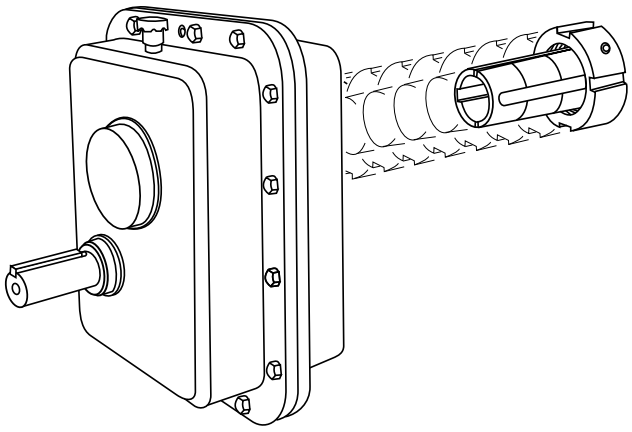
TABLE OF CONTENTS



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INTRODUCTION

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.

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.

CAUTION: *Do not weld the drive housing or accessories without prior approval from Rexnord Geared Products. Welding on the drive may cause distortion of the housing or damage to the bearings and gear teeth. Welding without prior approval will void the warranty.*

DRIVE RATING — Operate the drive only within the horsepower and output speed for which it was selected and specified in Selection Guide 371-110 for the application. Refer to the nameplate for drive size, ratio and data.

FALK FACTORY REPAIR AND REBUILD — Rexnord wants to continue to be your primary supplier, and we extend our service to you if your equipment is in need of repair or replacement.

We are able to furnish a fast turnaround on both the quotation and rebuild. Nobody can do the job better than Rexnord. If you need repair on Rexnord products, just ask.

Contact your local Rexnord Account Executive or distributor for more information.

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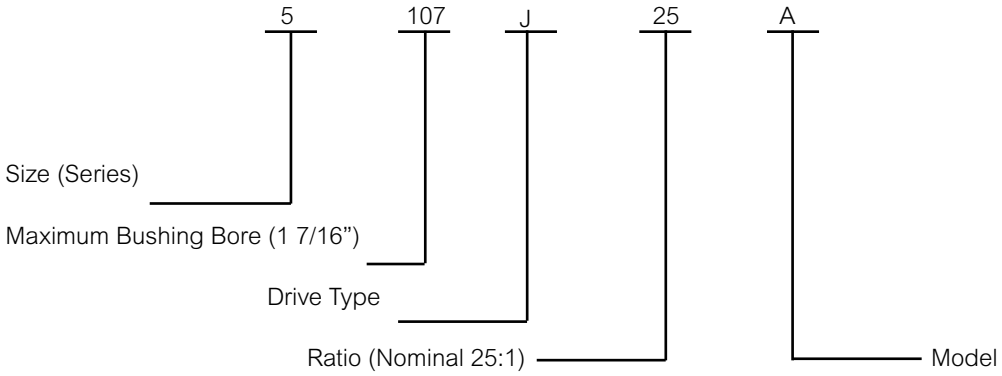
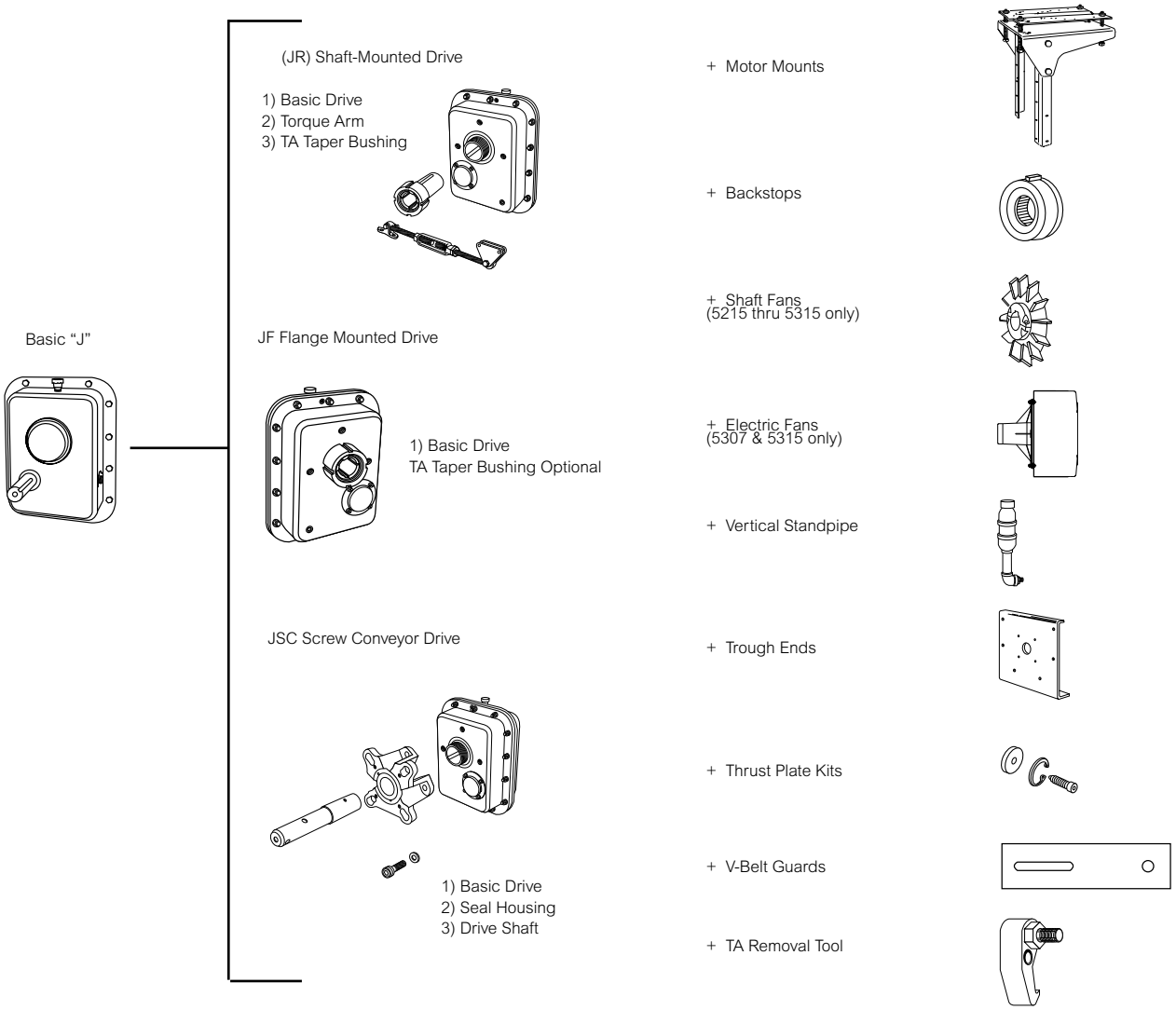
Drive Identification



J is the basic drive identification. It can be outfitted for use as a shaft-mounted drive JR; a flange-mounted drive JF; or a screw conveyor drive JSC, as illustrated below. These unique identifiers, JR, JF & JSC, are used throughout this manual to assist you in identifying the instructions which apply to your drive arrangement. The prefix "M" identifies a drive that features a nominal metric high-speed shaft.



NOTE: Use a TA Taper bushing when mounting these drives on a straight driven shaft (hollow shaft is taper bored).

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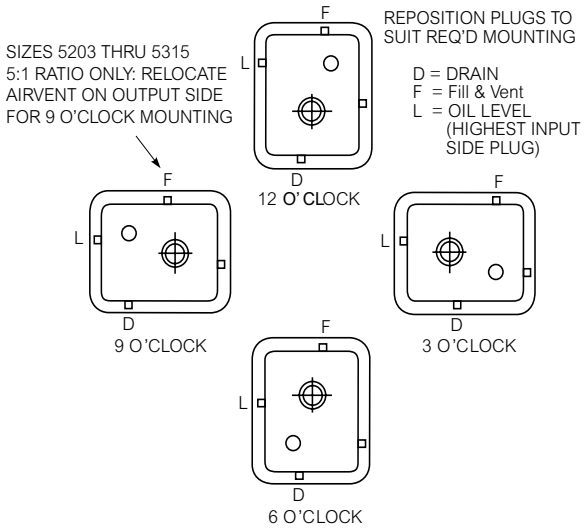
Section I

DRIVE INSTALLATION

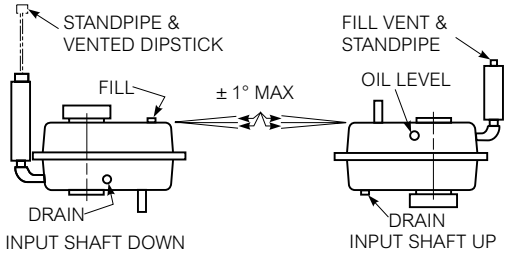
OUTFITTING

1. **JR, JF, & JSC —** Find the desired mounting position in Figure 1 and install air vent and magnetic drain plug (packaged separately with basic drive). Also note and/or mark the oil level plug location OR in the case of a vertical mounting, refer to Appendix E for installation of vertical stand pipe. If the mounting angle exceeds the limitations shown in Figure 1, refer to Appendix F to determine modifications necessary within the limits illustrated therein. DO NOT fill drive with lubricant at this time. Oil plugs are located on input housing half.

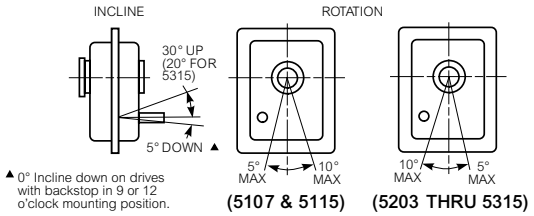
Figure 1 HORIZONTAL DRIVES



VERTICAL DRIVES



ANGULAR LIMITS FOR HORIZONTAL MOUNTING
(ALL CLOCK POSITIONS)



▲ 0° Incline down on drives with backstop in 9 or 12 o'clock mounting position.

2. **JR —** Remove anchor brackets, housing flange fasteners and rod end fasteners from tie rod kit and assemble to drive as illustrated in Figure 2. Refer to Table 1 for tightening torque (original fasteners may be discarded).

Figure 2

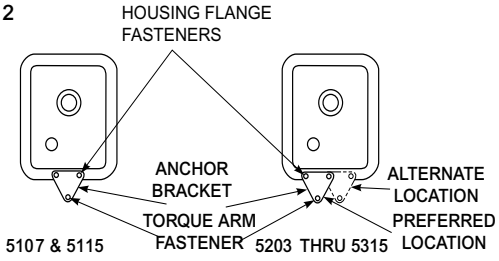


TABLE 1 — Housing Flange Fastener Size and Tightening Torque
(Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size	Tightening Torque lb-ft (Nm)
5107	.312-18	19 (26)
5115	.312-18	19 (26)
5203	.375-16	28 (37)
5207	.500-13	69 (94)
5215	.500-13	69 (94)
5307	.500-13	69 (94)
5315	.500-13	69 (94)

3. **JR —** The tapered bore hollow shaft is designed for use with a TA Taper bushing for mounting on a driven shaft with a straight outside diameter. Shaft tolerances for the driven shaft are given in Table 1A. The minimum and maximum driven shaft engagements, dimension "N" in Figure 3, are shown in Table 2. The minimum engagement is necessary for full bushing engagement; the maximum engagement is only required if a thrust plate will be employed to remove the drive from the driven shaft (see Appendix C for preferred removal method).

TABLE 1A — Driven Shaft Tolerances ▲

Shaft Diameter – Inches	Maximum Under-size – Inches
Up to 1.500	.004
1.500 - 2.500 incl.	.005
2.500 - 4.000 incl.	.006

▲ Millimeters = h10 tolerance.

Figure 3

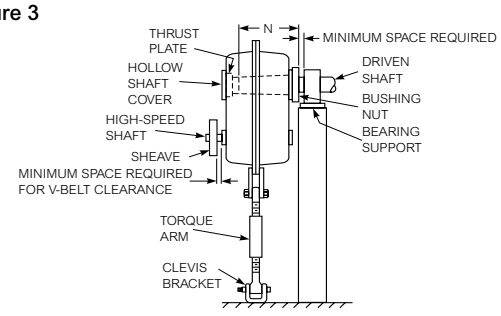


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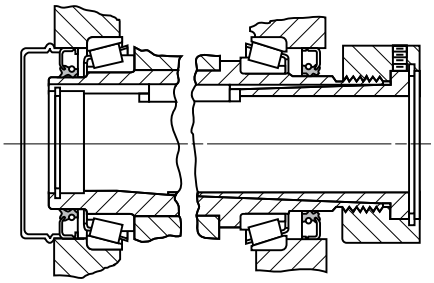
TABLE 2 — N Dimension Inches (mm) ▲

DRIVE SIZE	Minimum	Maximum
5107	5.00 (127)	7.19 (183)
5115	5.55 (141)	8.05 (204)
5203	5.53 (140)	7.78 (198)
5207	6.11 (155)	8.72 (221)
5215	7.08 (180)	10.15 (258)
5307	7.39 (188)	10.69 (272)
5315	7.92 (201)	10.74 (273)

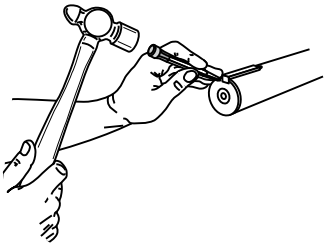
▲ The minimum engagement is necessary for full bushing engagement; the maximum engagement is only required if a thrust plate will be++oyed to remove the drive from the driven shaft.

a. **THIN WALL BUSHING** (with keyway slot through the bushing wall) — With the driven shaft keyway at the 12 o'clock position, slide bushing assembly onto the driven shaft, nut end first, and position the keyway slot over the shaft keyway (the bushing may have to be pried open slightly). Insert the drive, key furnished with the bushing, into the shaft keyway. Proceed to Step 7.



b. **THICK WALL BUSHING** (with separate internal and external keyways) — Insert the driven shaft key into the driven shaft keyway. If the driven shaft has an open-ended keyway, stake the keyway, Figure 4, to prevent axial dislocation of the shaft key under operating conditions. Slide the bushing assembly onto the driven shaft (the bushing may have to be pried open slightly). Rotate the shaft so the external keyway in the bushing is at the 12 o'clock position. Then insert the drive key, furnished with the bushing, into the keyway. Proceed to Step 7.

Figure 4



4. **JSC — NOTE**: See Appendix K for non-tapered drive shafts. Remove the hollow shaft cover from the input side of the hollow shaft bore and save. Separate contents from the drive shaft kit. Install thrust plate and retaining ring in the hollow shaft, Figure 5. When the drive is a size 4107 and will employ a 2.437" (61.9 mm) or 3.000" (76.2 mm) diameter drive shaft, place the (2) gaskets and trough end spacer, packaged separately, over the trough end surface of the seal housing, Figure 6. Continue outfitting based on the type of trough end seal to be installed: (a) Waste Packing Seal; (b) Lip Seal or; (c) Packing Gland Seal.

Figure 5

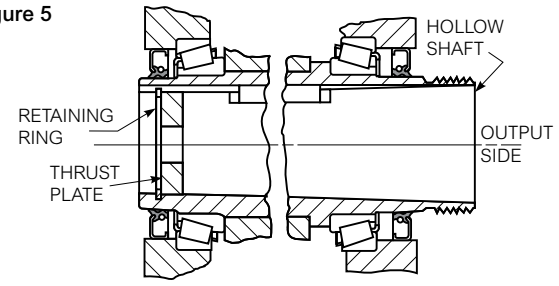
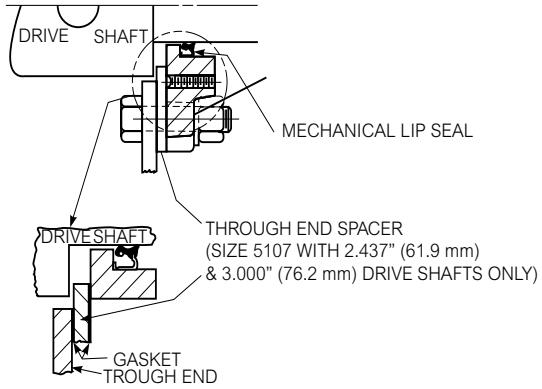


Figure 6



a. **WASTE PACKING SEAL (Figure 7) —** Slide drive shaft thru seal housing. Insert key into drive shaft and slide drive shaft into hollow shaft. The seal housing registers into the basic drive seal bore. Install the drive shaft thrust plate fastener thru thrust plate and torque to the value specified in Table 3. Use the seal housing fasteners to secure the seal housing to the basic drive housing. Refer to Table 4 for proper torque value. Reinstall hollow shaft cover. Pack seal housing with waste packing and proceed to Step 5.

TABLE 3 — JR & JSC Thrust Plate Fastener Data (Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size & Grade ▲	Torque lb-ft (Nm)	Min Thread Depth Inches (mm)
5107	.500-13UNC x 3.25, GR. 8	92 (125)	2.00 (50.8)
5115	.500-13UNC x 3.25, GR. 8	92 (125)	2.00 (50.8)
5203	.625-11UNC x 3.50, GR. 8	183 (248)	2.00 (50.8)
5207	.625-11UNC x 3.50, GR. 8	183 (248)	2.00 (50.8)
5215	.875-9UNC x 3.50, GR. 8	533 (723)	2.50 (63.5)
5307	1.00-8UNC x 4.00. GR. 5 ■	567 (769)	2.75 (69.8)
5315	1.00-8UNC x 4.00. GR. 8	792 (1074)	2.75 (69.8)

▲ Fastener lengths given are for applications using tapered drive shafts. Other lengths may be needed for applications using tapered bushings.
■ 1.00-8UNC x 3.50, GR. 5 for 5307JF.

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Figure 7

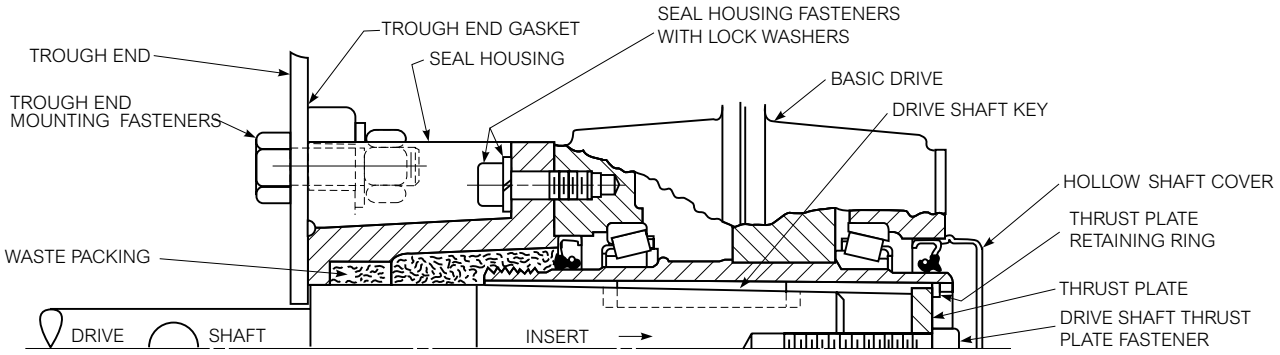
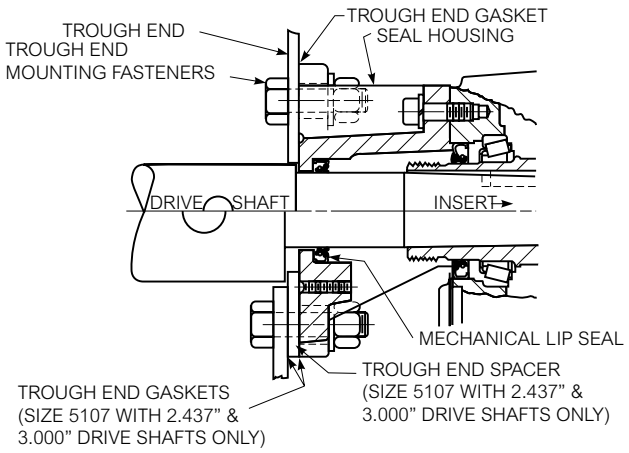


TABLE 4 — Seal Housing & Trough End Fastener Size – UNC & Tightening Torque (Non-Lubricated Fasteners)

Fastener Location	DRIVE SIZE						
	5107	5115	5203	5207	5215	5307	5315
Seal Housing Fasteners lb-ft (Nm)	.500-13 69 (94)	.625-11 137 (186)	.750-10 245 (332)	.875-9 380 (515)	1.000-8 567 (769)	1.000-8 792 (1074)	1.000-8 792 (1074)
Trough End Fasteners lb-ft (Nm)	1.500" Diameter Drive Shaft .500-13 Fasteners 69 (94)						
	2.000" & 2.437" Diameter Drive Shafts .625-11 Fasteners with Nuts — 137 (186)						
	3.000" & 3.437" Diameter Drive Shafts .750-10 Fasteners with Nuts — 245 (332)						

Figure 8



b. **LIP SEAL (Figure 8) —** Coat outside diameter of seal with Permatex #3 or equivalent. Drive seal into seal housing with the spring-loaded seal lip away from the driver. Wrap the keyway on tapered shank of drive shaft with masking tape or lightweight Kraft paper to protect against damaging the seal lips. Coat the seal lips and straight portion of the drive shaft with bearing grease. Line up the keyway in the drive shaft with the hollow shaft keyway and insert the drive shaft into the seal housing. Remove the protective wrap and install the drive shaft key. Insert the drive shaft into the hollow shaft. The seal housing registers into the basic drive seal bore. Use the thrust plate fastener, Figure 7, to secure the drive shaft. Refer to Table 3 for proper torque value. Install the seal housing fasteners to secure the seal housing to the basic drive. Refer to Table 4 for proper torque value. Reinstall hollow shaft cover and proceed to Step 5.

Figure 9

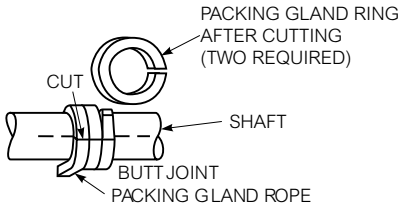
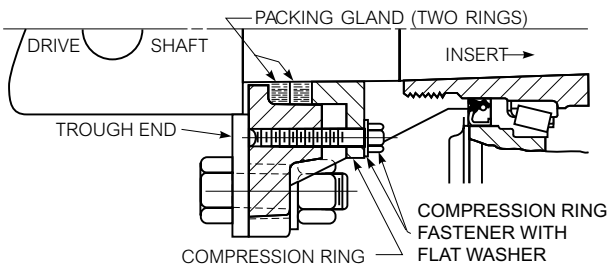


Figure 10



c. **PACKING GLAND SEAL** (Figure 10) — First, wrap the packing around the drive shaft adjacent to the tapered portion of the drive shaft as shown in Figure 9. Cut the packing to produce two complete split seal rings
CAUTION: *Do not mar the shaft's seal surface.*

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Remove packing rings from the drive shaft and slide the drive shaft through the seal housing. Install seal rings into the seal housing. Stagger the seal joints approximately 90° apart. Slip the compression ring into place. Use fasteners with flat washers to hold the ring but DO NOT tighten at this time. Install key in the drive shaft keyway and then install the drive shaft into the hollow shaft. Use the thrust plate fastener, Figure 7, to secure the drive shaft. Refer to Table 3 for torque value. Use the seal housing fasteners to secure the seal housing to the basic drive. Refer to Table 4 for the torque value. Reinstall the hollow shaft cover. To adjust packing seal, rotate input shaft to test the resistance. Tighten the compression ring fasteners evenly until an additional resistance can be detected when the high-speed shaft is rotated. DO NOT OVERTIGHTEN – this can cause premature seal wear and possible overheating. Proceed to Step 5.

5. **JSC —** Fasten the trough end to the seal housing using the hex head cap screws included in the drive shaft kit. Refer to Table 4 for torque value. Proceed to Step 7.
6. **JF —** Install backstops prior to installation of the drive (refer to Appendix B). If an adapter flange is provided, assemble it to the drive using fasteners provided with the flange. Refer to Table 5 for fastener selection and torque value. Remove the input side hollow shaft cover. The standard method for connecting a flange-mounted drive to the driven shaft is to prepare the driven shaft per Appendix H and mount the drive to the tapered shaft using a thrust plate kit with fastener as shown in Table 3. An optional method of connection should be used when replacing existing drives with special shafts or when producing tapered shafts is impractical. This optional method uses a TA tapered bushing as outlined in Appendix J.

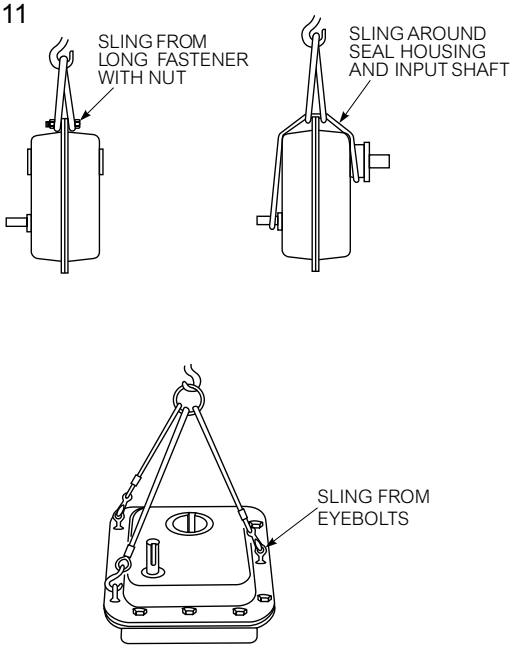
TABLE 5 — Flange-Mounted Drive – Foundation Fastener Size & Tightening Torque (Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size and Grade	Torque lb-ft (Nm)	Min Fastener Engagement Into Drive Housing Inches (mm)
5107	.500-13UNC, GR.5	69 (94)	.76 (19.3)
5115	.625-11UNC, GR.5	137 (186)	.94 (23.9)
5203	.750-10UNC, GR.5	245 (332)	.76 (19.3)
5207	.875-9UNC, GR.5	380 (515)	.88 (22.4)
5215	1.000-8UNC, GR.5	567 (769)	1.00 (25.4)
5307	1.000-8UNC, GR.8	792 (1074)	1.24 (31.5)
5315	1.000-8UNC, GR.8	792 (1074)	1.24 (31.5)

INSTALLATION

7. **JR, JF, & JSC —** Refer to Figure 11 for recommended lifting method. In order to sling JR & JF as illustrated, remove a housing flange fastener and install a long fastener with nut. For vertical installation, use (3) eye bolts as illustrated. Eyebolt sizes are 5/16" for 4107 and 4115, 3/8" for 4203 and 1/2" for 4207 thru 4315. DO NOT remove sling until drive is secured to shaft. Before lifting the drive into position, rotate the high-speed shaft until the hollow shaft keyway will be in position to line-up with the driven shaft key. JF proceed to Step 12; JSC to Step 13.

Figure 11



8. **JR —** If the drive was received with a backstop installed, the backstop must be temporarily removed to facilitate mounting.

