

Introduction

The following instructions apply to all standard Falk™ Type E Motoreducers and Type C Speed Reducers shown at right. If a drive is furnished with special features, refer to the supplementary instructions shipped with the drive.

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 regular lubrication. The details of this important job are the subject of this manual.

WARRANTY — Rexnord Industries (the “Company”) warrants that, for a period of three years from the date of shipment, the product described herein will deliver successfully its rated output as indicated on the nameplate, provided, it is properly installed and maintained, correctly lubricated, and operated in the environment and within the limits of speed, torque or other load conditions for which it was sold. Such product is expressly not warranted against failure or unsatisfactory operation resulting from dynamic vibrations imposed upon it by the drive system in which it is installed unless the nature of such vibrations has been fully defined and expressly accepted in writing by the Company as a condition of operation.

CAUTION: 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.

Installation Instructions

FOR SATISFACTORY PERFORMANCE, CAREFULLY FOLLOW THESE INSTRUCTIONS

WELDING — Do not weld the gear drive housing or accessories without prior approval from Rexnord Industries. 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.

NAMEPLATE — Operate drive only at horsepower, speed and ratio shown on nameplate. 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.

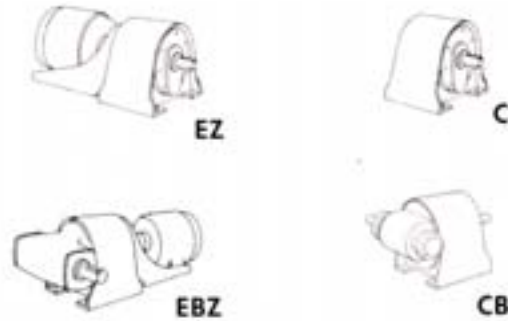
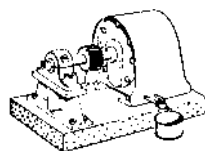
TIGHTENING TORQUES — Fasteners—See Page 2.

GREASE LUBRICATED BEARINGS — See Page 3.

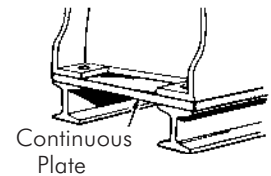
STORED AND INACTIVE DRIVES — See Page 4.

MOUNT HORIZONTALLY — **CAUTION:** Mount drive with base horizontal, unless it has been specifically ordered for mounting in another position. If it is necessary to mount the drive in a different position from that for which it was ordered, consult the Factory for changes necessary to provide proper lubrication.

FOUNDATION, GENERAL —To facilitate oil drainage, elevate the drive foundation above the surrounding floor level as illustrated. If desired, replace the drive oil drain plug with a valve, but provide a guard to protect the valve from accidental breakage. When an outboard bearing is used, mount drive and outboard bearing on a continuous foundation or bedplate and dowel both in place.

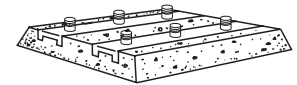


FOUNDATION, STEEL — When mounting drive on structural steel, it is recommended that an engineered design be utilized for a baseplate or bed to provide sufficient rigidity, to prevent induced loads from distorting the housing and causing gear misalignment. In the absence of an engineered design, it is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



FOUNDATION, CONCRETE — If a concrete foundation is used, allow the concrete to set firmly before bolting down the 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 (whether mounted on motor plates or motor brackets) may become misaligned during shipment. ALWAYS check alignment after installation. Refer to Page 2 for coupling alignment instructions.



DRIVE ALIGNMENT — Align drive with driven equipment by placing broad, flat shims under all mounting pads. Start at the low speed shaft side 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 machine and bolted down, align prime mover to drive input shaft. See Page 2 for coupling alignment.



If equipment is received from Rexnord mounted on a bedplate, the components were accurately aligned at Rexnord with the bedplate mounted on a large, flat assembly plate. Shim under the bedplate foot pads until the bedplate is level and all feet are in the same plane.

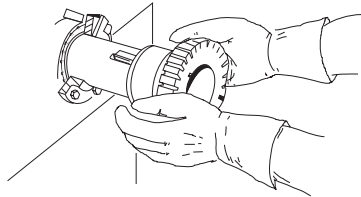
Check the high speed shaft coupling alignment. If the coupling is misaligned, the bedplate is shimmed incorrectly. Reshim bedplate and recheck high speed coupling alignment. If necessary, realign motor.

MOTOR BRACKETS — The weight, location and starting torque of the motor will cause some brackets to deflect downward and to twist. This movement is within allowable engineered limits for drive-motor selections from the Falk™ selection guide. If the customer considers the movement excessive, jackscrew supports for the bracket extension are available from Rexnord whether the motor was mounted by Rexnord or the customer. To compensate for deflection caused by heavy motors AND to get CORRECT COUPLING ALIGNMENT, use more shims under the rear motor feet than the front feet.

