



FURUKAWA ROCK DRILL USA

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Breaker/Attachment Division

SECTION IV

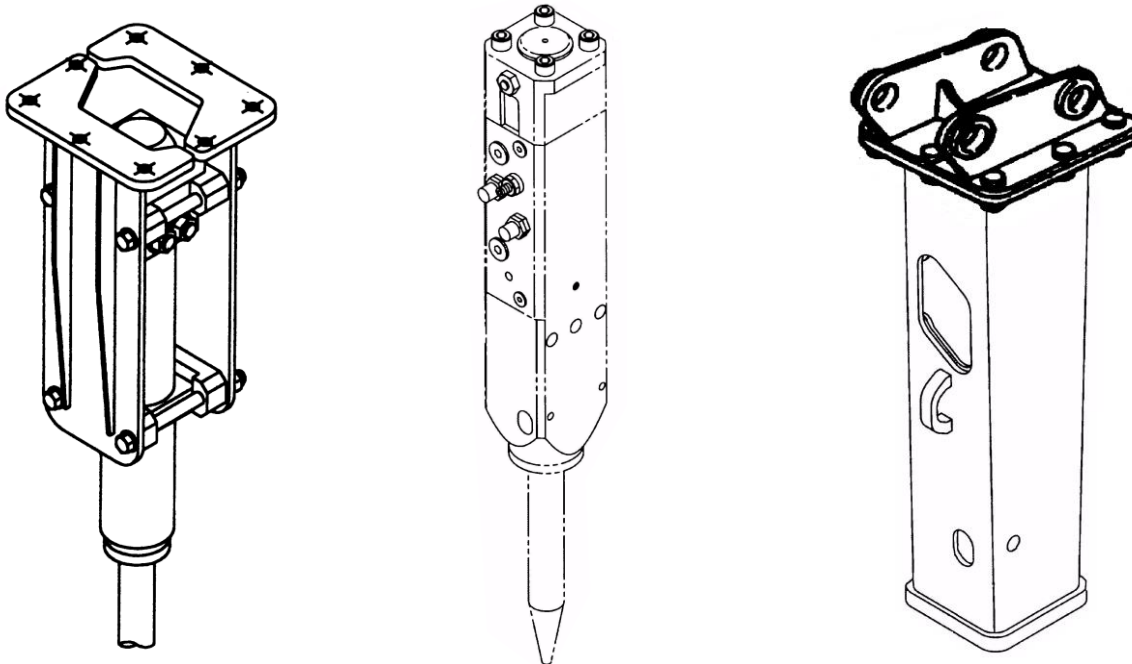
MAINTENANCE

DAILY BREAKER INSPECTION



WARNING: Any maintenance should be done in a safe, obstruction-free environment.

The following is a list of items should be inspected on a daily basis:



- A) Item:** Loose, missing or damaged nuts and bolts
Location: Top cover bolts and nuts
Back Head Socket Bolts
Remedy: Re-torque according to the torque specification page in this manual.
- B) Item:** Missing GPF and screw plugs
Location: Fronthead, Grease port
Remedy: Replace



- C) Item:** Loose or damaged hydraulic lines
Location: Pressure and return lines for the breaker
Remedy: Tighten any loose fittings
Replace any damaged hoses or piping
- D) Item:** Abnormal oil leakage at lower end of breaker
Location: Connection between the backhead & cylinder
Clearance between the working steel and front cover
Remedy: Breaker should be re-sealed
Contact your dealer
- E) Item:** Abnormal wear on the working steel
Location: Working steel
Remedy: All burrs should be removed with a grinder
If the point is worn, reshape with a grinder
(Refer to the WORKING STEEL" section of this manual)
- F) Item:** Grease
Location: Front head
Remedy: Grease at the start and every 2 to 3 hours of operation
5 to 10 pumps from a hand grease gun is recommended with the working steel pushed up into the breaker
- G) Item:** Fluid level and contamination of hydraulic oil
Location: Oil Reservoir, Filters
Remedy: If fluid level is low, fill per manufacturer's specifications
To inspect for contamination, refer to the "HYDRAULIC FLUIDS and GREASES" section of this manual.

To maintain the optimum performance from the breaker, it is recommended that a complete inspection and maintenance be done periodically.

HYDRAULIC FLUIDS and GREASES

The life-blood of the breaker is the hydraulic oil. In order to maintain peak performance from the breaker, it is essential to use the correct oil as well as maintain a clean hydraulic system.