   Refer to Section II, Figure 19 and remove cover Ref. #16 and backstop Ref. #5A1.
9. **JR —** Lift the drive into position and slide onto the drive shaft taking care that the driven shaft key seats into the hollow shaft keyway. DO NOT hammer or use excessive force. Refer to Figure 12 for installation of the torque arm. The exact position of the tie rod may vary within the range shown. For torque arm mountings other than shown, refer to Rexnord. If it is necessary to shorten the torque arm, cut the excess from either threaded end.

   The support to which the clevis bracket is to be fastened must sustain the torque reaction shown in Table 8. The maximum load reaction through the torque arm occurs when the torque arm is located in the extreme (30°) off angle position. Use Grade 5 fasteners to anchor the clevis bracket; see Table 7 for the fastener diameter and tightening torque.

   Bolt the tie rod to both the clevis bracket and the drive anchor bracket and tighten the bolts until seated against the brackets. DO NOT bend the bracket as clearance between the clevis brackets and tie rod is necessary.

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Figure 12

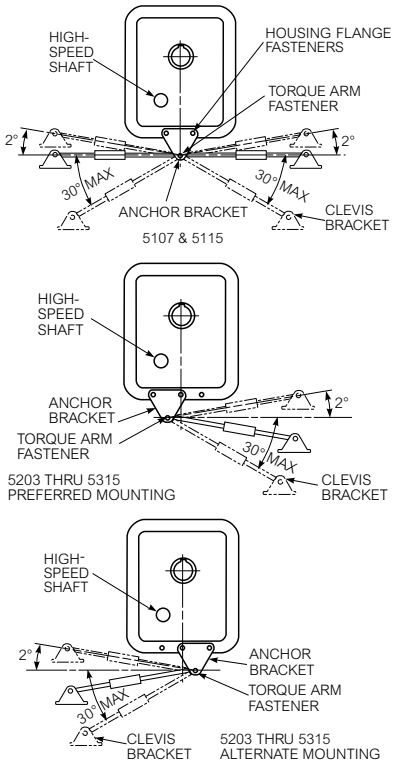


TABLE 6 — Spanner Wrench Type & Spanner Nut Tightening Torque

DRIVE SIZE	Adjustable Hook Spanner Wrench		Spanner Nut Tightening Torque lb-ft (Nm)
	GearWrench	Williams	
5107	81856 (2" to 4-3/4")	474	83 (113)
5115	81856 (2" to 4-3/4")	474	83 (113)
5203	81856 (2" to 4-3/4")	474	167 (226)
5207	81857 (4-1/2" to 6-1/4")	474A	167 (226)
5215	81857 (4-1/2" to 6-1/4")	474A	250 (339)
5307	81857 (4-1/2" to 6-1/4")	474A	250 (339)
5315	81858 (6-1/8" to 8-3/4")	474B	250 (339)

TABLE 6A — Bushing Nut Setscrew – Tightening Torque

DRIVE SIZE	Setscrew Size	Tightening Torque lb-ft (Nm)
5107	.250-20	5 (7)
5115-5207	.312-18	11 (15)
5215-5315	.375-16	19 (26)

TABLE 7 — Torque Arm Clevis Bracket Fastener Tightening Torque

DRIVE SIZE	Fastener ▲ Size	Tightening Torque – lb-ft (Nm)	
		Steel Foundation	Concrete Foundation
5107	.375-16UNC	28 (38)	21 (28)
5115	.375-16UNC	28 (38)	21 (28)
5203	.500-13UNC	69 (94)	53 (72)
5207	.500-13UNC	69 (94)	53 (72)
5215	.625-11UNC	137 (186)	107 (145)
5307	.750-10UNC	245 (332)	191 (259)
5315	1.000-8UNC	567 (769)	467 (633)

▲ Grade 5 fasteners required.

TABLE 8 — Load Reaction Through Torque Arm

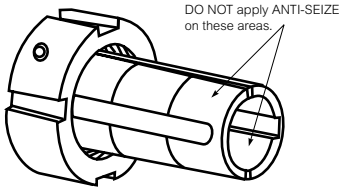
DRIVE SIZE	5107	5115	5203	5207	5215	5307	5315
Load lb (N) ▲	2440 (10850)	3810 (16940)	4680 (20810)	6750 (27790)	9160 (40720)	12963 (57660)	15890 (70700)

▲ Load includes moment due to motor and motor mount with torque arm at maximum angle.

10. **JR —** Thread the bushing nut onto the hollow shaft one to two turns. **NOTE:** The bushing nut threads have been coated with an anti-seize compound at the Factory. This compound should not be removed. Before re-installing a previously used nut, re-coat the nut threads only with an anti-seize compound.

    Note: In extremely severe or corrosive environments, additional anti-seize compound MUST be applied to the threads of the TA bushing nut.

WARNING: *DO NOT apply anti-seize or lubricant to bushing or shaft surfaces. Use of anti-seize may prevent secure connection of the drive to the shaft and cause the drive to move.*



WARNING: *Overtightening can fail the internal retaining ring (see Appendix G, for listing of retaining rings).*

a. **PREFERRED METHOD —** Use a spanner (Table 6), chain or pipe wrench to tighten the bushing nut to the torque value indicated in Table 6. Apply Loctite 243 or equivalent to threads of setscrew. Tighten the setscrew on the bushing nut to torque value indicated in Table 6A.

b. **ALTERNATE METHOD —** (To be used when torque cannot be measured.) Use a spanner (Table 6), chain or pipe wrench to tighten the bushing nut just until the drive can no longer be moved by hand axially on the driven shaft. Loosen nut ONLY until it can be turned by hand but do not unseat the taper. Retighten the nut hand tight. Now mark a spot on the top of the driven shaft. Next mark a spot on the bushing nut 180° from the driven shaft mark (90°CCW for sizes 5107 & 5115). Use the spanner wrench to tighten the nut CW one half turn until the two marks are aligned (one quarter turn for sizes 5107 & 5115). Apply Loctite 243 or equivalent to threads of setscrew. Tighten the setscrew on the bushing nut to torque value indicated in Table 6A.

11. **JR —** Install backstop, motor mount, motor, sheaves (mount sheaves as close to the drive and motor housing as possible), belts and guard. Refer to Appendix D for motor mount installation instructions. Proceed to Step 14.

12. **JF (USING TAPERED DRIVE SHAFT) —** Put key into the driven shaft. Lift drive into position and slide onto the driven shaft taking care that the driven shaft key seats into the hollow shaft keyway. DO NOT hammer or use excessive force. Secure the drive to the shaft with the thrust plate fastener. Refer to Table 3 for torque value. Reinstall the hollow shaft cover. Install motor mount, motor, sheaves, belts and guard. Refer to Appendix D for motor mount installation instructions. Proceed to Step 15.

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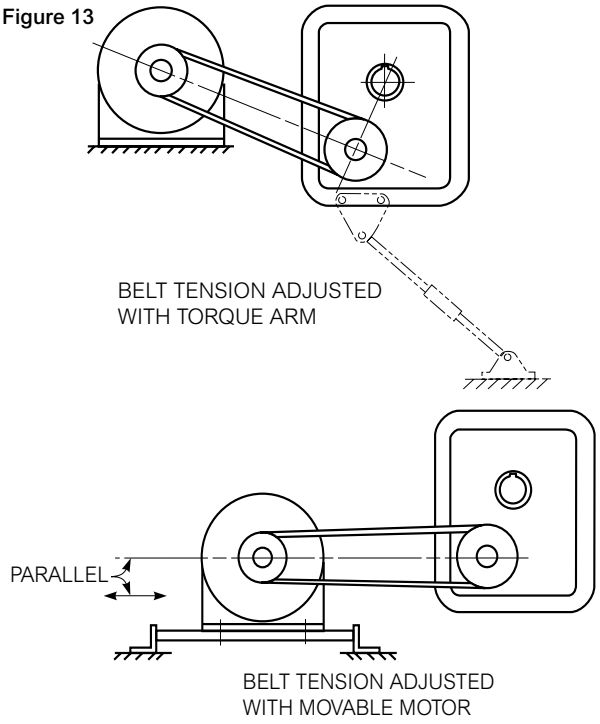
13. **JSC —** Assemble drive to trough and install drive shaft coupling bolts per screw conveyor manufacturer's instructions. Install motor mount, motor, sheaves, belts and guard. Refer to Appendix D for motor mount installation instructions. Proceed to Step 15.
14. **JR —** When the torque arm turnbuckle is used for belt tension adjustment, position the motor so that the belt pull will be about 90° to a line through the drive high-speed shaft and hollow shaft as shown in Figure 13. For drives where the motor is moved to adjust belt tension, mount the motor slide base so that the belt tension adjustment is approximately parallel to the belt centers. Refer to Appendix D for instructions relative to alignment of sheaves and belts.

Figure 13



LUBRICATION

***CAUTION**: Drives shipped without oil.*

15. **JR, JF, & JSC —** Refer to Appendix A for selection of lubricant. Refer to Table 9 at right for approximate oil capacity of drives.
16. **JR, JF, & JSC —** HORIZONTAL MOUNTING

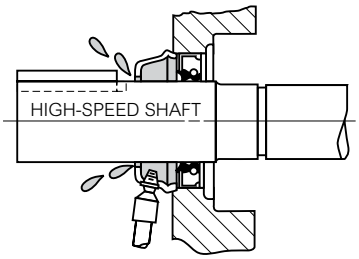
    Remove air vent and oil level plug (refer to Step 1). Fill the drive until oil shows in the oil level hole. Coat the air vent and plug threads with #3 Permatex or equivalent thread sealant before replacing.

    JRV, JFV, & JSCV — (VERTICAL MOUNTING) Refer to Figure 1, Step 1.

    Input Shaft DOWN — Remove the fill plug and fill with oil to level marked on the dipstick.

    Input Shaft UP — Remove the oil level and fill plugs and fill until oil shows in the oil level hole. Coat the plug threads with #3 Permatex or equivalent thread sealant before replacing.
17. **JR, JF, & JSC —** Where applicable, pump grease into the high-speed shaft seal cover with a **Hand Grease Gun,** Figure 14, until fresh grease flows out along the shaft. Wipe off excess grease from the shaft. DO NOT use grease where it could contaminate the product, e.g. foods, drugs, etc.

Figure 14



START UP

18. **JR, JF, & JSC —** Before operating the drive, check any fasteners, pipe plugs, air vent, etc. which may have been loosened in the course of outfitting, installing and lubricating the drive to be sure that they have been properly retightened. If a long fastener was used to lift the drive into place, reinstall the housing flange fastener and torque to the value shown in Table 1. After one week of operation, repeat check of all external fasteners and pipe plugs.
19. **AFTER ONE MONTH OF OPERATION:**
    a. Operate the drive until the sump oil reaches normal operating temperature. Shut the drive down and drain immediately.
    b. Immediately flush the 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.
    c. Close the drain and refill the drive to the correct level with new oil of the correct type and viscosity.

TABLE 9 — Approximate Oil Capacity – Quarts (Liters) ▲

DRIVE SIZE	JR, JF, & JSC	JRV & JFV
5107	2 (1.9)	3 (2.8)
5115	3 (2.8)	4.5 (4.3)
5203	3.5 (3.3)	5 (4.7)
5207	5.5 (5.2)	7.5 (7.1)
5215	9 (8.5)	13 (12.3)
5307	13 (12.3)	18 (17)
5315	15 (14.2)	21 (19.9)

▲ Quantities are approximate. Always fill drive to specified level.

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Section II

DRIVE SERVICE & REPAIR

PREVENTIVE MAINTENANCE

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 specified level, have the oil analyzed for water content. Moisture in the oil may indicate seal leakage or condensation. If so, correct the defect immediately and change the oil. DO NOT overfill or oil leakage may result. If a drive is equipped with a fan, periodically clean accumulated foreign matter from the fan and fan guard to allow adequate air flow.

GREASE PURGED SEALS — Periodically (at least every six months), depending upon the frequency and degree of contamination, purge contaminated grease from seal by slowly pumping fresh bearing grease through the seal cage, **WITH A HAND GREASE GUN,** until fresh grease flows out along the shaft. Wipe off the purged grease. Refer to Appendix A.

PACKING GLAND SEAL — Section I, Step 4(C)

OIL CHANGES

Refer to the Lubrication Recommendations Section in Appendix A.

STORED & INACTIVE GEAR DRIVES

Each drive is protected with a rust preventive 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 gear drive is to be stored, or is inactive after installation beyond the above periods, add Nox-Rust VCI-10 ▲ vapor-phase rust inhibitor. For drives that have oil installed, add Nox-Rust VCI-10 vaper-phase rust inhibitor at the rate of 2% of sump capacity. For drives without oil, add Nox-Rust VCI-10 vapor-phase rust inhibitor at the rate of one ounce per cubic foot of internal drive space. 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.

▲ Product of the Daubert Chemical Company, Chicago, Illinois.

Periodically inspect stored or inactive gear drives and add Nox-Rust VCI-10 every six months, or more often if necessary. Indoor dry storage is recommended.

The air breather should be replaced with a plug (air breather should be attached to gear drive for future use) so that the protective rust inhibiting atmosphere is sealed inside the drive. Install air breather when preparing drive for operation.

***WARNING**: The rust preventative oil from the factory and Nox-Rust VCI-10 are not H1 registered with the NSF (National Sanitation Foundation) as suitable for food processing applications. When Food Grade Lubricants are to be used, it is the end users responsibility to properly flush and prepare the drive for Food Grade service. Contact the lubricant manufacturer for specific information and flushing procedures.*

REPAIR & REPLACEMENT

***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.*

NOTE: Only the seals on the input side of the drive can be replaced without removing the drive from the driven equipment. All other repairs require removal of the drive from the driven equipment. Proceed to Step 1 for drive removal. Proceed to Step 5 for replacement of seals.

Removal (See above note for seal replacement only)

1. JR, JF & JSC — Drain the lubricant at this time. Remove safety guards and belts (motor and motor mount, optional). Remove backstop (if so equipped). Refer to Section II, Step 10, for backstop removal instructions.

***WARNING:** Drive must be supported during removal process. Use a sling around the motor mount or as recommended in Section I, Step 7. Take up the slack in the sling before proceeding.*

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2. **JR —** Refer to Appendix C for instructions on using the TA Torque Assist Removal Tool.

   Alternate Method — Loosen the setscrew on the bushing nut, which is located at the output end of the hollow shaft. Use a spanner, pipe or chain wrench to loosen the bushing nut (Section I, Table 6). Initially, the nut will freely rotate counter-clockwise approximately 180° as the nut moves from the locked position to the removal position. At this point anticipate resistance which indicates unseating of the bushing. Continue to turn the nut until it is free from the hollow shaft. Prepare drive for lifting by disconnecting the torque arm at the drive end. Slide the drive from the bushing. The bushing can be left in place or removed, as required. If bushing will not slide off of the shaft, insert a small pry bar into the split of the bushing and pry the split open slightly to loosen the bushing and remove from the shaft. Proceed to Step 5 for replacement of seals or Step 9 for drive disassembly procedure.

3. **JF & JSC —** Remove the cover from the input end of the hollow shaft.

   JF — Remove the bolts which fasten the drive to the driven equipment.

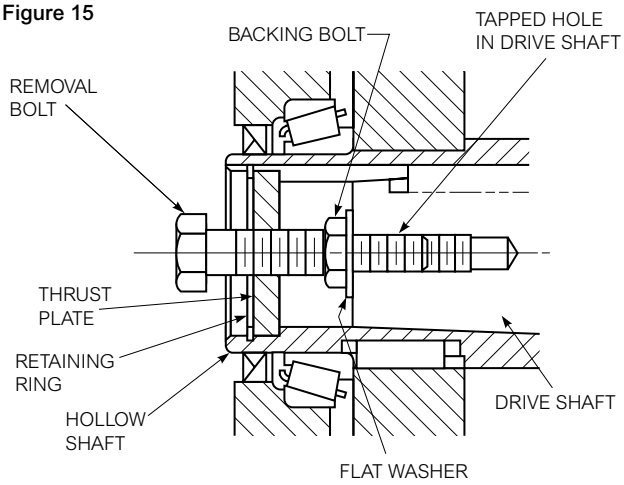
   JSC — (a) If the drive is to be removed from the drive shaft, remove the seal housing fasteners (Figure 7, Section I), or (b) if the drive is to be removed with the drive shaft attached, remove the trough end mounting fasteners and drive shaft coupling bolts. Remove the assembly from the trough.

   JF & JSC — Remove the thrust plate, fastener and retaining ring from the hollow shaft. Refer to Table 10 and select a backing bolt and flat washer and install them into the drive shaft as illustrated in Figure 15. The head of the backing bolt provides a working surface for the removal bolt. Reinsert the thrust plate and retaining ring into the hollow shaft and select a removal bolt from Table 10. Thread the removal bolt into the thrust plate until it contacts the backing bolt head. Torque the removal bolt to the value shown in Table 10 (if the thrust plate rotates in the shaft, align the slot in the plate with the hollow shaft keyway and insert a screwdriver or piece of key stock to prevent rotation of the plate). After torquing the bolt as instructed, strike the bolt sharply with a hammer and re-torque the bolt if separation of the drive from the shaft did not occur. Repeat this procedure, re-torquing the bolt after each blow, until separation occurs.

TABLE 10 — Removal & Backing Bolt Size & Length

DRIVE SIZE	Removal Bolt Size & Minimum Length - Inches	Maximum Tightening Torque lb-ft (Nm)	Backing Bolt Size & Maximum Length - Inches
5107	0.625-11UNC x 1.75	133 (180)	0.500-13UNC x 1.25
5115	0.625-11UNC x 1.75	133 (180)	0.500-13UNC x 1.25
5203	0.750-10UNC x 2.00	242 (328)	0.625-11UNC x 1.75
5207	0.750-10UNC x 2.00	242 (328)	0.625-11UNC x 1.75
5215	1.000-8UNC x 2.50	567 (769)	0.875-9UNC x 2.25
5307	1.125-7UNC x 3.00	742 (1006)	1.000-8UNC x 2.50
5315	1.125-7UNC x 3.00	742 (1006)	1.000-8UNC x 2.50

Figure 15



CAUTION: *Failure to follow this procedure may result in the destruction of the threads in the thrust plate (if the retaining ring becomes damaged, refer to Appendix G, for replacement information).*

Proceed as follows:

JF to Step 5 for replacement of Quadrive seals only OR Step 9 for drive disassembly procedure.

4. **JSC —** If the drive was removed with the seal housing and the drive shaft attached, remove the seal housing fasteners to separate the seal housing and drive shaft from the drive. After separation of the drive and shaft has been achieved, determine the type of seal equipped in the seal housing. If it is a waste packing seal (Figure 7, Section I), a packing gland seal (Figure 10, Section I) or a lip seal (Figure 8, Section I), proceed as follows for removal of the drive shaft from the seal housing:

   a. **PACKING GLAND SEAL —** Remove the key from the drive shaft keyway. Loosen the compression ring fasteners. Remove the seal housing toward the tapered end of the drive shaft.

   b. **LIP SEAL —** Remove the key from the drive shaft keyway. Remove any burrs from the tapered end of the shaft and wrap the entire length with masking tape or a lightweight Kraft paper to protect the seal lips during removal. Carefully remove the seal housing toward the tapered end of the drive shaft. For replacement of Quadrive seals only proceed to Step 5, otherwise to Step 9.

   c. **WASTE PACKING SEAL —** Remove the key from the drive shaft keyway. Remove the waste packing material and remove the seal housing toward the tapered end of the drive shaft.

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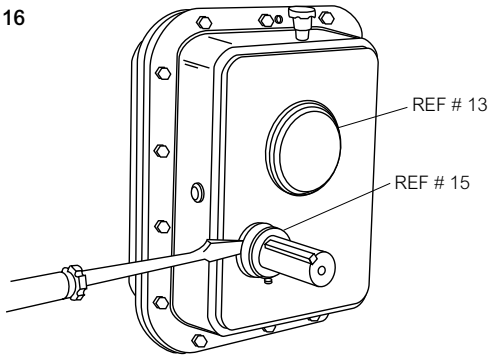
DRIVE DISASSEMBLY — (Refer to Parts Drawing Figure 19)

Prior to initiating any disassembly or repair, clean accumulated dirt and grime from the surface of the drive housing. Clean the exposed portion of the input and output shafts with a solvent and a non-abrasive cloth. If only the seals are being replaced, proceed to Step 5. If the drive will be disassembled for inspection or repair, remove input side seal covers, Ref. #13 & 15, as illustrated in Figure 16, then skip to Step 9.

CAUTION: *Do not damage shaft. New seals will leak if seal contacting surface is marred. Do not use abrasive material on shaft seal contacting surface.*

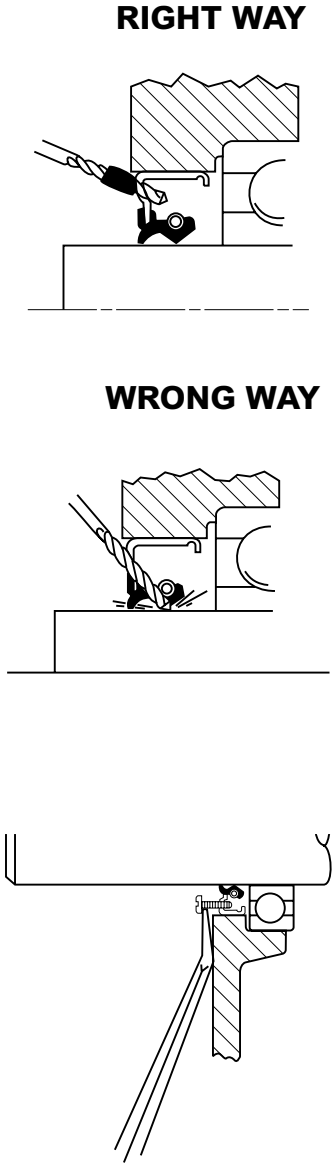
5. **SEAL REMOVAL —** The input side low-speed and high-speed shaft seals, Ref. #19 & 20, respectively, can be replaced without removing drive from the driven shaft. Remove input side seal covers, Ref. #13 & 15, as illustrated in Figure 16.

Figure 16



   a. Remove all sharp edges from shaft extension. Use a sharp center punch to lightly punch the seal case as a guide for drill bit. NOTE: Seals are not axially restrained. DO NOT drive seal into bore too deep, or disassembly of drive may be required to extract seal.
   b. Wrap several turns of tape around the drill bit approximately .250" (6 mm) from the drill point to prevent the drill bit from entering too deeply into the housing and damaging the bearing. Grease or magnetize the drill bit to help retain the chips. Drill two .125" (3 mm) diameter holes in the seal case 180° apart. Control the angle of the drill as illustrated in Figure 17 to prevent damage to the shaft.
   c. Insert two #10-.750" (M5 x 20) sheet metal screws into the seal case leaving .5" (13 mm) of the screw protruding above the seal face. DO NOT drive the screw more than .25" (6 mm) beyond seal face or bearing damage may occur. Use a claw type pry bar under the screw head as shown in Figure 17 to lift seal out. Remove all metal chips. Use a magnet to remove the metal chips that fall into the bore. Flush the drive to remove chips from the bearing. Remove Permatex from the housing bore.

Figure 17



6. **SEAL SURFACE CONDITION —** Carefully inspect polished surface of shaft where the seal makes contact. If the seal surface shows any sign of a nick, scratch, spiral swirl or groove, the shaft should be replaced or refurbished to prevent leakage of the lubricant. (In many instances, the seal surface can be restored by use of a thin wall wear sleeve. Check with your local seal supplier and follow the manufacturer's instructions for installing the wear sleeve.)

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7. SEAL INSTALLATION

   CAUTION: Protect seal lips from sharp edges of the keyway by wrapping thin, strong paper around the shaft and coating the paper and seal lips with grease before sliding the seal on or off the shaft. Do not expand the seal lips more than .030" (0.75 mm) diameter.

   a. Coat O.D. of seal with #3 Permatex or equivalent sealant. Position seal squarely in seal bore with the garter spring toward bearing. Place a square ended cylindrical tool against seal and press or lightly tap tool (not seal) until seal outer wall is seated .14" (3.5 mm) inside the seal bore outer wall.

      CAUTION: *A shaft shoulder is NOT provided for stopping seal. DO NOT seat seal against bearing.*

   b. Measure seal axial run-out with a dial indicator mounted on the shaft. If the seal axial run-out is more than .010" (0.25 mm), tap high side of seal with installation tool until seal axial run-out is .010" (0.25 mm) or less.

   c. Remove shaft wrapping and reinstall the input side seal covers, Ref. #13 and 15.

8. **DRIVE REPAIR IS COMPLETE —** Review instructions in Section I for reassembly of drive onto driven shaft.

9. When seals, Ref. #19 & #20, are to be reused (replacement is recommended), wrap the input shaft keyway and output shaft threads with masking tape or lightweight Kraft paper to protect seal lips during disassembly. Cover wrapping with a light coat of grease.

10. If drive is equipped with a backstop, remove output side end cover Ref. #16, gasket Ref. #23, backstop Ref. #5A1, and key Ref. #5A4 from output housing Ref. #11 (note the direction of rotation of the input shaft for proper reassembly).

11. Lay drive on bench with input shaft down. Remove housing flange fasteners, Ref. #25. Tap out dowel pins.

    SIZE 5115J05 — Remove fasteners from retaining plate, Ref. #3A6.

    SIZES 5203 THRU 5315 — Use one of the housing flange fasteners as a jackbolt to separate input and output housing halves using the tapped hole on input housing flange provided for this purpose. Carefully lift off output housing, Ref. #11.

12. Remove the shaft assemblies (J05 - 3A & 4A; J09, J14 or J25 -1A, 2A, & 4A) from input housing, Ref. #10.

13. Drive seals out from input and output housing bores if replacement is indicated. Remove gasket material, seal compound and any accumulated foreign matter from seal joints, bores and adjacent sealing surfaces. Use a solvent to clean housing and shaft assemblies.

    CAUTION: *On sizes 5203 thru 5315, tapered roller bearing cups are assembled in input housing with a slight clearance fit. In addition, metal shims for adjusting bearing preload and axial float are installed behind bearing cups in housing. When handling input housing, be careful that bearing cups and shims do not fall out of input housing.*

14. If drive is equipped with a backstop, check the shaft surface and backstop sprags (inside diameter) for signs of wear. If either component shows evidence of wear, both should be replaced (Ref. #1A and 5A or Ref. #3A and 5A assemblies). Also refer to Step 6 for inspection of seal surfaces.

15. Inspect gear teeth for wear or indications of fatigue e.g. hairline cracks at root of tooth. If one element has undergone severe wear or broken teeth, replace the mating element also.

16. Clean and inspect bearings for wear. Lubricate with light oil before spinning to avoid scoring of working surfaces. Remove any worn bearings with a wheel puller. When replacing tapered roller bearings, replace both cups and cones. DO NOT use new cone assemblies with worn (old) cups.

17. Use a wheel puller or press to remove gears Ref. #1A4 or 4A4 from the shaft. Exercise caution to avoid scoring shaft seal diameter with the keyway of gear.

18. Inspect all fasteners for damage or wear and replace with fasteners of equal grade. Grade 5 fasteners have three (3) radial lines on the head. Fasteners are available in kit form, Ref. #80.

