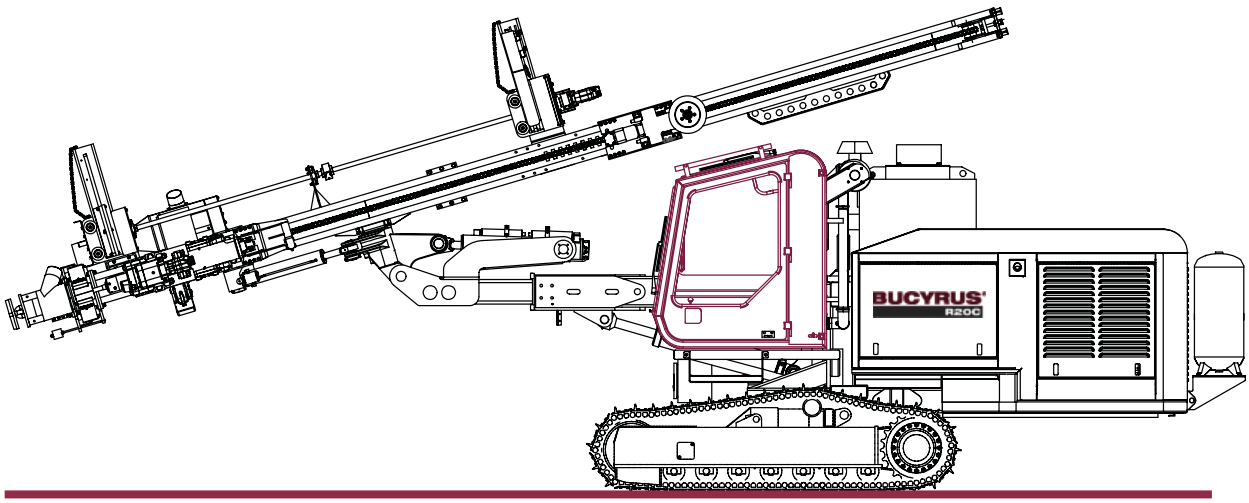
Model R20
Hydraulic Track Drill
Operation and Maintenance Manual
P/N 426689
2nd Edition



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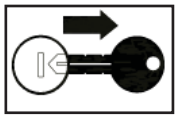
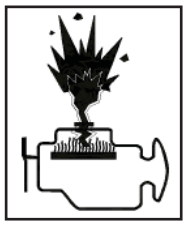
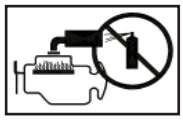
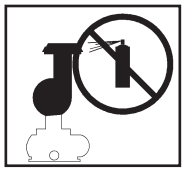
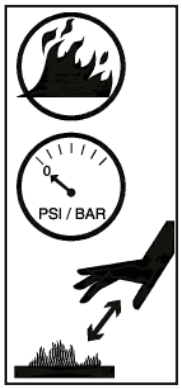
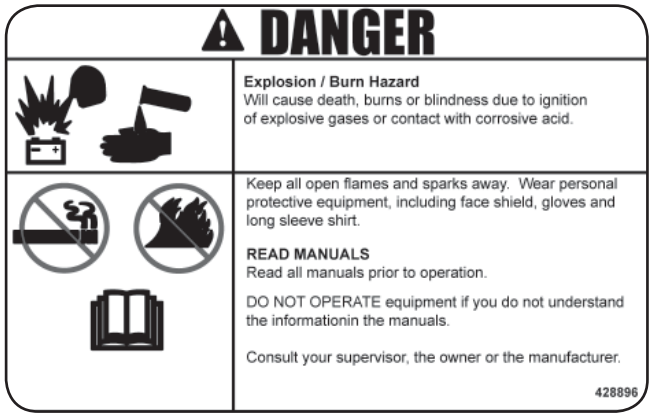
Potential Hazards

Potential Hazard		Prevention	
	Safety Alert Symbol. Used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.		See Operator's Manual for instructions. If you do not understand the information the manuals, consult your supervisor, the owner, or the manufacturer.
	**Entanglement Hazard.** Death or serious injury can result from contact with rotating drill steel and drivelines.		Keep clear of rotating drill steel and drivelines. Switch off engine before performing service.
	**Entanglement Hazard.** Rotating parts can cause personal injury.		Keep away from fan and belt when engine is running. Stop engine before servicing.
	**Explosion / Burn Hazard.** Will cause death, burns or blindness due to ignition of explosive gases or contact with corrosive acid.		Keep all open flames and sparks away. Wear personal protective equipment, including face shield, gloves and long sleeve shirt. READ MANUALS Read all manuals prior to operation.
	**Explosion Hazard.** Death or serious injury can result from the use of ether or other high energy starting aids.		Do not use ether or other high energy starting aids. Engine equipped with grid heating system.
	**Explosion Hazard.** Death or serious injury can result from the use of ether or other high energy starting aids.		Do not use ether or other high energy starting aids in compressor.
	**Burn Hazard.** Death or serious injury can result from release of hot pressurized liquids.		Keep away from flames. Relieve all pressure. Allow to cool before performing service on compressor.

