

How to Use This Manual

This manual provides detailed instructions on installation and maintenance of gear drives and couplings. Use the table of contents below to locate required information.

CAREFULLY FOLLOW THE INSTRUCTIONS IN THIS MANUAL FOR OPTIMUM PERFORMANCE AND TROUBLE FREE SERVICE.

Table of Contents

Installation Instructions	Page 1
Fastener Tightening Torques	Page 2
Mounting Positions	Page 3
Shaft Connections	Page 4
Lubrication Recommendations	Page 4
Preventive Maintenance	Page 6
Stored and Inactive Gear Drives	Page 6

Introduction

Credit for long service and dependable operation of a gear drive is often given to the engineers who designed it, or the craftsmen who constructed it, or the sales engineer who recommended the type and size. Ultimate credit belongs to the mechanic on the job who worked to make the foundation rigid and level, who accurately aligned the shafts and carefully installed the accessories, and who made sure that the drive received lubrication at prescribed intervals. The details of this important job are the subject of this manual.

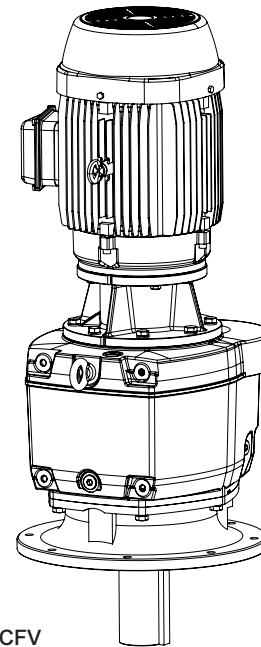
NAMEPLATE — Operate Rexnord gear drives only at horsepower, speed and ratio shown on nameplate and in the mounting position for which it was ordered. Before changing any one of these, submit complete nameplate data and new application conditions to the Factory for correct oil level, parts and application approval.

WARNING: Consult applicable local and national safety codes for proper guarding of rotating members. Lock out power source and remove all external loads from drive before servicing drive or accessories.

Warranty

Rexnord Industries, LLC (the "Company") warrants that Ultramite gear drives (I) conform to Company's published specifications, and (II) are free from defects of material for three years from the date of shipment.

Company does not warrant any non-Company branded products or components (manufacturer's warranty applies) or any defects in, damage to, or failure of products caused by: (I) dynamic vibrations imposed by the drive system in which such products are installed unless the nature of such vibrations has been defined and accepted in writing by Company as a condition of operation; (II) failure to provide suitable installation environment; (III) use for purposes other than those for which designed, or other abuse or misuse; (IV) unauthorized attachments, modifications or disassembly, or (V) mishandling during shipping.



Type UCXV & UCFV

Installation Instructions

The following instructions apply to standard Falk Type UCXV and UCFV drives shown above. If a drive is furnished with special features, refer to the supplementary instructions shipped with the drive.

WELDING — Do not weld on the gear drive or accessories without prior approval from the Factory. Welding on the drive may cause distortion of the housing or damage to the bearings and gear teeth. Welding without prior approval could void the warranty.

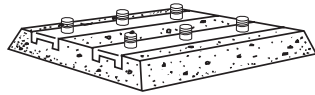
EFFECTS OF SOLAR ENERGY — If the gear drive operates in the sun at ambient temperatures over 100°F(38°C), then special measures should be taken to protect the drive from solar energy. This protection can consist of a canopy over the drive or reflective paint on the drive. If neither is possible, consult the Factory.

MOUNTING (Figure 2) — Units are furnished without oil. Refer to Table 3 for a list of typical lubricants meeting Rexnord specifications. Fill drives to the oil level plug. Refer to Table 4 for the approximate quantities of oil by the drive mounting position. Refer to Figure 2 for the placement of the breather, drain and oil level plugs based on the drive mounting position.

FOUNDATION GENERAL — To facilitate oil drainage, elevate the gear drive foundation above the surrounding floor level. If desired, replace the drive oil drain plug with a valve, but provide a guard to protect the valve from accidental opening or breakage.