19. If the shaft assemblies can be reused intact (no new parts required), refer to Section III, Steps 6 thru 9, for reassembly procedure. Replace all shim-gaskets with new parts, Kit Ref. #100. On sizes 5107 and 5115, use the same thicknesses as removed during disassembly.

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IDENTIFYING & ORDERING PARTS

1. Refer to the drive component diagram, Figure 18, and exploded parts diagram, Figure 19, and make a list of the parts required by part reference number. For example, Ref. #15, 20 100, 1A, 2A1, and 2A2. When a gasketed joint is separated, always replace with new shim-gaskets. Order Ref. #100 shim-gasket kit.
2. Now refer to the parts list, Table 11, and determine the part description and Falk part number using the part reference number (Step 1) and the drive identification (e.g. 5107J25) in the column headers of the parts list.
3. Use the part description and Falk part number to order the required parts. In the examples in steps 1 and 2, Ref. #15, 20, 100, 1A, 2A1 and 2A2 for a 5107J25 would be ordered as follows:

   Seal cover 4723094
   Seal 2921419
   Shim-gasket kit 4729429
   Shaft assembly with gear . . .4729373
   Bearing 2926359
   Bearing 2926359

4. Table 12 and 13 convert Falk part numbers to bearing and seal manufacturer's part numbers. Tooth combinations are listed in Appendix G.
5. Place your order with your local Rexnord distributor. If you need to locate a distributor, phone (414)342-3131 in the United States or Canada.

RECOMMENDED SPARE PARTS

1. For non-critical drive applications, a complete set of bearings, seals and shim-gaskets is recommended. If stored in their original packaging in a dry, cool location, these parts have a minimum shelf life of five years.
2. For critical drive applications (where an outage would create a major production loss), a complete drive is recommended.

Figure 18

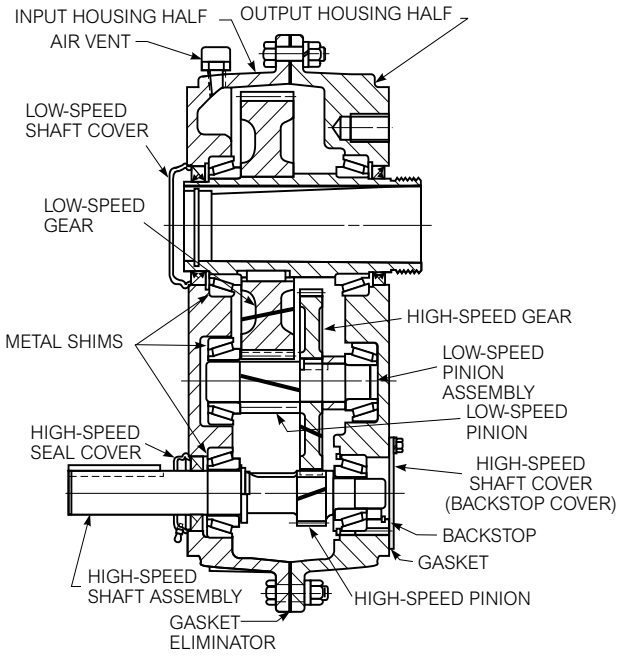

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Figure 19

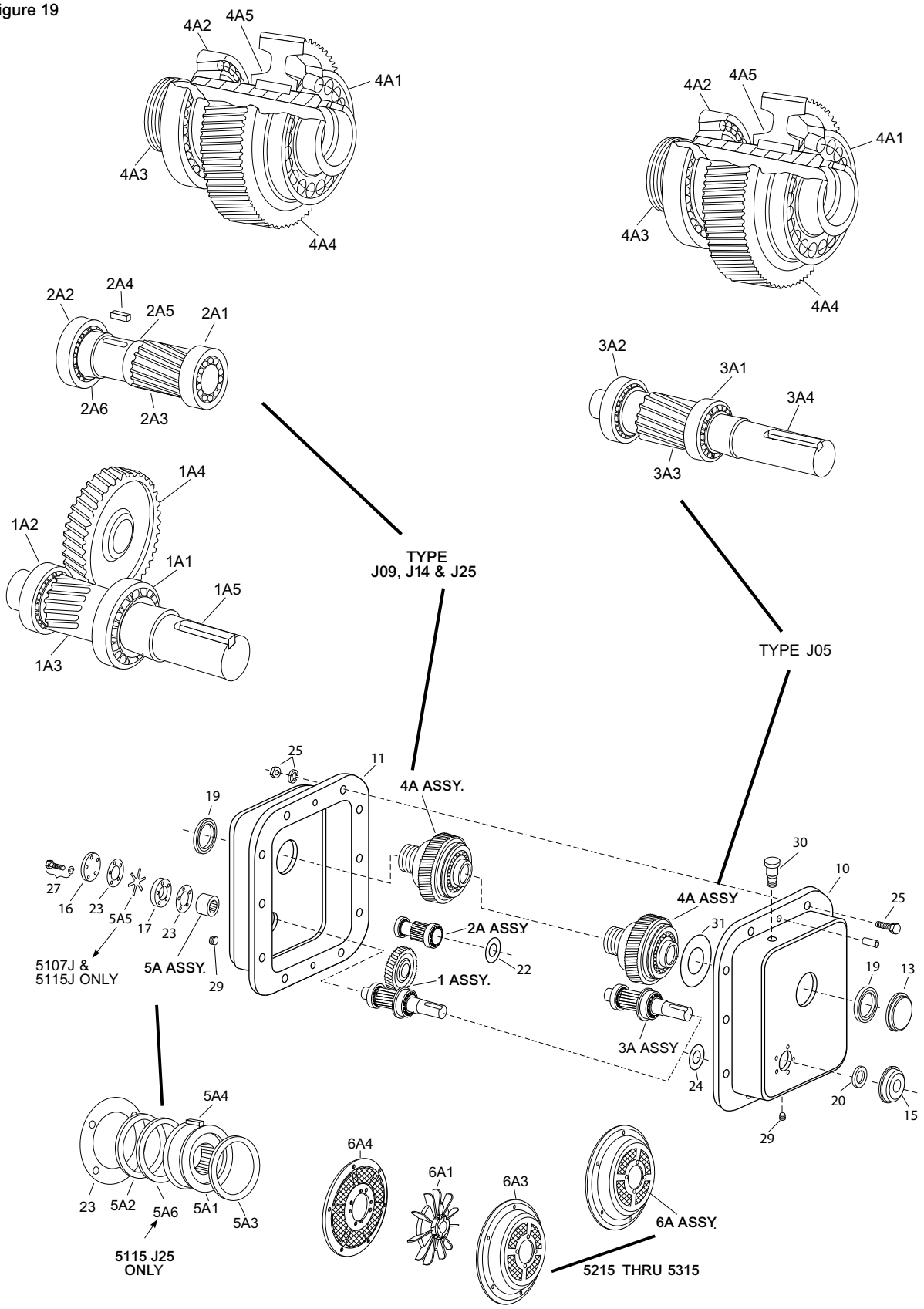

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TABLE 11 — Parts List of Falk Part Numbers

Ref. No	Part Description	DRIVE SIZE						
		5107 ①	5115 ①	5203 ①	5207	5215	5307	5315
	Housing Components							
13	Shaft Cover-LS	2109906	1164350	1164353	2110134	1164359	2110504	2110779
15	Seal Cover	4723094	4723095	4723096	4723097	4723098	4723099	4723109
16	Shaft Cover	1161865	1161866	1238030	2119130	1161870	1161870	1161870 ■
16	Shaft Cover W/BKSP	1243290	1161866	1238019	2119130	1219342	1237944	1219342
17	Cover Spacer BKSP	1243292	1243296		2119132			
19	Seal,	2916797	2921425	2921422	2921421	2904606	2921423	2922295
20	Seal, HS	2921419	2921416	2902929	2921417	2921420	2916797	2920669
30	Air Vent	0914088	0914088	0914088	0914088	0914088	0914088	0914088
80	Fastener Kit	4729000	4729000	4729032	4729049	4729064	4729082	4729100
100	Shim & Gasket Kit	4729429	4729430	0786836	0786837	0786838	0786839	0786840
	Rotating Elements — J05							
3A	Shaft Ass'y-Inc 3A1-3A4	4729363	4729377	4729045	4729061	4729076	4729094	4729112
3A1	Bearing	2926357	2926361	2919339	2918700	2919359	0921354	2919215
3A2	Bearing	2926357	2919340	2919340	0921521	2919360	2916263	0921853
3A3	Pinion & Shaft-Inc 3A4	4729364	4729378	4729046	4729062	4729077	4729095	4729113
4A	Shaft Ass'y-Inc 4A1-4A5	4729365	4729033	4729047	4729063	4729078	4729096	4729114
4A1	Bearing	4729014	4720891	2911822	2905191	0921778	0921727	0921366
4A2	Bearing	4729014	4720891	2911822	2905191	0921778	0921727	0921366
4A3	Hollow Shaft w 4A5 Key	4729016	4723015	4723028	4723039	4723050	4723061	4723073
4A4	Gear	1242585	1238105	1242878	1237897	1242848	1242860	1237763
5A	Backstop Ass'y	0795654	0793995	0785596	0783905	0785610		
	Rotating Elements — J09							
1A	Shaft Ass'y W/O 1A4 Gear	4729366	4729380	4729037	4729053	4729068	4729086	4729104
1A	Shaft Ass'y With 1A4 Gear	4729367	4729381	4729034	4729050	4729065	4729083	4729101
1A1	Bearing	2926357	2926361	2919339	2918700	2919359	0921354	2919215
1A2	Bearing	2926357	2919340	2919340	0921521	2919360	2916263	0921851
1A3	Pinion & Shaft w 1A5 Key	4729368	4729382	4729041	4729056	4729071	4729089	4729107
1A4	Gear	1242532	1242536	1242834	1242842	1242849	1242857	1242861
5A	Backstop Ass'y	0795654	0793995	0785596	0783905	0785610	0785529	0757183
	Rotating Elements — J14							
1A	Shaft Ass'y W/O 1A4 Gear	4729369	4729383	4729038	4729054	4729069	4729087	4729105
1A	Shaft Ass'y With 1A4 Gear	4729370	4729384	4729035	4729051	4729066	4729084	4729102
1A1	Bearing	2926357	2926361	2919339	2918700	2919359	0921354	2919215
1A2	Bearing	2926357	2919340	2919340	0921521	2919360	2916263	0921851
1A3	Pinion & Shaft w 1A5 Key	4729371	4729385	4729042	4729057	4729072	4729090	4729108
1A4	Gear	1242533	1242537	1242833	1242843	1242850	1242858	1237856
1A5	Backstop Ass'y	0795654	0793995	0785596	0783905	0785610	0785529	0757183
	Rotating Elements — J25							
1A	Shaft Ass'y W/O 1A4 Gear	4729372	4729386	4729039	4729055	4729070	4729088	4729106
1A	Shaft Ass'y With 1A4 Gear	4729373	4729387	4729036	4729052	4729067	4729085	4729103
1A1	Bearing	2926357	2926361	2919339	2918700	2919359	0921354	2919215
1A2	Bearing	2926358	2926359	2919340	0921521	2919360	2916263	0921853
1A3	Pinion & Shaft w 1A5 Key	4729374	4729388	4729043	4729058	4729073	4729091	4729109
1A4	Gear	1242534	1238106	1238017	1242844	1242851	1242859	1237764
1A5	Backstop Ass'y	0795655	0795658	0785596	0783905	0785610	0785529	0757183
	Rotating Elements — J09, J14, & J25							
2A	Shaft Ass'y-Inc 2A1-2A6	4729375	4729389	4729040	4729059	4729074	4729092	4729110
2A1	Bearing	2926359	2926360	2919338	2918700	0921350	0921793	0921850
2A2	Bearing	2926359	2926360	2919338	2918701	2916288	0921793	0921850
2A3	Pinion & Shaft w 2A4 Key	4729376	4729390	4729044	4729060	4729075	4729093	4729111
2A5	Spacer	1179876	1179877					
2A6	Spacer	1161925	1163034	1161889	1163762	21200246		
4A	Shaft Ass'y-Inc 4A1-4A5	4729365	4729033	4729047	4729063	4729078	4729096	4729114
4A1	Bearing	4729014	4720891	2911822	2905191	0921778	0921727	0921366
4A2	Bearing	4729014	4720891	2911822	2905191	0921778	0921727	0921366
4A3	Hollow Shaft w 4A5 Key	4729016	4723015	4723028	4723039	4723050	4723061	4729115
4A4	Gear	1242585	1238105	1242878	1237897	1242848	1242860	1237763

Continued on next page.

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TABLE 11 — Parts List of Falk Part Numbers (Continued from Page 16)

Ref. No.	Part Description	DRIVE SIZE						
		5107 ▲	5115 ▲	5203 ▲	5207	5215	5307	5315
	Shaft Fan Assembly — All Ratios							
6A	Shaft Fan Ass'y Inc 6A1-6A4	. . .	. . .	. . .	. . .	0785611	0785530	0785432
6A1	Fan	. . .	. . .	. . .	. . .	4729079	4729097	4729116
6A3	Guard	. . .	. . .	. . .	. . .	4729080	4729098	4729117
6A4	Backplate	. . .	. . .	. . .	. . .	4729081	4729099	4729118

▲ For sizes 5107J – 5203J, 4000J/5000J, revolving parts not necessarily interchangeable. Consult Service Parts Department.
■ For size 5315J05 only; use P/N 1161869.

TABLE 12 — Bearing Cross Reference Numbers ▲

Falk Part Number	Manufacturer's Number
Tapered Roller Bearings ■	
0921350	HM804843/HM804810
0921354	475/472
0921366	48393/48320
0921521	19138/19283-B
0921727	68462/68712
0921778	JM822049/JM822010
0921793	HM803149/HM803110
0921850	JHM807045/HM807010
0921851	46176/46368
0921853	46162/46368
2905191	497/492A
2911822	34478/34300
2916263	418/414
2916288	3879/3820
2918700	350A/352
2918701	339/332
2919215	HM813841A/HM813810
2919338	26112/26283-S
2919339	LM48548A/LM48510
2919340	17098/17244-B
2919359	386A/382A
2919360	3379/3320-B
2926357	30205M
2926358	30303M
2926359	30304M
2926360	30305M
2926361	30206M
4720891	29675/29620
4729014	JLM506810/JLM506849

▲ Other Falk suppliers of bearings that are considered equal to those listed are: TRW, Fafnir, FAG and BCA.
■ Falk suppliers of Tapered Roller Bearings are: Timken, Bower, and Tyson.

TABLE 13 — Viton Seal Cross Reference Numbers

Falk Part Number	Manufacturer's Number ▲	
	Chicago Rawhide	National
2902929	13661	. . .
2904606	42433	. . .
2916797	21091	. . .
2920669	23843	. . .
2921416	11207	470712V
2921417	15138	. . .
2921419	8704	481570V
2921420	18582	. . .
2921421	33699	. . .
2921422	29912	415995V
2921423	46155	. . .
2921425	27324	455315V
2922295	52498	. . .

▲ Subject to substitution of equivalent seals without notice.

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Section III

DRIVE REASSEMBLY

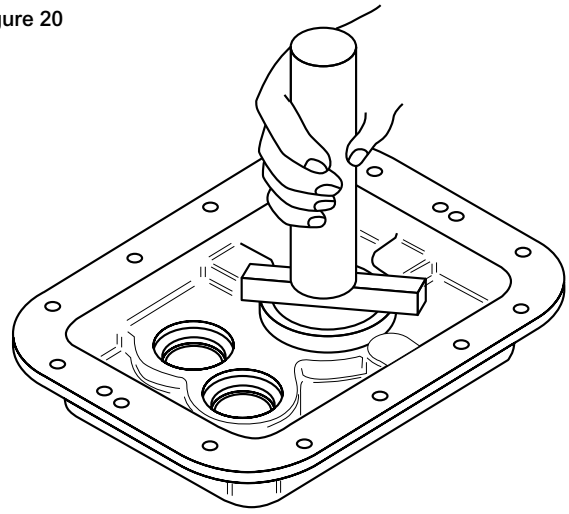
REFER TO PARTS DRAWING FIGURE 19

1. GENERAL
   a. Clean all parts to be reassembled and coat all tapered roller bearing cups and pinion teeth with an SAE 20 (or heavier) oil. DO NOT lubricate gear teeth prior to assembly on shaft.
   b. Heat all ball bearings and tapered roller bearing cones in an oven to 275°F (135°C).

      CAUTION: *Do not apply flame directly to bearings or rest bearings directly on a heated surface.*
   c. Slide or press all ball bearings and bearing cones tight against the shoulder.

      CAUTION: *Do not apply force to the bearing rollers or roller cage. Apply force against the inner race only.*
2. ASSEMBLY OF TAPERED ROLLER BEARING CUPS
   a. **SIZE 5107 THRU 5315 —** Drive high-speed bearing cup, Ref. #1A2 or 3A2, intermediate-speed bearing cup Ref. 2A2, and low-speed bearing cup 4A2 squarely into their respective bearing bores of output housing Ref. #11, with a press or steel bar as shown in Figure 20

Figure 20

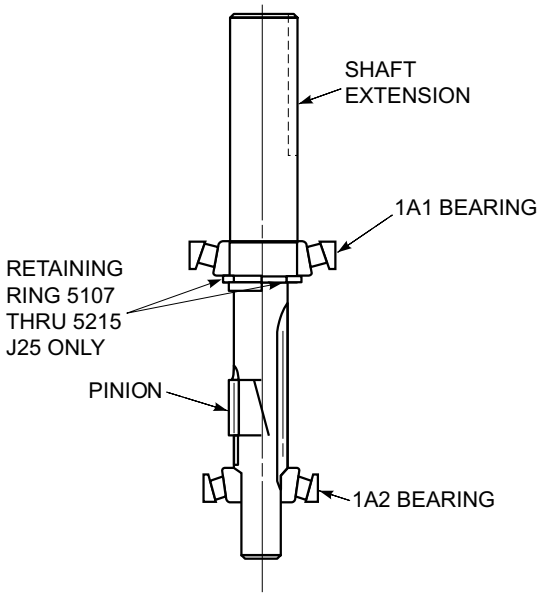


3. **High-speed SHAFT ASSEMBLY —** Ref. #1A or 3A Assembly.

   Seat heated bearings cones, Ref. #1A1, 1A2 or 3A1 & 3A2, firmly against shaft shoulder or retaining ring.

   CAUTION: *Allow bearings to cool. Apply a coat of oil to the cooled bearings to lubricate and avoid scoring of working surfaces.*

Figure 21



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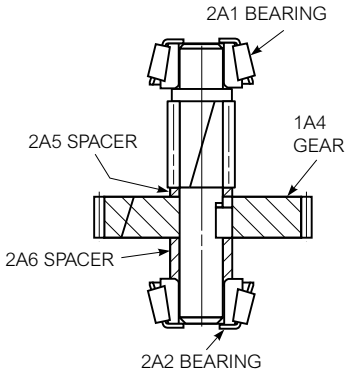
4. **INTERMEDIATE SHAFT ASSEMBLY —** Ref. #2A Assembly - Type J09, J14 and J25 - Figure 22. Prepare bearings per Steps 1b and c on Page 18.

Figure 22

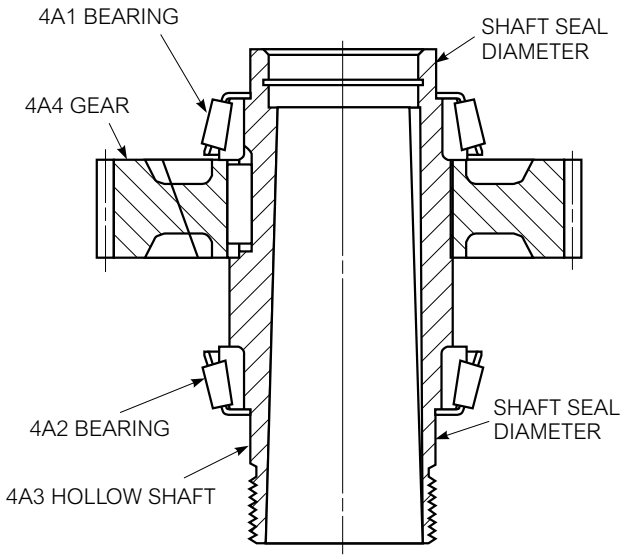


   a. **ALL SIZES —** Heat gear Ref. #1A4 to 325°F (163°C) in an oven. Insert key, Ref. #2A4, in shaft keyway. Assemble gear onto shaft, with the chamfer toward pinion, using a press to ensure a tight fit. Allow gear to cool before proceeding.
   b. Assemble spacer, Ref. #2A6, onto intermediate shaft (except sizes 5307 and 5315). Seat bearings or cones, Ref. #2A1 & 2A2, on shaft. Seat all components firmly so spacers do not rotate on shaft.

      CAUTION: *Allow assembly to cool. Apply a coat of oil to the cooled bearings to lubricate and avoid scoring of the working surfaces.*

5. **LOW-SPEED SHAFT ASSEMBLY —** Ref. #4A Assembly - ALL TYPES - Figure 23. Prepare bearing cones per Steps 1b and c.

Figure 23



   a. Heat gear, Ref. #4A4, to 325°F (163°C) in an oven. Insert gear key, Ref. #4A5, into hollow shaft keyway. Assemble the gear with the chamfer toward the shoulder on the shaft using a press to ensure a tight fit.

      WARNING: *Exercise care so that the gear keyway does not contact the shaft seal diameter(s) as scoring could occur.*
   b. Seat bearing cones, Ref. #4A1 & 4A2, firmly against gear and shoulder.

      CAUTION: *Allow assembly to cool before proceeding. Apply oil to the cooled bearing rollers and gear teeth to lubricate and avoid scoring of the working surfaces.*

6. **BEARING ADJUSTMENT**
   a. **SIZES 5107 THRU 5315 —** Bearing adjustment is made by adjusting thickness of metal shims, Ref. #24, behind bearing cups in input housing, Ref. #10.

      NOTE: The thickest shim should be located adjacent to the bearing cup. The thinnest shims should be located in the center of the shim pack.

      (1) Support input housing, such that when high-speed shaft assembly, Ref. #1A or 3A, is lowered into place there is clearance for shaft extension end. Install bearing cups in input housing without any metal shims. Tap dowel pins into input housing with solid pin nearest high-speed shaft bore.
      (2) Lower low-speed shaft assembly, Ref. #4A, into input housing, Ref. #10, with threaded end facing up (DO NOT install Ref. #1A [or 3A] or 2A shaft assemblies at this time).
      (3) Assemble output housing, Ref. #11, to input housing. Install housing flange fasteners, Ref. #25, with heads of cap screws against input housing. Cross tighten fasteners to torque specified in Table 14.)

TABLE 14 — Housing Flange Fastener Size & Tightening Torque ±5%
(Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size	Tightening Torque lb-ft (Nm)
5107	.312-18	19 (26)
5115	.312-18	19 (26)
5203	.375-16	27 (37)
5207	.500-13	67 (91)
5215	.500-13	67 (91)
5307	.500-13	67 (91)
5315	.500-13	67 (91)

      (4) Measure low-speed shaft axial float with a dial indicator, in accordance with method described on the following page.

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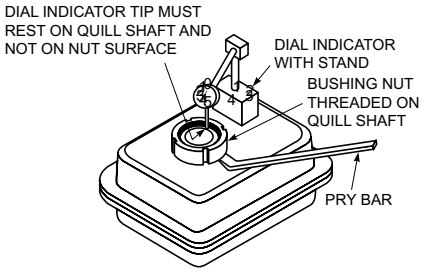
(5) Low-speed shaft axial float measurement — Ref. #4A Assembly – For drives equipped with TA Taper bushing, carefully thread bushing nut onto hollow low-speed shaft threads. Rotate shaft to seat cone assemblies in bearing cups. Set up a dial indicator on output housing as illustrated in Figure 24. Indicator tip must rest on low-speed shaft and not on nut surface. Rotate and oscillate shaft with axial force applied in both directions to obtain axial float measurement.

Figure 24



For drives without the TA Taper bushing, insert hollow shaft thrust plate and secure with retaining ring as illustrated in Section I, Figure 5. Thread a bolt into the thrust plate. Set up a dial indicator on output housing, as illustrated in Figure 24, with the indicator tip on end of hollow shaft. Rotate and oscillate shaft with axial force applied in both directions to obtain axial float measurement (upward force can be applied by applying upward force on head of thrust plate bolt).

Refer to Table 15 and note the preload specified for bearings 4A1 and 4A2. Add to upper and lower limits shown, the axial float measured. This will indicate thickness of metal shim(s), Ref. #31, to be added behind input housing bearing cup to obtain the specified preload. Table 16 provides shim thickness for each shim pack to assist in obtaining the desired results.

TABLE 15 — Preload & Axial Float Settings

DRIVE SIZE	Ref. # 4A1 & 4A2 Bearing Preload Inches (mm)	Ref. #2A3 Assembly Intermediate Shaft Axial Float Inches (mm)	Ref. # 1A3 or 3A3 Assembly High-speed Shaft Axial Float Inches (mm)
5107	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)
5115	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)
5203	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)
5207	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)
5215	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)
5307	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)
5315	0.001-0.004 (0.00-0.10)	.001-.003 (0.03-0.08)	.001-.003 (0.03-0.08)

For example, from Table 15 the desired bearing preload for the size 5203 low-speed shaft bearings, Ref. #4A1 & 4A2, is .002" to .004" (0.05 mm to 0.10 mm) tight. If the measured axial float is .039" (0.99 mm) then addition of metal shims with a total thickness between .041" to .043" (1.04 mm to 1.09 mm) behind the low-speed input housing bearing cup will produce the desired preload.

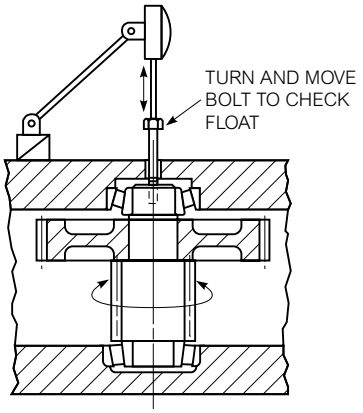
(6) With drive resting on input housing cover, Ref. #10, tap the dowel pins out of the housing, remove flange fasteners and set output housing aside. Remove low-speed shaft assembly and bearing cups. Install metal shim(s), as determined in Step 6b5, behind bearing cup in input housing.

Reinstall dowels, shims and output housing cover & torque housing flange fasteners, Ref. #25, to value in Table 14. Proceed to Step 7.

(7) Lower low-speed, Ref. #4A, high-speed, Ref. #1A (or 3A), and intermediate, Ref. #2A shaft assemblies into input housing. Reinstall dowels and output housing and torque flange fasteners to value listed in Table 14. Recheck low-speed shaft with dial indicator to ensure that no float is present. Measure intermediate and high-speed shaft float with a dial indicator in accordance with methods described below.

(8) **INTERMEDIATE SHAFT AXIAL FLOAT MEASUREMENT —** Ref. #2A Assembly – Figure 25. Remove pipe plug from output housing cover. Install a .375-16 x 2" size bolt through hole in housing and turn by hand until snug. Set up a dial indicator on output housing with the indicator tip on bolt head as illustrated in Figure 26. While turning bolt in a clockwise direction, lift upward to measure axial float. Subtract from this reading the axial float for the Ref. #2A shaft assembly shown in Table 15. This indicates the thickness of metal shim(s), Ref. #22 to be added behind the input housing bearing cup to obtain the specified axial float.