Safety Signs



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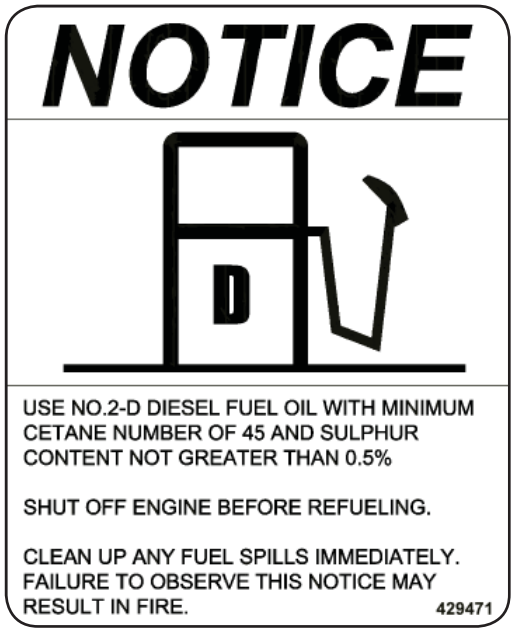

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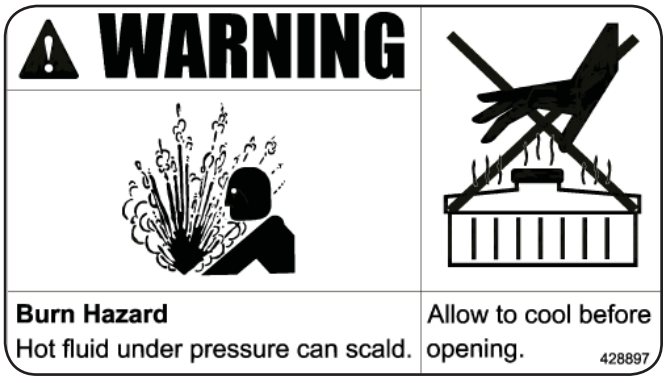

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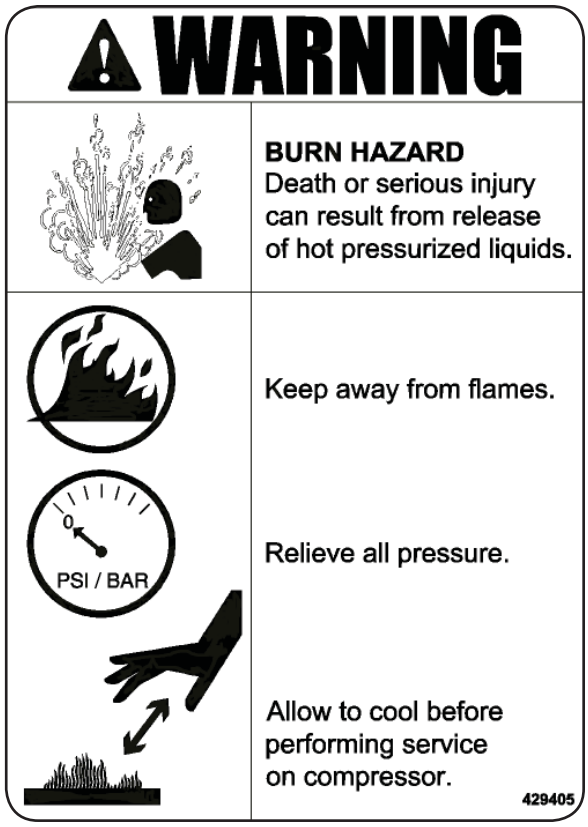

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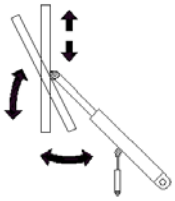
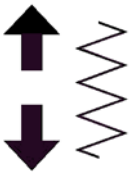
Graphic Symbol Legend