FOUNDATION, STEEL — When mounting gear drive on structural steel, it is recommended that an engineered design be utilized for a pedestal, adapter base or bed to provide sufficient rigidity, to prevent induced loads from distorting the housing and causing gear misalignment. In the absence of an engineered design, it is recommended that a base plate, with thickness equal to or greater than the thickness of the drive feet, be securely bolted to steel supports and extend under the entire drive.

FOUNDATION, CONCRETE — If a concrete foundation is used, allow the concrete to set firmly before bolting down the gear drive. For the best type of mounting, grout structural steel mounting pads into the mounting base, as illustrated, rather than grouting the drive directly into the concrete.



Motors and other components mounted on motor plates may become misaligned during shipment. ALWAYS check alignment after installation.

Important — The high speed motor adapters will initially be assembled and sealed with Loctite® at the Factory, unless otherwise specified. During assembly, *Do Not* break Loctite Seal.

- Place basic housing on a workbench so that high speed end is facing up as illustrated in Figure 1. If necessary, block housing so that it is stable and level.
- Remove high speed motor adapter from basic housing *ONLY* if replacing.
- Clean mating surfaces of basic housing, high speed motor adapter, and electric motor (use Loctite 7070 Super Clean or equivalent). Check for and remove any burrs from mating surfaces.
- Fill basic housing with lube type as specified in Table 3 to the oil level plug. Refer to Table 4 for the approximate quantities of oil by the drive mounting position.
- Apply anti-fretting compound (Dow Corning Molykote® G-n Metal Assembly Paste/Spray for non-food grade applications or Dow Corning Molykote P-1900 Food Grade Assembly Paste for food grade applications or equivalent) to bore of high speed motor adapter.
- Fit metal key into keyway of motor shaft. Apply anti-fretting compound (Dow Corning Molykote G-n Metal Assembly Paste/Spray for non-food grade applications or Dow Corning Molykote P-1900 Food Grade Assembly Paste for food grade applications or equivalent) to motor shaft. Install bushing on motor shaft. This assembly will be inserted into the bore of high speed motor adapter after applying sealant.
- Apply liquid gasket material (Loctite 518, Rexnord Part Number #10093848) furnished to flange face of basic housing as illustrated in Figure 1.
Caution: *This step must be followed to prevent leakage.*
- Align mounting holes of high speed motor adapter with threaded holes of basic housing while assembling motor adapter to basic housing. Secure high speed motor adapter to basic housing using fasteners with copper washers (when provided). Torque fasteners to value specified in Table 1 — Tightening Torques.
- Determine appropriate position that motor conduit box must be in once motor is assembled to basic housing. Slide motor shaft into high speed motor adapter, aligning key of shaft with keyway in motor adapter bore.
- Align threaded mounting holes of high speed motor adapter with holes of electric motor. Secure motor to basic housing using fasteners with copper washers (when provided). Torque fasteners to the value specified in Table 1 — Tightening Torques.