Motors and other components (whether mounted on motor plates or motor brackets) may become misaligned during shipment. ALWAYS check alignment after installation. Refer to coupling alignment instructions below.

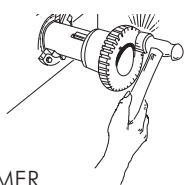
SHAFT CONNECTIONS

COUPLING CONNECTION — 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 drive shaft.



INCORRECT METHOD

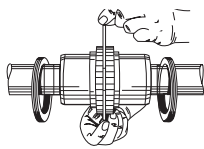
DO NOT drive coupling hub, pinion, sprocket or pulley onto the shaft. An endwise blow on the shaft may damage gears and bearings.

—CAUTION—
DO NOT HAMMER

Provide suitable guards in accordance with OSHA standards.

BACKSTOP— To prevent damage to backstops due to incorrect motor shaft rotation at startup, couplings are NOT assembled when drives are furnished with backstops. After completing the electrical connection, check motor and drive shaft rotations. Then complete alignment and assembly of coupling.

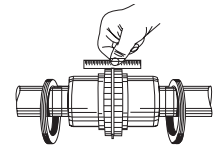
FALK™ COUPLINGS — Detailed installation manuals are available from the Factory and your local Rexnord Account Executive or Distributor – just provide size and type designations stamped on the coupling. Refer to Manual 428-010 for Steelflex® couplings and Manual 458-010 for Gear couplings for lubricant requirements and a listing of typical lubricants meeting Rexnord specifications.



The following instructions apply to coupling alignment:

Gap and Angular Alignment — If possible, after mounting coupling hubs, position the driving and driven drives 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 above, and also at 90° intervals around the hub. Check with feelers.

Offset Alignment — Align shafts of driving and driven drives so that a straightedge will rest squarely on both coupling hubs as shown to the right and also at 90° intervals. Tighten foundation bolts of the connected equipment and recheck alignment and gap.

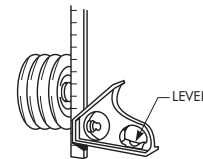
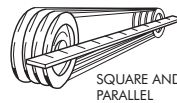
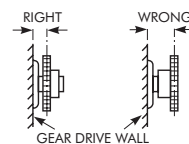


PINION MOUNTING — Mount the pinion as close to the drive as possible to avoid undue bearing load and shaft deflection. Refer to the Factory for pinion alignment instructions.

OUTBOARD BEARING — Mount the outboard bearing and drive on a common foundation so that they will shift as an assembly if settling should occur. Bring the outboard bearing to the correct horizontal position with broad flat shims under the mounting pad. Align accurately so that the load is equally divided between the two drive bearings and the outboard bearing. Mount a stop bar against the pillow block foot on the load side when large horizontal load components are exerted on the pillow block.

SPROCKET, PULLEY OR SHEAVE CONNECTION —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-belt periodically; tighten the belts if they are slipping.

TIGHTENING TORQUES — Use the values specified in the table below for fastening motors and Falk™ drives and accessories to their mounting surfaces with SAE Grade 5 or ASTM A449 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.

Tightening Torques – lb-in – DO NOT LUBRICATE FASTENERS

Thread Dia-UNC	Metal to Metal	Metal to Concrete	Thread Dia-UNC	Metal to Metal	Metal to Concrete
.250-20	90	70	1.250-7	12600	10000
.3125-18	185	145	1.375-6	16500	13000
.375-16	330	255	1.500-6	22100	17500
.500-13	825	640	1.750-5	23700	18700
.625-11	1640	1280	2.000-4 1/2	37000	29000
.750-10	2940	2290	2.250-4 1/2	52000	41000
.875-9	4560	3750	2.500-4	72000	56000
1.000-8	6800	5600	2.750-4	98000	77000
1.125-7	8900	7000	3.000-4	125000	99000

LUBRICATION

DRIVE LUBRICATION — Read and carry out all instructions on lubrication plate and heed all warning tags. Determine minimum and maximum ambient temperatures in which the drive is to operate and read the SAE or AGMA lubricant number for those temperature conditions from the lubrication plate on the drive. Select a lubricant from Manual 128-010 corresponding to the SAE or AGMA lubricant number.

OPERATING TEMPERATURE — If the drive is operated in an area where the temperatures vary with the season, change the oil viscosity to suit the season. For cold weather operation, use a light oil that will circulate freely at all times. The pour point of the oil should be less than the minimum external temperature encountered. During hot weather, use a high viscosity oil that will not thin out and lose its lubricating qualities.