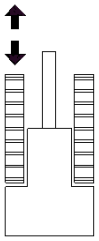
Left Hand Joystick Controls



Feed SWING/DUMP/EXTEND

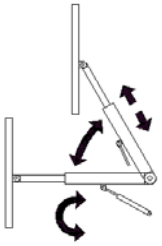


Feed UP/DOWN

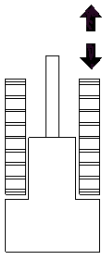


Left Track FORWARD/REVERSE

Right Hand Joystick Control

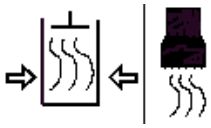


Boom LIFT/SWING/IN/OUT

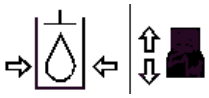


Right Track FORWARD/REVERSE

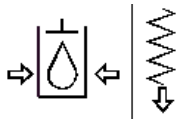
Gauge Panel



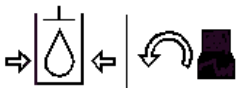
Air Pressure



Drill Pressure



Feed Pressure



Rotation Pressure

Auxiliary Controls

The auxiliary controls are mounted on the left side of the machine within the enclosure. These controls are not intended to be used for normal drilling or tramming, but are to be used in case of emergency or if a malfunction occurs in the electronic controls.

WARNING

DO NOT tram machine up or down slopes with auxiliary tram controls, as track brakes are non-functional.
DO NOT leave brake release valve (item 1, fig. 3-6a) in DOWN position.
When valve handle is in DOWN position, the track brake system is bypassed.
Brake release valve handle MUST BE in UP position for track brakes to hold.

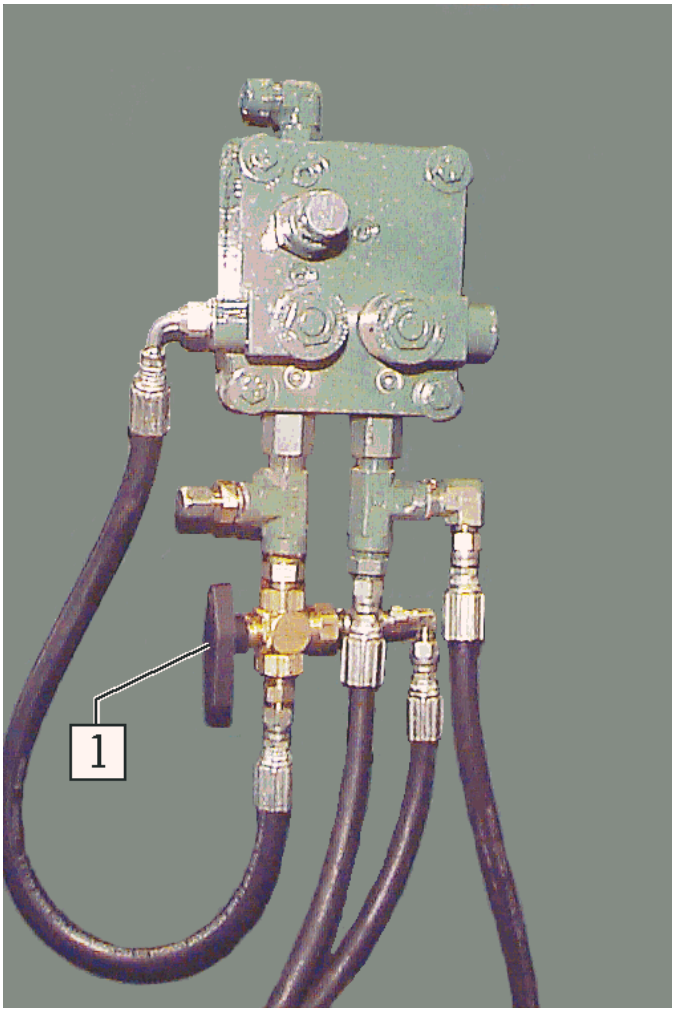


Fig. 3-6a Auxiliary 2 Manifold (located behind electrical panel)
1. Brake Release Valve (shown in UP position)
With arrow on valve handle pointing UP, brake system is activated.
With arrow on valve handle pointing DOWN, brake system is bypassed.

Vertical Indicator

Description

The angular display is connected to the sensor mounted on the feed. There are 10 display lights in each axis (Y+, Y-, X+ and X-). The maximum angle from plumb is + or - 6 degrees, thus each light represents 0.6 degrees. The lights remain lit if the feed is more than 6 degrees from plumb. The lights will go out successively as the feed approaches plumb in each direction.

