INTRODUCTION

This gear drive is furnished with a cooling system to dissipate the heat generated by the load being transmitted through the drive. The installation, operation and minor adjustments to this cooling system is the subject of this manual. For detailed maintenance instructions and specifications for accessories such as the oil filter, thermometer, oil relief valve, oil heater, oil flow indicator, oil pressure gauge, pressure control switch and warning device, consult the product manufacturer's literature.

SPLASH LUBRICATION

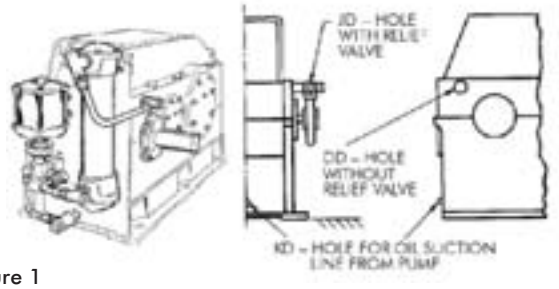

Figure 1

JET LUBRICATION

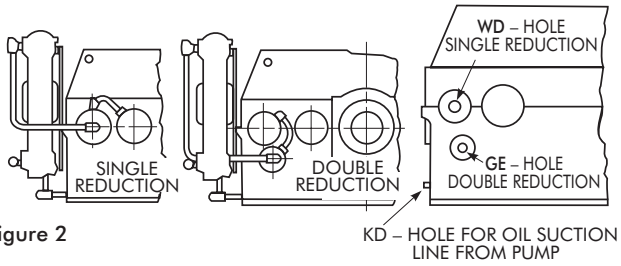

Figure 2

OIL AND WATER LINE LOCATIONS

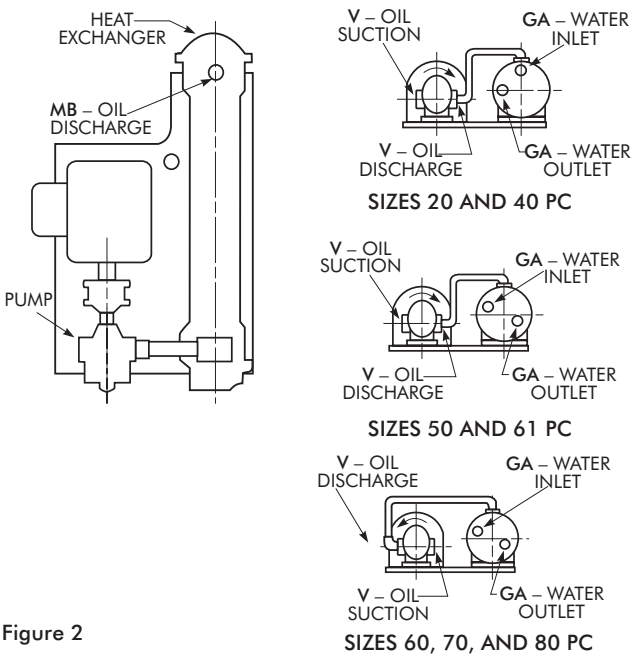

Figure 2

Falk™ Specifications 146-764 lists part numbers and brief construction and operation data for the above accessories. Selection Guide 141-931 gives selection and dimensional data for Falk™ standard external pump and cooler systems.

When ordering parts, or requesting information, specify the Falk M.O. number, unit size, H.S. shaft rpm, ratio and date stamped on the unit nameplate.

CAUTION: Lock out power source and remove all external loads from unit before servicing unit or accessories.

PIPE CONNECTIONS

Oil line connections are completed at Falk™ for internal and unit mounted pumps; only the cooler water lines require connection during installation. For floor-mounted pumps and coolers, connect oil and water lines after the gear drive has been installed. Refer to Figures 1 thru 3 and Tables 1 and 2 for oil and water line connection points and pipe sizes. Always locate floor mounted pumps BELOW the unit oil level to maintain a prime and CLOSE to the unit to minimize pipe lengths.

Connect water inlet line to the tube side of the heat exchanger and run the discharge line to an OPEN DRAIN to prevent back pressure. DO NOT use a throttling valve between heat exchanger and drain.