If a 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, a heat exchanger or other cooling device may be required to prevent the sump temperature from exceeding the allowable maximum of 200°F (93°C).

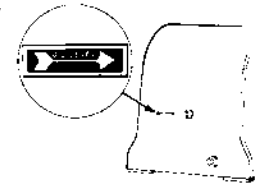
EXTREME PRESSURE LUBRICANT — **DO NOT use extreme pressure lubricant in drives equipped with an internal backstop.** Drives sometimes are severely overloaded due to a change in design of the driven machine, or a change in the nature of the material that is being processed. This also occurs when power requirements are in excess of that originally estimated. As a result, the gear teeth may show signs of distress in the nature of scuffing, scoring or pitting. For applications of this nature, an extreme pressure lubricant is recommended. This gives added protection to the gear teeth and may retard scoring and scuffing. However, this is not a cure-all. Applications which are severely overloaded should be referred to the Factory for further study and recommendations. Extreme pressure lubricants are listed in Manual 128-010.

SYNTHETIC LUBRICANTS — Do not use synthetic lubricants in drives equipped with internal backstops. Synthetic lubricants of the polyalphaolefin type have been used successfully in gear drives to provide certain advantages beyond that available with Mineral Oil or Extreme Pressure Oil. Depending upon operating conditions, these advantages may include: longer service life between lubricant changes, elimination of need to change lubricant to suit the season, operating capabilities beyond the high and low temperature limits of Mineral or EP oils.

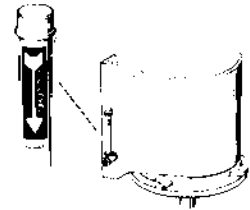
Select synthetic lubricants in accordance with specifications in Manual 128-010.

Splash Lubricated Drives — Standard Type E & C drives are splash lubricated. The lubricant is picked up by the revolving elements and distributed to all bearings and gear meshes.

OIL LEVELS — Fill the reducer with oil to the level indicated by the arrow on the side of the drive, on the vertical standpipe, or on the oil dipstick. Approximate oil capacities are shown at right.



When an oil level standpipe is furnished and shipped separately, assemble the standpipe to the side of the drive so that the scribed line will be clearly visible for future service checks.



Before starting, if conditions permit, rotate the input shaft by hand to check for any obstruction. Then start the drive and allow it to run without a load for several minutes. **Shut**

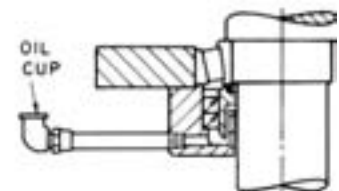
down and recheck oil level. Add oil to compensate for cooler, filter, etc., oil capacities. If everything is satisfactory, the drive is ready for operation.

GREASE LUBRICATED BEARINGS — When changing oil in the drive, grease bearings with a NLGI #2 bearing grease. Regrease these bearings as part of the standard maintenance program. Before installing a drive, note the location of all of the bearing grease fittings and grease labels for future maintenance reference. Note that some fittings may be ABOVE the oil level line and others BELOW. If a grease fitting will become inaccessible after the drive is installed, replace the fitting with a pipe extension (and the fitting) so that the grease fitting will be in an accessible location after the drive is installed.

DO NOT confuse the grease fittings for grease lubricated seals with those for grease lubricated bearings. If seal is inadvertently greased, grease will appear along the shaft at the shaft cover.

All right angle L.S.S. bearings are grease lubricated. Always remove the purge plug (when provided) when greasing bearings so that the old grease can escape. Wipe off purged grease and replace the plug after greasing bearings.

VERTICAL DRIVES — Fill the oil cup to a level slightly below the notch in the cup to lubricate the lower of the two low speed shaft seals.



L.S.S. Seal
for Vertical Units

The oil in the seal housing compartment is independent of the oil in the reducer housing; it is a lubricant reservoir for the lower seal and also a trap to protect the seals from direct contact with dust or dirt.

If both seals fail, oil from the reducer housing will pass into the oil compartment and then overflow through the notch in the oil cup

OIL CAPACITIES — ADD OIL TO THE LEVEL MARKED ON THE DRIVE OR STANDPIPE.

MOTOREDUCERS AND SMALL SPEED REDUCERS — The table below lists approximate oil capacities for Type E & C drives. Always fill drive to oil level marked on housing or standpipe.