Vertical Adjustment

1. Position feed vertical (plumb) and adjust the sensor to indicate plumb (no lights on).
2. Move feed to non-vertical position, then move back until all lights go out (plumb). Feed should be plumb within + or - 0.6 degrees.

Fig. 3-17 Vertical Indicator

Start-up Procedure (cab machine)

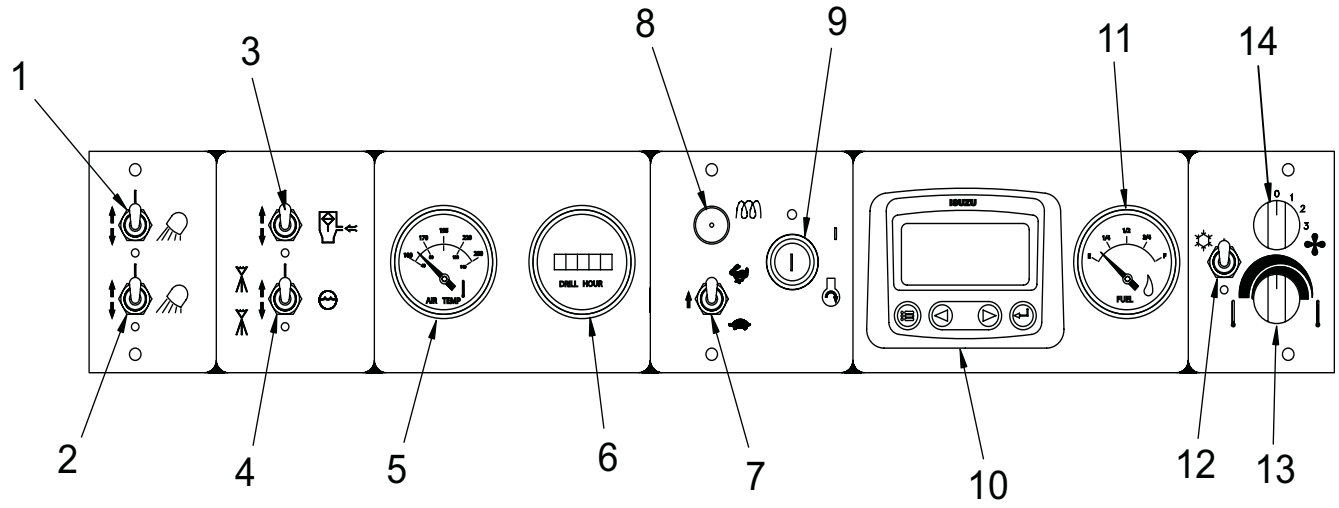


Fig. 4-13 Overhead Console (ref. 436599 rev. B)

1. Front Drill Lights ON/OFF Switch
2. Rear Drill Lights ON/OFF Switch
3. Dust Collector ON/OFF Switch
4. Water ON/OFF Switch
5. Air Temperature Gauge
6. Drill Hourmeter Gauge
7. LOW/HIGH Idle Switch
8. Glow Plug Indicator
9. Engine ON/OFF Switch
10. Engine ECM Monitor
11. Fuel Gauge
12. AC ON/OPF Switch
13. Cab Temperature Control
14. Fan Control Switch

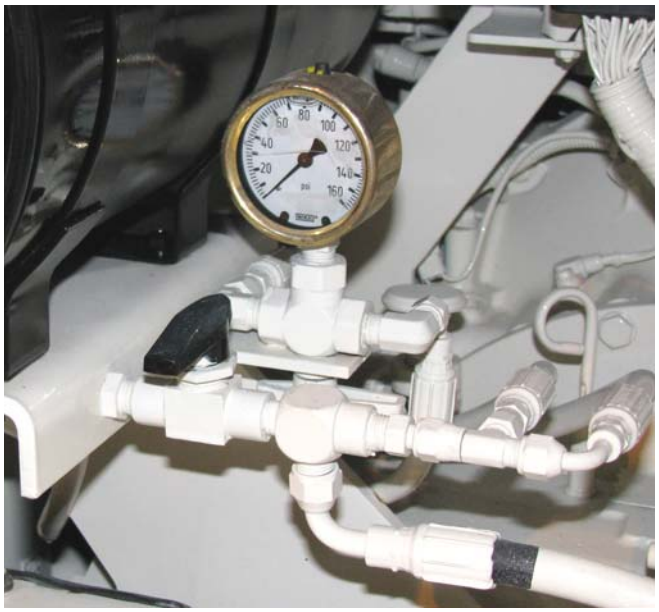
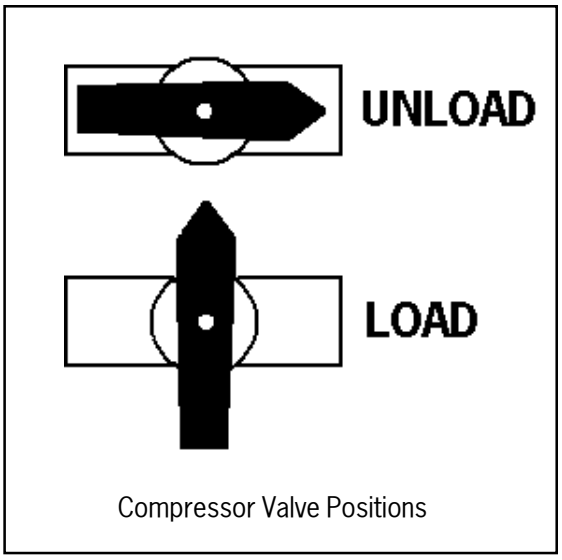