Equip units with a by-pass valve or an immersion type oil heater when the ambient temperature is below 50°F(10°C). Consult Factory for size and type of heater and Specifications 146-764 for wiring diagram.

OIL LEVELS — Prior to filling Type Y and YB reducers, remove the inspection plate and FLOOD THE OIL TROUGHS to insure a generous flow of oil to the bearings. For Type YBX, remove the top plug or sight glass and flood oil passages. This priming action lubricates and protects the bearings until sufficient oil is circulated. Fill unit to level marked on the dipstick.

TABLE 1 — Y and YF Drive Pipe Sizes – NPT
(Refer to Figures 1 and 2)

DRIVE SIZE ★	DD	GE	JD	KD	DRIVE SIZE *	DD	GE	JD	KD
2050	.50	. . .	. . .	1.00	**2120/25**	.75	1.00	1.25	1.25
2060	.50	. . .	. . .	1.00	**2130/35**	.75	1.00	1.25	1.25
2070	.50	. . .	. . .	1.00	**2140/45**	1.00	1.00	1.50	1.50
2080	.50 †	. . .	. . .	1.25	**2150/55**	1.00	1.25	1.50	1.50
2090	.50 †	. . .	. . .	1.25	**2160/65**	1.50 ‡	1.25	2.00	2.00
2100	.75	. . .	1.25	1.25	**2170/75**	1.25	1.25	2.00	2.00
2110	.75	.75	1.25	1.25	**2180/85**	1.50 ‡	1.25	2.00	2.00
					2190/95	1.50 ‡	1.25	2.00	2.50

★ Dimensions also apply to YF series drives. For YB and YBX, refer to Factory.
† DD = .75 with 40PC.
‡ DD = 1.25 with 50PC.

TABLE 2 — Pump and Cooler Pipe Sizes – NPT
(Refer to Figure 3)

Pump and Cooler Size	GA	MB	V	WD	Pump and Cooler Size	GA	MB	V	WD
20PC	.75	1.00	.50	. . .	**50PC**	2.00	3.00	1.00	1.25 ●
30PC	1.00	1.50	.50	.75	**60/61PC**	2.00	3.00	1.50	1.50 ●
40PC	1.50	2.00	.75	1.00	**70PC**	2.00	3.00	1.50	2.00

● WD = 2 for Drive Sizes 2180 through 2195.

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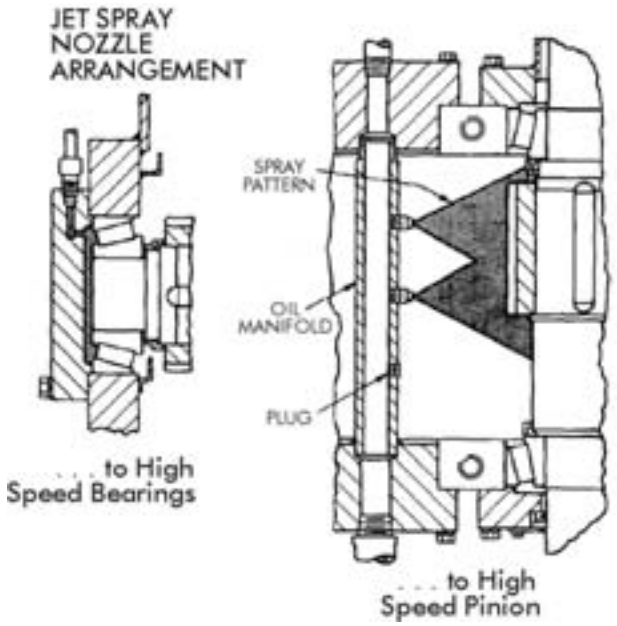
BEFORE STARTING — Rotate the external pump shaft by hand to prime the pump. Start the pump motor and check for oil flow thru the oil sight or in the oil troughs. If oil is not circulating, reverse the motor shaft rotation and recheck. Internal pumps on YBX units do not require priming, but check for oil flow through the oil sight after the unit has been started.

RECHECK OIL LEVEL — After operating the unit for 2 or 3 minutes, shut down and immediately recheck the oil level before oil lines drain. This reading will indicate the true operating oil level. Add oil, if necessary, to raise level to the "full" mark on the dipstick.

