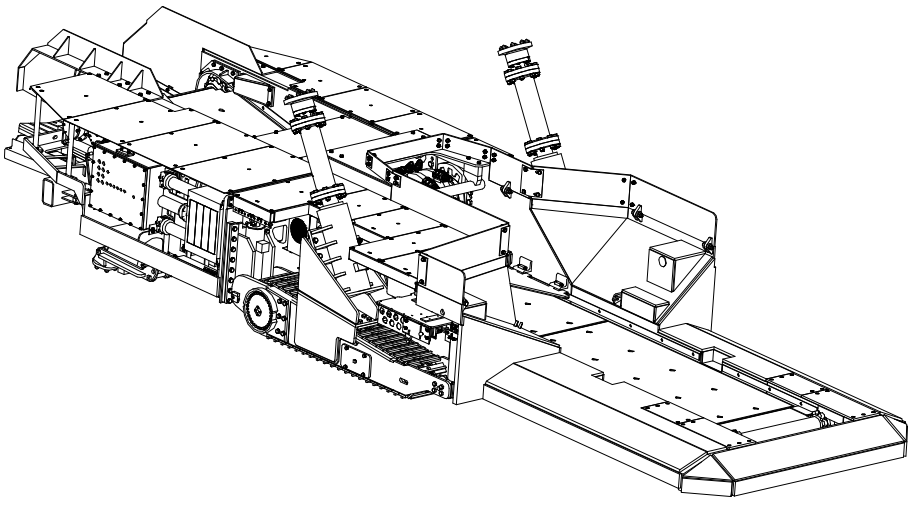
Operation Manual

Bucyrus - Feeder Breaker
Model - 7MFBHM-48DD

Doc. No.: A6474X280



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Characters and symbols used

The following characters and symbols are used for safety instructions and important information in the operating manual.

Try to memorize the symbols and their meanings.

DANGER!
Points in the text marked with this symbol draw your attention to immediately impending danger. Possible consequences are: very serious injury or even death.

WARNING!
These points contain information on dangerous situations. Possible consequences are: very serious injury or even death.

CAUTION!
This symbol draws attention to dangerous situations. Possible consequences are: light to moderately serious injuries and machine damage.

NOTICE!
Points in the text marked with this symbol draw attention to harmful situations. Possible consequences are: damage to the machine or damage in the immediate vicinity.

IMPORTANT!
Points in the text marked with this symbol contain useful tips and information intended to facilitate work for you. They do not warn about harmful or dangerous situations.

- Items in lists are marked with bullets.
  - Points in sub-lists are marked with a long dash at the start of the line.

☞ Points in text marked in this way describe individual operations. Follow these instructions step by step. They will help you carry out your work faster and more importantly, safer.

Storage and transport

Maintain the prescribed storage periods and observe the instructions for storage.

Do not store materials or parts in the travel way or in your working area.

Inform the persons involved about the intended transport route and the anticipated duration of the transport.

transport safety device

Ensure that the transport safety devices are correctly fitted.

Fix all moving parts with transport locks.

Never stand under unsupported parts or suspended loads.

means of attachment

Connect the lifting equipment only to the points of attachment provided for that purpose. Observe the different load limits of the attachment points. Also observe the instructions on the transport sheet.

Only use means of attachment which are in good condition and have been designed for the loads to be handled.

For round components use transport straps, only. Never use chains or steel cables for this purpose.

Do not damage the treated or polished surfaces of shafts, sealing surfaces, etc.

mobile handling equipment

When using mobile handling systems for transport make sure that the center of gravity is as low as possible.

Installation and start-up

inclined face

On inclined faces secure all component parts by chains, e.g. to the support.

environmental acceptability

When working with oils, greases and other chemical substances, observe the safety regulations applicable to the product.

Dispose of cleaning rags, etc. which have been soiled with oil, grease or other chemical substances in an environmentally safe manner.

inspection

Inspect the machine and have any malfunctioning, broken or missing parts corrected or replaced before use.

maintenance

Verify that all maintenance has been performed.

instruction and safety tags

Verify that all instruction and safety tags are in place and readable. These are as important as any other equipment on the machine.

operator's area

Clean any foreign material from the operator's area.

Overview of safety instructions

WARNING!
The tilt and lift hydraulic cylinders have counterbalance cartridges which serve as load holding valves. Do not replace these cylinders with different style cylinders or the machine may fall. The machine could be damaged or you or other personnel could be seriously injured or killed by the falling machine.
The machine is equipped with lock pins that should be installed when the unit is not being moved. Pin are located near the lift cylinders on both sides of the machine.

WARNING!
This section is intended only to familiarize the user with the major mechanical assemblies of the feeder breaker. All mechanical maintenance should be performed only by a qualified technician with the knowledge of the function of the assemblies involved.

IMPORTANT!
Weld on split sprockets are available for replacement/emergency rebuilds. See the Bucyrus America, Inc. parts manual for your machine or contact your Bucyrus America, Inc. service engineer.

NOTICE!
In the event that a sudden jam occurs which could damage the power unit, the breaker is protected by a shear pin.

WARNING!
Before performing maintenance on the machine, the circuit breaker must be in the "OFF" position and the power should be disconnected at the main power source. Follow all Federal and mine safety regulations for lockout/tagout procedures. Electrical shock and accidental machine movement can cause serious injuries or even death to you or the maintenance person.

WARNING!
Do not move any hydraulic control lever unless you are certain that everyone is completely clear of any machine movement. Accidental machine movement can cause serious injuries or even death to you or the maintenance person.

WARNING!
Never disconnect a hydraulic hose if the circuit is pressurized or if there is a load on the circuit. If a hose is disconnected while the circuit is pressurized or a load is on the circuit, the load may fall, causing damage to the machine or serious injury or death to you or other workers. Do not rely on counterbalance valves to hold the load. Always block or place a mechanical lock on the load. Follow all Federal and mine safety standards for blocking the load.