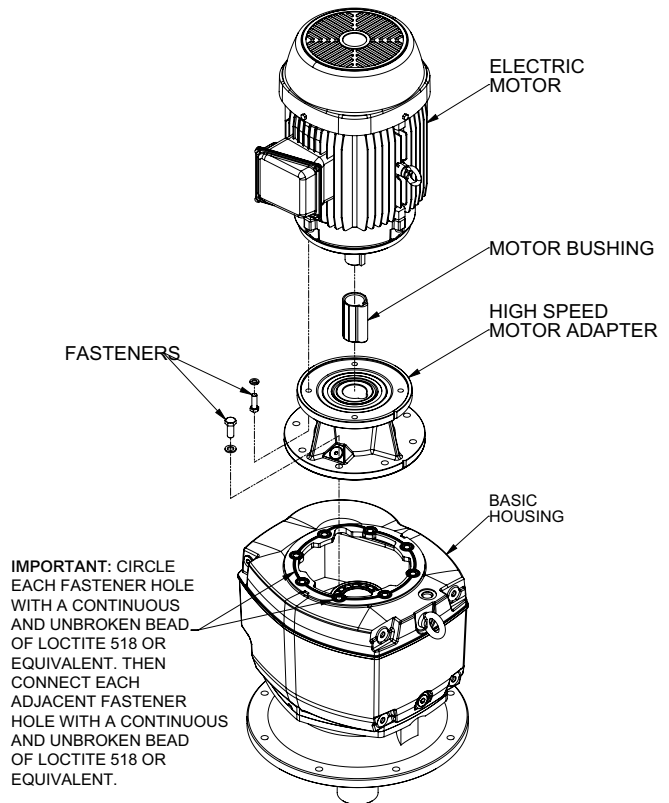


Figure 1

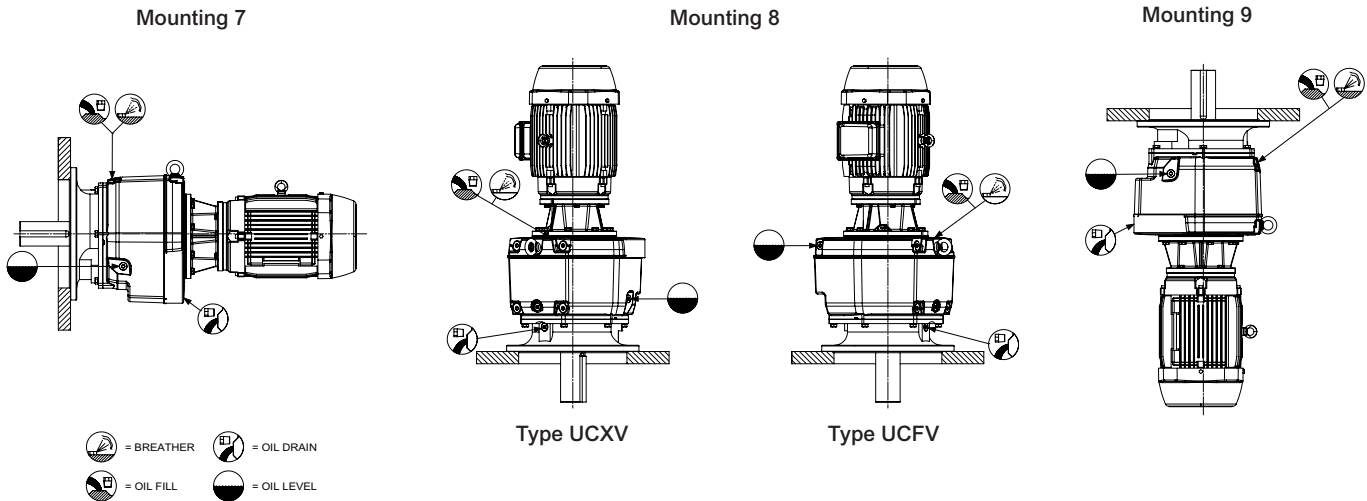
Fastener Tightening Torques

Use the tightening torque values specified in Table 1, for fastening gear drives, motors, and accessories to their mounting surfaces with non-lubricated fasteners. **DO NOT** use these values for “torque locking” fasteners or for fastening components with aluminum feet or with soft gaskets or vibration dampers on the mounting surface. If the tightening torque exceeds the capacity of the torque wrench, use a torque multiplier. Use Grade 5 fasteners for diameters through 1.50”.

TABLE 1 — Tightening Torques (lb-in) ±5%
DO NOT Lubricate Fasteners

Thread Dia – UNC	Metal to Metal	Metal to Concrete
0.250-20	90	70
0.3125-18	185	145
0.375-16	330	255
0.500-13	825	640
0.625-11	1640	1280
0.750-10	2940	2290

Thread Dia (mm)	Metal to Metal
M8 x 1.25	220
M10 x 1.5	420
M12 x 1.75	740
M16 x 2.0	1870


Figure 2

GEAR DRIVE ALIGNMENT — Align drive with driven equipment by placing broad, flat shims under all mounting pads. Start at the low speed shaft end and level across the length and then the width of the drive. Check with a feeler gauge to make certain that all pads are supported to prevent distortion of housing when drive is bolted down. After drive is aligned with driven equipment and bolted down, align prime mover to drive input shaft. Refer to next column for coupling alignment.

Check high speed shaft coupling alignment. If the coupling is misaligned, the drive is shimmed incorrectly. Re-shim drive and recheck high speed coupling alignment. If necessary, realign motor.