For Ordering Oil — Approximate Gallons

DRIVE SIZE	Standard Types E and C			Standard Types EB and CB		
	Double	Triple	Quad	Triple	Quad	Quint
1 & 15	1	1	...	1 ³ / ₄	1 ³ / ₄	2
2 & 25	1	1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₄	1 ³ / ₄	2
3 & 35	1 ¹ / ₂	2 ³ / ₈	2 ⁵ / ₈	2 ³ / ₈	2 ³ / ₈	3
4 & 45	2 ⁵ / ₈	4 ³ / ₈	4 ³ / ₈	5	5	5
5 & 55	4 ³ / ₈	7	7	8 ¹ / ₈	8 ¹ / ₈	8 ¹ / ₈
6 & 65	7	10 ¹ / ₂	10 ¹ / ₂	11 ³ / ₄	11 ³ / ₄	11 ³ / ₄
7	12 ¹ / ₄	12 ¹ / ₄	14 ¹ / ₂	17 ¹ / ₄	17 ¹ / ₄	17 ¹ / ₄
75	12 ¹ / ₄	19	19	21	21	21
8	13 ¹ / ₄	19	19

† For double reductions drives with ratios LESS than 14.27:1 and input speeds MORE than 1400 rpm, use approximately 10 gallons and check low oil level plug indicated on drive housing.

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 reducer; these were permanently set at the Factory.

AFTER FIRST MONTH’S SERVICE — Proceed as follows:

1. Operate drive until old sump oil reaches normal operating temperature. Shut the drive down and drain immediately.
2. Immediately flush drive with an oil of the same type and viscosity grade as the original charge (warmed to approximately 100°F (38°C) in cold weather). Rapidly pour or pump a charge equal to 25-100% of the initial fill thru the drive or until clean oil flows thru the drain.
3. Close the drain and refill the drive to the correct level with new or reclaimed oil of the correct type and viscosity. If determined to be in good condition by the supplier, reclaimed oil may be reused if it is filtered thru a 40 micron or finer filter.

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 high level mark on the dipstick or the oil level plug, have the oil analyzed for water content. Moisture in the oil may indicate that the heat exchanger or a seal is leaking. If so, replace the defective part immediately and change the oil. **DO NOT** fill above mark indicated as leakage or undue heating may result. Also check coupling alignment to make certain that foundation settling has not caused excessive misalignment. If drive is equipped with a fan, periodically clean accumulated foreign matter from the fan, fan guard and deflector to allow adequate air flow.

OIL CHANGES — For normal operating conditions, change gear oils every 6 months or 2500 operating hours, whichever occurs first. Compounded oils may require more frequent changes. In dusty areas or where temperatures are high, more frequent changes may be required. Lubricant suppliers can test oil samples from the drive periodically and recommend economical change periods based on the rate of lubricant contamination and degradation.

If the drive is operated in an area where temperatures vary with the seasons, change the oil viscosity grade to suit the temperature.

Refer to Manual 128-010 for viscosity recommendations and typical lubricants meeting Rexnord specifications.

BEARINGS — Some drives have one or more grease lubricated bearings. See GREASE LUBRICATED BEARINGS, Page 3. When changing oil in the drive, grease bearings with a NLGI #2 grease.

COUPLINGS — Lubricate the Falk™ Steelflex® couplings in accordance with instructions in Manual 428-010 and Falk™ Gear couplings in accordance with instructions in Manual 458-010.

DISMANTLING — CAUTION: Lockout power source and remove all external loads from drive before servicing drive or accessories.

Service manuals and parts guides are available from the Factory and Rexnord Account Executive. When writing, please give complete data from the nameplate on the drive; Model, M.O., Date, RPM, and Ratio.

SPARE AND REPAIR PARTS — When ordering parts, always give complete data from the nameplate on the Falk™ drive. This complete nameplate data will assure you of receiving the correct parts. If a new nameplate is received with the new parts (for example, when the drive ratio is changed), replace the old nameplate on the drive with the new nameplate for future reference.

STORED AND INACTIVE DRIVES

Each drive is spin-tested with rust preventive oil that will protect parts against rust for a period of 4 months in an outdoor shelter or 12 months in a dry building after shipment from the Factory.

If a 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 in the amounts tabulated below. Before operating, drives which have been stored or inactive must be filled to the proper level with oil meeting the specifications given in Manual 128-010.

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

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 above, if specified on the order.

The vent is replaced with a plug (vent is then attached to the drive) so that the protective rust inhibiting atmosphere is sealed inside the drive. Replace plug with vent when preparing drive for operation.

MOTORSTOR★ — Add to Stored or Inactive Drives

DRIVE TYPE	DRIVE SIZE	MOTORSTOR OUNCES PER DRIVE
All E types C types	1 thru 45	1
	5 thru 65	2
	7 thru 8	3

★ Product of Daubert Chemical Company, Chicago, IL. (Formerly known as “Nucle Oil”)