SELECTION OF HYDRAULIC OIL

To select the proper oil, refer to the following table:

MANUFACTURER	ISO VG 68 (HOT WEATHER)	ISO VG 46 (COLD WEATHER)	(EXTREME COLD)
SHELL	TELLUS OIL 56	TELLUS OIL 46	
ESSO	NUTO H68	NUTO H46	
MOBIL	DTE 26	DTE 25	DTE 13

**** NOTE: IF A PHOSPHATE ESTHER FLUID IS USED, SPECIAL SEALS ARE REQUIRED. CONSULT YOUR FURUKAWA ROCK DRILL USA REPRESENTATIVE.**

HYDRAULIC OIL CONTAMINATION

Oil contamination can result in malfunctions and unsatisfactory performance of both the hydraulic breaker and the base machine. Special attention must be paid to the hydraulic system. The base machine's hydraulic system may become contaminated faster when using a breaker than when using a bucket or other attachment. The following guidelines should be followed when using a hydraulic breaker:

- When installing the breaker onto a machine for the first time, drain the base machine's hydraulic system completely. Flush the reservoir, cylinders and piping as thoroughly as possible. Replace the main line oil filter cartridge. Add new hydraulic oil. If the base machine is brand new, this step may be omitted.
- The main return filter element should be replaced after the first 50 hours of operation, and every 125 hours thereafter.
- Change the hydraulic oil after the first 250 hours of operation, and every 600 hours thereafter, or sooner in accordance with the carrier manufacturers specifications.

- Oil temperature should be between 100°F and 140°F during normal hammer operation.
- Oil contamination should be kept to NAS NO.9 class / ISO 20/18/15.

Field determination of contamination is as follows:

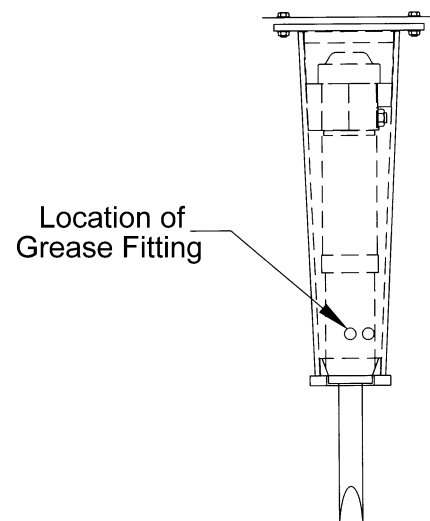
Place a sample of the base machine's hydraulic oil in a transparent container. Also place a sample of unused oil in another transparent container. Compare the two containers. If there is a visual difference in the color, the base machine's oil is presumed to be contaminated.

GREASE

Furukawa Rock Drill USA's Fx Series hydraulic breakers are equipped with one (1) grease fitting. This fitting is located on the front bushing, down by the working steel (refer to the illustration below). Lack of lubrication can cause failure of the working steel, piston or shorten the life of the seals. An NLGI NO.2 grease is recommended. The following is a list of the recommended greases:

SHELL ALVANIA EP2
ESSO LITHTAN EP2
MOBIL MOBILPLEX 48

- The fronthead should be lubricated every 2 - 3 hours of operation. Grease more frequently, if needed, but do not over-load the tool with grease.
- When greasing the hammer, hold it in an upright, vertical, position, being sure that the working steel is fully engaged into the chuck.
- Avoid getting rock or cement chips into the fronthead when replacing working steels. Particles which may have adhered to the grease can cause scratches and scaring inside the hammer.



BACKHEAD CHARGING PROCEDURE

To receive the optimum performance from the hydraulic breaker, care must be taken to maintain the proper nitrogen charge in the backhead of the breaker. To assist with this, Furukawa Rock Drill USA can supply a charge kit as illustrated on the opposite page.

The following is a step-by-step procedure that should be used to properly charge the backhead. (Note: These instructions are written for Furukawa Rock Drill USA's charge kit. If you are not using Furukawa Rock Drill USA's charge kit, use the same procedure only disregard the reference to item numbers.

STEP 1 The breaker should be charged at ambient temperature (not operated) and in a horizontal position with the working steel all the way out.

STEP 2 The customer must supply a nitrogen tank complete with a regulator.



USE EXTREME CAUTION WHEN HANDLING PRESSURIZED VESSELS!!

STEP 3 Attach charge adapter (1) to swivel elbow (18). Be sure that O-ring (2) is installed on charge adapter (1). The charge kit is shipped partially assembled. Assemble as shown in the illustration. A charge adapter (1) and O-ring (2) can also be found in the tool box included with the hammer.