Shaft Connections

WARNING: Provide suitable guards in accordance with OSHA standards.

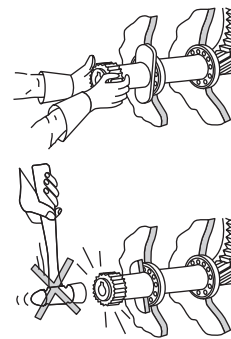
Input and output shaft extension diameter tolerance is +0.0000"; -0.0005" for shafts up to 1.375" diameter and +0.000"; -0.001" for shafts larger than 1.375" diameter. The fitted component must be machined to ensure proper fit.

DO NOT drive coupling hub, pinion, sprocket or pulley on the shaft. An endwise blow on the shaft may damage gears and bearings. Coupling hubs, pinions, sprockets or pulleys must be pushed onto the shaft using a screw jack device fitted into the threaded hole provided in the end of the shaft, see Table 2 below.

TABLE 2 — Shaft End Threaded Holes – Inches

DRIVE SIZE	Input Shaft	Output Shaft
302	0.375-16 UNC-2B	0.375-16 UNC-2B
304	0.375-16 UNC-2B	0.375-16 UNC-2B
307	0.375-16 UNC-2B	0.625-11 UNC-2B
308	0.500-13 UNC-2B	0.750-10 UNC-2B
309	0.500-13 UNC-2B	0.750-10 UNC-2B
310	0.750-10 UNC-2B	0.750-10 UNC-2B
313	0.750-10 UNC-2B	1.000-8 UNC-2B
314	0.750-10 UNC-2B	1.000-8 UNC-2B
316	0.750-10 UNC-2B	1.250-7 UNC-2B

COUPLING CONNECTIONS — The performance and life of any coupling depends largely upon how well the coupling is installed and serviced. Refer to the coupling manufacturer's manual for specific instructions.



CORRECT METHOD

Heat interference fitted coupling hubs, pinions, sprockets or pulleys to a maximum of 275°F (135°C) and slide onto gear drive shaft.

INCORRECT METHOD

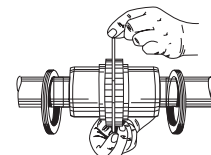
DO NOT drive coupling hub, pinion, sprocket or pulley onto the shaft. An endwise blow on the shaft/coupling may damage gears and bearings.

– CAUTION –
DO NOT HAMMER

FALK COUPLINGS — (Except fluid type) Detailed installation manuals are available from the Factory, your local Rexnord Representative or Distributor—just provide size and type designations stamped on the coupling. For lubricant requirements and a list of typical lubricants meeting Rexnord specifications, refer to appropriate coupling service manual.

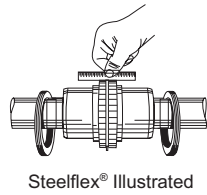
GAP AND ANGULAR ALIGNMENT

— If possible, after mounting coupling hubs, position the driving and driven equipment so that the distance between shaft ends is equal to the coupling gap. Align the shafts by placing a spacer block, equal in thickness to required gap, between hub faces, as shown, and also at 90° intervals around the hub. Check with feelers.



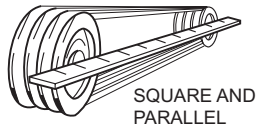
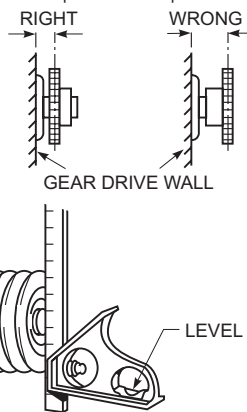
Steelflex Illustrated

OFFSET ALIGNMENT — Align driving and driven shafts so that a straight edge will rest squarely on both couplings hubs as shown to the right and also at 90° intervals. Tighten foundation bolts of the connected equipment and recheck alignment and gap.



SPROCKETS, PULLEYS OR SHEAVES — Mount power take-offs as close to the gear drive housing as possible to avoid undue bearing load and shaft deflection.

Align the output shaft of the gear drive square and parallel with the driven shaft by placing a straightedge across the face of the sprockets or sheaves as illustrated. Check horizontal shaft alignment by placing one leg of a square against the face of the sheave or sprocket with the spirit level on the horizontal leg of the square.