Fig. 4-14 Compressor Side of Machine–Compressor Load/Unload Valve



Compressor Valve Positions

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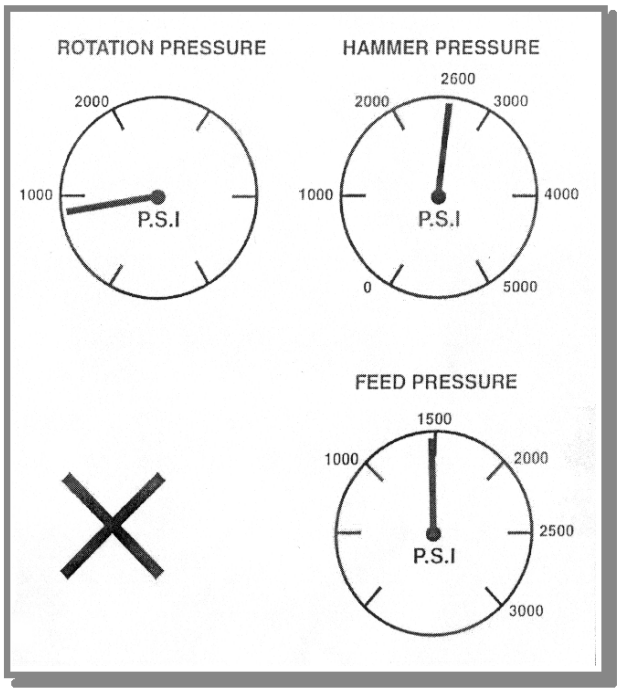
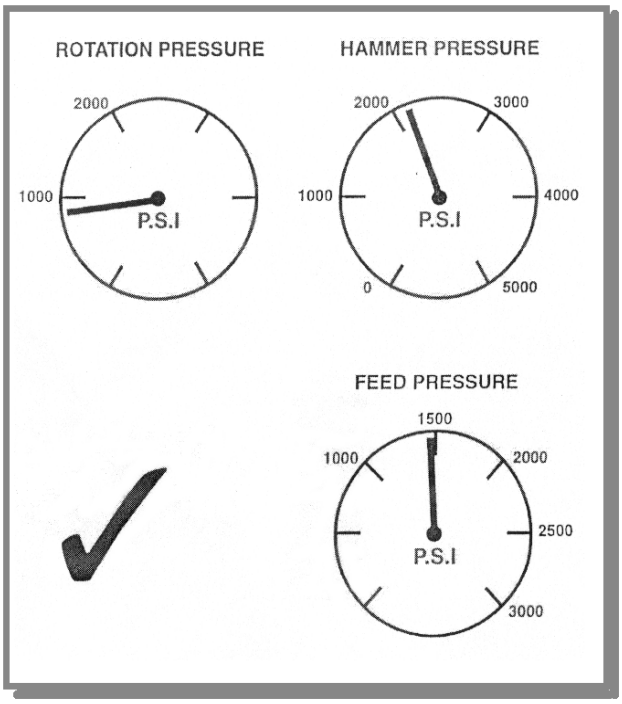
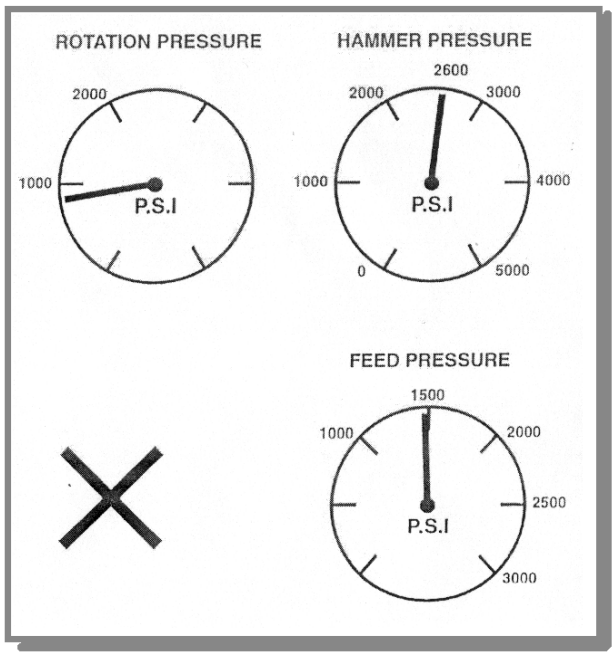
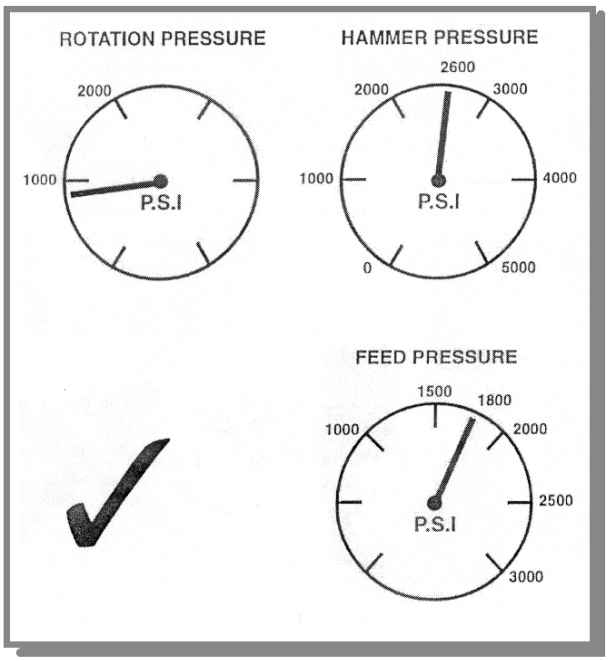
Drilling Practices