Figure 25



For example, from Table 15 the desired axial float for the size 5307 intermediate shaft assembly, Ref. #2A, is .001" to .003" (0.03 mm to 0.08 mm). If the measured axial float is .039" (0.99 mm) then addition of metal shims with a total thickness between .036" to .038" (0.91 mm to 0.96 mm) behind the intermediate-speed input housing bearing cup will produce the desired axial float.

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Figure 26

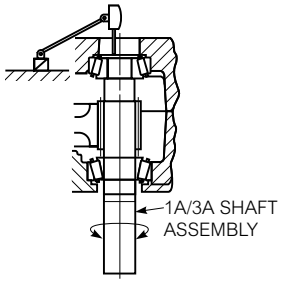
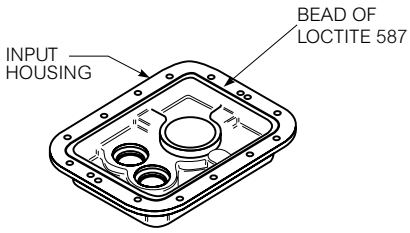


Figure 27



9) **High-speed Shaft Axial Float Measurement —** Ref. #1A or 3A Assembly – Figure 26. Set up a dial indicator as illustrated in Figure 26 to measure axial float of output end of shaft. Push upward on shaft extension end with a twisting motion to obtain reading. Subtract from this reading the axial float for the Ref. #1A (or 3A) shaft assembly shown in Table 15. This indicates the thickness of metal shim(s), Ref. #24, to be added behind the input housing bearing cup to obtain the specified axial float.

WARNING: *Cover shaft extension end keyway with tape to avoid lacerations to the hand.*

(10) Disassemble drive once more to add metal shim(s) behind input intermediate and high-speed housing bearing cups to obtain the specified axial float shown in Table 15.

(11) Apply a bead of Loctite 587 to input housing flange as shown in Figure 27. Assemble output housing to input housing and install dowels. Install and cross tighten flange fasteners to torque specified in Table 14.

(12) Check intermediate and high-speed shaft axial floats with dial indicator to ensure they are within specified limits. If necessary, disassemble drive. Clean Loctite 587 from housing flanges. Readjust metal shims behind input housing bearing cups, reapply Loctite 587, and reassemble. Repeat until specified float is achieved.

7. **BACKSTOP INSTALLATION**

If drive will be installed on the driven equipment using a TA tapered bushing, do not install backstop at this time. If not, refer to Appendix B, for installation instructions.

8. **SHAFT COVER INSTALLATION**

Assemble output side high-speed shaft cover, Ref. #16, and gasket, Ref. #23 (Table 16). Cross tighten fasteners to 3.5 lb-ft (4,7 Nm) torque.

9. **SEAL INSTALLATION**

Refer to Section II, Step 7. Position input end low-speed and high-speed shaft covers, Ref. #13 & 15, respectively, over housing bore and tap lightly until cover is fully seated into bore.

DRIVE IS READY TO INSTALL — Refer To Section I.

TABLE 16 — Individual Shim-Gasket Part Numbers

Ref. No.	Shim Thickness Inch (mm)	DRIVE SIZE						
		5107	5115	5203	5207	5215	5307	5315
100	. . .	4729429	4729430	0786836	0786837	0786838	0786839	0786840
22	.002 (0.05) .005 (0.13) .010 (0.25) .030 (0.76)	793762 793763 1242592 793764	793770 793771 1242594 793772	0787097 0787098 1238022 0787099	0781116 0781117 1237213 0781118	0787109 0787110 1238062 0787111	0787080 0787081 1237946 0787082	0785034 0785035 1237766 0785036
23 (w/o backstop) ▲ 23 (with backstop) ▲	.031 (0.79) .031 (0.79)	1243291 1243291	1243297 1243297	2120198 1238020	2119131 2119131	1161876 1189882	1161876 2120077	1161876 1189882
24	.002 (0.05) .005 (0.13) .010 (0.25) .030 (0.76)	793762 793763 1242592 793764	793770 793771 1242594 793772	0787100 0787101 1238023 0787102	0781116 0781117 1237213 0781118	0787106 0787107 1238061 0787108	0787083 0787084 1237947 0787085	0785037 0785038 1237767 0785039
31	.002 (0.05) .005 (0.13) .010 (0.25) .030 (0.76)	793758 793759 1242591 793760	793766 793767 1242593 793768	0787094 0787095 1238021 0787096	0781113 0781114 1237212 0781115	0787112 0787113 1238063 0787114	0787077 0787078 1237945 0787079	0785031 0785032 1237765 0785033

▲ Ref. Number 23 Gasket compresses to .028 (0.71); all others are metal shims.

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TABLE OF CONTENTS

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Lubrication Recommendations

INTRODUCTION

Carefully follow instructions on the drive nameplate, warning tags and installation manuals furnished with the drive.

Lubricants listed in this manual are typical products ONLY and should not be construed as exclusive recommendations. Industrial type petroleum-based rust and oxidation inhibited (R & O), industrial type extreme pressure (EP) or industrial type micropitting resistant gear lubricants are the recommended gear lubricants. They can be formulated using petroleum or synthetic base stocks.

The section on food grade lubricants provides guidance selecting lubricants for applications needing this class of lubricants. Food grade lubricants are formulated using petroleum or different types of synthetic base stocks.

LUBRICANT SELECTION PROCESS

1. Refer to Table 3 or 4 for proper lubricant viscosity grade based on ambient temperature range. See Falk GMax 6000 paragraph on this page for ambient air temperature range if using this lubricant.
2. Refer to Table 1 for summary of lubricant type.
3. Using proper lubricant table and viscosity grade, select desired lubricant manufacturer name.
4. Refer to Table 2 for approximate oil capacity to purchase.

TABLE 1 — Summary of Lubricant Type and Greases

Petroleum-Based		
R & O Inhibited See Table 5A	Extreme Pressure (EP) ♦ See Table 5B	Micropitting Resistant ♦ See Table 5C
Synthetic Lubricant, Polyalphaolefin Type (PAO)		
R & O Inhibited See Table 6A	Extreme Pressure (EP) ♦ See Table 6B	Micropitting Resistant ♦ See Table 6C
Synthetic Lubricant, Polyalphaolefin Glycol Type (PAG)		
See Falk GMax 6000 (Paragraph to Right)		
Conventional Grease		
See Table 7		
Food Grade Lubricant & Grease		
See Page 28		

♦ DO NOT use in drives equipped with internal backstop.

VISCOSITY (IMPORTANT)

The proper viscosity grade for petroleum-based lubricant is found in Table 3. For synthetic lubricant viscosity grades, refer to Table 4 and the "Synthetic Lubricants" paragraphs.

Viscosity grade is determined by ambient air temperature in immediate vicinity of gear drive. Lubricant selections must have a pour point at least 10°F (5.5°C) below the expected minimum ambient starting temperature.

LUBRICANT TYPES

PETROLEUM-BASED LUBRICANTS (TABLEs 5A, 5B & 5C) — Industrial type petroleum-based rust and oxidation inhibited (R & O) gear lubricants are the most common and readily available general purpose gear lubricants.

SYNTHETIC LUBRICANTS (TABLES 6A, 6B & 6C) — Synthetic lubricants of the polyalphaolefin (PAO) type are recommended for cold climate operation, high temperature applications, extended temperature range (all season) operation and/or extended lubricant change intervals. The proper viscosity grade of synthetic lubricant is given in Table 4.

Polyalkylene glycols (PAG) are another class of synthetic lubricants. They have similar performance properties as PAO synthetics — low pour point, stable at elevated temperatures, and high viscosity index. PAG's have exceptional tolerance to water contamination.

WARNING: *Polyalkylene glycols (PAG's) are not compatible with petroleum mineral oil or PAO synthetic lubricants and must not be topped off with either lubricant. In addition, petroleum mineral oils or PAO synthetic lubricants must not be used to top off systems containing PAG's. Do not use PAG's in gear drives with painted interior housing walls unless paint compatibility is checked. Compatibility with oil seals and gasket materials must be checked prior to use. PAG lubricants are not compatible with polycarbonate sight glass. Use glass sight glass.*

Falk GMax 6000 — Rexnord markets Falk GMax 6000, a polyalkylene glycol lubricant. It is available in ISO VG 135 and covers ambient air temperature range -30° to +125°F (-34° to +52°C). Gear drives equipped with internal backstop can use GMax in ambient temperatures above -20°F (-29°C).

WARNING*: GMax 6000 is not compatible with petroleum mineral oil or PAO synthetic lubricants and must not be topped off with either lubricant. In addition, petroleum mineral oils or PAO synthetic lubricants must not be used to top off systems containing GMax 6000. Do not use GMax 6000 in gear drives with painted interior housing walls unless paint compatibility is checked. Compatibility with oil seals and gasket materials must be checked prior to use. GMax 6000 is not compatible with polycarbonate sight glass. Use glass sight glass.*

ANTI-WEAR (AW) LUBRICANTS — For moderately loaded gear drives or operating conditions challenging for conventional R & O oils, industrial type anti-wear (AW) lubricants are suggested. These lubricants contain anti-wear additives that provide stronger thicker lubricant film to help maintain surface separation. Synthetic lubricants by inherent nature of base stock properties provide anti-wear performance.

EXTREME PRESSURE (EP) LUBRICANTS (TABLES 5B & 6B) — For highly loaded drives or for drives loaded in excess of original estimates, industrial-type petroleum EP lubricants are preferred. EP lubricants are manufactured from petroleum or synthetic base lubricants. Anti-scuff is another term used to describe EP lubricants.

CAUTION: EP LUBRICANTS & INTERNAL BACKSTOPS — *Do not use EP lubricants or lubricant formulations including sulfur-phosphorus (EP), chlorine, lead derivatives, graphite or molybdenum disulfides in drives equipped with internal cartridge type backstops. Lubricant formulations may change over time. Some lubricants in Tables 5A & 6A may contain higher amounts of additives to reduce friction, resulting in lubricant properties*

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approaching that of extreme pressure (EP) lubricants; end user should consult lubricant manufacturer/supplier and Rexnord as necessary. Typically EP lubricants in Tables 5B & 6B contain these additives.

MICROPITTING RESISTANT LUBRICANTS (TABLES 5C & 6C) — Micropitting resistant lubricants are specially developed for surface hardened gearing commonly used in modern industrial gear drives. These lubricants contain additives to resist formation of micropitting and other conventional forms of gear wear. Highly loaded gear drives or applications where operating loads are not well defined may benefit from this type of lubricant. Generally lubricants are available in limited number of viscosity grades.

CAUTION: MICROPITTING RESISTANT LUBRICANTS & INTERNAL BACKSTOPS — *Do not use micropitting resistant lubricants in drives equipped with internal cartridge type backstops. These lubricants are listed in Tables 5C & 6C.*

WARNING: LUBRICANTS IN FOOD PROCESSING INDUSTRY — *Generally conventional gear lubricants are classified as H2 by NSF (National Sanitation Foundation) since they contain harmful substances and should not be used in the food processing industry. Lubricants registered as H1 by NSF are suitable for food processing applications.*

CLIMATE CONDITIONS — Ambient temperature in immediate vicinity of gear drive is very important for determining viscosity grade. Table 3 provides viscosity grade selections for petroleum-based lubricants. See Table 4 for synthetic lubricants.

OIL LEVELS

Fill the drive with lubricant to pipe plug level indicated in illustrations in Section 1. Approximate oil capacities are given in Table 2 below.

TABLE 2 — Approximate Oil Capacity – Quarts (Liters) ▲

DRIVE SIZE	JR, JF & JSC	JRV & JFV
5107	2 (1.9)	3 (2.8)
5115	3 (2.8)	4.5 (4.3)
5203	3.5 (3.3)	5 (4.7)
5207	5.5 (5.2)	7.5 (7.1)
5215	9 (8.5)	13 (12.3)
5307	13 (12.3)	18 (17)
5315	15 (14.2)	21 (19.9)

▲ Quantities are approximate. Always fill drive to specified level.

TABLE 3 — Viscosity Grade Recommendations For Petroleum-Based Lubricants

Ambient Temperature Range	+30° to +90°F (-1° to +32°C)	+70° to +125°F (+21° to +52°C)
ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6

LUBRICANT ANALYSIS AND CHANGES

OIL ANALYSIS REPORT — Checking oil condition at regular intervals is recommended. Analyze oil samples approximately every 1000 hours for petroleum lubricants or every 3000 hours for synthetic lubricants. In the absence of more specific limits, the guidelines listed below may be used to indicate when to change petroleum or polyalphaolefin type synthetic lubricants:

1. Water content is greater than 500 ppm (parts per million) (0.05%).
2. Iron content exceeds 150 ppm.
3. Silicon (dust/dirt) exceeds 25 ppm, above reference sample from new oil container.
4. Copper content exceeds 75 ppm.
5. TAN (Total Acid Number) 50% increase above reference sample from new oil container.
6. Viscosity changes more than ±15%.
7. Solid particle contamination code exceeds 25/22/18 for particle sizes ≥4/≥6/≥14 microns, respectively per ISO 4406.

Guidelines for when to change Falk GMax 6000 polyalkylene glycol type lubricant are:

1. Water content is greater than 3%.
2. Iron content exceeds 150 ppm.
3. Silicon (dust/dirt) exceeds 25 ppm, above reference sample from new oil container.
4. Copper content exceeds 75 ppm.
5. Viscosity changes more than ±15%.
6. Solid particle contamination code 25/22/18 per ISO 4406.

Laboratory analysis is recommended for optimum lubricant life and gear drive performance.

TABLE 4 — Viscosity Grade Recommendations For Synthetic Lubricants

Ambient Temperature Range	Cold Climates		Normal Climates		
	–30° to +10°F (–34° to –12°C)	–15° to +50°F (–26° to +10°C)	0° to +80°F (–18° to +27°C)	+10° to +125°F ▲ (–12° to +52°C)	+20° to +125°F (–7° to +52°C)
ISO Viscosity Grade	32	68	150	220	320
AGMA Viscosity Grade	0	2	4	5	6

▲ Gear drives **NOT** equipped with internal backstop may widen the ambient temperature range to -18° to +125°F (-28° to +52°C).

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TABLE 5A — Petroleum Based R & O (Rust & Oxidation) Inhibited Lubricants ▲

Maximum Operating Temperature of Lubricants 200°F (93°C)

ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6
Viscosity cSt @ 40°C ■	198-242	288-352
Viscosity SSU @ 100°F	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**
Castrol Industrial Lubricants	Hyspin AWS 220 Castrol Paradene R&O 220 Castrol Paradene AW 220	- - - Castrol Paradene R&O 320 Castrol Paradene AW 320
Chevron / Texaco / Caltex	Rando HD 220	Rando HD 320
Citgo Petroleum Corp.	Pacemaker SD 220	Pacemaker SD 320
Exxon Mobil / Esso	DTE Oil BB Vacuoline 533	DTE Oil AA Vacuoline 537
Petro-Canada Lubricants	TurboFlo R&O 220	TurboFlo R&O 320
Phillips 66 / Conoco / 76 Lubricants / Kendall	Multipurpose R&O 220	Multipurpose R&O 320
Shell Oil Co.	Morlina S2 B 220 Morlina S2 BA 220	Morlina S2 B 320 Morlina S2 BA 320
Total Lubricants USA / Keystone Div. Penwalt Corp.	Cirkan ZS 220	Cirkan ZS 320
Whitmore Manufacturing Company	Hyperion 220	Hyperion 320

▲ Minimum viscosity index of 90.
■ Kinematic viscosity in units of mm^2/s is equivalent to cSt (centistokes).

TABLE 5B — Petroleum Based EP (Extreme Pressure) Lubricants ▲ ♦

Maximum Operating Temperature of Lubricants 200°F (93°C)

ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6
Viscosity cSt @ 40°C ■	198-242	288-352
Viscosity SSU @ 100°F	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**
Castrol Industrial Lubricants	Alpha SP 220	Alpha SP 320
Chevron / Texaco / Caltex	Meropa 220 Ultra Gear 220	Meropa 320 Ultra Gear 320
Citgo Petroleum Corp.	EP Compound 220	EP Compound 320
Exxon Mobil / Esso	Mobilgear 600 XP 220	Mobilgear 600 XP 320
Fuchs Lubricants Company	GearMaster CLP Oils 220	- - -
Petro-Canada Lubricants	Enduratex EP 220	Enduratex EP 320
Phillips 66 / Conoco / 76 Lubricants / Kendall	Extra Duty Gear Oil 220	Extra Duty Gear Oil 320
Shell Oil Co.	Omala S2 G 220	Omala S2 G 320
Total Lubricants USA / Keystone Div. Penwalt Corp.	Carter EP 220	Carter EP 320

▲ Minimum viscosity index of 90.
■ Kinematic viscosity in units of mm^2/s is equivalent to cSt (centistokes).
♦ DO NOT use in drives equipped with internal backstop.

TABLE 5C — Petroleum Based Micropitting Resistant Lubricants ▲ ♦

Maximum Operating Temperature of Lubricants 200°F (93°C)

ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6
Viscosity cSt @ 40°C ■	198-242	288-352
Viscosity SSU @ 100°F	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**
Kluber Lubrication	Kluberoil GEM 1 N 220	Kluberoil GEM 1 N 320

▲ Minimum viscosity index of 90.
■ Kinematic viscosity in units of mm^2/s is equivalent to cSt (centistokes).
♦ DO NOT use in drives equipped with internal backstop.

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TABLE 6A — Synthetic PAO (Polyalphaolefin) R & O (Rust & Oxidation) Inhibited Lubricants ▲

ISO Viscosity Grade	32	68	150	220 ●	320
AGMA Viscosity Grade	0	2	4	5	6
Viscosity cSt @ 40°C ■	28.8-35.2	61.2-74.8	135-165	198-242	288-352
Viscosity SSU @ 100°F	134-164	284-347	626-765	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**
Castrol Industrial Lubricants	Alphasyn T 32 Castrol Isolube 32	Alphasyn T 68 Castrol Isolube 68	Alphasyn T 150 Castrol Isolube 150	Alphasyn T 220 Castrol Isolube 220	Alphasyn T 320 Castrol Isolube 320
Chevron / Texaco / Caltex	Cetus HiPerSYN Oil 32	Cetus HiPerSYN Oil 68	Cetus HiPerSYN Oil 150	Cetus HiPerSYN Oil 220	Cetus HiPerSYN Oil 320
Citgo Petroleum Corp.	- - -	CITGEAR Synthetic HT 68	CITGEAR Synthetic HT 150	CITGEAR Synthetic HT 220	CITGEAR Synthetic HT 320
Exxon Mobil / Esso	Mobil SHC 624	Mobil SHC 626	Mobil SHC 629	Mobil SHC 630	Mobil SHC 632
Kluber Lubrication	- - -	Klubersynth G 4 68	Klubersynth G 4 150	Klubersynth G 4 220	- - -
Petro-Canada Lubricants	Synduro SHB 32	Synduro SHB 68	Synduro SHB 150	Synduro SHB 220	- - -
Phillips 66 / Conoco / 76 Lubricants / Kendall	- - -	Syncon R&O 68	Syncon R&O 150 ★	Syncon R&O 220 ★	Syncon R&O 320 ★
Shell Oil Co.	- - -	Morlina S4 B 68	Morlina S4 B 150	Morlina S4 B 220	Morlina S4 B 320

▲ Minimum viscosity index of 130. Consult lubricant supplier/manufacturer for maximum operating temperature.
■ Kinematic viscosity in units of mm^2/s is equivalent to cSt (centistokes).
● Gear drives NOT equipped with internal backstop may widen the ambient tempeature range to -18° to +125°F (-28° to +52°C).
★ Minimum viscosity index of 120.

TABLE 6B — Synthetic PAO (Polyalphaolefin) EP (Extreme Pressure) Lubricants ▲ ♦

ISO Viscosity Grade	32	68	150	220 ●	320
AGMA Viscosity Grade	0	2	4	5	6
Viscosity cSt @ 40°C ■	28.8-35.2	61.2-74.8	135-165	198-242	288-352
Viscosity SSU @ 100°F	134-164	284-347	626-765	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**
Castrol Industrial Lubricants	- - -	Castrol Isolube EP 68	Alphasyn EP 150 Castrol Isolube EP 150	Alphasyn EP 220 Castrol Isolube EP 220	Alphasyn EP 320 Castrol Isolube EP 320
Chevron / Texaco / Caltex	- - -	- - -	Tegra Synthetic Gear Lubricant 150	Tegra Synthetic Gear Lubricant 220	Tegra Synthetic Gear Lubricant 320
Citgo Petroleum Corp.	- - -	CITGEAR Synthetic EP Gear 68	CITGEAR Synthetic EP Gear 150	CITGEAR Synthetic EP Gear 220	CITGEAR Synthetic EP Gear 320
Exxon Mobil / Esso	- - -	- - -	Mobil SHC Gear 150	Mobil SHC Gear 220	Mobil SHC Gear 320
Fuchs Lubricants Company	- - -	- - -	- - -	Renolin Unisyn CLP 220	Renolin Unisyn CLP 320
Kluber Lubrication	- - -	- - -	Klubersynth EG 4 150	Klubersynth EG 4 220	Klubersynth EG 4 320
Petro-Canada Lubricants	- - -	- - -	Enduratex Synthetic EP 150	Enduratex Synthetic EP 220	Enduratex Synthetic EP 320
Phillips 66 / Conoco / 76 Lubricants / Kendall	- - -	- - -	Syncon EP Plus Gear Oil 150	Syncon EP Plus Gear Oil 220	Syncon EP Plus Gear Oil 320
Shell Oil Co.	- - -	Omala S4 GX 68	Omala S4 GX 150	Omala S4 GX 220	Omala S4 GX 320
Whitmore Mfg. Company	- - -	- - -	Decathlon HD 150	Decathlon HD 220	Decathlon HD 320

▲ Minimum viscosity index of 130. Consult lubricant supplier/manufacturer for maximum operating temperature.
■ Kinematic viscosity in units of mm^2/s is equivalent to cSt (centistokes).
● Gear drives NOT equipped with internal backstop may widen the ambient tempeature range to -18° to +125°F (-28° to +52°C).
♦ DO NOT use in drives equipped with internal backstop.

TABLE 6C — Synthetic PAO (Polyalphaolefin) Micropitting Resistant Lubricants ▲ ♦

ISO Viscosity Grade	32	68	150	220 ●	320
AGMA Viscosity Grade	0	2	4	5	6
Viscosity cSt @ 40°C ■	28.8-35.2	61.2-74.8	135-165	198-242	288-352
Viscosity SSU @ 100°F	134-164	284-347	626-765	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**
Chevron / Texaco / Caltex	- - -	- - -	- - -	- - -	Pinnacle WM 320
Exxon Mobil / Esso	- - -	- - -	- - -	- - -	Mobil SHC Gear 320 WT
Kluber Lubrication	- - -	- - -	Klubersynth GEM 4 N 150	Klubersynth GEM 4 N 220	Klubersynth GEM 4 N 320
Petro-Canada Lubricants	- - -	- - -	- - -	- - -	Harnex 320
Phillips 66 / Conoco / 76 Lubricants / Kendall	- - -	- - -	- - -	- - -	Syncon WTL 320
Whitmore Manufacturing Company	- - -	- - -	Decathlon F 150	Decathlon F 220	Decathlon F 320

▲ Minimum viscosity index of 130. Consult lubricant supplier/manufacturer for maximum operating temperature.
■ Kinematic viscosity in units of mm^2/s is equivalent to cSt (centistokes).
● Gear drives NOT equipped with internal backstop may widen the ambient tempeature range to -18° to +125°F (-28° to +52°C).
♦ DO NOT use in drives equipped with internal backstop.

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PETROLEUM LUBRICANTS — In the absence of oil analysis, change gear oils every 6 months or 2500 operating hours, whichever occurs first. Change oil more frequently when gear drives operate in extremely humid, chemical or dust laden atmospheres. In these cases, lubricants should be changed every 3 to 4 months or 1500 to 2000 hours. 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 Table 3. Lubricant suppliers can test oil from the drive periodically and recommend economical change schedules.

SYNTHETIC LUBRICANTS — In the absence of oil analysis, synthetic lube change intervals can be extended to 8000 hours depending upon operating temperatures. Laboratory analysis is recommended for optimum lubricant life and drive performance. Change lube with change in ambient temperature, if required. Refer to Table 4.

Falk GMax 6000 change interval can be up to 15,000 hours. It has broad temperature range so seasonal oil changes are generally not needed. The condition of GMax must be monitored to maintain lubricant properties and cleanliness.

GREASE-LUBRICATED SEALS

All drives are furnished with grease purged seals which minimize the entry of contaminants and abrasive dusts into the drive. Drives are shipped with NLGI #2 grade grease in the seal housing cavities unless otherwise specified.

Whenever changing oil in the drive, purge the seals with one of the NLGI #2 grade greases listed in Table 7. Depending upon the degree of contamination, it may be necessary to purge contaminated grease from seals more often (at least every 3 to 6 months). Slowly pump fresh bearing grease through the seal, **WITH HAND GREASE GUN,** until fresh grease flows out along the shaft. Wipe off purged grease.

TABLE 7 — Conventional NLGI #2 Grade Grease ▲ for Grease Purged Seals

0° to +200°F (-18° to +93°C)

Manufacturer	EP Grease ■	Grease Without EP Additives
Chevron / Texaco / Caltex	Multifak EP 2	- - -
Citgo Petroleum Corp.	Lithoplex RT 2 Premium Lithium EP 2	- - -
ExxonMobil / Esso	Mobilux EP 2	Unirex N2
Petro-Canada Lubricants	Precision General Purpose EP2	Precision XL EMB Grease Precision Synthetic EMB
Phillips 66 / Conoco / 76 Lubricants / Kendall	Multiplex Red	- - -
Shell Oil Co.	Gadus S1 V220-2	Gadus S2 V100 - 2
Total Lubricants USA / Keystone Div. Penwalt Corp.	Multis EP 2	Multis 2

▲ Not suitable for food grade applications.
■ Caution: Do not use EP grease in external backstop purged seals.

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

WARNING: *Greases in Table 7 contain harmful substances not allowed in the food processing industry. 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 14. Refer to gear drive assembly/disassembly instructions. Simply purging grease with grease gun will not remove all grease and cross-contamination will likely occur. Grease registered as H1 by NSF, National Sanitation Foundation, is suitable for food processing applications.*

STORED & INACTIVE GEAR DRIVES

Refer to Section II (Drive Service and Repair) for details on stored & inactive gear drives.

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FOOD GRADE LUBRICANTS

Guidance for selecting petroleum-based and synthetic-based food grade lubricants are shown below in Table 8. For general lubrication guidelines, refer to the first part of the "Lubrication Recomendation" Section.

FOOD GRADE LUBRICANT SELECTION PROCESS

1. Refer to Table 9 or 10 for proper lubricant viscosity grade based on ambient temperature range.
2. Refer to Table 8 for summary of food grade lubricant type.
3. Using proper food grade lubricant table and viscosity grade, select desired lubricant manufacturer name.
4. Refer to Table 2 for approximate oil capacity to purchase.