DO NOT over tighten belts or chains. Adjust chains to manufacturers' specifications. Adjust belts as follows:

The ideal tension is the lowest tension at which the belt will not slip under peak load conditions. Check the belt tension frequently during the first 24 to 48 hours of run-in operation. Over tightening belts shortens belt and bearing life. Keep belts free from foreign material which may cause slippage. Inspect the V-belts periodically; tighten the belts if they are slipping.

PINION MOUNTING — Mount pinion as close to the drive as possible to avoid undue bearing load and shaft deflection. Refer to the Factory for pinion alignment instructions.

Lubrication Recommendations

Carefully follow lubrication instructions on warning tags and installation manuals furnished with the gear drive. Nameplates are stamped with a designation for recommended lubricant, standard is 6E.

Lubricants listed in this manual are typical ONLY and should not be construed as exclusive recommendations. Refer to your lubricant supplier for additional lubricants meeting the indicated specifications. Industrial type extreme pressure (EP) gear lubricants are the recommended lubricants for ambient temperatures of 15°F to 125°F (-9°C to +52°C).

For drives operating outside the above temperature range refer to "Synthetic Lubricants" paragraphs. Synthetic lubricants can also be used in normal climates.

VISCOSITY (IMPORTANT) — The proper grades of EP Mineral lubricants and EP Synthetic lubricants are found in Table 3. For cold climates refer to "EP Synthetic Lubricant" paragraphs. Select a lubricant which has a pour point at least 10°F (5.5°C) below the expected minimum ambient starting temperature. Usable temperature ranges can sometimes be widened if specific application conditions are known.

Lubricants in Table 3 that do not contain extreme pressure additives have been approved for use based on laboratory bench tests or factory testing.

TABLE 3 — Kinematic Viscosity in cSt@40°C of Typical Lubricants Recommendations and Specifications

		AGMA Viscosity Grade				
		...	...	5	6	7
		ISO Viscosity Grade				
		...	...	220	320	460
		Nameplate Designation				
		...	...	5E	6E	7E
		Ambient Temperature Range °F				
Manufacturer	Lubricant	...	...	+23 to +77	+32 to +104	+50 to +122
Chevron USA Inc.	Gear Compounds EP	...	...	220	320	460
Exxon Co. USA	Spartan EP	...	...	220	320	460
Mobil Oil Corp.	Mobilgear	...	...	630	632	634
Shell Oil Co.	Omala Oil	...	...	220	320	460

		AGMA Viscosity Grade				
		0	2	5	6	7
		ISO Viscosity Grade				
		32	68	220	320	460
		Nameplate Designation				
		0H	2H	5H	6H	7H
		Ambient Temperature Range °F				
Manufacturer	Lubricant	-30 to +10	-15 to +50	+14 to +86	+32 to 113	+50 to +122
Conoco Inc	Syncon	32 †	68	220	...	...
Exxon Co. USA	Spartan Synthetic EP	...	...	220	320	460
Mobil Oil Corp.	Mobilgear SHC	...	...	220	320	460
	Mobil SHC	624 †	626 †	...	...	...
Pennzoil Prod. Co.	Super Maxol "S"	...	68	220	320	460
Shell Oil Co.	Hyperia S	...	...	220	...	460
Sun Company Inc.	Sunoco Challenge EP	...	...	220	320	...
	Sunoco Challenge AC	32 †	68 †	...	...	...
Exxon Mobil	Mobil SHC Cibus	...	...	198-242*	288-352*	...
Kluber Lubrication	Kluberoil 4 UH1 N	...	...	198-242*	288-352*	...
Lubriplate Lubricants Co.	Lubriplate SFGO Ultra	...	...	198-242*	288-352*	...
Petro-Canada	Purity FG Synthetic EP	...	...	198-242*	...	...
Total Lubricants USA, Inc.	Nevastane SL	...	...	198-242*	288-352*	...

‡ Consult lubricant supplier/manufacturer for maximum operating temperature.
 † Lubricant does not contain EP (extreme pressure) additives. Consult your lubricant supplier for additional lubricant recommendations.
 * Food grade PAO lubricant NSF H1 registered. Lubricant does not contain EP (extreme pressure) additives.