System Gauge Readings for Clay or Soft Ground.
Clay or soft ground may need lower feed pressure. To maintain the correct differential pressure between feed and hammer pressure, and to avoid shortened hammer seal and consumable life, the hammer pressure needs to lowered accordingly.





System Gauge Readings for Solid Rock.
To maximize penetration rate in solid rock, higher hammer pressure is required. To maintain the correct differential between hammer and feed pressures, and to prevent "under-feeding", the feed pressure needs to be raised accordingly.

Linear Rod Changer (cab machine)

Loading Drill Rod

WARNING
ALWAYS check for obstructions before moving feed or machine.
DO NOT allow any part of the machine to contact or come near electrical power lines.

CAUTION
Apply adequate lubricant to all couplings and drill rod threads before loading.

NOTE **Three people are required to perform this procedure; one operator and two people loading drill rod.**

1. Do not lay drill rod on ground. Put wood blocks under drill rod and keep threads clean.
2. Grease threads with coupling grease on upper end of drill rod and install coupling. Make sure each piece of drill rod has a coupling on the upper end.
3. Select DRILL position with switch (12). Select ROD CHANGER position with switch (13).
4. Push lower left button (7) on right joystick to UNLOCK rod rack carriage. Move right joystick FORWARD to move carriage to OUT position. Use feed lever (1) run drill to bottom of feed so drill shank is positioned just above centralizer. Be sure drill shank is aligned with centralizer when it is closed, if not adjust centralizer for correct alignment. Open centralizer jaws.
5. Tilt the feed to a suitable angle which will allow insertion of drill rod through dust collector pick-up pot and be able to align with the drill shank.
6. Open the centralizer (9) and position drill rod through dust collector pickup pot and hold in alignment with the shank.
7. Use forward (counterclockwise) rotation (11) to thread the shank into the coupling.
8. Raise the drill and rod so coupling is above the rod wrench and close the centralizer.
9. Move left joystick LEFT to swing wrench IN and clamp the drill rod. Move joystick slightly to right to open the wrench so it is not clamped on the drill rod. The wrench is now in the "guide" position for the drill rod. Continue to raise the drill up towards the top of the feed so the top coupling is above the upper rack.

