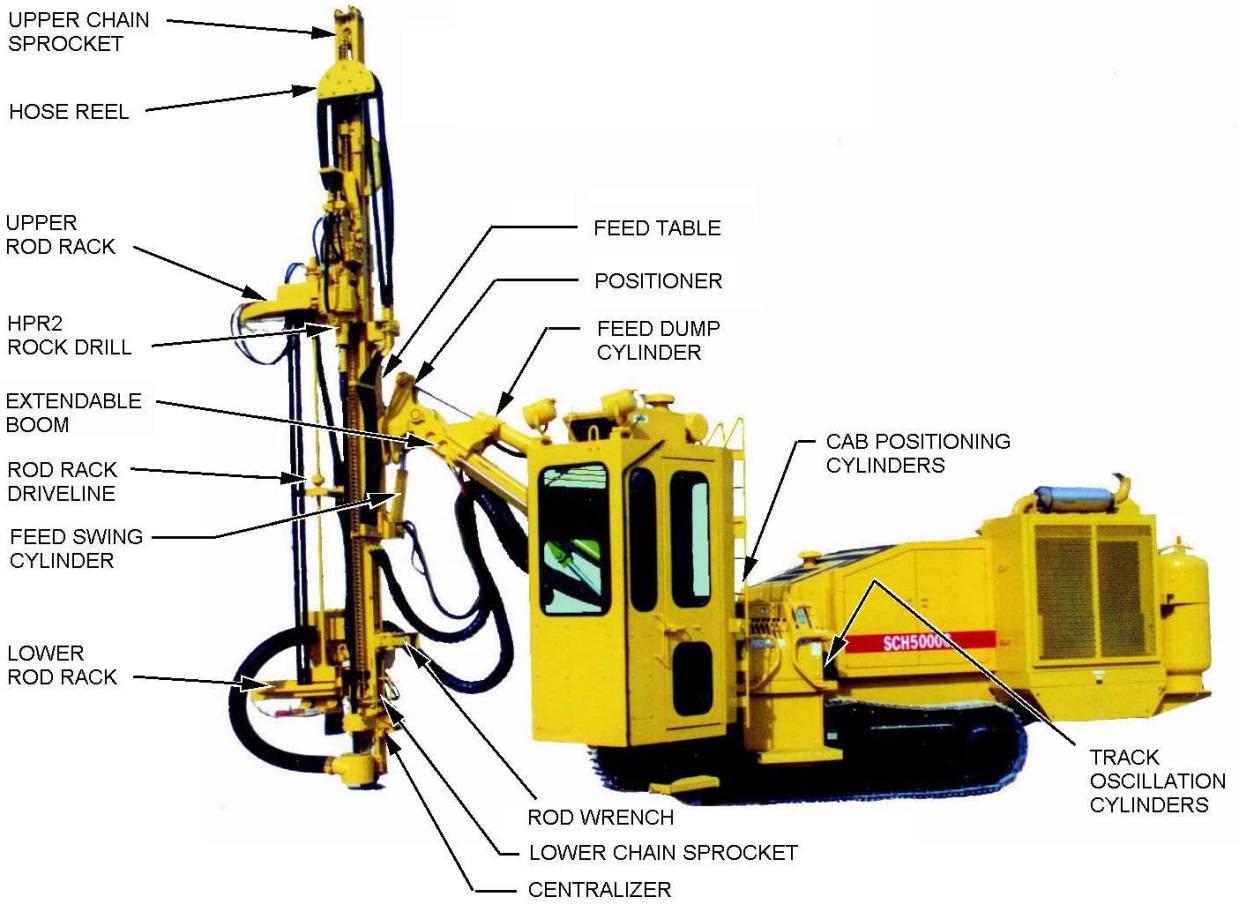


Fig. 5-1 SCH5000 - Left Side with 12 ft. feed and extendable boom.