STEP 4 Connect hose assembly (15) to the regulator on your nitrogen tank.

STEP 5 Turn shut-off valve (12) clockwise until it is completely closed.

STEP 6 Connect the 0 - 200 PSI pressure gauge (11) and Q.D. coupler (9), to the Q.D. nipple (8).

STEP 7 Adjust your regulator to its lowest setting before opening the valve on your nitrogen tank. Open the valve on your tank and adjust your regulator to the appropriate backhead charge.

(Refer to the table shown on the opposite page to select the appropriate charge.)

STEP 8 Remove the external plug located in the backhead charge port.

STEP 9 Insert the charge adapter (1) into the charge port. Push the charge adapter (1) into the charge port until it is fully seated. It will be necessary to hold the charge adapter in place until charging is completed.

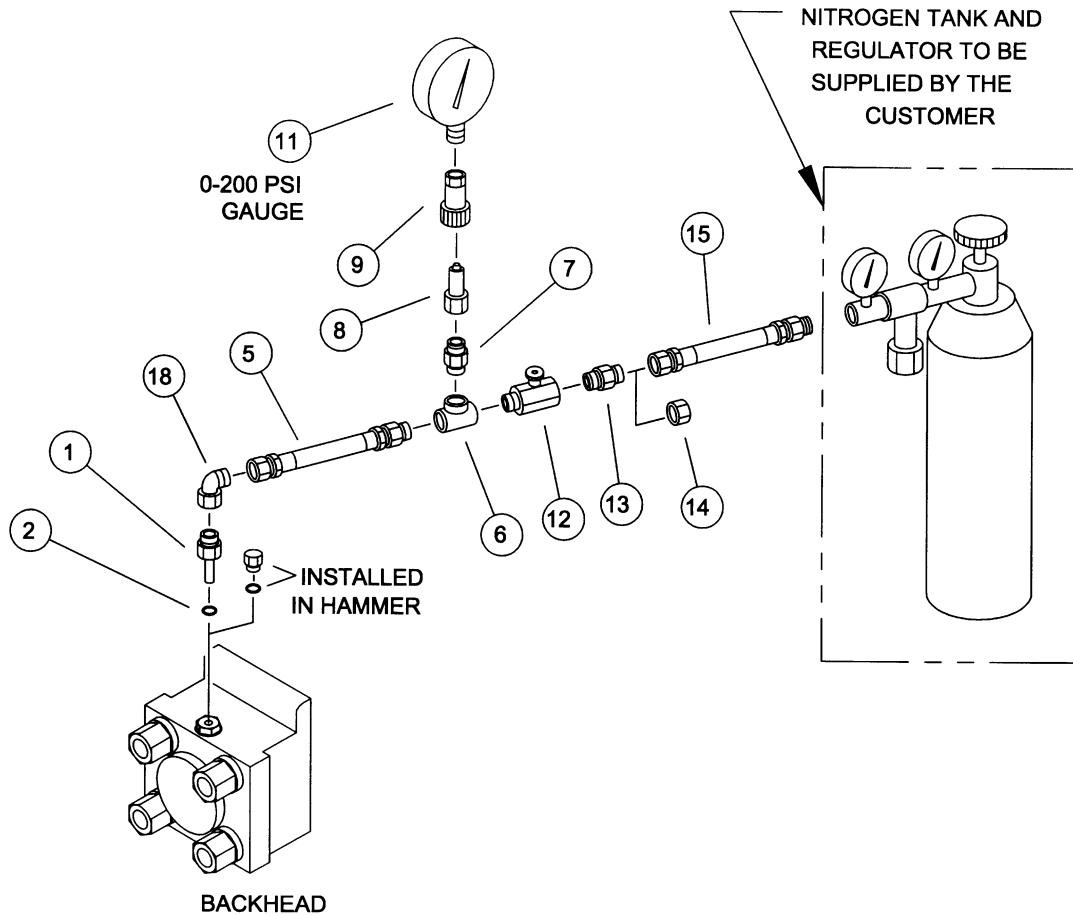
STEP 10 Open shut-off valve (12) to allow the gas to enter the backhead chamber.

STEP 11 Wait about 15 seconds while holding the charge adapter (1) into the charge port. The pressure reading on gauge (11) should now be correct. If the reading is not the proper charge pressure as shown in the table, adjust your regulator accordingly.