TABLE 8 — Summary of Food Grade Lubricants and Greases

Petroleum-Based	
R & O Inhibited See Table 11A	Extreme Pressure (EP) ♦ See Table 11B
Synthetic Lubricant, Polyalphaolefin Type (PAO)	
R & O Inhibited See Table 12A	Extreme Pressure (EP) ♦ See Table 12B
Synthetic Lubricant, Polyalkylene Glycol Type (PAG)	
Extreme Pressure (EP) ♦ See Table 13	
Food Grade Grease	
See Table 14	

♦ DO NOT use in drives equipped with internal backstop.

FOOD GRADE LUBRICANTS (TABLES 11A, 11B, 12A, 12B, 13 & 14) — Food grade lubricants are a class of lubricants registered as H1 by NSF, National Sanitation Foundation. They contain base stock and additives which comply with Food and Drug Administration Title 21 CFR 178.3570 regulations for lubricants with incidental food contact. Base stock can be petroleum oil or different types of synthetic lubricant. Food grade lubricants are not same as biodegradable or environmentally friendly lubricants.

Rust and corrosion inhibitors used to protect gear drive during shipment are not qualified as food grade fluids. Flush out inhibitor oil before filling with food grade lubricant.

Tables 11A, 11B, 12A, 12B, 13 & 14 list food grade lubricants that have performance properties meeting Rexnord/Falk specifications. They are not exclusive recommendations but serve as a guide for making proper lubricant selections.

CLIMATE CONDITIONS — Ambient temperature in immediate vicinity of gear drive is very important for determining viscosity grade. Table 9 provides viscosity grade selections for petroleum-based lubricants. See Table 10 for synthetic lubricants.

TABLE 9 — Viscosity Grade Recommendations For Food Grade Petroleum-Based Lubricants

Ambient Temperature Range	+30° to +90°F (-1° to +32°C)	+70° to +125°F (+21° to +52°C)
ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6

Polyalkylene glycols (PAG) are another class of synthetic lubricants. They have similar performance properties as PAO synthetics — low pour point, stable at elevated temperatures, and high viscosity index. PAG's have exceptional tolerance to water contamination.

WARNING: *Polyalkylene glycols (PAG's) are not compatible with petroleum mineral oil or PAO synthetic lubricants and must not be topped off with either lubricant. In addition, petroleum mineral oils or PAO synthetic lubricants must not be used to top off systems containing PAG's. Do not use PAG's in gear drives with painted interior housing walls unless paint compatibility is checked. Compatibility with oil seals and gasket materials must be checked prior to use. PAG lubricants are not compatible with polycarbonate sight glass. Use glass sight glass.*

CAUTION: EXTREME PRESSURE (EP) LUBRICANTS & INTERNAL BACKSTOPS — *Do not use EP lubricants in drives equipped with internal cartridge type backstops. These lubricants are listed in Tables 11B, 12B & 13.*

LUBRICANT ANALYSIS AND CHANGES

OIL ANALYSIS REPORT (FOOD GRADE) — Checking oil condition at regular intervals is recommended. Analyze oil samples approximately every 1000 hours for food grade petroleum lubricants or every 3000 hours for food grade synthetic lubricants. In the absence of more specific limits, the guidelines listed below may be used to indicate when to change food grade lubricants:

1. Water content is greater than 500 ppm (parts per million) (0.05%).
2. Iron content exceeds 150 ppm.
3. Silicon (dust/dirt) exceeds 25 ppm, above reference sample from new oil container.
4. Copper content exceeds 75 ppm.
5. TAN (Total Acid Number) 50% increase above reference sample from new oil container.
6. Viscosity changes more than ±15%.
7. Solid particle contamination code exceeds 25/22/18 for particle sizes ≥4/≥6/≥14 microns, respectively per ISO 4406.

TABLE 10 — Viscosity Grade Recommendations for Food Grade Synthetic Lubricants

Ambient Temperature Range	Cold Climates		Normal Climates		
	–30° to +10°F (–34° to –12°C)	–15° to +50°F (–26° to +10°C)	0° to +80°F (–18° to +27°C)	+10° to +125°F ▲ (–12° to +52°C)	+20° to +125°F (–7° to +52°C)
ISO Viscosity Grade	32	68	150	220	320
AGMA Viscosity Grade	0	2	4	5	6

▲ Gear drives **NOT** equipped with internal backstop may widen the ambient temperature range to -18° to +125°F (-28° to +52°C).

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TABLE 11A — Food Grade Petroleum-Based R & O (Rust & Oxidation) Inhibited Lubricants — NSF (National Sanitation Foundation) H1 Registered

Maximum operating temperature of lubricants 200°F (93°C)

ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6
Viscosity cSt @ 40°C ▲	198-242	288-352
Viscosity SSU @ 100°F	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**
Bel-Ray Company, Inc.	No-Tox Gear Oil ISO 220	No-Tox Gear Oil ISO 320
Kluber Lubrication	---	---
Lubriplate Lubricants Co.	Lubriplate FMO 1100-AW	Lubriplate FMO 1700-AW

▲ Kinematic viscosity in units of mm^2/S is equivalent to cSt (centistokes)

TABLE 11B — Food Grade Petroleum-Based EP (Extreme Pressure) Lubricants ♦ — NSF (National Sanitation Foundation) H1 Registered

Maximum operating temperature of lubricants 200°F (93°C)

ISO Viscosity Grade	220	320
AGMA Viscosity Grade	5	6
Viscosity cSt @ 40°C ▲	198-242	288-352
Viscosity SSU @ 100°F	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**
Petro-Canada	Purity FG EP 220	Purity FG EP 320
Total Lubricants USA, Inc.	Nevastane EP 220	Nevastane EP 320

▲ Kinematic viscosity in units of mm^2/S is equivalent to cSt (centistokes)
♦ DO NOT use in drives equipped with internal backstop.

TABLE 12A — Food Grade Synthetic PAO (Polyalphaolefin) R & O (Rust & Oxidation) Inhibited Lubricants — NSF (National Sanitation Foundation) H1 Registered

Maximum operating temperature of lubricants 200°F (93°C)

ISO Viscosity Grade	32	68	150	220 ■	320
AGMA Viscosity Grade	0	2	4	5	6
Viscosity cSt @ 40°C ▲	28.2-35.2	61.2-74.8	135-165	198-242	288-352
Viscosity SSU @ 100°F	134-164	284-347	626-765	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**
ExxonMobil	Mobil SHC Cibus 32	Mobil SHC Cibus 68	Mobil SHC Cibus 150	Mobil SHC Cibus 220	Mobil SHC Cibus 320
Kluber Lubrication	Kluberoil 4 UH1 N 32	Kluberoil 4 UH1 N 68	Kluberoil 4 UH1 N 150	Kluberoil 4 UH1 N 220	Kluberoil 4 UH1 N 320
Lubriplate Lubricants Co.	Lubriplate SFGO Ultra 32	Lubriplate SFGO Ultra 68	Lubriplate SFGO Ultra 150	Lubriplate SFGO Ultra 220	Lubriplate SFGO Ultra 320
Total Lubricants USA, Inc.	Nevastane SL 32	Nevastane SL 68	Nevastane SL 150	Nevastane SL 220	Nevastane SL 320

▲ Kinematic viscosity in units of mm^2/S is equivalent to cSt (centistokes)
■ Gear drives NOT equipped with internal backstop may widen ambient temperature range to -18° to +125°F (-28° to +52°C).

TABLE 12B — Food Grade Synthetic PAO (Polyalphaolefin) EP (Extreme Pressure) Lubricants ♦ — NSF (National Sanitation Foundation) H1 Registered

Maximum operating temperature of lubricants 200°F (93°C)

ISO Viscosity Grade	32	68	150	220 ■	320
AGMA Viscosity Grade	0	2	4	5	6
Viscosity cSt @ 40°C ▲	28.8-35.2	61.2-74.8	135-165	198-242	288-352
Viscosity SSU @ 100°F	134-164	284-347	626-765	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**
Petro-Canada	---	---	---	Purity FG Synthetic EP 220	---

▲ Kinematic viscosity in units of mm^2/S is equivalent to cSt (centistokes)
■ Gear drives NOT equipped with internal backstop may widen ambient temperature range to -18° to +125°F (-28° to +52°C).
♦ DO NOT use in drives equipped with internal backstop.

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TABLE 13 — Food Grade Synthetic PAG (Polyalkylene Glycol) EP (Extreme Pressure) Lubricants ♦ — NSF (National Sanitation Foundation) H1 Registered

Maximum operating temperature of lubricants 200°F (93°C)
See Warning Note below.

ISO Viscosity Grade	32	68	150	220 ■	320
AGMA Viscosity Grade	0	2	4	5	6
Viscosity cSt @ 40°C ▲	28.8-35.2	61.2-74.8	135-165	198-242	288-352
Viscosity SSU @ 100° F	134-164	284-347	626-765	918-1122	1335-1632
Manufacturer	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**	**Lubricant Name**
Exxon Mobil	---	---	Glygoyle 150	Glygoyle 220	Glygoyle 320
Kluber Lubrication	---	---	Klubersynth UH1 6-150	Klubersynth UH1 6-220	Klubersynth UH1 6-320
Lubriplate	---	---	PGO-FGL Synthetic Gear Oil 150	PGO-FGL Synthetic Gear Oil 220	PGO-FGL Synthetic Gear Oil 320

WARNING: *Polyalkylene glycol (PAG) lubricants are not compatible with petroleum mineral oils or PAO synthetic lubricants. PAG's must not be mixed or used to top off either petroleum mineral oils or PAO synthetic lubricants.*

▲ Kinematic viscosity in units of mm^2/S is equivalent to cSt (centistokes).

■ Gear drives NOT equipped with internal backstop may widen the ambient temperature range to -18° to +125°F (-28° to +52°C).

♦ DO NOT use in drives equipped with internal backstop.

Guidelines for when to change food grade polyalkylene glycol type lubricant are:

1. Water content is greater than 3%.
2. Iron content exceeds 150 ppm.
3. Silicon (dust/dirt) exceeds 25 ppm, above reference sample from new oil container.
4. Copper content exceeds 75 ppm.
5. Viscosity changes more than ±15%.
6. Solid particle contamination code 25/22/18 per ISO 4406.

Laboratory analysis is recommended for optimum lubricant life and gear drive performance.

PETROLEUM LUBRICANTS (FOOD GRADE) — In the absence of oil analysis, change gear oils every 6 months or 2500 operating hours, whichever occurs first. Change oil more frequently when gear drives operate in extremely humid, chemical or dust laden atmospheres. In these cases, lubricants should be changed every 3 to 4 months or 1500 to 2000 hours. 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 Table 9. Lubricant suppliers can test oil from the drive periodically and recommend economical change schedules.

SYNTHETIC LUBRICANTS (FOOD GRADE) — In the absence of oil analysis, synthetic lube change intervals can be extended to 8000 hours depending upon operating temperatures. Laboratory analysis is recommended for optimum lubricant life and drive performance. Change lube with change in ambient temperature, if required. Refer to Table 10.

GREASE-LUBRICATED SEALS

All drives are furnished with grease purged seals which minimize the entry of contaminants and abrasive dusts into the drive. Drives are shipped with NLGI #2 grade grease in the seal housing cavities unless otherwise specified.

Whenever changing oil in the drive, purge the seals with one of the NLGI #2 grade greases listed in Table 14. Depending upon the degree of contamination, it may be necessary to purge contaminated grease from seals more often (at least every 3 to 6 months). Slowly pump fresh bearing grease through the seal, **WITH HAND GREASE GUN,** until fresh grease flows out along the shaft. Wipe off purged grease.

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 14. Refer to gear drive assembly/disassembly instructions. Simply purging grease with grease gun will not remove all grease and cross-contamination will likely occur. Grease registered as H1 by NSF, National Sanitation Foundation, is suitable for food processing applications.

TABLE 14 — Food Grade Grease ▲ for Grease Purged Seals , NLGI #2 Grade

0° to +200°F (-18° to +93°C)

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 20°F (-7°C). If grease must be applied at cooler temperatures consult lubricant supplier for recommendations.

STORED & INACTIVE GEAR DRIVES

Prior to shipment from the factory, all Rexnord enclosed gear drives are protected internally against corrosion with a rust preventative oil. A vapor phase rust inhibitor may also be added.

WARNING*: These corrosion inhibitors are not H1 registered with the NSF (National Sanitation Foundation) as suitable for food processing applications. When Food Grade Lubricants are to be used, it is the end users responsibility to properly flush and prepare the drive for Food Grade service. Contact the lubricant manufacturer for specific information and flushing procedures.*

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Backstop Installation

INTRODUCTION

The following instructions apply to INSTALLATION ONLY of internal backstops in horizontal drives, sizes 5107 thru 5215 single and double reduction and size 5307 & 5315 double reduction.

CAUTION: *If backstop is to be replaced, the high-speed shaft must also be replaced. Refer to instructions regarding high-speed shaft replacement, Section III.*

Remove all external loads from system before servicing drive or accessories, and lock out starting switch of prime mover.

LUBRICANT

PETROLEUM-BASED LUBRICANTS — Use R & O type lubricants which do not contain extreme pressure (EP) additives if the drive is equipped with an internal backstop.

CAUTION: *Do not use EP lubricants, or lubricant formulations including sulfur, phosphorus, chlorine, lead derivatives, graphite or molybdenum disulfides in drives equipped with internal backstops. Refer to Appendix A for proper selection of lubricants. Use of an improper lubricant will contribute to premature wear or malfunction of the backstop.*

SYNTHETIC LUBRICANTS — Synthetic lubricants of the polyalphaolefin type may be used in drives with internal backstops.

Before installing backstop, check direction of free rotation (overrunning) indicated by the arrow etched on each side of the backstop.

BACKSTOP APPLICATION

Backstops are designed to prevent reverse rotation or back-run without backlash in applications such as conveyors, bucket elevators, fans, rotary pumps and kilns. Backstops are not approved for use on systems that are designed for handling of people such as elevators, manlifts, ski tows and ski lifts. DO NOT use a backstop as a substitute for a brake.

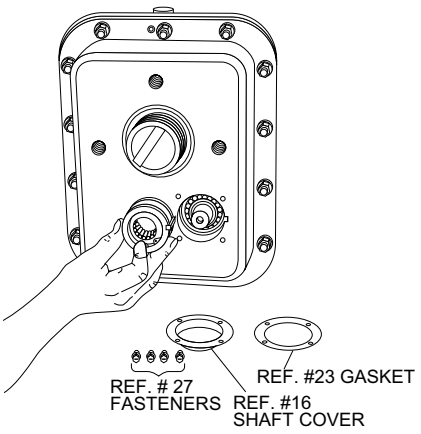
INDEXING

DO NOT use the backstop for indexing applications. The backstop is designed to prevent reverse rotation five times or less in eight hours, with one minute or more in overrunning direction between backstopping load applications. If backstopping operations are more frequent, or the time between operations is less than one minute, the backstop is classified as an indexing device and must be referred to the Factory.

INSTALLATION (Backstop Added to Existing Drive Only)

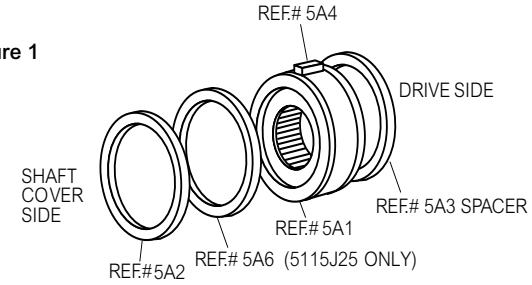
1. DRIVE PREPARATION: Drain oil from drive. Remove fasteners Ref. #27, end cover Ref. #23, and gasket Ref. #16, Figure 1. Keep size 5115J and 5207J end covers, size 5207J fasteners and all lock washers for reuse, all other parts may be discarded.

Figure 1



2. **BACKSTOP PREPARATION:** Remove backstop Ref. #5A1 from the kit and wipe off any excess lubricant. On drive sizes 5107 (all ratios) and 5115 (24.87 ratio), assemble retaining ring Ref. #5A2 onto one of the grooves on the backstop OD. On drive size 5115J25, assemble spacer Ref. #5A6 to backstop OD adjacent to retaining ring on inboard side. All other size 5115J and larger drives, insert housing spacer Ref. #5A3 (retaining ring used as housing spacer on drive size 5207J) into housing bore adjacent to bearing cup (Figure 2). Assemble key Ref.#5A4 to backstop keyway (spacer Ref. #5A6 is between retaining ring and key on 511J25 backstop).

Figure 1



3. **ALL SIZES — BACKSTOP INSTALLATION:** Apply oil to the O.D. of the high-speed shaft backstop journal and the sprags inside of the backstop. Align the backstop key with the keyway in the exposed housing bore and carefully slide the backstop into the bore while slowly rotating the high-speed shaft. The shaft will only rotate in one direction. DO NOT FORCE OR HAMMER; this may damage the shaft or misalign the sprags.

   Check operation of backstop by turning high-speed shaft in required direction of rotation by hand. If the shaft does not rotate in the required direction, remove backstop, reverse it, reposition the retaining ring and spacer (where used) and reinsert it into the housing bore as instructed.

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Backstop Installation

Rotate high-speed shaft in the required direction of rotation and then reverse the rotation to lock up the backstop. Observe the position of the sprags. All sprags must be engaged and lay in the same relative position around the shaft. If the sprags are not uniformly positioned, lightly tap the backstop cage to centralize all the sprags around the shaft and cage. If sprags cannot be uniformly positioned in this manner, remove the backstop and run a finger around the sprags in the overrunning direction. Reinstall backstop as instructed in preceding steps.

Check the position of the sprags several times by overrunning and locking the sprags. If all sprags move uniformly, hold the backstop in the locked position and proceed to the next assembly step.

4. FINAL ASSEMBLY — EXTERNAL PARTS: On drive sizes 5107J and 5115J, install one gasket Ref. #23, cover spacer Ref. #17, spider Ref. #5A5, second gasket Ref. #23, and backstop end cover Ref. #16 (size 5115J uses stamped end cover removed in Step 1). Oil feed slots in gaskets and cover spacer must be aligned with the housing backstop oil feed hole to provide proper lubrication for the backstop. Refer to figures 3A and 3B. Install fasteners with lock washers and cross tighten to 3.5 lb-ft (4,7 Nm) torque.

Figure 3A 5107J WITH BACKSTOP

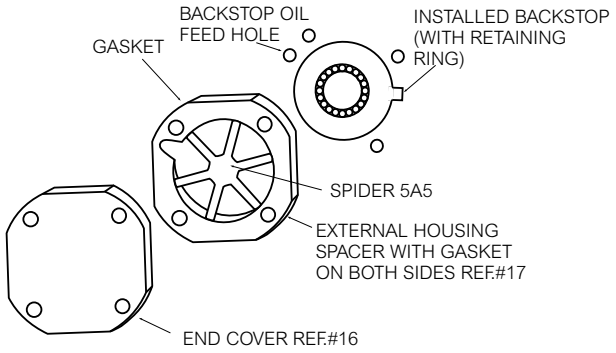
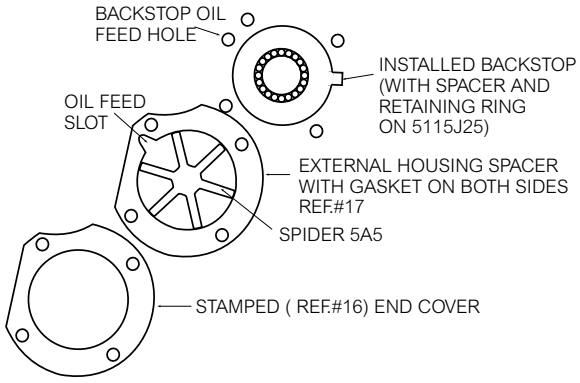


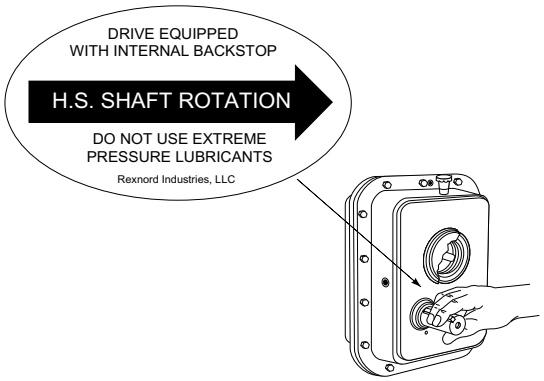
Figure 3B 5115J WITH BACKSTOP



On drive sizes 5203 thru 5315, install one gasket Ref. #23 and backstop end cover Ref. #27 to drive housing (one gasket Ref. #23, cover spacer Ref. #17, second gasket Ref. #23, and end cover Ref. #16 on drive size 5207J). Size 5207J uses end cover and fasteners removed in Step 1. Oil feed holes or slots in gaskets, cover spacer (5207J), and cast shaft covers must be aligned with the housing backstop oil feed hole to provide proper lubrication to the backstop. Install fasteners with lock washers and cross tighten to 8 lb-ft (11 Nm) torque.

Clean housing surface for rotation and WARNING labels. Affix the rotation indicator label next to the high-speed shaft extension to indicate the free direction of rotation (Figure 4). Fill to oil level specified in Section I with oil specified in Appendix A. Check motor for correct rotation before completing connection to drive.

Figure 4



BACKSTOP REPLACEMENT — IN EXISTING DRIVES WITH DAMAGED BACKSTOPS

5. **DISASSEMBLY— EXTERNAL PARTS:** Drain oil from drive and remove backstop cover fasteners, backstop end cover, gasket(s), cover spacer (where used), and spider (where used). Save all metallic parts for possible reuse.
6. **BACKSTOP REMOVAL:** Remove backstop from drive and discard, keep backstop key, backstop spacer (5115J25 only), and backstop retaining rings (where used) for possible reuse. Remove housing spacer from drive housing backstop bore and keep for reuse. NOTE: Complete drive disassembly is required to replace the high-speed shaft, refer to Sections II and III of this manual for disassembly, parts replacement, and reassembly of the basic drive.
7. **BACKSTOP PREPARATION, BACKSTOP INSTALLATION AND EXTERNAL PARTS ASSEMBLY:** Refer to Sections 2, 3, and 4 of this appendix for preparation of the backstop, installation of the backstop in the rebuilt drive, assembly of the external parts associated with the backstop to the drive and preparation of the drive for service.

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TA Removal Tool

INTRODUCTION

The patented TA removal tool offers a positive method for removing a TA Taper equipped Quadrive from the driven shaft. This method uses the torque multiplying characteristic of the drive to separate the drive from the bushing and driven shaft.

The removal tool is available in kit form suitable for use with sizes 5107 thru 5315. The kit can be ordered from your Rexnord distributor by specifying "TA Removal Kit - Part 0769406". NOTE: Use of this tool requires a minimum axial clearance "M" shown in Figure 1 and Table 1.

CAUTION: *DO NOT modify the tool in any way OR use it in another manner except to loosen the bushing nut as instructed herein.*

Figure 1

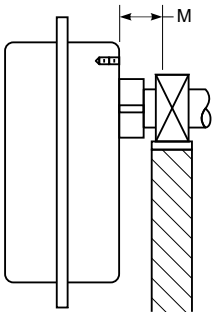


TABLE 1 — Minimum Tool Clearance – Inches (mm)

DRIVE SIZE	M Dimension
5107	2.62 (67)
5115	2.62 (67)
5203	2.62 (67)
5207	2.62 (67)
5215	3.18 (81)
5307	3.18 (81)
5315	3.18 (81)

PREPARATION FOR REMOVAL

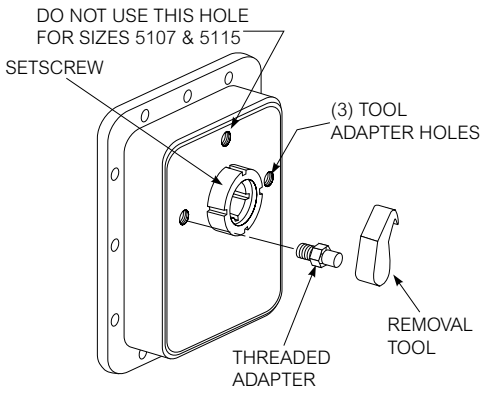
WARNING: *Always "lock out" prime mover before working on the Quadrive.*

1. Quadrive shafts, input and output, must be free to rotate.
   a) Remove any external load on the driven shaft.
   b) Remove belts from input shaft sheave.
   c) Remove the backstop (if so equipped). Refer to Section II — Step 10, for backstop removal instructions.

   CAUTION: *DO NOT disconnect the drive from its torque arm until the removal process is completed. In addition, the drive must be supported during removal process. Use a sling around the motor mount or as recommended in Section I, Step 7. Be sure to take up the slack in the sling before proceeding.*

2. Loosen the setscrew on the O.D. of the bushing nut and select the most convenient of the tapped holes in the housing face for the threaded adapter. Figure 2.

Figure 2



3. Select the proper adapter from the tool kit (adapters are marked with the Quadrive Size and part number). Make sure the tapped hole in the housing face is clean before inserting the adapter. Apply tightening torque from Table 2.

TABLE 2 — Adapter Tightening Torque

DRIVE SIZE	Adapter Part Number	Torque lb-ft (Nm)
5107	2111955	35 (47)
5115	2111956	70 (95)
5203	9111957	108 (146)
5207	2111958	120 (163)
5215	2111959	180 (244)
5307	2111959	180 (244)
5315	2111959	180 (244)

4 Mount the removal tool as illustrated in Figure 3 or 4. It is generally preferable to install the tool in a position where its weight will tend to keep it engaged into the nut. Then rotate the input shaft until the tool hook engages one of the slots in the nut.

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TA Removal Tool

Figure 3

SIZES 5107, 5115, 5203, & 5207

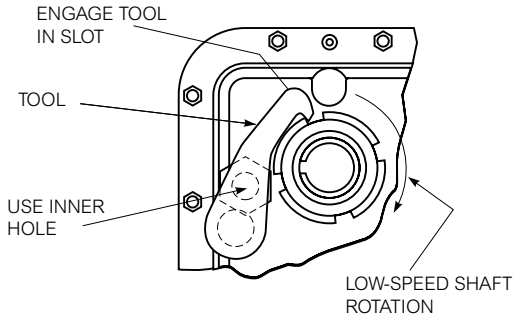
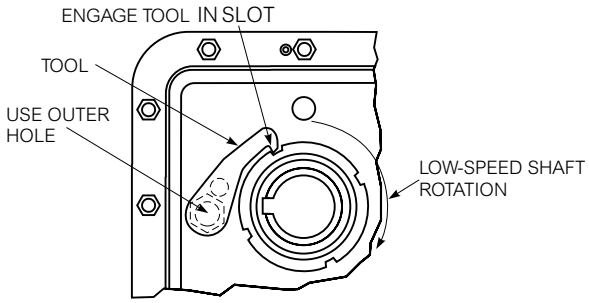


Figure 4

SIZES 5215, 5307, & 4315



REMOVAL OF QUADRIVE

5. Use a spanner wrench to apply torque through the input shaft keyway (Type J05 clockwise; Types J09, J14 or J25 counter-clockwise) to loosen the bushing nut.