WARNING!
You could be seriously injured or even killed by falling loads. Observe the safe working load limits of lifting or blocking devices and keep a safe distance from suspended loads.

Storage and transport

This chapter contains important information on the correct storage and transport of the feeder breaker. Observance of the instructions and tips will increase the service life and availability of the machine. You will also be able to carry out the transport work quicker and more safely. Careful attention to the points in this chapter will help you to simplify your day-to-day work.

Storage

corrosion protection

Components coated with temporary corrosion inhibitor are protected for approximately six months.

Before delivery, the hydraulic functions are tested and the hydraulic pressures are preset to OEM specifications.

Storage of the machine and spare parts

no direct exposure to sunlight

Store the equipment indoors or cover with a tarpaulin to protect against direct exposure to sunlight.

dirt and moisture

Protect the equipment and all spare parts stored outdoors against moisture and dirt, e.g. using tarpaulins.

Protect the hydraulic plug connectors and the connectors of the electrical cables with the caps and plugs supplied.

short-term storage

During short-term storage (approximately 4 weeks) of equipment outdoors, but at temperatures above freezing, electrical components need not be removed. Such components must be particularly protected against excessive temperatures, dirt and moisture.

long-term storage

If the equipment is to be stored more than six months, the following lubrication and corrosion inhibiting procedures must be followed:

- If the cylinder rods are exposed, the rods must be coated with a corrosion inhibiting fluid or grease.
- Remove the breather on the hydraulic oil tank and plug. Completely fill the tank with oil.
- Remove breathers from the gear cases and plug. Completely fill all gear cases.
- Lubricate all grease points (see the Maintenance section in Chapter 5 of this manual).
- Coat the conveyor chain and the breaker drive chain with a heavy coat of rust inhibitor fluid or grease.

Fig. 7: Safety features on the feeder breaker

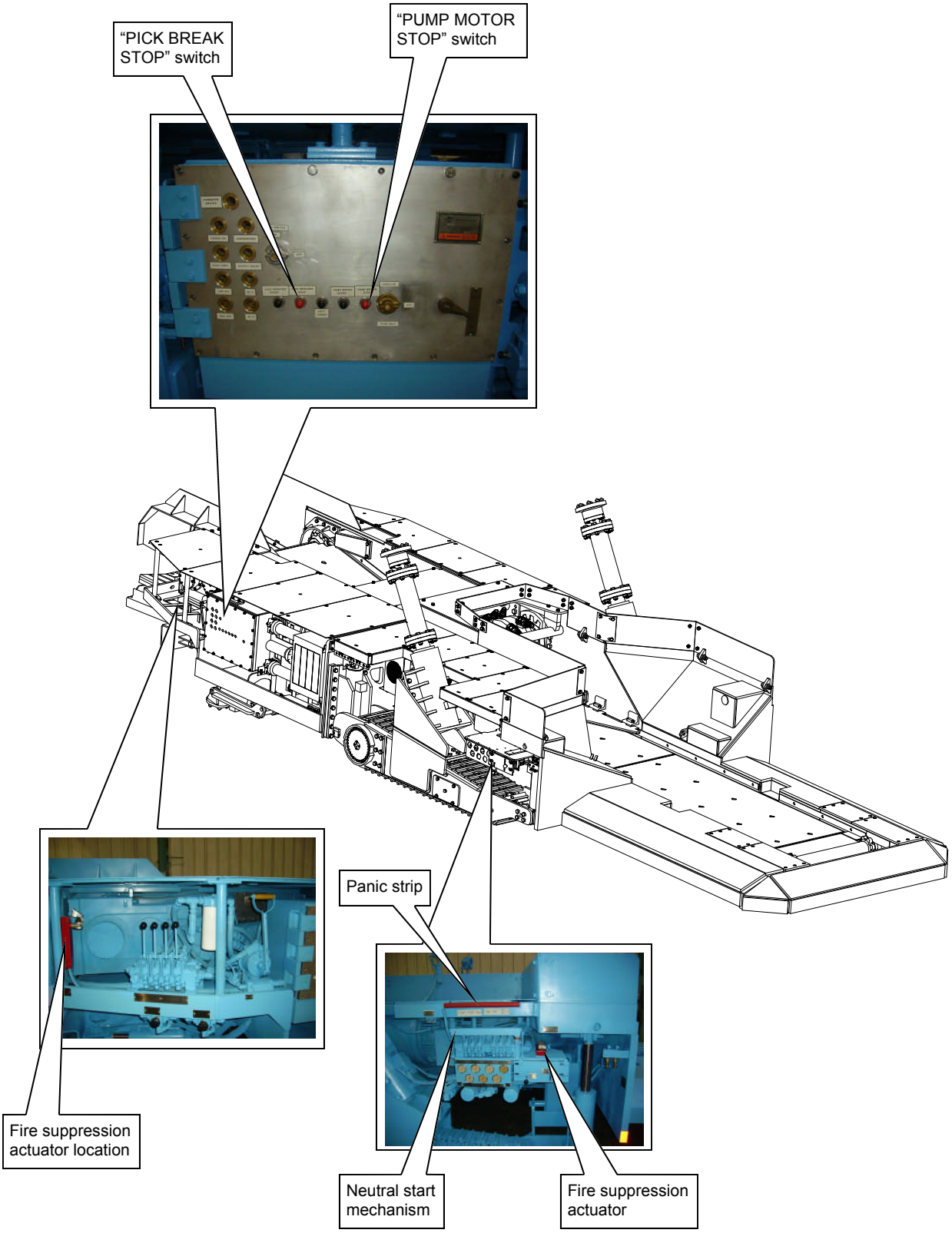
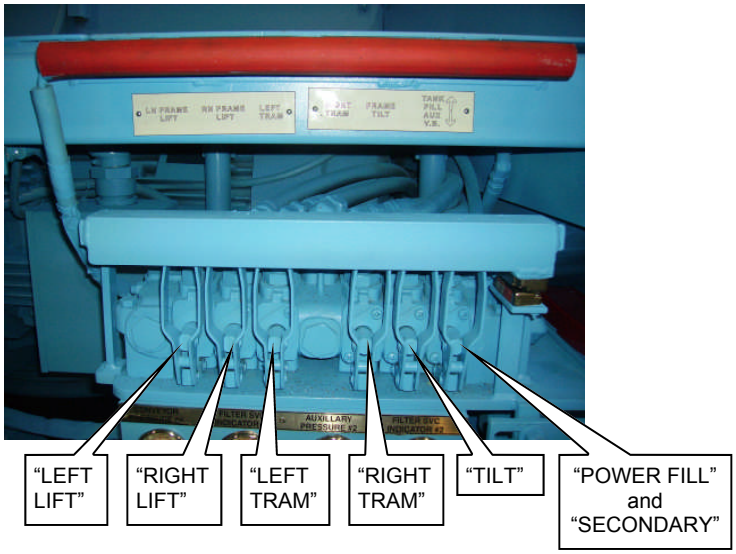