Extreme Pressure (EP) Mineral Lubricants

Mineral (EP) Lubricants (Table 3) — Industrial type petroleum based extreme pressure lubricants are preferred. The EP lubricants currently recommended are of the sulfur-phosphorus type.

WARNING: EP LUBRICANTS IN FOOD PROCESSING INDUSTRY — EP lubricants may contain toxic substances and should not be used in the food processing industry without the lubricant manufacturers' approval. Lubricants which meet NSF "H1" classification are suitable for food processing applications.

Extreme Pressure (EP) Synthetic Lubricants

Synthetic (EP) Lubricants (Table 3) — Polyalphaolefin type extreme pressure lubricants are recommended for cold climate operation, high temperature applications, extended temperature range (all season) operation and/or extended lubricant change intervals.

WARNING: SYNTHETIC LUBRICANTS IN FOOD PROCESSING INDUSTRY — Synthetic lubricants may contain toxic substances and should not be used in the food processing industry without the lubricant manufacturers' approval. Lubricants which meet NSF "H1" classification are suitable for food processing applications.

Oil Levels

All units are furnished without lubricant. Oil levels are determined by drive mounting position.

Location of the vent, drain and oil level plugs are determined by the drive mounting position and are shown in Figure 2. Refer to Table 4 for approximate quantities of oil by drive mounting position.

Lubricant Changes

OIL ANALYSIS REPORT — Checking oil condition at regular intervals is recommended. In the absence of more specific limits, the guidelines listed below may be used to indicate when to change oil:

1. Water content is greater than 0.05% (500 ppm)
2. Iron content exceeds 150 ppm
3. Silicon (dust/dirt) exceeds 25 ppm
4. Viscosity changes more than 15%

The UC Ultramite can require an oil change at 2,500 hours for EP mineral lubricants and 10,000 for polyalphaolefin type EP synthetic lubricants.

Table 4 — Approximate Lube Quantities of UCXV and UCFV Drives in Liters[‡]

Mtg Position	DRIVE SIZE									
	UCXV Double and Triple Reduction									
	302	304	307	308	309	310	313	314	316	
7	N/A	N/A	N/A	N/A	N/A	6	11	15	24	
8	N/A	N/A	N/A	N/A	N/A	8	12	22	41	
9	N/A	N/A	N/A	N/A	N/A	23	35	63	123	

Mtg Position	DRIVE SIZE									
	UCFV Double Reduction									
	302	304	307	308	309	310	313	314	316	
7	0.45	0.9	1.4	2.3	3.1	6	11	N/A	N/A	
8	1.2	2.7	4.5	8	12.1	23	35	N/A	N/A	
9	1.4	2.8	4.9	9.3	15.4	23	35	N/A	N/A	

Mtg Position	DRIVE SIZE									
	UCFV Triple Reduction									
	302	304	307	308	309	310	313	314	316	
7	0.4	0.85	1.2	2	2.8	6	11	15	24	
8	1.1	2.6	4	9	12.1	23	35	63	123	
9	1.4	2.7	4.3	8.5	14.2	23	35	63	123	

[‡] Convert quantities using the following:
 Liters to US Gallons = liters x 0.26
 Liters to Imperial Gallons = liters x 0.22
 Liters to US Quarts = liters x 1.057

Grease Lubricated Seals and Bearings

Gearmotors are shipped with NLGI #2 grade grease in the seal housing cavities and in those bearings requiring grease lubrication unless otherwise specified. Refer to Table 5 for grease recommendations.

GREASE LUBRICATED SEALS — Ultramite UC Mixer Motors are furnished with grease purged seals which minimize the entry of contaminants and abrasive dusts into the drive.

Grease seals during oil change intervals. Depending on the degree of contamination, it may be necessary to purge contaminated grease from seals more often (at least every 3 to 6 months). Purge grease from seals by first cleaning grease fitting and then slowly pump fresh grease, **WITH A HAND GREASE GUN**, through the seal cavity until fresh grease flows out along the shaft. Wipe off purged grease. Cooling accessories can be removed to access grease purge without removing shaft connection on motor.