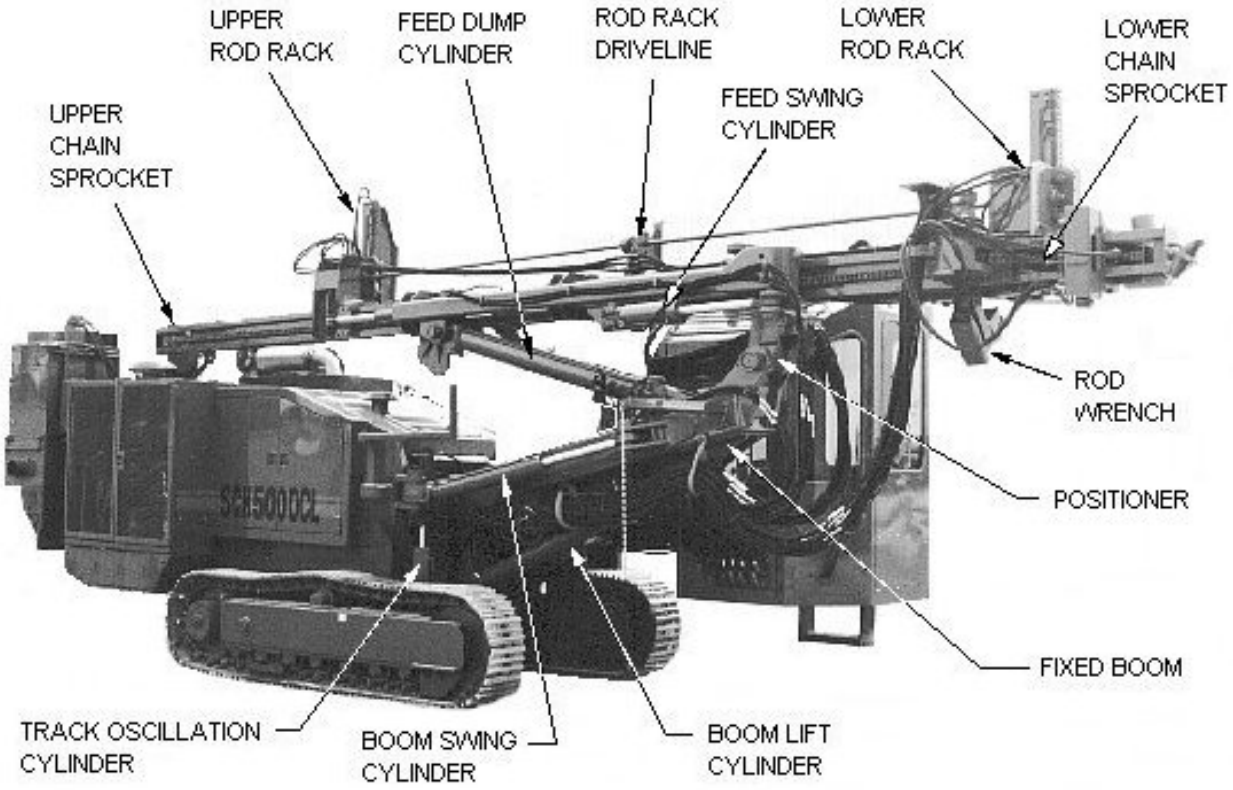


Fig. 5-2 SCH5000 - Right Side with 20 ft. feed and fixed boom.