   CAUTION: *Never use the prime mover to produce the torque needed. This could result in severe personal injury or damage to the equipment.*

   To avoid damage to the drive or the removal tool, DO NOT exceed the H.S. shaft torque values listed in Table 3. NOTE: The nut will rotate freely for approximately 180° as it moves from the locked to the removal position. Resistance will indicate that unseating is occurring. Turn until the nut and bushing are completely free. Now, prepare the drive for lifting by disconnecting the torque arm at the drive end.

6. **ALTERNATE METHOD —** Torque may be applied to the sheave or sprocket mounted on the input shaft.

TABLE 3 — Maximum Torque – H.S. Shaft lb-ft (Nm)

DRIVE SIZE	Drive Reduction			
	J05	J09	J14	J25
5107	164 (223)	88 (120)	58 (78)	33 (44)
5115	248 (336)	133 (181)	90 (121)	50 (68)
5203	406 (550)	224 (304)	143 (193)	79 (107)
5207	493 (668)	263 (357)	173 (234)	100 (136)
5215	677 (917)	371(503)	245 (332)	133 (181)
5307	762 (1033)	405 (549)	278 (377)	150 (203)
5315	813 (1102)	432 (585)	283 (384)	160 (217)

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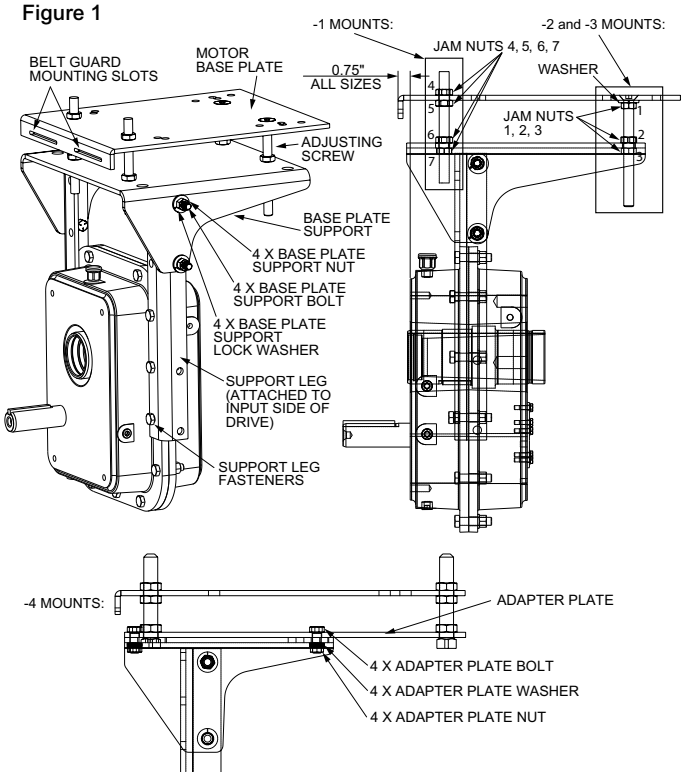
Motor Mount Installation

INTRODUCTION

The Falk Equi-Poised motor mount is an all steel weldment that bolts directly to the drive housing of Falk Shaft-Mounted (Type JR), Flange-Mounted (Type JF) and Screw Conveyor (Type JSC) Drives, as shown in Figure 1.

This modern design provides a simple means of tensioning V-belts or chains with adjusting screws. Motor baseplates are available from Factory pre-drilled for NEMA and IEC standard foot-mounted motors within the rated capacity of the drive.

Figure 1



ASSEMBLY INSTRUCTIONS

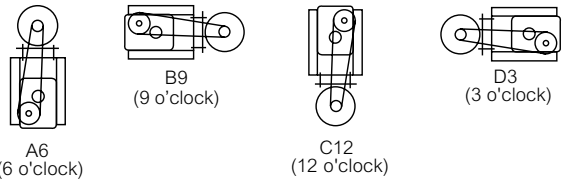
From Figure 2, determine which assembly is required. For minimum bearing loads on driven machine, minimum shaft deflection and the most economical belt selections, use the 6 o'clock mounting position, high-speed shaft relative to the low-speed shaft, illustrated in Figure 1. The motor/drive assembly can also be mounted in positions shown in Figure 2. Always locate air vent at the top of horizontal drives.

TABLE 1 — Torque Arm Kit Clearance Dimensions

	Distance from Output Shaft	Distance from Bottom (Ref)
5107J-1-A6C	5.88	(6.12)
5107J-1-A6S	5.88	(2.92)
5115J-1-A6C	6.12	(6.12)
5115J-1-A6S	6.12	(2.92)
5115J-2-A6C	6.12	(6.12)
5115J-2-A6S	6.12	(2.92)
5203J-1-A6C	8.00	(2.26)
5203J-2-A6C	8.00	(2.26)

STANDARD ASSEMBLIES

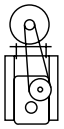
Figure 2



Letter = Motor Mount Position
Clock = Drive High-speed Shaft Position

OPTIONAL ASSEMBLY

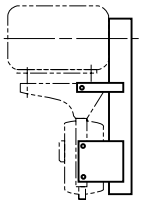
The motor mount may be mounted on the high-speed shaft end of FLANGE MOUNTED DRIVES – JF (also SCREW CONVEYOR DRIVES – JSC) if clearance over the trough end permits) when increased motor mount clearance is required at the driven machine. Consult Factory for SHAFT-MOUNTED DRIVES – JR.



GUARDS

CAUTION: *Consult applicable local and national safety codes for proper guarding of rotating members.*

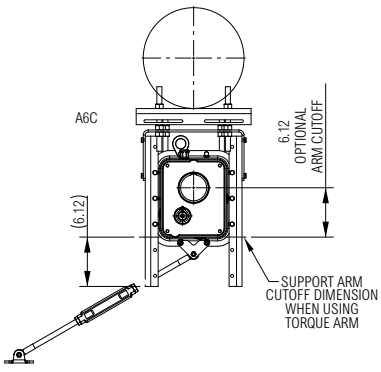
Mounting slots located on the motor base plate are provided for installing a belt guard. Refer to Appendix L for installation of Falk V-Belt guards.



OSHA type guard when specified. Dimensions to suit components.

WARNING: *Remove all external loads from system before servicing drive or accessories.*

1. **ATTACH BASE PLATE SUPPORT TO SUPPORT LEGS** — Loosely assemble support legs to the base plate support as shown in Figure 1.
2. **ATTACH SUPPORT LEGS WITH BASE PLATE SUPPORT TO DRIVE** — To determine the number of housing flange fasteners to be removed for a given shaft center and drive size, refer to Table 3. Attach support legs to the input side of drive with the hex nuts on output side of drive. Tighten support leg and base plate support fasteners to torque values specified in Table 2.
   a. For Compact (C) and Short (S) centers the support arms may need to be cut to allow clearance for a torque arm kit. See Table 1 for dimensions. Once cut, deburr the end and touch up the paint.



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Motor Mount Installation

TABLE 2 — Motor Mount Fasteners & Torques lb-ft (Nm)

DRIVE SIZE	Support Leg to Baseplate Support		Support Leg to Housing		Adapter Plate to Baseplate Support		-1 & -2 Adjusting Screws		-3 Adjusting Screws		-4 Adjusting Screws	
	Fastener Size	Tightening Torque	Fastener Size	Tightening Torque	Fastener Size	Tightening Torque	Fastener Size	Tightening Torque	Fastener Size	Tightening Torque	Fastener Size	Tightening Torque
5107	.375-16UNC x 1.00	28 (38)	.312-18UNC x 1.50	20 (26)	...	...	.625-11UNC	137 (186)	...	...	...	...
5115	.375-16UNC x 1.00	28 (38)	.312-18UNC x 1.50	20 (26)	...	...	.625-11UNC	137 (186)	...	...	...	...
5203	.500-13UNC x 1.25	69 (94)	.375-16UNC x 2.00	28 (38)	...	...	.625-11UNC	137 (186)	...	...	...	...
5207	.500-13UNC x 1.25	69 (94)	.500-13UNC x 2.25	69 (94)	...	...	.625-11UNC	137 (186)	.750-10UNC	108 (146)	...	...
5215	.625-11UNC x 1.50	137 (186)	.500-13UNC x 2.25	69 (94)	...	...	.625-11UNC	137 (186)	.750-10UNC	108 (146)	...	...
5307	.750-10UNC x 1.75	245 (332)	.500-13UNC x 2.50	69 (94)	.625-11UNC x 1.50	60 (81)	.625-11UNC	137 (186)	.750-10UNC	108 (146)	1.000-8UNC x 8.00	180 (244)
5315	.750-10UNC x 1.75	245 (332)	.500-13UNC x 2.50	69 (94)	.625-11UNC x 1.50	60 (81)	.625-11UNC	137 (186)	.750-10UNC	108 (146)	1.000-8UNC x 8.00	180 (244)

3. Loosely install adjusting screws, washers (for flat-head socket cap screws only) and jam nuts (except #3 and #7) on to the motor base plate per Figure 1. Do not tighten adjusting bolts until step 4.

   NOTE: *If your motor base plate uses two 82 degree flat-head socket cap screws, make sure to install the washer between motor base plate and first jam nut as shown in Figure 1, otherwise motor base plate may be loose between the flathead cap screw and motor base plate.*

4. ATTACH MOTOR BASE PLATE TO BASE PLATE SUPPORT — Install motor base plate onto base plate support, install jam nuts 3 and 7 per Figure 1. Set motor plate to desired height and torque all jam nuts per Table 2. After jam nuts are tightened make sure motor base plate is fully secured to base plate support.

Figure 3

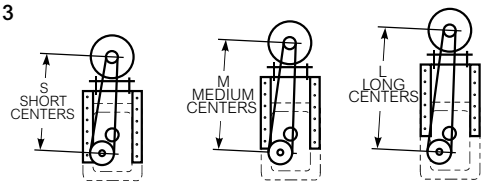
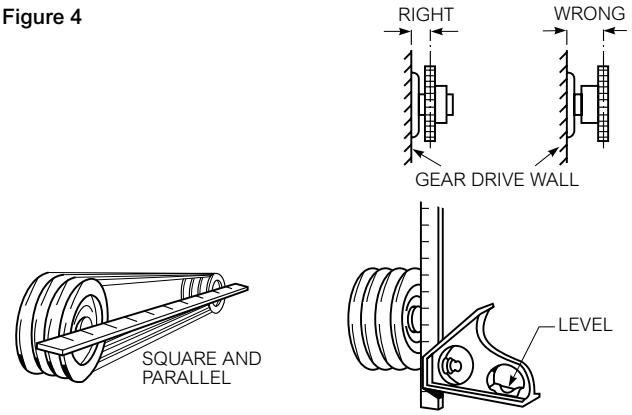


TABLE 3 — Support Leg Fastener Quantity (Per Side)

A6 Shaft Centers	Drive Size					
	5107	5115	5203	5207	5215	5307 & 5315
Compact	3	3	4	...	...	...
Short	3	3	4	4	4	6
Medium	3	3	3	3	3	5
Long	2	2	2	2	2	4
A3 & A9 Shaft Centers						
Compact	3	3	3	...	...	...
Short	3	3	3	3	3	5
Medium	3	3	3	2	2	4
Long	2	2	2	...	...	3

5. MOUNT MOTOR — Position motor on motor base plate so that all mounting holes are in alignment. Install and tighten motor fasteners.
6. SPROCKET, PULLEY OR SHEAVE CONNECTION — Mount power take-offs as close to drive and motor housing as possible to avoid undue bearing load and shaft deflection. Align the high-speed shaft of drive square and parallel with motor shaft by placing a straightedge across the face of the sprockets or sheaves as illustrated in Figure 4. 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.

Figure 4



Adjustment of the belt or chain is accomplished by turning adjusting screws evenly. DO NOT over-tighten belts or chains. Over-tightening belts or chains reduces belt/chain and bearing life. When the required tension is reached, tighten adjusting screw jam nuts to torques listed in Table 2. Adjust chain tension to manufacturer's specifications. Adjust belts as follows:

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

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Vertical Standpipe Installation

INTRODUCTION

The following instructions apply to the installation of standpipe kits to standard drives mounted for vertical operation (high-speed shaft up or down). Drawings are representative of this series of drives and may not agree in exact detail with all drive sizes.

HIGH-SPEED SHAFT DOWN — FIGURE 1

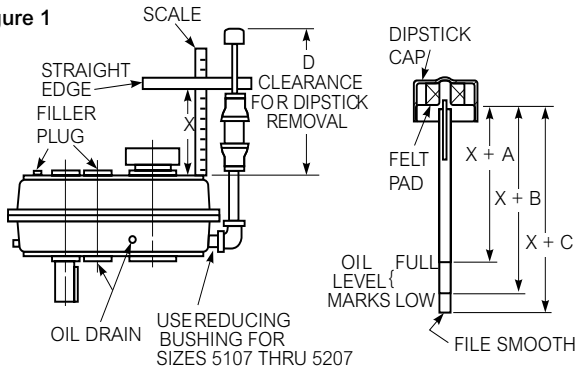
1. After installing the drive per the Owners Manual installation instructions, determine which of the lower side plug locations on the drive will provide the best location for the standpipe, observing clearance required to remove dipstick (Dimension D, Table 1). Discard the air vent. When the air vent location is not used for the standpipe, relocate the pipe plug from the selected standpipe location to the air vent location. Re-coat pipe plug threads with Permatex #3 or equivalent sealant before reinstalling.

TABLE 1 — Dimensions – Inches (mm)

DRIVE SIZE	A	B	C	D
5107	0.90 (23)	1.10 (28)	1.60 (41)	19.2 (488)
5115	0.90 (23)	1.10 (28)	1.60 (41)	18.3 (465)
5203	1.08 (27)	1.28 (33)	1.78 (45)	18.2 (462)
5207	1.14 (29)	1.34 (34)	1.84 (47)	20.4 (518)
5215	1.54 (39)	1.74 (44)	2.24 (57)	22.1 (561)
5307	1.54 (39)	1.84 (47)	2.34 (59)	23.7 (602)
5315	1.70 (43)	2.20 (56)	2.70 (69)	23.1 (587)

2. Coat all pipe threads of kitted parts with Permatex #3 or equivalent sealant.
3. Assemble kitted parts to the drive as illustrated in Figure 1 and then secure the standpipe with an external support to maintain its vertical position.

Figure 1



4. Carefully measure Dimension “X” as illustrated in Figure 1.
5. From Table 1:

   X + A equals oil level “Full” mark.

   X + B equals oil level “Low” mark.

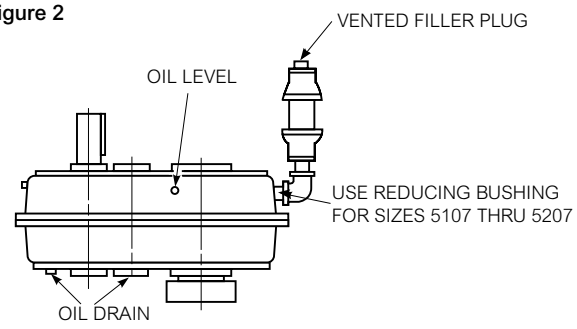
   X + C equals dipstick length.

6. Scribe Dimensions X + A and X + B on the dipstick as illustrated in Figure 1. Make measurements from the felt pad in the dipstick cap.
7. Lightly chisel permanent oil level marks on the scribed lines and cut the dipstick to the length marked. File end of dipstick smooth.
8. Install magnetic drain plug furnished in oil drain location.
9. Remove the oil filler plug. Add oil until the oil level reaches the “Full” mark on the dipstick. Coat the filler plug (not vented) with Permatex #3 or equivalent sealant and replace it.
10. Filler plug must always be removed to relieve entrapped air before checking oil level.

HIGH-SPEED SHAFT UP — FIGURE 2

1. After installing the drive per the Owners Manual installation instructions, determine which of the upper four side plug locations on the drive will provide the best location for the standpipe, observing clearance required to remove dipstick (Dimension D, Table 1). Discard the air vent. When the air vent location is not used for the standpipe, relocate the pipe plug from the selected standpipe location to the air vent location. Re-coat pipe plug threads with Permatex #3 or equivalent sealant before reinstalling.

Figure 2



2. Coat all pipe threads of kitted parts with Permatex #3 or equivalent sealant.
3. Assemble kitted parts to drive as illustrated in Figure 2 and then secure the standpipe with an external support to maintain its vertical position.
4. See Figure 1 and follow steps 4 thru 7.
5. Install magnetic drain plug furnished in oil drain location.
6. Remove one of the three oil level plugs. Add oil through the standpipe until the oil level reaches the plug hole. Coat the plug with Permatex #3 or equivalent sealant and replace it. Be sure to use only the vented filler plug in the standpipe.

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Modifications for Non-Standard Mounting Positions

INSTRUCTIONS

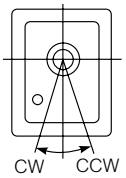
For non-standard mountings, modify drives as illustrated below and on Page 38 to assure satisfactory lubrication. For applications that exceed the limits shown, drives that are both rotated AND tilted and drives with backstops, consult Factory.

CAUTION: *Inadequate lubrication will cause damage.*

When replacing a pipe plug (P) with a street elbow (E), insert the plug in the elbow (E/P). When replacing a pipe plug (P) with a street elbow (E), pipe nipple (N) and a pipe cap (C), discard the pipe plug. Kits consist of parts for an oil expansion chamber. Pipe fittings and kits tabulated on Page 35 are available from Rexnord. Pipe fittings may also be purchased locally. Use galvanized pipe fittings.

Remove all pipe plugs and coat them and the added parts, with Permatex #3 or equivalent to prevent leakage. Install parts as illustrated to suit the mounting position. The air vent must be in the top of the drive or in the kit standpipe. Fill drives with oil to the level indicated by the letter "L" in the following drawings.

STANDARD DRIVE MOUNTING LIMITS



The standard drive rotation limits from the basic 3, 6, 9 & 12 o'clock mounting positions are given in Section I, Page 4. For higher limits, follow the instructions at the left and the drawings below (6 o'clock illustrated).

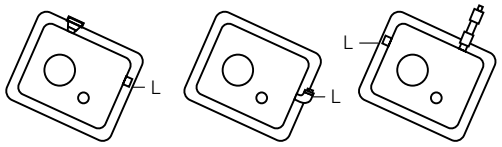
CODE

B — Bushing N — Nipple
C — Cap P — Pipe Plug
E — Street Elbow STD — No Modifications
L — Oil Level

HORIZONTAL DRIVE MODIFICATIONS 20° MAX. DRIVE ROTATION

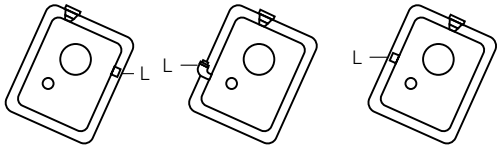
5 to 20° CW Rotation – Sizes 5107 & 5115
10 to 20° CW Rotation – Sizes 5203 thru 5315

3 o'clock — CW Rotation



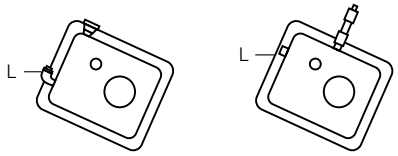
5107 = STD
5115 = .375 E/P
5203 & 5207 = KIT 0786775

6 o'Clock — CW Rotation



5107 = STD
5115 = .375 E/P
5203 thru 5315 = STD

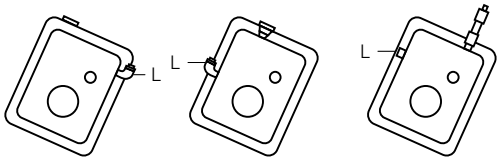
9 o'Clock — CW Rotation



5107 = 5-12° STD
5107 = 13-20° .375 E/P
5115 = .375 E/P

5203 & 5207 = KIT 0786775
5215 thru 5315 = KIT 0786776

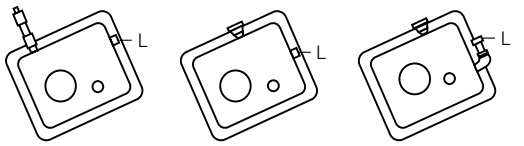
12 o'Clock — CW Rotation



5107 = .375 E/P
5115 = .375 E/P
5203 & 5207 = KIT 0786775
5215 thru 5315 = KIT 0786776

5 to 20° CCW Rotation – Sizes 5203 thru 5315
10 to 20° CCW Rotation – Sizes 5107 & 5115

3 o'Clock — CCW Rotation

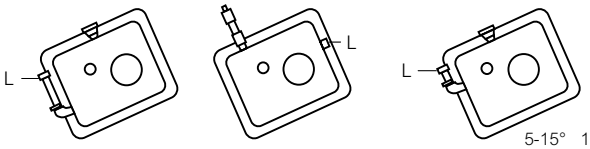


5107 = KIT 0738540
5115 = STD
5203 = .375 E/C & .375 X 1.00N
5207 = .375 E/C & .375 X 2.00N
5215 = .500 E/C & .500 X 2.00N
5307 = .500 E/C & .500 X 2.50N
5315 = .500 E/C & .500 X 2.50N

6 o'Clock — CCW Rotation

5107 & 5115 = STD
5203 = .375 E/C & .375 X 1.00N
5207 = .375 E/C & .375 X 1.50N
5215 = .500 E/C & .500 X 1.12N
5307 & 4315 = .500 E/C & .500 X 2.00N

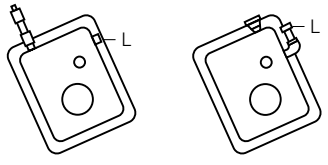
9 o'Clock — CCW Rotation



5107 = .375 E/C & .375 X 3.00N
5115 = KIT 0786775

	5-15°	16-20°
5203 = .375 E/C & .375 X 1.00N	1.50N	
5207 = .375 E/C & .375 X 1.00N	1.50N	
5215 = .500 E/C & .500 X 1.12N	1.50N	
5307 = .500 E/C & .500 X 1.50N	2.00N	
5315 = .500 E/C & .500 X 1.50N	2.00N	

12 o'Clock — CCW Rotation



5107 & 5115 = KIT 0738540

5203 = .375 E/C & .375 X 1.50N
5207 = .375 E/C & .375 X 2.00N
5215 = .500 E/C & .500 X 2.00N
5307 = .500 E/C & .500 X 2.50N
5315 = .500 E/C & .500 X 2.50N

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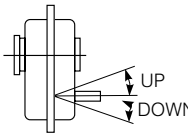
Modifications for Non-Standard Mounting Positions



STANDARD DRIVE MOUNTING LIMITS

The standard drive incline limits from the basic 3, 6, 9 & 12 o'clock mounting positions are given in Section I, Page 4. For higher limits, follow the instructions on Page 38 and the drawings below (6 o'clock illustrated).

CODE

C — Cap	N — Nipple
E — Street Elbow	P — Pipe Plug
L — Oil Level	STD — No Modifications

Standard Pipe Fittings ▲ — Inches

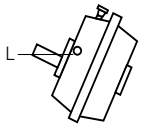
.375-18 NPT	Falk No.	.500-14 NPT	Falk No.
.375 Street Elbow	0915252	.500 Street Elbow	0915251
.375 Cap	0914802	.500 Cap	0914803
.375 x 1 Nipple	0915724	.500 x 1.12 Nipple	0915734
.375 x 1.5 Nipple	0915725	.500 x 1.5 Nipple	0915735
.375 x 2 Nipple	0915722	.500 x 2 Nipple	0915736
.375 x 3 Nipple	0915727	.500 x 2.5 Nipple	0915723
		.500 x 3 Nipple	0915737
		.500 x 4 Nipple	0915739

▲ Kits: Falk Nos. 0786775 & 0786776, oil expansion chamber parts. All pipe fittings are galvanized.

HORIZONTAL DRIVE MODIFICATIONS FOR INCLINED H.S. SHAFT

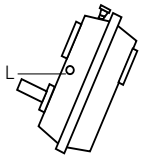
H.S. Shaft Inclined 20 to 30° Up

3 o'Clock — H,S,S Up



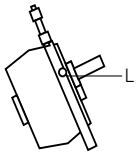
5107 THRU 5315 = STD

6 o'clock — H,S,S Up



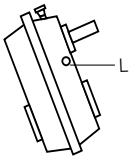
5107 THRU 5315 = STD

9 o'clock — H,S,S Up



5107 THRU 5307 = STD
5315 = KIT 0786776

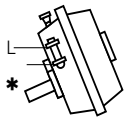
12 o'Clock — H,S,S Up



5107 THRU 5315 = STD

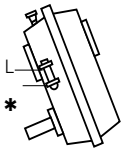
H.S. Shaft Inclined 5 to 30° Down

3 o'Clock — H,S,S Down



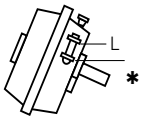
5107 = 5-25° .375 E/P
5107 = 26-30° .375 E/C, .375 X 1.00N & KIT 0786775
5115 = 5-20° .375 E/C & .375 X 1.00N
5115 = 21-30° .375 E/C, .375 X 2.00N & KIT 0786775
5203 = 5-30° .375 E/C & .375 X 1.50N
5207 = 5-15° .375 E/P
5207 = 16-30° .375 E/C & .375 X 2.00N
5215 = 5-30° .500 E/C & .500 X 2.50N
5307 = 5-30° .500 E/C & .500 X 2.50N
5315 = 5-30° .500 E/C & .500 X 2.50N

6 o'Clock — H,S,S Down



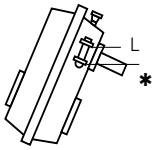
5107 = .375 E/P
5115 = .375 E/C & .375 X 2.00N
5203 = .375 E/C & .375 X 1.50N
5207 = .375 E/C & .375 X 2.00N
5215 = .500 E/C & .500 X 2.50N
5307 = .500 E/C & .500 X 2.50N
5315 = .500 E/C & .500 X 2.50N

9 o'Clock — H,S,S Down



5107 = 5-15° STD
5107 = 16-30° .375 E/P & KIT 0786775
5115 = 5-15° .375 E/P
4115 = 16-30° .375 E/C, .375 X 2.00N & KIT 0786775
5203 = 5-20° .375 E/P
5203 = 21-30° .375 E/C, .375 X 1.50N & KIT 0786775
5207 = 5-20° .375 E/C
5207 = 21-30° .375 E/C, .375 X 2.00N & KIT 0786775
5215 = 5-15° .500 E/P
5215 = 16-30° .500 E/C, .500 X 2.00N & KIT 0786776
5307 = 5-20° .500 E/P
5307 = 21-30° .500 E/C, .500 X 2.00N & KIT 0738471
5315 = 5-30° .500 E/C, .500 X 4.00N & KIT 0738471

12 o'Clock — H,S,S Down



5107 = 5-15° .375 E/P
5107 = 16-30° .375 E/C, .375 X 1.00N & KIT 0786775
5115 = 5-15° .375 E/P
5115 = 16-30° .375 E/C, .375 X 2.00N & KIT 0786775
5203 = 5-30° .375 E/C & .375 X 1.50N
5207 = 5-30° .375 E/C & .375 X 2.00N
5215 = 5-30° .500 E/C & .500 X 2.50N
5307 & 4315= 5-30° .500 E/C & .500 X 2.50N

✱ This oil level applies when only a street elbow with a pipe plug is used.