Fig. 11: Primary valve bank



two position conveyor direction and speed control valve

The two position conveyor direction and speed control valve (Fig. 12) controls the feeder breaker conveyor chain direction and speed. Push the control lever down to run the conveyor in the direction of the discharge end and pull the control lever up to run the conveyor in the direction of the receiving end. Conveyor chain speed is controlled by the distance that the control handle is pushed.

tram/conveyor mode control valve

The tram/conveyor mode control valve (Fig. 12) allows the operator to change the machine from tram to conveyor mode. Push the control handle down for conveyor mode and pull the handle up for tram mode.

panic strip

The panic strip (Fig. 12) is used to break the control circuit in emergency situations. Striking the panic strip with a small amount of force will actuate the panic strip: all machine functions are shutdown immediately.

fire suppression

The machine fire suppression (remote) actuators (Fig. 12) is used to activate the fire suppression system on the machine. The fire suppression system is pneumatically actuated and extinguishes with dry chemicals. To actuate the system, pull the safety pin and strike downward on the plunger. Immediately after the plunger is struck, dry chemical will be dispensed throughout the machine. The fire suppression system must be completely recharged with dry chemicals and expellants after it has been actuated.

WARNING!
If the fire suppression actuator is actuated, the system must be completely recharged with dry chemicals and expellants.

“REGULAR” mode starting procedure

After reading the previous descriptions and locating each control, the operator is ready to operate the feeder breaker. An experienced operator should monitor a new operator’s indoctrination to the starting procedure.

WARNING!
The machine should not be started if it’s core temperature is below 30° Fahrenheit. If the machine is started at extremely low temperatures pump and pump motor failure could occur.

IMPORTANT!
Before start-up, check that daily maintenance has been performed on the machine.

- ☞ Operate all primary and secondary valve bank control levers to ensure that they are free and in neutral position.
- ☞ Position the primary valve bank handle lock guard over the valve handles so that they cannot be operated. Make sure the magnetic contactors are fully seated and are in direct contact.

IMPORTANT!
The machine will not start unless all valve control levers on the primary valve bank are in neutral position and the guard is fully closed, engaging the magnetic switch.

- ☞ Check conveyor for any foreign material or objects.
- ☞ Check that all other personnel are within a safe distance of the machine.

WARNING!
Before start-up, check the conveyor for any foreign material or objects and that all other personnel are within a safe distance of the machine.

- ☞ Set main circuit breaker located on the door of the starter enclosure by first moving the circuit breaker lever to the “RESET” position and then to the “ON” position.
- ☞ Turn the “REGULAR/OFF/TRAM ONLY” selector switch located on the cover of starter enclosure to the “REGULAR” position.
- ☞ Engage the “PICK BREAK START” pushbutton located on the cover of the starter enclosure.
- ☞ The contactor M1 will energize and the pick break motor will start.
- ☞ Engage the “PUMP MOTOR START” pushbutton located on the cover of the starter enclosure.
- ☞ The contactor M2 will energize and the pump motor will start.

“IS#1” and “CR1” “IS#1” is an intrinsically safe relay that works in conjunction with the high temperature relay “CR1”. If the hydraulic oil temperature exceeds 150°F, the high temperature switch will shut the pump motor down and the “HI TEMP” indicator light will be illuminated.

“IS#2” and “CR2” “IS#2” is an intrinsically safe relay that works in conjunction with the low oil relay “CR2”. If the oil in the hydraulic tank drops below the bottom of the sight glass on the side of the tank, the low oil switch will shut the pump motor down and the “LOW OIL” light will be illuminated.

“IS#3” and “CR3” “IS#3” is an intrinsically safe relay that works in conjunction with the sequence switch relay “CR3”. If the outby belt stops, the sequence switch will shutdown the pump motor and the “SEQ SW” light will be illuminated.

“IS#4” and “CR4” “IS#4” is an intrinsically safe relay that works in conjunction with the pressure switch relay “CR4”. If the hydraulic pressure exceeds 4,800 psi, the pressure switch will shutdown the pump motor and the “PRESSURE SWITCH” light will be illuminated.

“SR” “SR” is the safety relay. If the panic bar is struck, both the pump motor and the pick break motor will be shutdown and the “SAFETY RELAY” light will be illuminated.

“CR5” “CR5” is the regular mode relay. When the mode switch on the front of the starter enclosure is in the “REGULAR” position, both the pump motor and the pick break motor can be energized.

“CR6” “CR6” is the tram only mode relay. When the mode switch on the front of the starter enclosure is in the “TRAM ONLY” position, only the pump motor can be energized. The pick break motor will not run in “TRAM ONLY” mode.

“CB-2” “CB-2” is the circuit breaker on the control circuit. If the control circuit is overloaded, or if the circuit becomes grounded, “CB2” will trip. To reset the circuit breaker, press the pushbutton on the front of the starter enclosure.