BACKHEAD CHARGING PROCEDURE

- STEP 12 Once the correct pressure reading is achieved, turn the shut-off valve (12) clockwise until it is fully closed.
- STEP 13 Quickly remove the charge adapter (1) from the charge port. Replace the plug into the charge port.



CHARGE KIT
PART NO. BM-21805

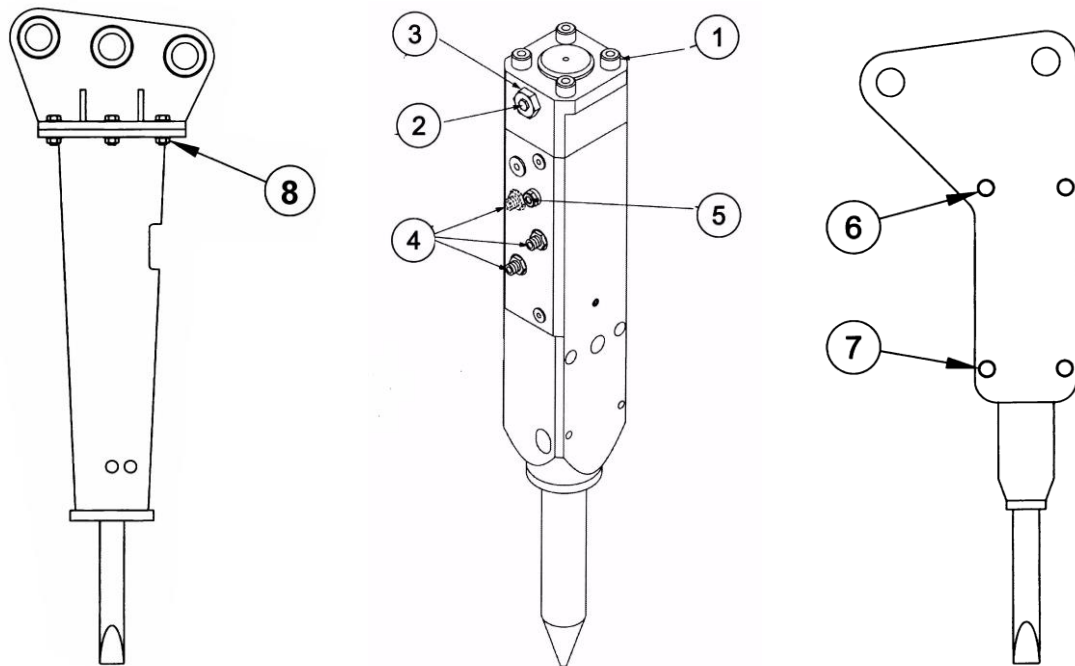
<u>ITEM</u>	<u>PART NO.</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1	K15587	1	CHARGE KIT ADAPTER
2	K03034	1	O-RING
3	K15588	1	CHARGE KIT ADAPTER
4	K01829	1	O-RING
5	K21806	1	HOSE ASSEMBLY
6	K08897	1	1/4" NPT FEMALE TEE
7	K08977	1	1/4" NPT PIPE NIPPLE
8	K15341	1	1/4" NPT Q.D. NIPPLE
9	K15340	2	1/4" NPT Q.D. COUPLER
10	K15350	1	1000 PSI PRESSURE GAUGE
11	K15351	1	200 PSI PRESSURE GAUGE
12	K15348	1	1/4" NPT SHUT-OFF VALVE
13	K04692	1	1/4" NPT X 4 JIC ADAPTER
14	K15339	1	4 JIC CAP
15	K21373	1	HOSE ASSEMBLY
18	K15374	1	4 JIC SWIVEL ELBOW

BACKHEAD
PRESSURE TABLE

<u>AMBIENT TEMPERATURE</u>	<u>CHARGE PRESSURE</u>
90° ~ 100° F	135 - 149 PSI
80° ~ 90° F	132 - 146 PSI
70° ~ 80° F	130 - 144 PSI
60° ~ 70° F	127 - 141 PSI
50° ~ 60° F	122 - 136 PSI
40° ~ 50° F	120 - 134 PSI
30° ~ 40° F	118 - 132 PSI
20° ~ 30° F	114 - 128 PSI
10° ~ 20° F	111 - 125 PSI
0° ~ 10° F	110 - 124 PSI
-10° ~ 0° F	107 - 121 PSI

TORQUE SPECIFICATIONS

*Note: Some external box, plates, or weldments have been removed for clarity.
This drawing is representative of a number of models and might
not match your hammer.*



As a general rule, all bolts should be torqued in sets, so that the load is divided equally among any bolts that function as a group. Torques listed refer to lubricated threads. Apply anti-sieze compound to all threads, nuts, and washers prior to assembly. All bolts in a group should first be loosened, and then re-tightened in stages, alternately bringing opposing bolts up to the same torque level, until all bolts in the group share the load equally. Continue in the same way, bringing all bolts in that group up to the final torque level specified.