Manual Drilling (cab machine)

1. Once hole is collared, move air switch (11, fig. 5-7) to fully OPEN position.
2. Place rotation control (13, fig. 5-7) to full FORWARD position.
3. Maintain proper feed pressure. If rod starts to bow, you are using too much feed pressure. If drill starts to bounce, or excessive heating in coupling is evident, you are not using enough. Use feed force control (15, fig. 5-7) to adjust feed pressure.

> **WARNING**
> **ALWAYS shut down machine and let air pressure bleed off before removing a plugged bit.**
> **NEVER hammer on drill bit or rod. Fragmentation may occur, causing serious injury.**

- If air and cuttings stop coming out of the hole, the bit is becoming plugged and must be pulled back immediately. When the blowing air is stopped by a plugged bit, the bit and drill rod can become stuck very quickly.
- Work the bit up and down with the drill and rotation ON until cuttings can be seen coming from the hole.
- If the bit cannot be cleared, the drill rod and bit must be pulled out of the hole. Try placing bit on solid rock or hard wood and place hammer lever (14, fig. 5-7) in DRILL mode to clear bit. If bit remains plugged, you will have to shut down the machine and let the air pressure bleed off and then remove bit and manually unclog bit and or drill rod.
- If the downward movement of the drill rod increases suddenly, this may mean that the bit has drilled into a void, crack or some soft material. Use feed lever (1, fig. 5-6) to slow down the forward travel of the bit.
- If the rotation begins to slow down or stops, the bit must be pulled back immediately. Reduce the feed speed to drill through broken ground.
- If bit keeps getting plugged or the rotation continues to jam, pull out the drill rod and start another hole a safe distance away.

NOTE **Never continue drilling if cuttings stop coming from the hole. Always pull back the bit. Do not restart drilling again until air is coming from the hole.**
Shut off dust collector if water is coming out of the hole. This will plug the dust collector filters. Turn dust collector on after water stops coming out of the hole. It may be necessary to remove the dust collector hose from the pickup pot to avoid clogging the hose with mud. Connect the hose when dry drilling resumes.

4. As drill rod coupling approaches centralizer, open centralizer (12, fig. 5-7) to allow the coupling to pass through.
5. When drilling cycle is complete, turn off feed, hammer, rotation and air. If required, add another piece of drill rod (described in detail, following) and continue drilling or raise drill up until bit clears the hole and move to next hole.

NOTE **If extra air is needed for drilling large diameter or deep holes, you may add an auxiliary air source. See "Auxiliary Air Option" in this section.**

Carousel Rod Changer (cab machine)

Adding Drill Rod (cont.)

NOTE **The rod changer switch (19) MUST be in the ROD CHANGER position for the right joystick to control the rod changer functions.**

8. Move the right joystick RIGHT to ensure jaws are opened fully. Push right joystick FORWARD to ensure jaws are in position to accept a rod.
9. Move the left joystick RIGHT and position first rod against jaws.
10. Move right joystick LEFT to clamp the rod. Then move joystick BACK and swing rod under drill.
11. Slowly start forward (counterclockwise) rotation (13), use feed lever (1) to slowly lower drill shank into the coupling. Continue rotation and feed until coupling is tight.
12. Slightly move right joystick RIGHT to loosen grip. The jaws are now used as a guide wrench to remove the drill rod clamped in the centralizer.
13. Lower the drill until the threads of the drill rod are in line with the automatic thread grease nozzle (fig. 5-8), activate coupling grease switch (9) to grease threads.
14. Use feed lever (1) to slowly lower drill rod into coupling. Use forward (counterclockwise) rotation (13) and feed until all couplings are tight.
15. Place centralizer switch (12) in OPEN position and resume drilling. When coupling clears the centralizer, close centralizer and swing carousel jaws out of the way by pushing the right joystick FOWARD.
16. Repeat the above steps for all additional rods to be added.

Section 6

Preventive Maintenance

Compressor Air Filter

The compressor air cleaner should be cleaned when the service indicator, indicates the filter is clogged. There is a service window on the indicator that will gradually turn red as the filter restriction increases to a maximum of 30" of H_20. After cleaning the filter, reset the service window to green by pressing the rubber diaphragm on top of the service indicator.

The compressor air filter service indicator is mounted on the rear of the air filter housing.

- Check filter indicator daily or every 10 hours.

CAUTION:
DO NOT clean the safety element. The safety element should be replaced once a year or sooner, if required.