“TR1” “TR1” is the breaker shaft underspeed timer. If the breaker shaft slows down below the normal speed calibrated during initial machine setup for longer than three (3) seconds, the underspeed sensor will shutdown the pick break motor.

“TR2” “TR2” is the override timer for the breaker shaft underspeed timer. During startup, the override timer will allow the breaker shaft to run under speed for approximately seven (7) seconds. This override is active during startup only.

“TR3” “TR3” is the conveyor run time timer. The timer is activated when the pump motor pushbutton, or the start button on the infrared remote, is pushed. The conveyor will run for approximately 2 1/2 minutes. To keep the conveyor running, the operator must push the start button (on the starter enclosure cover or the infrared remote) before the 2 1/2 minutes expires. If the timer is not reset within 2 1/2 minutes, the pump motor will shutdown.

Mechanical assemblies

The following pages contain a brief description of the major mechanical assemblies that are on the feeder breaker.

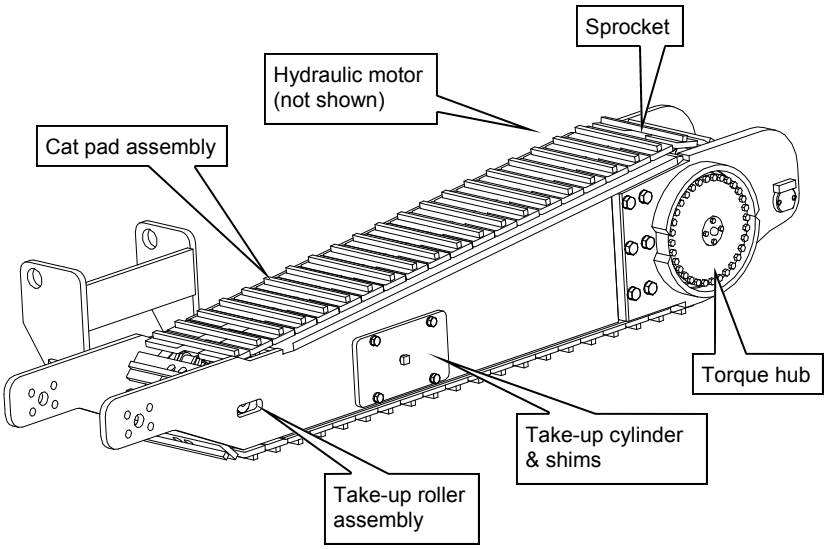
WARNING!
This section is intended only to familiarize the user with the major mechanical assemblies of the feeder breaker. All mechanical maintenance should be performed only by a qualified technician with the knowledge of the function of the assemblies involved.

Crawler assembly (s)

The feeder breaker is trammed by two (2) hydraulically driven crawlers (Fig. 32); one is located on each side of the machine. The complete drive assemblies are housed in crawler frames which enclose, guide and support the tram components. Each tram drive is independently controlled by the operator for moving the machine forward, backward and for making turns.

The crawlers on the machine are hydraulic driven through torque hub gear reducers. Attached to the torque hub is a single sprocket that engages the crawler tracks directly. The crawler track loops around the take-up roller assembly located on the opposite end of the crawler assembly. The idler assembly, along with a grease take-up is used to adjust the tension on the crawler tracks. (See Maintenance section in this chapter for Crawler track adjustment procedure.)

Fig. 32: Crawler assembly main components



NOTICE!
All hydraulic filter elements should be changed after one week of the initial start-up of machine or pre-mature wear of hydraulic components could occur.

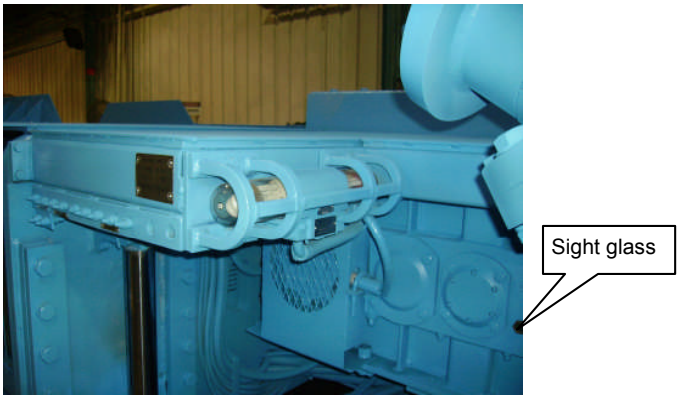
Table 2: Lubrication and maintenance schedule

Item	Description	Places	Lubricant	Specification
	Every 8 hours of operation			
1	Head shaft bearings	2		Spec. 100-3
2	Head shaft bearing seals	2		
3	Breaker bearings	2		Spec. 100-3
4	Tail shaft and slide tube bearings	4		Spec. 100-3
5	Hydraulic oil level (check)	1		Spec. 100-1
6	Charge filter (check)	1		
7	Pressure filter (auxiliary circuit) (check)	2		
8	Return filter (check)	1		
9	Pressure filter (hydrostatic) (check)	1		
10	Bits (breaker)	Inspect		
	Weekly			
11	Crawler track take-up bearings	2		Spec. 100-3
12	Conveyor chain tension	1		
13	Fasteners (nuts, bolts and screws)	Inspect		
14	Electrical cables, conduits and glands	Inspect		
15	Hydraulic hoses and connections	Inspect		
16	Tram reducer (s) (check oil level)	2		Spec. 100-2 or Spec. 100-13
17	Breaker reducer (check)	1	Century 220	
18	Dust system strainer (check)	1		
19	Charge filter (change)	1		
20	Tailpiece bearing	2		Spec. 100-3
	Every 2 weeks			
21	Pressure filter (auxiliary circuit) (change)	2		
22	Return filter (change)	1		
23	Pressure filter (hydrostatic) (change)	1		
	Monthly			
24	Power fill filter (check/change as required)	1		
25	Conveyor tilt cylinders (rod and base)	4		Spec. 100-3
26	Conveyor lift cylinders (rod and base)	4		Spec. 100-3
27	Crawler anchor pin (s)	2		Spec. 100-3
28	Foot cylinder	4		Spec. 100-3
	Every 3 months			
29	Breaker electric motor	2		Spec. 100-3
30	Conveyor electric motor	2		Spec. 100-3
31	Breaker reducer	2		Spec. 100-3
32	Torque limiter (check clutch wear)	1		
	First 500 hours then every 2500 hours			
33	**Breaker reducer (Change)	1	Century 220	
	Every 6 months			
34	Hydraulic oil tank (change)	1		Spec. 100-1
35	Tram reducer (change oil)	2		Spec. 100-2 or Spec. 100-13