JET SPRAYS — Drives equipped with this system may be identified by the oil piping shown in Figure 2. A jet of oil is directed to the H.S. shaft bearings, while a spray of oil lubricates the H.S pinion.

Check to see that an even spray of oil emerges from the nozzles onto the pinion and that oil is flowing through the H.S bearings. If not, disassemble the clogged portion and clean the oil passages with a wire. Flush thoroughly to remove any contaminant.

Oil must be free of lint or any contamination that may clog the lubrication nozzles or oil passages.



WATER FLOW — Be sure that all parts of the system are clean and that the exchanger is full of fluid. Maintain the specified rate of oil and water flow. Avoid excessive flow of cooling water since this may cause tube failure through erosion and may decrease cooling efficiency.

Add antifreeze per manufacturer's specification to closed water supply systems. However, note that antifreeze reduces the rate of heat dissipation.

The additional thermal horsepower capacity provided by the cooler is based on a 1:1 oil/water flow rate, a 55°F(31°C) inlet temperature difference between oil and water, 90°F(32°C) inlet water temperature and maximum inlet water pressure of 50 psig.

Adjust the water flow rate within the flow range shown on the cooler or unit water circulation plate to maintain a reducer operating temperature range of 140° to 160°F(60° to 71°C).

The minimum value of the range is for clean water at a minimum velocity to prevent fouling of the tube bundle. For brackish water, a flow rate of 2 times the minimum value is required to prevent suspended solids from settling. The maximum value of the range is based on a maximum velocity to avoid erosion of the tube bundle.

MAINTENANCE

HEAT EXCHANGER — It is important that the inside parts are kept clean. Inspect the exchanger periodically and clean thoroughly. Inspect all tubes carefully for possible corrosion or foreign material. Bleed the oil side of the cooler periodically if air tends to collect in the system.

For open systems, drain vertical coolers by removing the two zinc anodes and loosening the bottom bonnet. Disconnect and drain the lines on horizontal open systems. Blow out all lines.

Heat exchangers are equipped with zinc anodes to minimize galvanic corrosion. Inspect after first month of service and periodically thereafter, depending on the severity of corrosion. If 50% of the anode is used up, replace it.

Check the reducer oil level periodically. If it is ABOVE the high level mark on the dipstick, have the oil analyzed for water content. Moisture or water in the oil may indicate that the heat exchanger is leaking. If so, replace the exchanger immediately and change the oil.

EXTERNAL PUMP — Correct shaft alignment is essential; check with a straightedge across the flanges of the coupling, or use a feeler gauge between the faces of the coupling halves at 90° intervals. The pump is a positive displacement rotary type with a mechanical seal. Refer to manufacturer for detailed maintenance.

INTERNAL PUMP — The lubricating pump on the 2000YBX2 exchanger cooled units is a positive displacement rotary type manufactured at Falk. If maintenance is required, refer to the Factory for detailed instructions.

OIL FILTER — If the filter is a Purolator, cleaning of the element is accomplished by rotating the hand wheel several turns once a week. Remove the filtering element and scrub with a fiber bristle and a non caustic solvent at oil change intervals. Flush out housing with solvent. If the filter is a Marvel, follow the above element cleaning procedure, and when reassembling, be sure that the "O" ring is properly seated in the head groove.

JET LUBRICATION SYSTEM DISASSEMBLY — Disconnect piping and remove the housing end covers. The oil manifold with spray nozzles is attached to one end cover and will pull free from the opposite cover. Refer to Figure 4.

JET LUBRICATION SYSTEM ASSEMBLY — Install all new end cover gaskets. Align the nozzles in a horizontal plane facing the centerline of H.S. pinion as shown in Figure 4.

MERCOID PRESSURE CONTROL SWITCH — The mercoid switch is a sealed unit and should not be serviced. There is a double adjustment for setting both "on" and "off" operating points.

RELIEF VALVE — This valve is pre-set at the factory and normally does not require adjustment. However, rotating the adjusting screw clockwise will reduce the opening pressure.

Accessories such as flow indicator, pressure gauges, thermometers, heaters and pressure controls are sealed units. If a malfunction occurs, return the sealed unit directly to the manufacturer for repair or replacement.

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ACCESSORIES

The drawing below illustrates the general location of the various accessories that may be used with the pump and cooler system.