L — Always locate at high side plug.
KIT — Install at standard air vent location.

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Retaining Rings for Bushing Nuts & Thrust Plates

JR — Retaining Rings for Bushing Nuts

DRIVE SIZE	Manufacturer Part Number
5107	Truarc N5000-237
5115	Truarc N5000-312
5203	Truarc N5000-334
5207	Eaton IN375
5215	Truarc N5000-462
5307	Eaton IN500
5315	Truarc N5000-575

JF & JSC — Retaining Rings for Thrust Plate Kits

DRIVE SIZE	Manufacturer Part Number
5107	Truarc N5000-165
5115	Eaton IN225
5203	Eaton IN244
5207	Eaton IN281
5215	Eaton IN334
5307	Eaton IN375
5315	Eaton IN433

Tooth Combinations for Vibration Analysis

Type J05 — Tooth Combinations

DRIVE SIZE	Exact Ratio	Pinion Ref. #3A3	Gear Ref. #4A4
5107	5.077	13	66
5115	5.053	19	96
5203	5.071	14	71
5207	5.077	13	66
5215	4.923	13	64
5307	4.857	14	68
5315	4.857	14	68

Type J09 — Tooth Combinations

DRIVE SIZE	Exact Ratio	Input		Output	
		Pinion Ref. #1A3	Gear Ref. #1A4	Pinion Ref. #2A	Gear Ref. #4A4
5107	9.462	22	41	13	66
5115	9.357	27	50	19	96
5203	9.179	21	38	14	71
5207	9.492	23	43	13	66
5215	8.997	29	53	13	64
5307	9.131	25	47	14	68
5315	9.131	25	47	14	68

Type J14 — Tooth Combinations

DRIVE SIZE	Exact Ratio	Input		Output	
		Pinion Ref. #1A3	Gear Ref. #1A4	Pinion Ref. #2A3	Gear Ref. #4A4
5107	14.43	19	54	13	66
5115	13.95	21	58	19	96
5203	14.45	20	57	14	71
5207	14.47	20	57	13	66
5215	13.60	21	58	13	64
5307	14.03	18	52	14	68
5315	13.91	22	63	14	68

Type J25 — Tooth Combinations

DRIVE SIZE	Exact Ratio	Input		Output	
		Pinion Ref. #1A3	Gear Ref. #1A4	Pinion Ref. #2A3	Gear Ref. #4A4
5107	25.81	12	61	13	66
5115	24.87	13	64	19	96
5203	26.94	16	85	14	71
5207	24.99	13	64	13	66
5215	24.94	15	76	13	64
5307	25.26	15	78	14	68
5315	25.26	15	78	14	68

Seal Housing Lip Seals for Types JSC

Type JSC — Seal Housing Lip Seals Accessory

DRIVE SIZE	Falk Part No.	Manufacturer's Part No.
5107	2905318	Chicago Rawhide 17271
5115	0912859	National 470565
5203	2911847	Chicago Rawhide 26153
5207	0912835	Chicago Rawhide 29865
5215	2911957	Chicago Rawhide 34861
5307	0912741	Chicago Rawhide 34886
5315	0912741	Chicago Rawhide 34886

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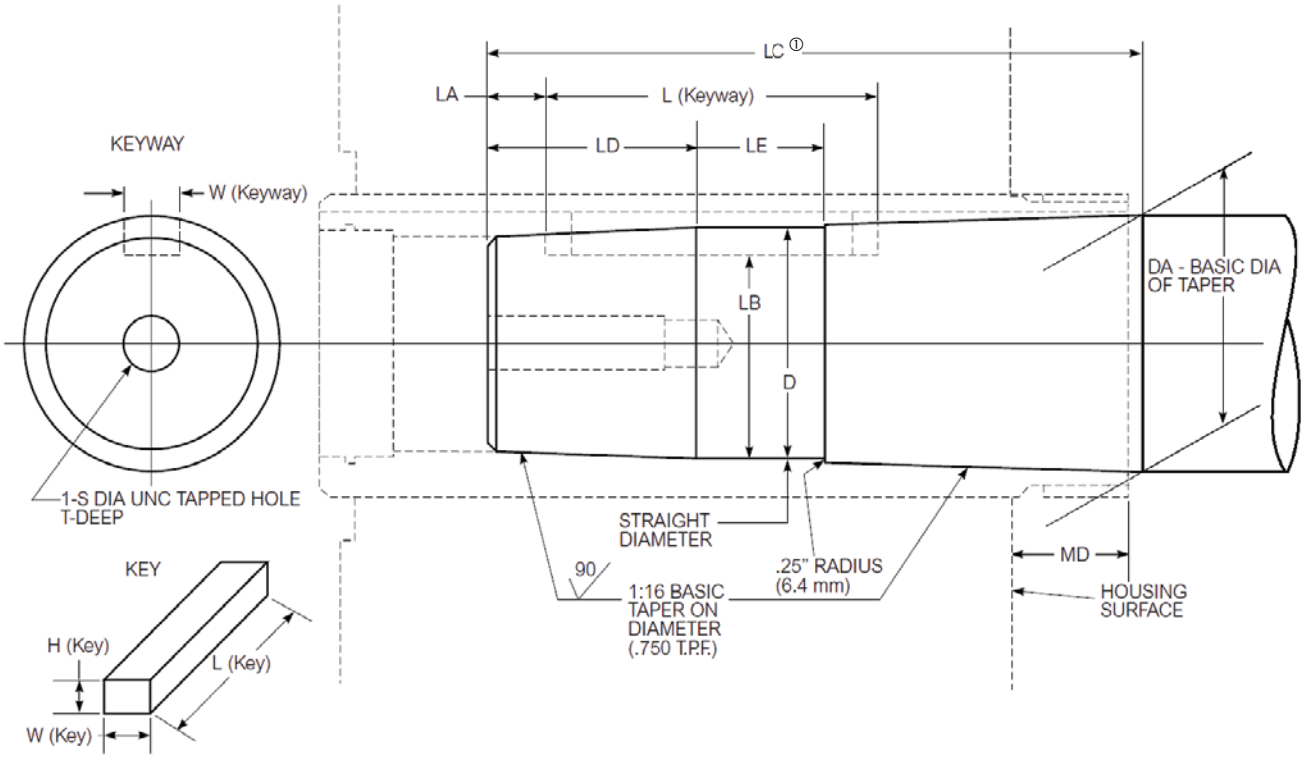
Drive Shaft Recommendations for Tapered Drive Shafts



Dimensions — Inches (mm) ▲

DRIVE SIZE	Keyway W ■	Keyway L ±.010 (±0.25)	D ◆ +.000, –.005 (+0.00, –0.13,	DA	LA ±.030 (±0.76)	LB +.000, –.010 (+0,00, – 0.25)	LC ✱ +.040, – .000 (+1.02, – 0.00)	LD	LE	MD ●	S	T Min	Key W	Key H	Key L
5107□	.375 (9.53)	2.875 (73.02)	1.614 (40.996)	1.750 (44.45)	.437 (11.10)	1.329 (33.76)	3.679 (93.45)	1.50 (38.1)	1.50 (38.1)	1.07 (27.2)	.500-13	2.00 (50.8)	.375	.375	2.50
5115	.500 (12.70)	3.250 (82.55)	2.173 (55.194)	2.357 (59.87)	.500 (12.70)	1.902 (48.31)	5.656 (143.66)	2.72 (69.1)	1.50 (38.1)	1.16 (29.46)	.500-13	2.00 (50.8)	.500	.375	2.75
5203	.500 (12.70)	3.750 (95.25)	2.425 (61.595)	2.620 (66.55)	.500 (12.70)	2.153 (54.69)	5.286 (134.26)	2.13 (54.1)	1.50 (38.1)	1.10 (27.9)	.625-11	2.00 (50.8)	.500	.375	3.25
5207	.625 (15.88)	4.875 (123.82)	2.725 (69.215)	2.920 (74.17)	.625 (15.88)	2.416 (61.37)	6.218 (157.94)	3.10 (78.7)	2.00 (50.8)	1.11 (28.2)	.625-11	2.00 (50.8)	.625	.438	4.25
5215	.750 (19.05)	4.250 (107.95)	3.258 (82.753)	3.500 (88.90)	.750 (19.05)	2.923 (74.24)	7.616 (193.45)	3.75 (95.3)	2.00 (50.8)	1.19 (30.2)	.875-9	2.50 (63.5)	.750	.500	3.50
5307	.875 (22.23)	5.875 (149.22)	3.878 (98.501)	4.100 (104.14)	.875 (22.22)	3.413 (86.69)	8.008 (203.40)	4.46 (113.3)	2.04 (51.8)	1.27 (32.2)	1.000-8	2.75 (69.8)	.875	.625	5.00
5315	1.000 (25.40)	6.000 (152.40)	4.433 (112.598)	4.664 (118.47)	1.000 (25.40)	3.871 (98.32)	8.398 (213.31)	4.75 (120.7)	2.00 (50.8)	1.27 (32.2)	1.000-8	2.75 (69.8)	1.000	.750	5.00

▲ Dimensions are for reference only and are subject to change without notice unless certified.
■ Inch keyway width tolerances are as follows: over .312" (7.92) to & including .500" (12.70) = +.0025" (+0.064), –.0000" (–0.000), over .500" (12.70) to & including 1.000" (25.40) = +.0030"(+0.076), –.0000"(–0.000). Keyway depth tolerance is +.010"(+0.25), –.000"(–0.00).
◆ Straight diameter is used to aid in measurement and manufacture of the keyway.
● Dimension "MD" will vary slightly depending on degree of axial compression during installation and manufacturing tolerances.
✱ Dimension "LC" is a measure of the length of the taper from the basic taper diameter ("DA") to the end of the shaft. **NOTE:** for Drive Size 5107, "LC" will be located approximately 1.16" (29.5 mm) inside end of hollow shaft (not near the end of the hollow shaft as shown).

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Drive Shaft Recommendations Using TA Taper Bushing

INTRODUCTION — These instructions are for use when a flange-mounted 5107-5315JF drive is to be used and the manufacture of a tapered drive shaft is not feasible. For JF tapered drive shaft recommendations, see Appendix H. Use this appendix to retrofit existing applications or for outfitting new installations. Parts required are the Basic drive, TA Taper bushing and a thrust plate kit.

This appendix will allow the use of a straight drive shaft with the tapered bushing (without spanner nut) on flange-mounted applications. Provided are dimensions (Table 4) for shaft recommendations and instructions for the installation and removal of the assembly. All bushing bore sizes, which are available in the standard Quadrive, are possible with this setup.

Drives are provided with tapped holes in the output face of the housing along with a female register to allow mounting to the driven equipment. JF drives are mounted to the equipment without the use of an adapter flange. Optional adapter flanges are available, consult the Factory.

FIGURE 2 — The hollow shaft of the drive has a tapered bore which accepts the tapered bushing. When the bushing is drawn into the taper, a clamping force is applied to the drive shaft. The drive shaft is drawn into the hollow shaft via a fastener in the thrust plate. The bushing seats against a shoulder on the driven shaft and is drawn into the drive with the shaft. Removal is accomplished by using a jackscrew in the thrust plate and forcing the drive shaft out of the drive. The retaining ring in the drive shaft assures that the bushing will be removed along with the shaft.

DRIVE SHAFT RECOMMENDATIONS — The recommendations for the drive shaft consist of two major features. The first is the shoulder which must be provided in the location shown in Figure 2. This shoulder provides the backing necessary to draw the bushing into the taper. A permanently fixed shoulder must be provided in order for this design to be effective. The shoulder may be a welded collar or an integral step. SET COLLARS ARE NOT ACCEPTABLE. A retaining ring may be used, in the driven shaft, to provide the shoulder, but stress concentrations occur at the groove and therefore shaft stresses must be checked. The second major feature on the shaft is the retaining ring groove in the shaft end. This feature is recommended to ensure positive removal of the bushing when the drive shaft is removed from the drive. The threaded hole in the end of the drive shaft accepts the thrust plate fastener.

WARNING: *Lock out power source and remove all external loads from system before servicing drive or accessories.*

INSTALLATION PROCEDURE — With the drive shaft manufactured per the recommendations shown, and the bushing selected for the proper shaft diameter, remove and discard the retaining ring and spanner nut from the bushing assembly.

Slide the bushing (flange end first) onto the drive shaft until it contacts the shoulder on the shaft. Insert the key through the bushing and into the drive shaft keyway. Install the retaining ring into the groove in the drive shaft. Bring the drive into position, line-up the hollow shaft keyway with the key, and slide the bushing and drive shaft into the hollow shaft bore.

Attach the drive to the mounting surface with fasteners (not provided). Refer to Table 1 for fastener size and tightening torque. Assemble the thrust plate and retaining ring into the counterbore in the hollow shaft. Insert the thrust plate fastener through the thrust plate and thread into the drive shaft end. Tighten to the torque given in Table 2. Install all covers and guards.

REMOVAL PROCEDURE — Remove low-speed shaft input end cover. Remove the thrust plate fastener, retaining ring and thrust plate from the hollow shaft. Refer to Table 3 and select a backing bolt and flat washer and install them into the drive shaft as illustrated in Figure 1. The head of the backing bolt provides a working surface for the removal bolt. Reinsert the thrust plate and retaining ring into the hollow shaft and select a removal bolt from Table 3. Thread the removal bolt into the thrust plate until it contacts the backing bolt head. Tighten the removal bolt to the torque indicated in Table 3 (if the thrust plate rotates in the shaft, align the slot in the plate with the hollow shaft keyway and insert a screw driver or piece of key stock to prevent rotation of the plate). After torquing the bolt, as instructed, strike the bolt sharply with a hammer and re-torque the bolt if separation of the drive from the shaft did not occur. Repeat this procedure, re-torquing the bolt after each blow, until separation occurs.

Figure 1

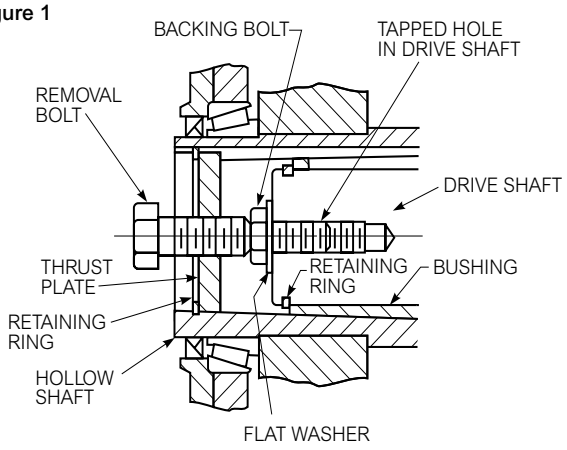

TABLE 1 — JF Drive – Foundation Fastener & Tightening Torque

(Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size & Grade	Max Tightening Torque lb-ft (Nm)	Min. Fastener Engagement Into Drive Housing Inch (mm)
5107	.500-13UNC, GR. 5	69 (94)	.76 (19.3)
5115	.625-11UNC, GR. 5	137 (186)	.94 (23.9)
5203	.750-10UNC, GR. 5	245 (332)	.76 (19.3)
5207	.875- 9UNC, GR. 5	380 (515)	.88 (22.4)
5215	1.000- 8UNC, GR. 5	567 (769)	1.00 (25.4)
5307	1.000- 8UNC, GR. 8	792 (1074)	1.24 (31.5)
5315	1.000- 8UNC, GR. 8	792 (1074)	1.24 (31.5)

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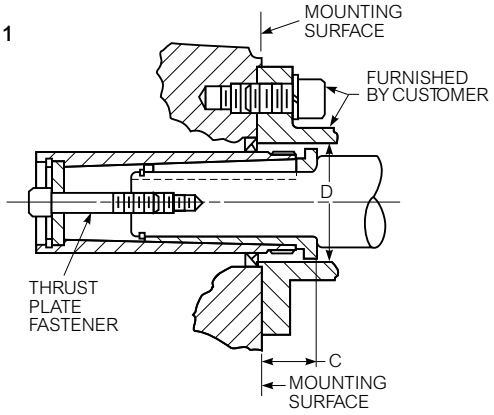
Drive Shaft Recomendations Using TA Taper Bushing

Figure 1



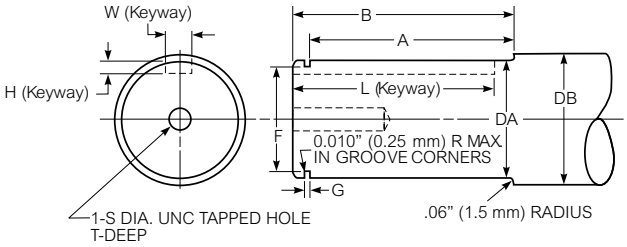


TABLE 2 — Thrust Plate Fastener Data ▲
(Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size & Grade	Max Tightening Torque lb-ft (Nm)	Min Thread Depth Inches (mm)
5107	.500-13UNC x 3.50, GR.8	92 (125)	2.00 (50.8)
5115	.500-13UNC x 4.00, GR.8	92 (125)	2.00 (50.8)
5203	.625-11UNC x 3.50, GR.8	183 (248)	2.00 (50.8)
5207	.625-11UNC x 3.50, GR.8	183 (248)	2.00 (50.8)
5215	.875- 9UNC x 5.00, GR.8	533 (723)	2.50 (63.5)
5307	1.000- 8UNC x 5.00, GR.5	567 (769)	2.50 (63.5)
5315	1.000- 8UNC x 5.00, GR.8	792 (1074)	2.50 (63.5)

▲ Fasteners may be hex socket head or hex head except for size 5307, which must be a hex head to clear input end cover.

TABLE 3 — Removal & Backing Bolt Size and Tightening Torque

DRIVE SIZE	Removal Bolt Size & Min Length – Inches	Max Tightening Torque lb-ft (Nm)	Backing Bolt Size & Max Length – Inches
5107	.625-11UNC x 1.75	133 (180)	.500-13UNC x 1.25
5115	.625-11UNC x 1.75	133 (180)	.500-13UNC x 1.25
5203	.750-10UNC x 2.00	242 (328)	.625-11UNC x 1.75
5207	.750-10UNC x 2.00	242 (328)	.625-11UNC x 1.75
5215	1.000- 8UNC x 2.50	567 (769)	.875- 9UNC x 2.25
5307	1.125- 7UNC x 3.00	742 (1006)	1.000- 8UNC x 2.50
5315	1.125- 7UNC x 3.00	742 (1006)	1.000- 8UNC x 2.50

TABLE 4 — Dimensions for Largest Bore Bushing – Inches (mm) ▲

DRIVE SIZE	Thrust Plate Kit ■	Thrust Plate Part No.	A ± 0.010 (±0.250)	B ± 0.030 (±0.75)	C ◆	D ●	DA ✱	DB Min	Retaining Ring ♣				Keyway ♥			S	T Min
									Groove		Spir O Lox		W	H	L Min		
									F	G	Mfg No.	Max O.D					
5107	TP4107JF	0778773	4.780 (121.41)	5.000 (127.00)	-1.356 (-34.4) -1.606 (-40.8)	2.500 (63.50)	1.4375	1.750 (44.45)	1.295 1.287	0.056 0.060	RSN-137	1.500	0.375	0.1875	3.563 (90.50)	0.500-13	2.00 (50.8)
5115	TP4115JF	0778774	5.330 (135.38)	5.500 (139.70)	-1.528 (-38.8) -1.794 (-45.6)	3.250 (82.55	1.9375	2.250 (57.15)	1.735 1.725	0.068 0.072	RST-181	2.000	0.500	0.2500	4.000 (101.60)	0.500-13	2.00 (50.8)
5203	TP4203JF	0778775	5.310 (134.87)	5.625 (142.88)	-1.634 (-41.5) -1.921 (-48.8)	3.500 (88.90)	2.1875	2.500 (63.50)	1.952 1.940	0.086 0.091	RSN-206	2.250	0.500	0.2500	4.625 (117.48)	0.625-11	2.00 (50.8)
5207	TP4207JF	0778776	5.890 (149.61)	6.250 (158.75)	-1.557 (-39.6) -1.885 (-47.9)	4.000 (101.60)	2.4375	2.750 (69.85)	2.290 2.278	0.056 0.060	RS-236	2.500	0.625	0.3125	5.625 (142.88)	0.625-11	2.00 (50.8)
5215	TP4215JF	0778777	6.860 (174.24)	7.125 (180.98)	-1.755 (-44.6) -2.082 (-52.9)	4.750 (120.65)	2.9375	3.250 (82.55)	2.728 2.716	0.056 0.060	RS-281	3.062	0.750	0.3750	5.875 (149.22)	0.875-9	2.50 (63.5)
5307	TP4307JF	0778778	7.170 (182.12)	7.500 (190.50)	-1.843 (-46.8) -2.175 (-55.2)	5.125 (130.18)	3.4375	3.750 (95.25)	3.172 3.160	0.103 0.108	RSN-334	3.625	0.875	0.4375	6.750 (171.45)	1.000-8	2.50 (63.5)
5315	TP4315JF	0778779	7.700 (195.58)	8.000 (203.20)	-1.840 (-46.7) -2.175 (-55.2)	6.000 (152.40)	3.9375	4.250 (107.95)	3.701 3.690	0.120 0.125	RST-387	4.125	1.000	0.5000	7.062 (179.37)	1.000-8	2.50 (63.5)

▲ For metric drive shafts or bushing bores smaller than the maximum provide the retaining ring groove per manufacturers' recommendations, keyway appropriate for the shaft diameter, and DB minimum of 0.300" (7.62 mm) larger than the bushing bore to provide adequate backing.
■ Kit consists of: thrust plate, thrust plate fastener, hollow shaft retaining ring, and drive shaft retaining ring.
♦ The range for C dimensions is the variation which may occur due to axial compression and manufacturing tolerances. Negative C dimensions indicate that the bushing protrudes beyond the mounting surface.
● The D dimension is the recommended minimum bore which clears the TA Taper bushing flange.
✱ Ⓢ Shaft diameter tolerances are per AGMA as follows: to 1.50" = +.000", -.004"; over 1.50" to & including 2.50" = +.000", -.005"; over 2.50" to & including 4.00" = +.000", - .006". Metric drive shafts are to be based on h10 tolerances.
♣ Smalley retaining rings may be used instead of Spir O Lox by substituting WS for RS. WST for RST or WSM for RSN.
♥ Inch keyway width tolerances are as follows: over .312" to & including .500" = +.0025", -.0000"; over .500" to & including 1.000" = +.0030", -.0000". Metric keyway widths are based on class N9 tolerances. Inch keyway depth tolerance is +.010", -.000". Refer to ISO 773 or DIN 6885 sheet 1 for metric keyway depth tolerances

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Drive Shaft Recomendations Using (TCB) Kit

INTRODUCTION — These instructions are for use when a screw conveyor 5107 - 5315JSC drive is to be used and the following conditions exist: Falk standard or 316 stainless steel JSC tapered drive shafts can not be used due to special extension dimensions or materials; or manufacturing a special tapered drive shaft is not feasible. Use this appendix to retrofit existing applications or for outfitting new installations where the above conditions warrant. For tapered shaft recommendations, see Appendix H.

This appendix will allow the use of a straight (non-tapered) drive shaft with a special bushing conversion kit on screw conveyor applications. This kit provides one bushing bore per drive size as shown in Table 4. Provided in this appendix are dimensions for drive shaft recommendations and instructions for the installation and removal of the assembly.

FIGURE 2 — The hollow shaft of the drive has a tapered bore which accepts the tapered bushing. When the bushing is drawn into the taper, a clamping force is applied to the drive shaft. The drive shaft is drawn into the hollow shaft via a fastener in the thrust plate. The bushing seats against a shoulder on the drive shaft and is drawn into the drive with the shaft. Removal is accomplished by using a jackscrew in the thrust plate and forcing the drive shaft out of the drive. The retaining ring in the drive shaft assures that the bushing will be removed along with the shaft.

The packing gland sealing option (sizes 5107-5315) is usable with the bushing kit, but the clamp ring must be assembled from the extension end of the drive shaft on sizes 5307 and 5315.

DRIVE SHAFT RECOMMENDATIONS — The recommendations for the drive shaft consist of two major features. The first is the shoulder which must be provided in the location shown in Figure 2. This shoulder provides the backing necessary to draw the bushing into the taper. A permanently fixed shoulder must be provided in order for this design to be effective. The shoulder may be a welded collar or an integral step. SET COLLARS ARE NOT ACCEPTABLE. A retaining ring may be used in the drive shaft, to provide the shoulder, but stress concentrations can occur at the groove and therefore shaft stresses must be checked. The second major feature on the shaft is the retaining ring groove in the shaft end. This feature is recommended to ensure positive removal of the bushing when the drive shaft is removed from the drive. The threaded hole in the end of the drive shaft accepts the thrust plate fastener.

WARNING: *Lock out power source and remove all external loads from system before servicing drive or accessories.*

INSTALLATION PROCEDURE — With the shaft manufactured per the recommendations shown, proceed as follows:

5107-5215JSC — The seal housing may be assembled to the drive before or after the drive shaft is installed into the drive, depending on the shaft extension diameter.

5307-5315JSC — The seal housing must be assembled over the drive shaft from the extension end of the shaft, or the shaft shoulder must be fixed in position after the seal housing is assembled over the drive shaft (see Figure 2).

ALL JSC DRIVES — Slide the bushing (large end first) onto the drive shaft until it contacts the shoulder on the shaft. Insert the key through the bushing and into the drive shaft keyway. Install the retaining ring into the groove in the drive shaft. Line up the keyway in the drive hollow shaft with the key in the drive shaft and slide shaft/bushing assembly into the hollow shaft. Attach the seal housing to the drive with the fasteners provided.

Tighten fasteners to torque given in Table 1. Assemble the thrust plate and retaining ring into the counterbore in the hollow shaft. Insert the thrust plate fastener through the thrust plate and thread into the drive shaft end. Tighten to the torque given in Table 2. Install all covers and guards.

REMOVAL PROCEDURE — Remove low-speed shaft input end cover. Remove the thrust plate fastener, retaining ring and thrust plate from the hollow shaft. Refer to Table 3 and select a backing bolt and flat washer and install them into the drive shaft as illustrated in Figure 1. The head of the backing bolt provides a working surface for the removal bolt. Reinsert the thrust plate and retaining ring into the hollow shaft and select a removal bolt from Table 3. Thread the removal bolt into the thrust plate until it contacts the backing bolt head. Tighten the removal bolt to the torque indicated in Table 3 (if the thrust plate rotates in the shaft, align the slot in the plate with the hollow shaft keyway and insert a screwdriver or piece of key stock to prevent rotation of the plate). After torquing the bolt, as instructed, strike the bolt sharply with a hammer and re-torque the bolt if separation of the drive from the shaft did not occur. Repeat this procedure, re-torquing the bolt after each blow, until separation occurs.