breaker reducer

Check oil level in the breaker drive reducer (Fig. 51). Oil level should be maintained inside the sight glass on the side of the reducer when it is in operation. If the reducer does not have a sight glass, a pipe plug will be installed in the side of the reducer slightly below the input shaft center line. This is the level that the fluid should be maintained at. The oil should be changed after the first 500 hours of operation. Use Century 220 lubricant.

Fig. 51: Breaker reducer

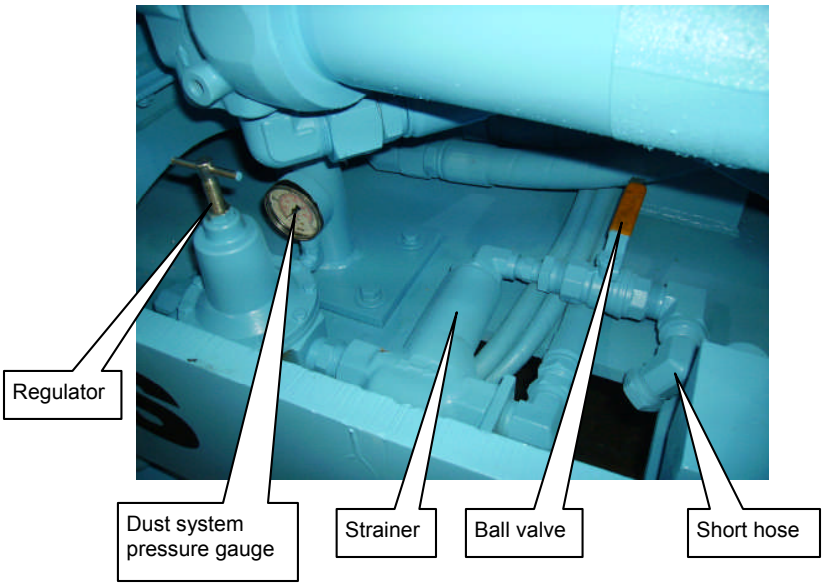


dust system strainer

Clean the strainer mounted inside the dust suppression system. Open ball valve (Fig. 52) and allow water to flow from the short attached hose. The flowing water will flush out the filter strainer.

IMPORTANT!
A short hose is attached to ball valve in dust suppression system to allow water to be directed away from other machine components.

Fig. 52: Dust system



Inspection of the feeder breaker

CAUTION!
During inspection, report any damage, missing parts or other faults to your immediate supervisor.

Prior to each shift the following points should be inspected:

- ☞ Clean and remove any foreign material from the operator's station.
- ☞ Inspect all electrical cables, conduits, hydraulic hoses, fittings and warning devices for signs of wear or damage.
- ☞ Visually inspect the condition and readability of all tags, labels and reflectors.
- ☞ Check the "STOP" button (s) for correct operation.
- ☞ Check the hydraulic oil level in the feeder breaker by looking at the sight glass. The oil level should be kept at the level of the top sight glass.
- ☞ Check oil level in the crawler reducers.
- ☞ Inspect the condition of all electrical and hydraulic components.
- ☞ Check for proper conveyor chain tensioning.
- ☞ Check for proper crawler chain tensioning.
- ☞ Lubricate per the lubrication schedule.
- ☞ Check power input cable to power source insuring that the voltage and breaker settings are correct.
- ☞ Check that the cable handling device is intact and oriented correctly.
- ☞ Check that all covers are installed and secure.
- ☞ Check the tightness of all connecting elements.
- ☞ Check that the neutral start mechanism is installed on the primary valve bank.

Underspeed sensor calibration

To calibrate the underspeed sensor (Fig. 70), proceed as follows:

- ☞ Start the feeder breaker (see Startup procedure in this chapter).
- ☞ Start the conveyor belt and run at the slowest normal operating speed expected.

IMPORTANT!
Calibration should be performed with the conveyor belt running the slowest normal operating speed expected to avoid nuisance shutdowns.

- ☞ Turn Speed 1 control switch left (ccw) until it stops (approximately 7 o'clock).
- ☞ Hold test/set switch (SW1) in the set position to engage relay (RY1).
- ☞ Turn Speed 1 control switch right (cw) slowly until critical speed LED (LED 3) stays on continuously.

IMPORTANT!
For all speed adjustments, the critical speed LED (LED 3) must stay on continuously.

- ☞ Continue turning Speed 1 control right (cw) until margin LED (LED 4) begins to blink.
  - ☞ The control relay will drop out with the above at a 15% slow down.
  - ☞ For a 20% margin, adjust the Speed 1 control so that the margin light (LED 4) is continuously on.
  - ☞ For a 10% margin, turn the Speed 1 control left (ccw) until the margin light (LED 4) turns off.
- ☞ After the relay status LED is illuminated, return the test/set switch to the run position.
- ☞ A momentary test position is provided to simulate the loss of sensor signal, which releases the relay.