CAUTION: Rapid greasing with a power grease gun can force grease inward past the seals causing seal leaks.

If grease could contaminate the product, as in the food and drug industries, the grease originally supplied with gear drive must be removed and replaced with grease listed in Table 6. Simply purging grease with grease gun will not remove all grease and cross-contamination will likely occur. Refer to gear drive assembly/disassembly instructions. Grease registered as H1 by NSF, National Sanitation Foundation, is suitable for food processing applications.

Table 5 — Conventional NLGI #2 Grade Grease[▲] for Grease Lubricated Bearings & Grease Purged Seals
-18° to +93°C (0° to 200°F)

Manufacturer	Lubricant
Chevron / Texaco / Caltex	Multifak EP 2
Citgo Petroleum Corp.	Lithoplex RT 2 Premium Lithium EP 2
ExxonMobil / Esso	Mobilux EP 2 Mobilith SHC 460 ■
Petro-Canada Lubricants	Precision General Purpose EP2
Phillips 66 / Conoco / 76 Lubricants / Kendall	Multiplex Red
Shell Oil Co.	Gadus S1 V220-2
Total Lubricants USA / Keystone Div. Penwalt Corp.	Multis 2 or Multis EP 2

- ▲ Not suitable for food grade applications.
- High performance synthetic alternate.

Grease application or re-lubrication should be done at temperatures above -7°C (20°F). If grease must be applied at cooler temperatures consult lubricant supplier for recommendations.

Preventive Maintenance

AFTER FIRST WEEK — Check alignment of the total system and realign where necessary. Also, tighten all external bolts and plugs where necessary. DO NOT readjust the internal gear or bearing settings in the drive, these were permanently set at the Factory.

PERIODICALLY — Carefully check the oil level of the drive when it is stopped and at ambient temperature, add oil if needed. If the oil level is ABOVE the oil level plug have the oil analyzed for water content. If moisture content exceeds 500 ppm change the oil. DO NOT fill above the oil level plug as leakage or undue heating may result. Also check coupling alignment to make certain that foundation settling has not caused excessive misalignment.

Stored & Inactive Gear Drives

Each gear drive includes a rust preventive that will protect parts for a period of 6 months in an indoor dry shelter.

If a gear drive is to be stored, or is inactive after installation beyond the above periods, drain oil from housing and spray all internal parts with a rust preventive oil that is soluble in lubricating oil or add “Motorstor[®]” vapor phase rust inhibitor at the rate of one ounce per cubic foot of internal drive space (or 5% of sump capacity) and rotate the shafts several times by hand. Before operating, drives which have been stored or inactive must be filled to the proper level with oil meeting the specifications given in this manual. Refer to Manual 128-014 for “Start-up after Storage” instructions.

Periodically inspect stored or inactive gear drives and spray or add rust inhibitor every six months, or more often if necessary. Indoor dry storage is recommended.

Gear drives ordered for extended storage can be treated at the Factory with a special preservative and sealed to rust-proof parts for periods longer than those cited previously.

Table 6 — Food Grade Grease[▲] for Grease Lubricated Bearings & Grease Purged Seals, NLGI #2 Grade
-18° to +93°C (0° to 200°F)

Manufacturer	Lubricant
Bel-Ray Company, Inc.	No-Tox HD Grease 2
Chevron USA, Inc. (Texaco/Caltex)	Chevron FM ALC EP 2
Exxon Mobil	Mobil SHC Polyrex 462
Kluber Lubrication	Klubersynth UH1 14-222
Lubriplate	Lubriplate FGL-2
Total Lubricants USA, Inc.	Nevastane HT/AW 2
Petro-Canada	Purity FG
Phillips 66/Conoco/76 Lubricants / Kendall	Food Machinery Grease 2

- ▲ NSF (National Sanitation Foundation) H1 Registered.

Grease application or re-lubrication should be done at temperatures above -7°C (20°F). If grease must be applied at cooler temperatures consult lubricant supplier for recommendations.

Material Safety Data

For material safety data sheets pertaining to the lubricants in table contact:

Rexnord
Customer Service Department
3001 W. Canal Street, Milwaukee, WI 53208-4200
Phone: (414) 342-3131