To replace the compressor air cleaner filter

1. Shut down the machine.
2. Loosen the clamp ring and remove the filter cover. Remove the rubber dust cover inside the filter cover and empty out dust. Clean inside of filter cover with a clean cloth and replace rubber dust cover.
3. Unscrew the wing nut and carefully slide the primary element from the air cleaner housing to avoid dislodging dust from element when removing. Be careful not to knock the element against the side of the housing. Check condition of element, if you see a streak of dust on the clean air side, it is an indication of a poor seal. Check seal area of housing for foreign material or damage.
4. Clean the inside the of the housing with a clean cloth.
5. Install safety element (if removed) and primary element and secure with wing nuts. Be sure to install filter cover with arrow pointing up and secure with clamp.

Fig. 6-6 Compressor Air Filter

Lower Rod Rack Grease Points

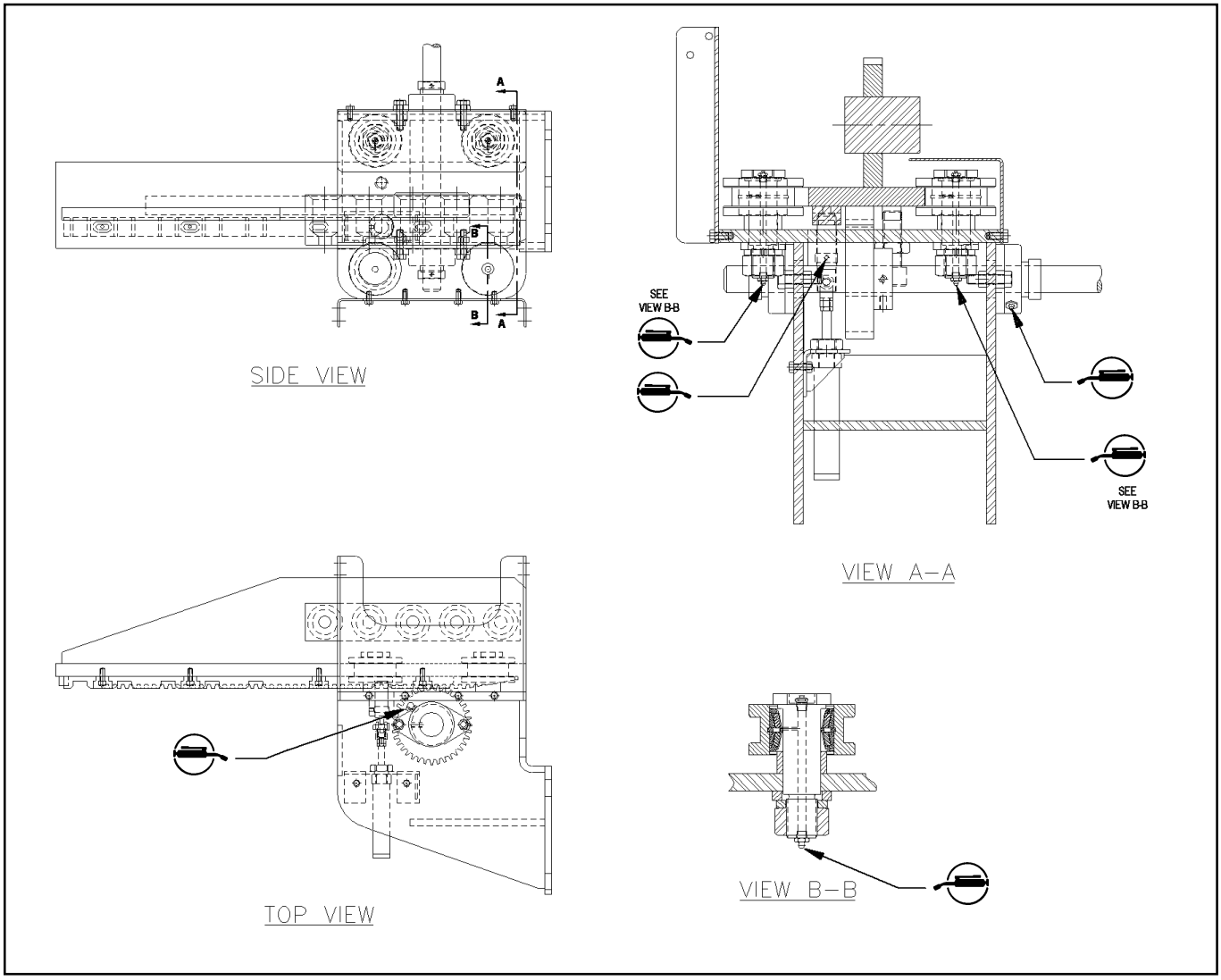


Fig. 6-17 Lower Rod Rack - 7 Grease Points

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