To adjust relief cartridge 1:

☞ Two people are required to adjust the pressure setting. One person must operate the tilt cylinder valve handle on the primary valve bank, relay pressure gauge readings to the mechanic making the adjustment, and be ready to shutdown the machine via the panic bar, if necessary. The second person will perform the actual pressure adjustment procedure at the dual relief manifold.

WARNING!
Two people are required to adjust the pressure setting. One person must operate the tilt cylinder valve handle and remain at the panic bar at all times during the adjustment procedure. Failure to do so may result in serious injury or death.

☞ Measure the setting of cartridge 1 by fully extending or retracting (deadheading) the tilt cylinders, then reading the pressure on “AUXILIARY PRESSURE #3” gauge while the cylinders are deadheaded. The reading should be 2,250 psi.

WARNING!
The feeder will move during this step and it must be ensured that all standard safety procedures are adhered to in order to avoid personnel injury and equipment damage. Do not operate the tram function during this adjustment procedure as it is unsafe. Failure to adhere to this warning may result in serious injury or death.

☞ Loosen the jam nut on the relief by turning out (ccw).

☞ Turn the hex key adjustment in (cw) to increase the setting or out (ccw) to decrease the setting.

☞ Once the desired setting is obtained, tighten the jam nut by turning in (cw) while hold the hex key in place.

Head shaft sprockets

The head shaft sprocket transmits the torque of the hydraulic motor to the conveyor chain assembly. It is part of the head shaft assembly. As soon as the sprockets are worn they must be replaced. Due to the high abrasion forces the chain sprockets are subject to a very high level of wear.

How to remove the head shaft sprockets

To remove the sprockets from the head shaft assembly proceed as follows (Fig. 79):

- ☞ Remove the head shaft assembly from the feeder (see Head shaft removal in this chapter).
- ☞ Remove the two (2) bearings from the head shaft.
- ☞ Remove the two (2) set screws from each sprocket. It may be necessary to apply heat because the screw are reained witth Loctite.
- ☞ Slide both sprockets from the drive shaft.
- ☞ Remove old keys.
- ☞ Inspect all components of the drive shaft for wear and damage. See parts manual for replacement parts list.

How to install the head shaft sprockets

To install the sprockets on the head shaft proceed as follows (Fig. 79):

- ☞ Thoroughly clean and lubricate the drive shaft with Spec. 100-3 grease.
- ☞ Insert one of the keys into the shaft keyway and slide first sprocket onto shaft (see Fig. 80 for location). It is customer preference on whether to weld the sprocket in place or not. See Fig. 79 for weld spcifications. Apply Loctite 242 (blue) to screws and torque to 100 ft-lbs.
- ☞ Insert the other key into the shaft keyway and slide second sprocket onto shaft (see Fig. 79 for location). It is customer preference on whether to weld the sprocket in place or not. See Fig. 80 for weld spcifications. Apply Loctite 242 (blue) to screws and torque to 100 ft-lbs.
- ☞ Install bearings on shaft (ss Bearing installation procedure in this chapter). Note that the bearing housing must be installed on shaft so that the Taconite seal is facing the middle of the shaft. One of the bearings must have the internal spacer remvoed to allow the shaft to float and not be in a bind.
- ☞ Install the drive shaft assembly in the feeder breaker. (See Drive shaft installation in this chapter.)

- ☞ Separate conveyor chain by removing spiral pins and connecting links in one section of the chain.
- ☞ Connect a pulling device (e.g. winch or lifting tackle with adequate load limit), or the new conveyor chain, to either end of the old conveyor chain and slowly pull the old conveyor chain completely out of the machine.

WARNING!
When using a pulling device (e.g. winch or lifting tackle with adequate load limit) for pulling the conveyor chain, the connection could fracture under the load. You could be seriously injured or killed by the recoiling chain or cable. Use only approved lifting equipment for connecting pulling devices to the conveyor chain.

How to install the conveyor chain assembly

To install the conveyor chain assembly proceed as follows:

- ☞ Check to ensure that the conveyor tail shaft is completely retracted. If not retracted, see Conveyor chain adjustment in this chapter.
- ☞ If the old conveyor chain was nut used to install the new conveyor chain, then run a cable or pull rope with an adequate load limit through the bottom conveyor pan and connect to the conveyor chain.
- ☞ Connect an additional pulling or lifting device (e.g. winch or lifting tackle with adequate load limit) to the other end of the cable or pull rope and slowly pull the new conveyor chain completely through the bottom conveyor pan.

IMPORTANT!
If old conveyor chain is still on machine, installation can be facilitated by connecting the new conveyor chain to the old conveyor chain via the chain connectors and pulling it through the bottom conveyor pan.

- ☞ Fold conveyor chain back over the tail shaft and drive shaft and slowly pull the chain along the conveyor ensuring that the chain is under the chain hold downs.
- ☞ Ensure that the chain is properly meshed with the sprockets on the head and tail shafts.
- ☞ Connect conveyor chain (see How to assemble the conveyor chain sections in this chapter for proper connection).
- ☞ Adjust tension on the conveyor chain (see Conveyor chain adjustment procedure in this chapter.
- ☞ With machine running, visually inspect tail shaft to ensure that the conveyor chain is properly engaged with the tail shaft sprockets.

- Step 1: 25 ft-lb
- Step 2: 50 ft-lb
- Step 3: 70 ft-lb

☞ If using a motor adapter plate that does not have the keepers already installed, weld four (4) keepers against the motor flanges to prevent motor movement.

☞ Clean all dirt and debris from mounting area of crawler frame.

☞ Attach an appropriate lifting device to the torque hub and slide complete assembly into crawler frame.

☞ Secure torque hub assembly to frame with the twelve (12) bolts and lock washers. Apply Loctite 242 (blue) to bolts and torque incrementally and evenly in a crossing pattern as follows.

- Step 1: 50 ft-lb
- Step 2: 140 ft-lb
- Step 3: 280 ft-lb
- Step 4: 420 ft-lb

☞ Connect hydraulic hoses to drive motor.