Boom Assembly Grease Points

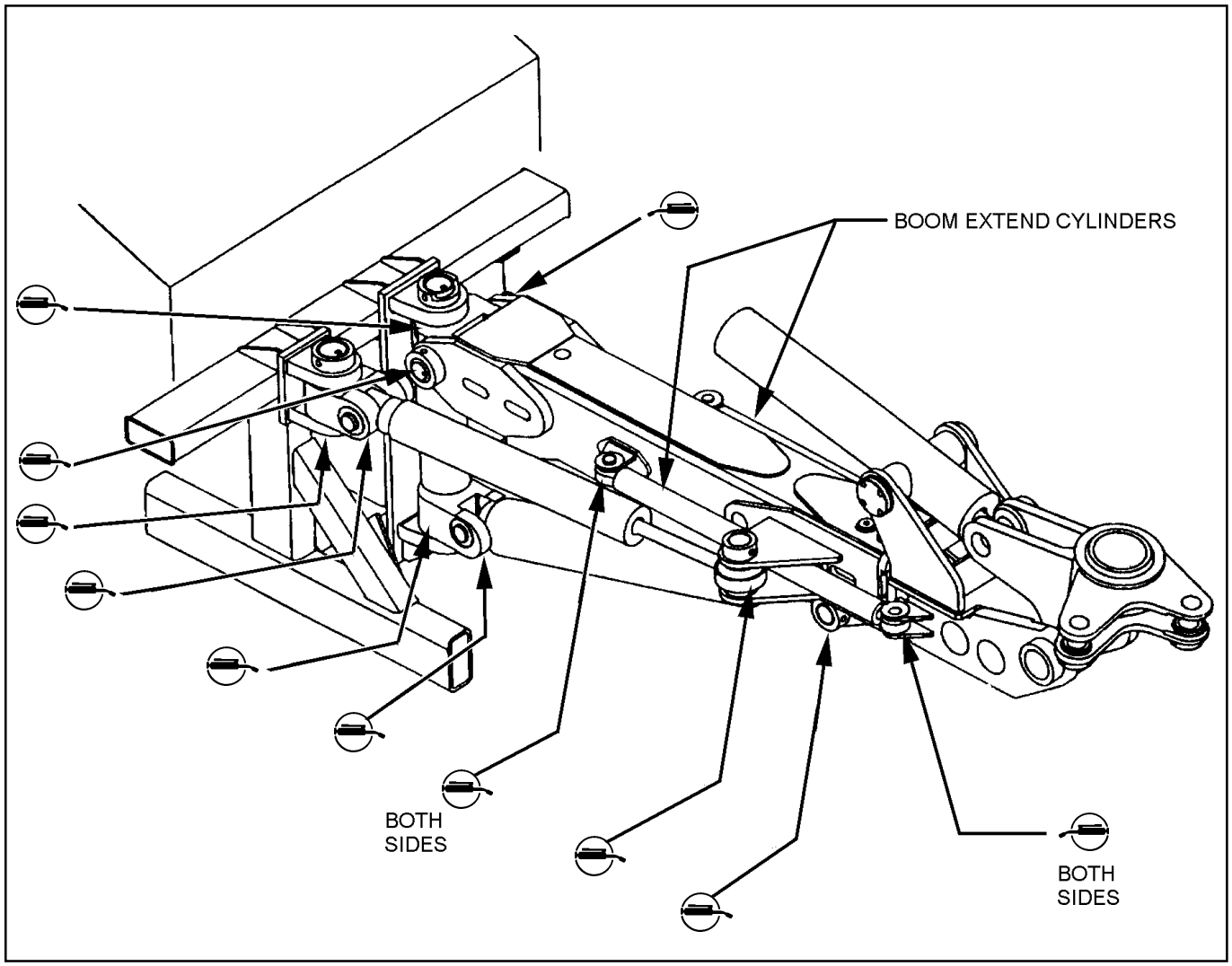


Fig. 5-16 Boom Assembly (extendable shown) - 11 Grease Points
(Fixed Boom does not use boom extend cylinders, so there are only 7 grease points).

Maintenance Record

DATE	HOUR METER	MAINTENANCE PERFORMED	WORK PERFORMED BY	WORK AUTHORIZED BY

Notes

Dust Collector Setup

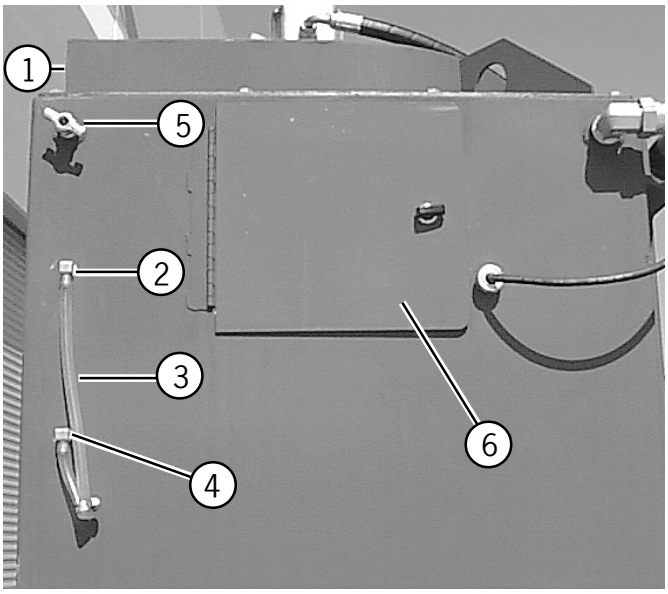


Fig. 7-7 Dust Collector
1. Fan Exhaust
2. Upper Test Port
3. Jump Tube
4. Lower Test Port
5. Water Drain
6. Timer Compartment Door

Filter Elements

1. Remove jump tube and connect manometer to upper and lower test ports.
2. Start machine and place tram/drill switch in DRILL position, switch dust collector switch to DRILL position and turn blowing air valve on.
3. Manometer should read 1-2 inches (2.5-5 cm) W.G. (Water Gauge) for new filter elements. This pressure reading represents the pressure drop across the filters. If manometer reads over 4 inches (10.2 cm) W.G. filters are contaminated to the point that are flow is restricted.
4. Remove manometer and install jump hose between upper and lower ports to seal out dirt and other contaminants.

Dust Collector Efficiency

Following the dust collector setup procedures outlined previously will result in the dust collector running at about 75% capacity. This is sufficient to handle most drilling conditions.

In lighter duty applications, such as, smaller diameter holes in rock of light specific gravity; energy may be saved by decreasing the purging air pressure and increasing the time interval between pulses.

In heavier duty applications, the purging air pressure may be increased and the time interval between pulses may be decreased.