TORQUE SPECIFICATIONS

Fx45 Series Hammers

- | | |
|-----------------------------------|--|
| 1) Back Head Bolt | Torque: 330 ft-lbs. (46 kg-m)
Every 50 hours of operation |
| 2) Charge Valve Plug | Torque: 18 ft-lbs. (2.5 kg-m)
Every 50 hours of operation |
| 3) Charging Valve | Torque: 90 ft-lbs. (12 kg-m)
Every 50 hours of operation |
| 4) Port Adapter | Torque: 180 ft-lbs. (25 kg-m)
Every 50 hours of operation |
| 5) Valve Adjuster Seal Nut | Torque: 30 ft-lbs. (4 kg-m)
Every 100 hours of operation |
| 6) Cross Bolts | Torque: 380 ft-lbs. (53 kg-m)
Every 100 hours of operation |
| 7) Cross Bolts | Torque: 380 ft-lbs. (53 kg-m)
Every 100 hours of operation |
| 8) Top Cap Mounting Bolts | Torque: 330 ft-lbs. (46 kg-m)
Every 100 hours of operation |

TROUBLE SHOOTING GUIDE

If a problem occurs with the breaker, it is important to first get a flow and pressure reading of the breaker circuit. To do this, plumb a flow meter and pressure gauge into the pressure line going to the breaker, locate them as close to the breaker as possible. Once the readings are taken, refer to the following list of problems and possible causes:

<u>Condition</u>	<u>Problem</u>	<u>Remedy</u>
Does not hammer...	Control valve does not operate.	Check connections between foot switch and valve solenoid.
	Supply hoses have been reversed.	Pressure line from pump must be connected to pressure port marked "P". The return line connects to tank port marked "T".
	Oil flow is not sufficient to cycle hammer.	Flow test pump circuit. Replace or repair pump, Adjust hammer valve.
	Operating pressure not sufficient to cycle hammer.	Check and/or adjust relief settings. Adjust hammer valve.
	Supply hoses collapsed, plugged, or leaking.	Replace hose.
	Backhead chamber filled with oil.	Replace all hammer seals.
	Shuttle valve stuck.	Disassemble and clean all valve ports. Replace worn valve.
	Quick disconnects are faulty	Check Q.D. connectors and replace as needed.
	Screw couplings are faulty	Check fillings and replace as needed.



Continued...

Condition

Hammer is slow or erratic...

Problem

Hydraulic oil temperature is too high.

Remedy

Oil temperature should not exceed 176°F. If an oil cooler needs to be installed, an inline accumulator is needed to protect cooler.

Low oil flow or pressure.

Test and repair hydraulic system. Adjust hammer valve.

Too little down pressure between steel and material.

Increase down pressure, or reposition carrier closer to work.

Too much grease in fronthead.

Remove steel, and clean fronthead cavity. Do not over-grease.

Steel is galled or sticking.

Hammer should be greased every 2 to 3 hours of operation. Grease the fronthead with hammer upright, and steel engaged fully.

Working steel is not fully engaged.

Use correct down pressure. Be sure the steel and front cover are not worn, and have been properly greased.

Working steel does not stay engaged, or extends under load.

Check carrier oil pressure. Adjust to specifications.

Continued...



Continued...

<u>Condition</u>	<u>Problem</u>	<u>Remedy</u>
Hammering is weak...	Insufficient oil flow.	Adjust control valve to rated specifications.
	Operating pressure is low	Check the pump and pressure relief valve.
	Oil is contaminated, discolored, or cloudy in appearance	Change hydraulic oil, and filters.
	Oil level is low	Refill to proper levels.
	Return line back pressure is too high	Check filter and hose connections.
	Filter element is clogged.	Clean or replace.
	Excessive amounts of oil are leaking out from chuck area. Oil flows off end of working steel.	Replace seal kit if oil consumption is greater than 1 pint per hour.

- If the cause of the problem still cannot be isolated, contact your Furukawa Rock Drill USA distributor for additional assistance.

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