☞ Install and connect crawler and track pad assembly (see How to install the crawler track pad assembly in this chapter).

☞ Install the removable side plate and secure with the six (6) bolts and lock washers. Torque incrementally as follows.

- Step 1: 300 ft-lb
- Step 2: 600 ft-lb
- Step 3: 905 ft-lb

☞ Apply grease to anchor pin and slide anchor pin through crawler frame and tilt cylinder. Secure pin with slotted nut, washer and roll pin.

☞ Purge hydraulic system of air.

☞ Adjust crawler track pad tension (see How to adjust crawler track pad tension in this chapter).

Conveyor power unit

The conveyor power unit (Fig. 92) has been assembled as a unit and can be removed and installed as a unit.

The power unit consists of the following main components:

- electric motor (125 hp)
- connecting tube
- coupling
- hydrostatic pump
- piggyback gear pump

Fig. 92: Conveyor power unit main components

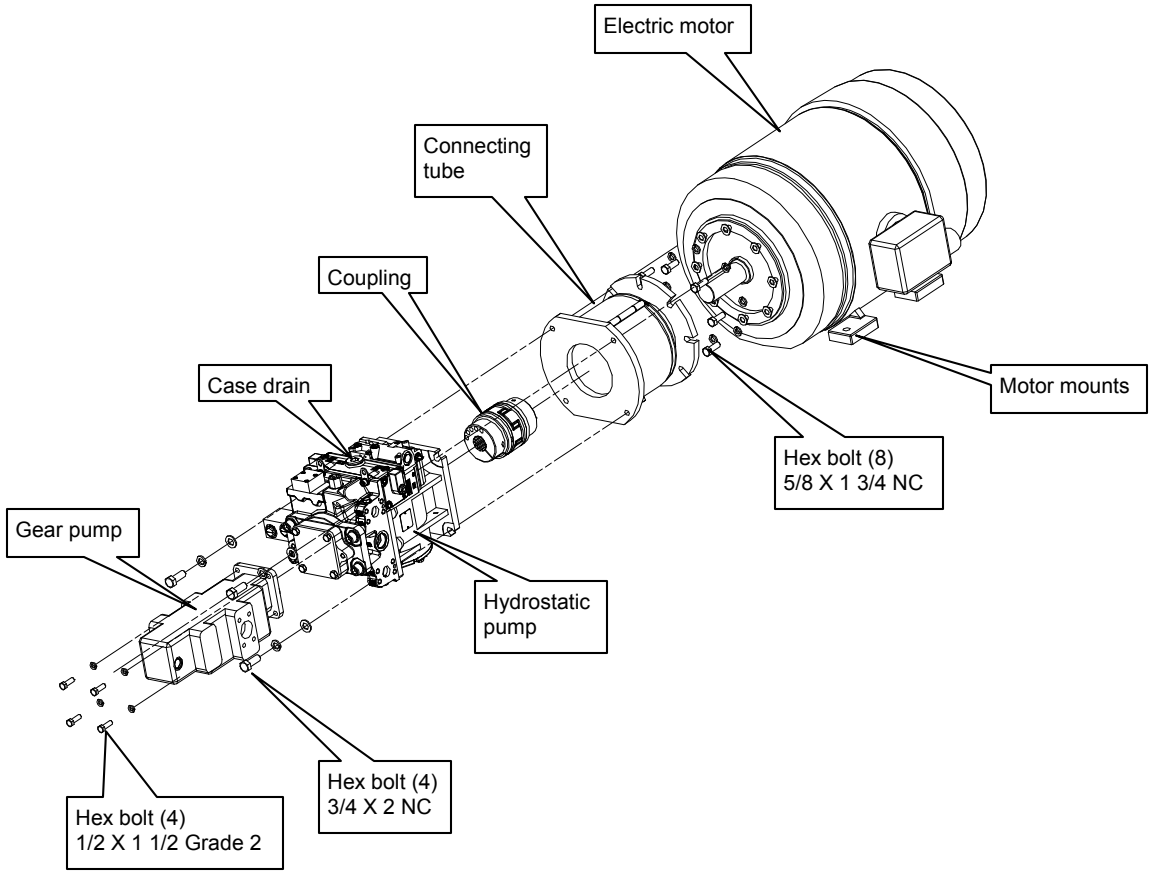
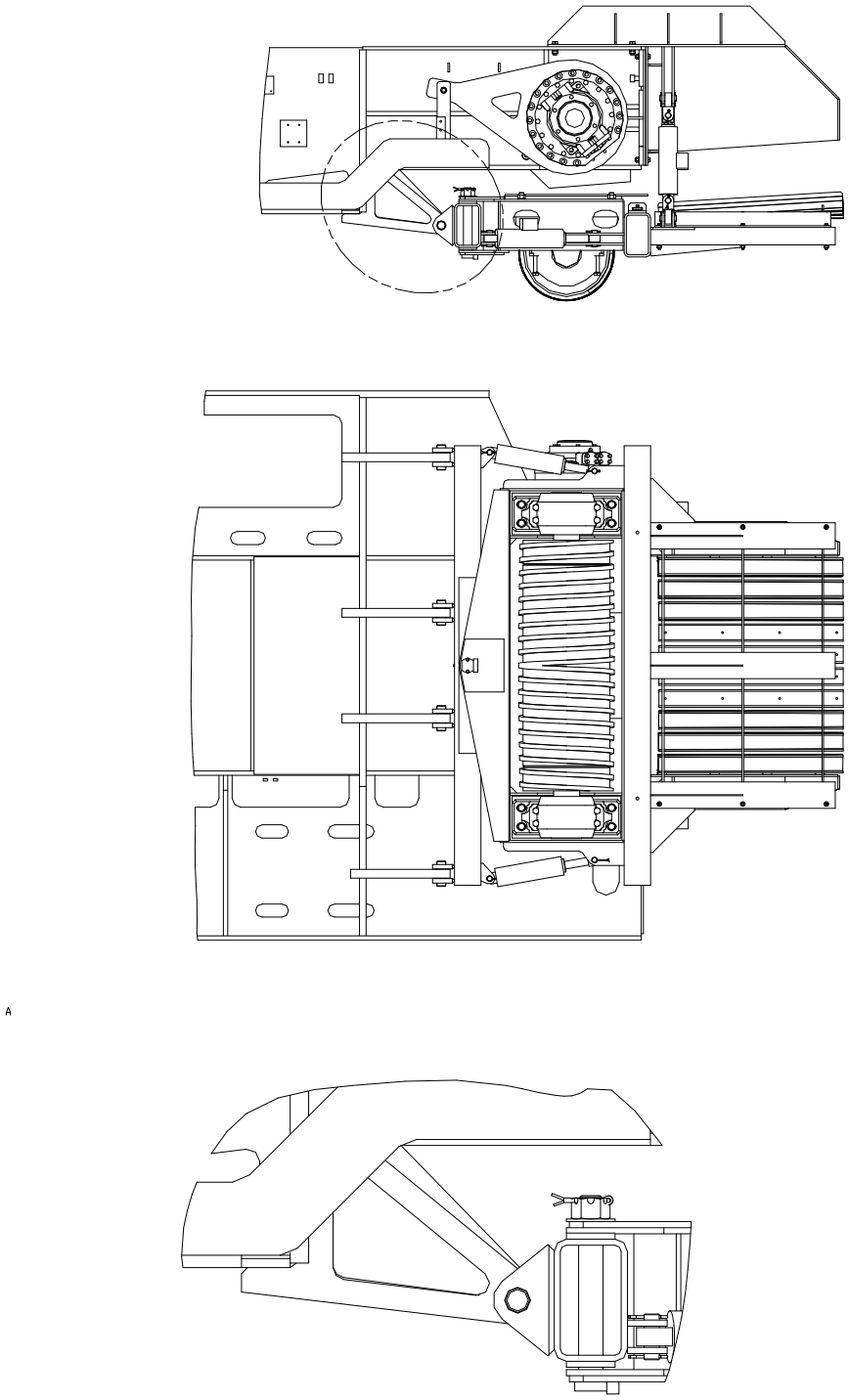


Fig. 95: Tailpiece installation (continued)



Detail A

Tailpiece tilt cylinder removal and installation

To remove a tailpiece tilt cylinder (reference Fig. 101):

- ☞ Shutdown the feeder breaker (see Shutdown procedure in this chapter).
- ☞ Turn the circuit breaker to the “OFF” position and disconnect and lock and tag out the main power source. Follow all standard Federal and mine practices for locking/tagging out power sources.

WARNING!
Before performing maintenance on the machine, the circuit breaker should be in the “OFF” position and power should be locked and tagged out at the main power source. Electrical shock or accidental machine movement can cause serious injury or death to personnel.

- ☞ Disconnect, tag, and cap the hydraulic hoses going to the cylinder.

WARNING!
Never disconnect a hydraulic hose if the circuit is pressurized or if there is a load on the circuit. If a hose is disconnected while the circuit is pressurized or a load is on it, the load will fall, causing damage to the machine or serious injury or death to personnel.

- ☞ Attach an appropriate lifting device to the cylinder.

WARNING!
Serious injury or death can result from falling loads. Observe the safe working load limits of lifting devices and keep a safe distance from suspended loads.

- ☞ Pull cotter pin out of the pin through the cylinder eye.
- ☞ Pull cotter pin out of the pin through the rod eye.

To install a tailpiece tilt cylinder (reference Fig. 101):

- ☞ Attach an appropriate lifting device to the cylinder.

WARNING!
Serious injury or death can result from falling loads. Observe the safe working load limits of lifting devices and keep a safe distance from suspended loads.

- ☞ Align the cylinder in the mounting clevises on the machine.
- ☞ Install the pin through the cylinder eye and secure with a cotter pin.
- ☞ Install the pin through the rod eye and secure with a cotter pin.

Tightening torques

IMPORTANT!
Due to the application of fasteners being subject to great stresses and heavy or extreme vibration, it is imperative that all bolts be applied with an adequate amount of torque. For this reason this list of recommended torque settings for different types and sizes of fasteners used has been compiled.
The tightening torques stated in the spare parts lists have to be observed, as well, for installation and maintenance.

Set screws

Table 4: Set screws (Socket standard steel)

Nominal diameter	Recommended torque setting
#6	9 in-lbs
#8	16 in-lbs
#10	30 in-lbs
¼"	6 ft-lbs
5/16"	12 ft-lbs
3/8"	18 ft-lbs
7/16"	29 ft-lbs
½"	43 ft-lbs
5/8"	100 ft-lbs
¾"	146 ft-lbs
7/8"	199 ft-lbs
1"	262 ft-lbs

Table 5: Hex and socket head cap screws, coarse thread (Grade 8)

Nominal diameter	Recommended torque setting (lubed)	Recommended torque setting (dry)
¼"	8 ft-lbs	13 ft-lbs
5/16"	16 ft-lbs	26 ft-lbs
3/8"	28 ft-lbs	47 ft-lbs
7/16"	45 ft-lbs	75 ft-lbs
½"	70 ft-lbs	115 ft-lbs
9/16"	99 ft-lbs	165 ft-lbs
5/8"	135 ft-lbs	225 ft-lbs
¾"	240 ft-lbs	400 ft-lbs
7/8"	390 ft-lbs	645 ft-lbs
1"	545 ft-lbs	905 ft-lbs
1 1/8"	830 ft-lbs	1,380 ft-lbs
1 ¼"	1,160 ft-lbs	1,935 ft-lbs
1 3/8"	1,525 ft-lbs	2,540 ft-lbs
1 ½"	2,030 ft-lbs	3,380 ft-lbs