Figure 1

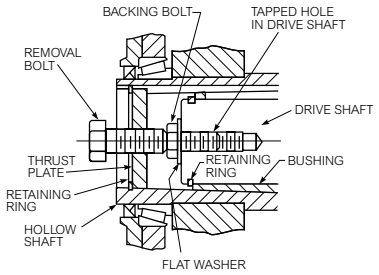

TABLE 1 — Seal Housing Fastener Tightening Torque (Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Size	Max Tightening Torque lb-ft (Nm)
5107	.500-13UNC	69 (94)
5115	.625-11UNC	137 (186)
5203	.750-10UNC	245 (332)
5207	.875- 9UNC	380 (515)
5215	1.000- 8UNC	567 (769)
5307	1.000- 8UNC	792 (1074)
5315	1.000- 8UNC	792 (1074)

TABLE 2 — Thrust Plate Fastener Data ▲

(Non-Lubricated Fasteners)

DRIVE SIZE	Fastener Grade & Size	Max Tightening Torque lb-ft (Nm)	Min Thread Depth Inches (mm)
5107	.500-13UNC x 3.50, GR.8	92 (125)	2.00 (50.8)
5115	.500-13UNC x 4.00, GR.8	92 (125)	2.00 (50.8)
5203	.625-11UNC x 3.50, GR.8	183 (248)	2.00 (50.8)
5207	.625-11UNC x 3.50, GR.8	183 (248)	2.00 (50.8)
5215	.875- 9UNC x 5.00, GR.8	533 (723)	2.50 (63.5)
5307	1.000- 8UNC x 5.00, GR.5	567 (769)	2.50 (63.5)
5315	1.000- 8UNC x 5.00, GR.8	792 (1074)	2.50 (63.5)

▲ Fasteners may be hex socket head or hex head except for size 5307, which must be a hex head to clear input end cover.

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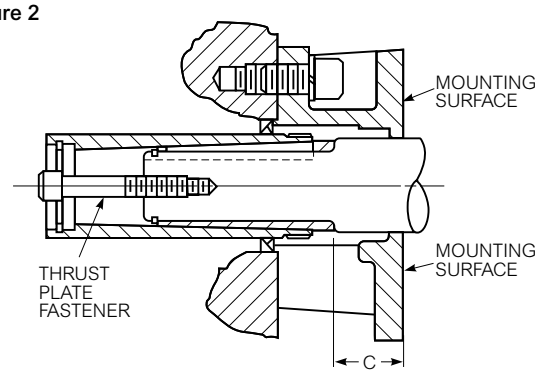
Drive Shaft Recommendations Using (TCB) Kit

Figure 2



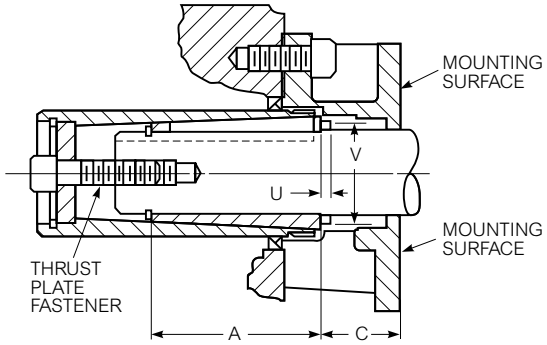


TABLE 3 — Removal & Backing Bolt Size and Tightening Torque

DRIVE SIZE	Removal Bolt Size & Min Length – Inches	Max Tightening Torque lb-ft (Nm)	Backing Bolt Size & Max Length – Inches
5107	.625-11UNC x 1.75	133 (180)	.500-13UNC x 1.25
5115	.625-11UNC x 1.75	133 (180)	.500-13UNC x 1.25
5203	.750-10UNC x 2.00	242 (328)	.625-11UNC x 1.75
5207	.750-10UNC x 2.00	242 (328)	.625-11UNC x 1.75
5215	1.000- 8UNC x 2.50	567 (769)	.875- 9UNC x 2.25
5307	1.125- 7UNC x 3.00	742 (1006)	1.000- 8UNC x 2.50
5315	1.125- 7UNC x 3.00	742 (1006)	1.000- 8UNC x 2.50

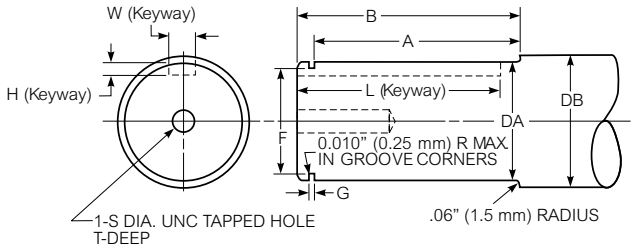


TABLE 4 — Dimensions – Inches (mm)

Taper Conversion Bushing Kit ▲	(TCB) Kit Part No.	A ± 0.010 (± 0.25)	B ± 0.030 (± 0.75)	C ■	DA ◆	DB ● +0.000, - 0.003 (+0.00, - 0.08)	Retaining Ring ✱				Keyway ♣			S	T Min	Weld/Integral Flange	
							Groove		Mfg No.	Max O.D.	W	H	L Min			U	V
							F	G									
TCB5107J-1.438	0766041	4.780 (121.41)	5.000 (127.00)	2.625 (66.68) 2.414 (61.32)	1.4375	1.750 (44.45)	1.295 1.287	0.056 0.060	Spir O Lox RSN-137	1.500	0.375	0.1875	3.563 (90.50)	0.500-13	2.00 (50.8)	. . .	. . .
TCB5115J-1.938	0766042	5.330 (135.38)	5.500 (139.70)	2.452 (62.28) 2.226 (56.54	1.9375	2.375 (60.33)	1.735 1.725	0.068 0.072	Spir O Lox RST-181	2.000	0.500	0.2500	4.000 (101.60)	0.500-13	2.00 (50.8)	. . .	. . .
TCB5203J-2.188	0766043	5.310 (134.87)	5.625 (142.88)	2.346 (59.59) 2.099 (53.31)	2.1875	2.625 (66.68)	1.952 1.940	0.086 0.091	Spir O Lox RSN-206	2.250	0.500	0.2500	4.625 (117.48)	0.625-11	2.00 (50.8)	. . .	. . .
TCB5207J-2.438	0766044	5.890 (149.61)	6.250 (158.75)	2.548 (64.72) 2.260 (57.40)	2.4375	3.000 (76.20)	2.290 2.278	0.056 0.060	Spir O Lox RS-236	2.500	0.625	0.3125	5.625 (142.88)	0.625-11	2.00 (50.8)	. . .	. . .
TCB5215J-2.938	0766045	6.860 (174.24)	7.125 (180.98)	2.475 (62.87) 2.188 (55.58)	2.9375	3.500 (88.90)	2.728 2.716	0.056 0.060	Spir O Lox RS-281	3.062	0.750	0.3750	5.875 (149.22)	0.875-9	2.50 (63.5)	. . .	. . .
TCB5307J-3.438	0766046	6.530 (165.86)	6.860 (174.24)	3.527 (89.59) 3.235 (82.17)	3.4375	3.500 (88.90)	3.172 3.160	0.103 0.108	Spir O Lox RSN-334	3.625	0.875	0.4375	6.750 (171.45)	1.000-8	2.50 (63.5)	0.375 ♥ (9.52)	4.250 (107.95)
TCB5315J-3.438	0785785	7.030 (178.56)	8.500 (215.90)	3.560 (90.42) 3.266 (82.96)	3.4375	3.500 (88.90)	3.263 3.251	0.103 0.108	Spir O Lox RSN-343	. . .	0.875	0.4375	8.250 (209.55)	1.000-8	2.50 (63.5)	0.375 ♥ (9.52)	4.250 (107.95)

▲ Kit consists of: Bushing, thrust plate, fastener, key, retaining ring, and hardware.

■ The range of C dimension is the variation which may occur due to axial compression and manufacturing tolerances.

♦ Shaft diameter tolerances are per AGMA as follows: to 1.50" = +.000", -.004"; over 1.50" to & including 2.50" = +.000", -.005"; over 2.50" to & including 4.00" = +.000", - .006".

● If a lip type seal is used, a 32rms finish is recommended.

✱ Smalley retaining rings may be used instead of Spir O Lox by substituting WS for RS, WST for RST or WSM for RSN.

♣ Inch keyway width tolerances are as follows: over .312" to & including .500" = +.0025", -.0000"; over .500" to & including 1.000" = +.0030", -.0000"; 1.000". Inch keyway depth tolerance is +.010", -.000".

♥ Maximum for use with packing gland seal.

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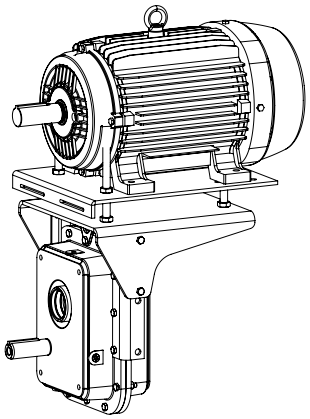
OSHA V-Belt Guard Installation for Drives without Shaft Fan

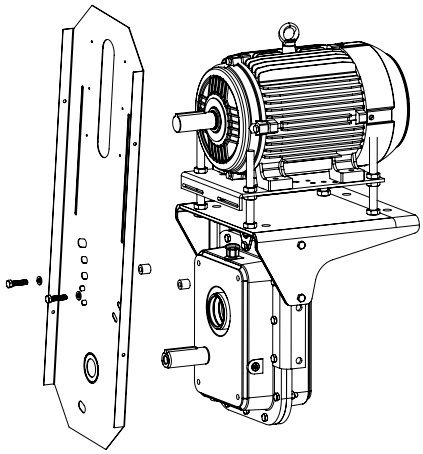
WARNING: *Consult applicable local and national safety codes for proper guarding of rotating members.*

WARNING: *Lock out power source and remove all external loads from drive before servicing drive or accessories.*

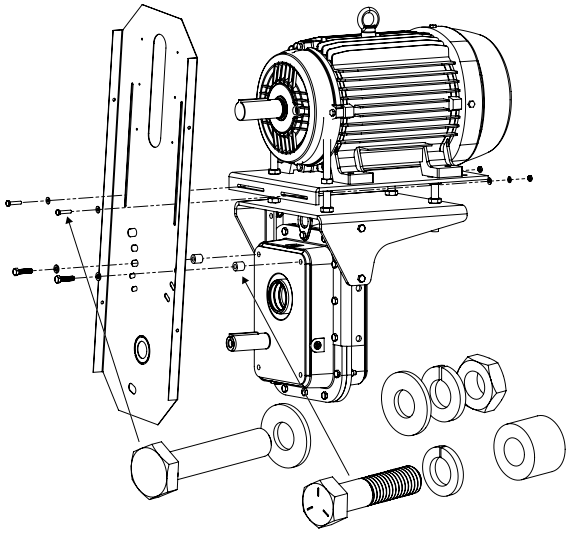
1. ASSEMBLE MOTOR MOUNT AND MOTOR TO DRIVE AS INSTRUCTED IN APPENDIX D



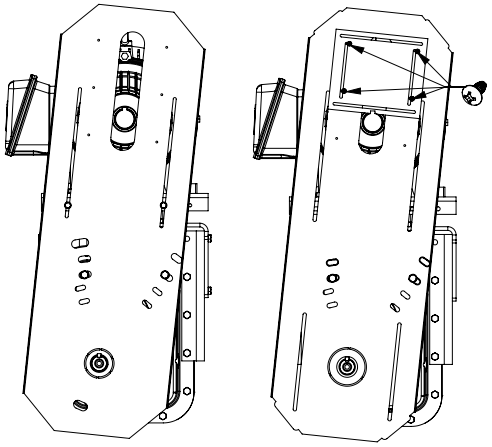
2. ASSEMBLE BELTGUARD BACKPLATE WITH SPACERS TO DRIVE FRONT



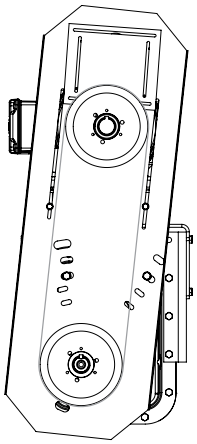
3. ASSEMBLE BELTGUARD BACKPLATE TO MOTOR PLATE



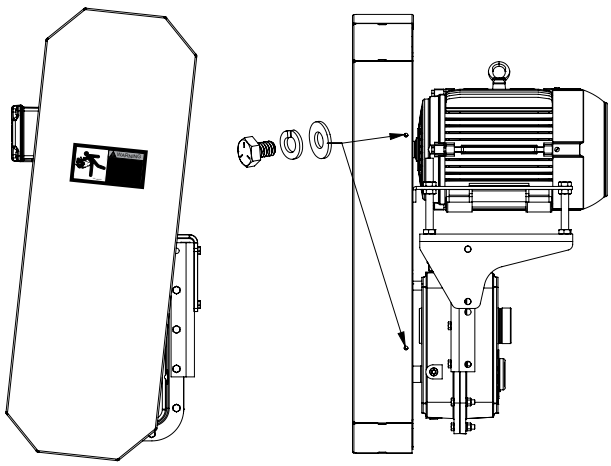
4. ASSEMBLE SLOT COVER(S) AS REQUIRED



5. MOUNT BELT DRIVE AS INSTRUCTED IN APPENDIX D



6. MOUNT COVER AND APPLY WARNING LABEL



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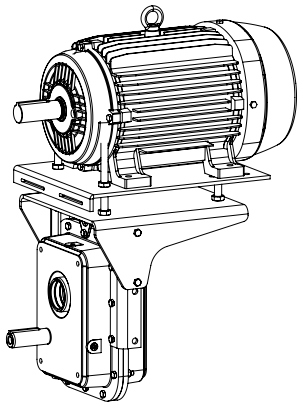
OSHA V-Belt Guard Installation for Drives with Shaft Fan

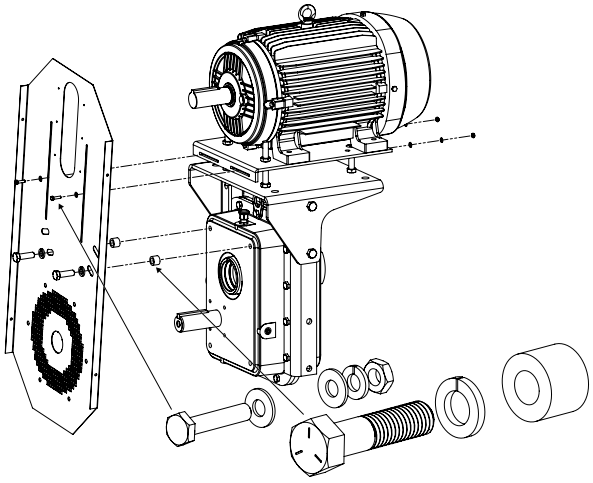
WARNING: *Consult applicable local and national safety codes for proper guarding of rotating members.*

WARNING: *Lock out power source and remove all external loads from drive before servicing drive or accessories.*

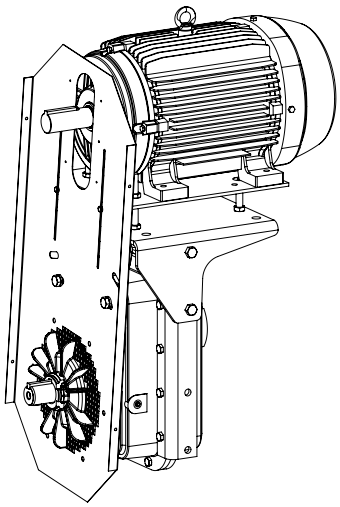
1. ASSEMBLE MOTOR MOUNT AND MOTOR TO DRIVE AS INSTRUCTED IN APPENDIX D



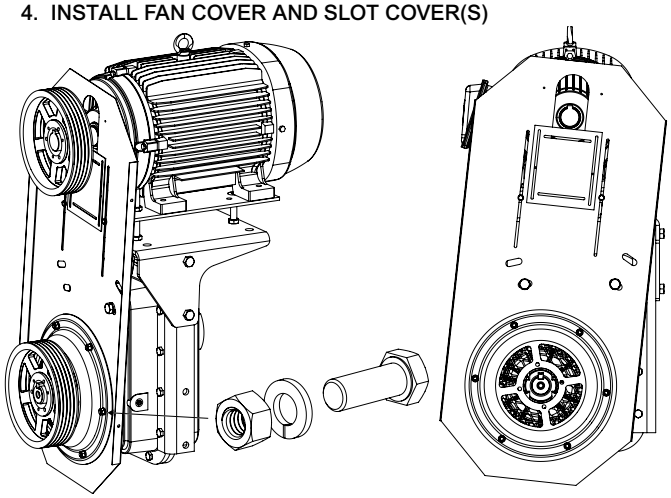
2. ASSEMBLE BELTGUARD BACKPLATE WITH SPACERS TO DRIVE FRONT AND MOTOR PLATE



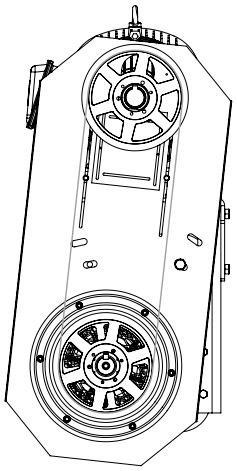
3. INSTALL FAN ONTO SHAFT



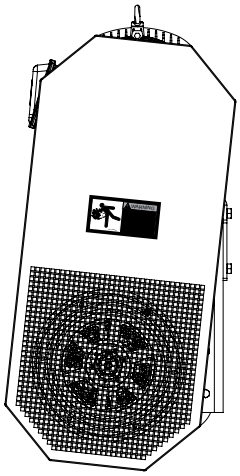
4. INSTALL FAN COVER AND SLOT COVER(S)



5. MOUNT BELT DRIVE AS INSTRUCTED IN APPENDIX D



6. MOUNT COVER AND APPLY WARNING LABEL



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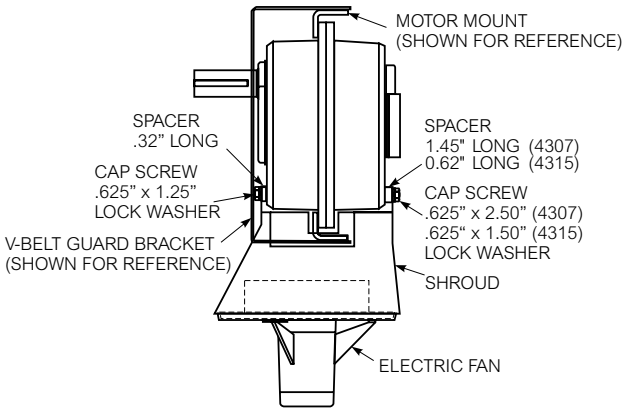
Electric Fan Installation

NOTE: Electric Fan Installation only applies to sizes 5307 and 5315.

INTRODUCTION

The following instructions apply to the installation of electric fans. Refer to Figure 1 for fan mounting location.

Figure 1



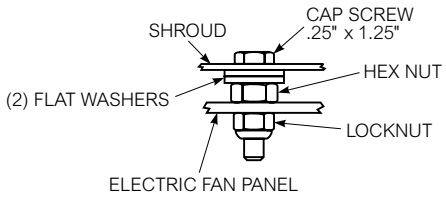
ASSEMBLY INSTRUCTIONS

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.

1. Remove V-belt guard assembly.
2. Insert four 1.25" (32 mm) long cap screws through fan mounting holes in shroud with threaded portion of cap screw away from drive. Secure cap screws to shroud with flat washers and hex nut. See Figure 2.
3. Mount shroud to drive using spacers and hardware. See Figure 1.

Figure 2



4. Assemble V-belt guard bracket.
5. Position the electric fan panel on the remaining threaded portion of the cap screws and secure it to the shroud with four locknuts. See Figure 2.
6. Remove the condensation plug from bottom of the fan.
7. Finish installing V-belt guard assembly per installation instruction in Appendix L.
8. Connect electric fan to power source per local and national electrical codes.

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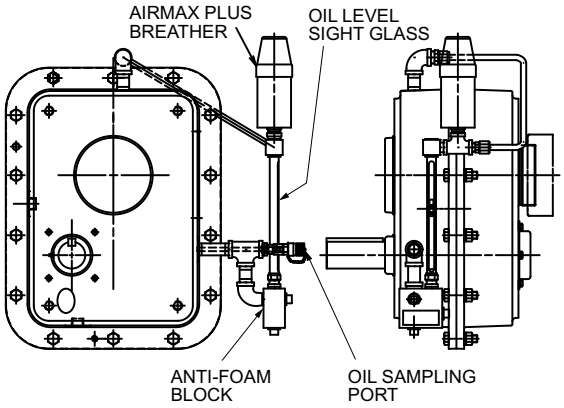
Reliability Package

NOTE: The Reliability Package only applies to sizes 5215-5315.

INTRODUCTION

The Quadrive Reliability Package shown in Figure 1 includes an enhanced desiccant and particulate filter, anti-foam block, oil level sight glass and oil sampling port. The



Reliability Package will be supplied in two subassemblies,

a prebent hydraulic tube and an AirMax Plus breather that will need to be assembled by the customer.

TABLE 1 — Kit Part Numbers for Quadrive Reliability Package

Drive Size	Kit Part Number
5215J	7708104
5307J	7708105
5315J	7708105

Figure 1 — Reliability Package

The Quadrive reliability kit part numbers and corresponding drive sizes are provided in Table 1.

INSTALLATION INSTRUCTIONS

When removing components from the shipping package, use caution to avoid damaging the oil sight glass.

The sight glass and elbow subassemblies have been pressure tested in the factory. It will be the installer's responsibility to ensure that the installed fittings are oil tight. The Reliability Package can be assembled by following the steps outlined below:

1. **Pipe Plugs** — Remove the two (2) 1.25" NPT pipe plugs from locations #1 & #2 of the gearbox as shown in Figure 2.

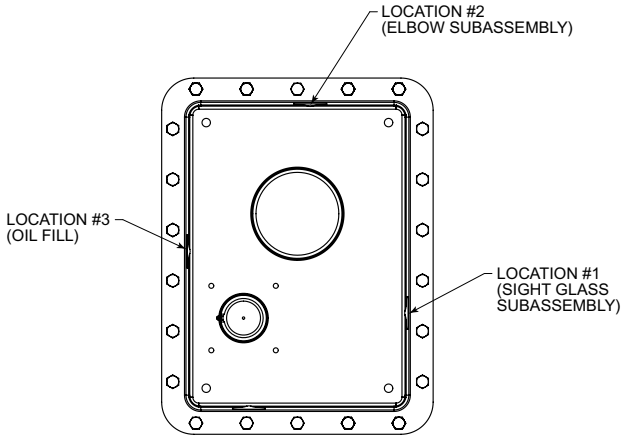


Figure 2 — Pipe Plug Locations

2. **Sight Glass Subassembly** — Prepare the sight glass subassembly for installation by applying Loctite joint compound #1534294 to the male threads as shown in Figure 3. Install the sight glass subassembly into the Quadrive housing at location #1 as shown in Figure 2. The galvanized pipe nipple shown in Figure 3 should be used to thread the subassembly hand tight. Using a pipe wrench, turn the pipe nipple an additional 2-3 turns so that it is oil tight. The sight glass should be in a vertical position when completed as shown in Figure 1.

   ***CAUTION**: Do not use the sight glass to thread the assembly into the housing.*

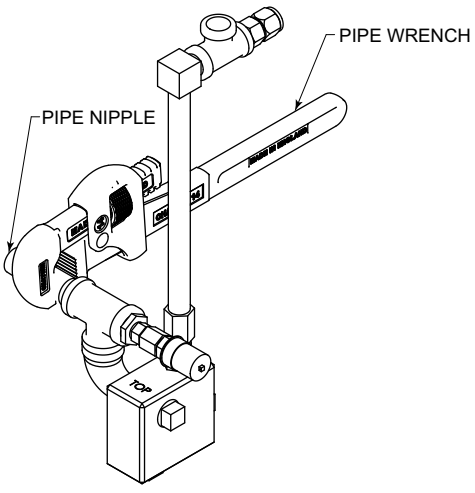


Figure 3 — Sight Glass Subassembly

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3. **Elbow Subassembly** — Prepare the elbow subassembly for installation by applying Loctite joint compound #1534294 to the male threads as shown in Figure 4. Install the elbow subassembly into the Quadrive housing at location #2 as shown in Figure 2. The galvanized elbow should be used to thread the subassembly hand tight. Using a pipe wrench, turn the galvanized elbow an additional 2-3 turns so that it is oil tight. The elbow should be parallel to the output shaft when finished as shown in Figure 1.

Figure 4 — Elbow subassembly

4. **AirMax Plus** — Prepare the AirMax breather for installation by removing the two smaller red plastic plugs from the bottom air vents located 180°F apart. Also, remove the large red plastic plug from the breather mounting threads. Thread the breather into the pipe tee of the Reliability Package as shown in Figure 1. Hand-tighten only to seal o-ring against pipe tee. For detailed breather installation and maintenance instructions, refer to the literature included with the AirMax Plus breather (GR3-002).
5. **Lifting** — The drive can be lifted by using either a sling with a longer housing flange fastener or a sling wrapped around the seal housing and input shaft. Lift and mount the drive by following the drive installation and lifting instructions provided in Section 1 (page 7) of this Owner's Manual.

   ***CAUTION**: To prevent damage to the hydraulic tubing, it should NOT be installed until after the drive has been lifted and mounted into position. Prevent debris from entering the drive by covering the Lenz fittings of the subassemblies, until the hydraulic tubing can be installed.*
6. **Hydraulic Tubing** — Install the hydraulic tubing by following the steps outlined below:
   1. Remove the nut and tapered split ring from the two Lenz fittings.
   2. Slide the nut and the tapered split ring onto the ends of the hydraulic tubing. The large end of the tapered ring should face the fitting.
   3. Apply oil to the O-ring.
   4. Insert the ends of the hydraulic tubing simultaneously into the appropriate Lenz fittings.Continue to push the tubing into the Lenz fittings until the tube ends are past each o-ring for proper sealing.

      NOTE: The hydraulic tubing may have to be bent slightly to install it properly into the Lenz fittings thus ensuring the tubing extends past the o-rings in the fittings.
   5. Once the hydraulic tube is positioned properly, slide the tapered spit rings up to the Lenz fittings.
   6. Tighten the nut hand tight. Then with a wrench tighten one turn or until the rear of the tapered ring is flush with the nut.
7. **Oil Fill** — Remove the oil fill pipe plug from location #3 as shown in Figure 2. Using a funnel with a flexible spout, fill the gearbox with an approved lubricant (refer to Page 23 for Lubrication Recommendations; DO NOT USE GMAX 6000 or other types of polyalkylene glycol (PAG) lubricants which are not compatible with the polycarbonate sight glass). Once the oil level reaches the bottom of the fill hole, wait a minimum of 5 minutes for the oil to reach the oil level sight glass. Add additional oil to the gearbox and repeat the process until the oil level in the gearbox and sight glass are constant and the excess runs out. It is recommended to mark the sight glass with this final oil level.

   The oil level sight glass is intended to be used when the gearbox is not running; in the static condition. Therefore, the sight glass contains a label that indicates a static oil level. *(oil levels tend to fluctuate based on oil churning and are dependent on speed and direction of rotation; for continuous direction, and continuous speed applications it is recommended that the oil level sight glass be marked once steady state operating conditions have been reached).*

   Prepare the oil fill pipe plug for installation by applying Loctite joint compound #1534294 to the threads. Reinstall the elbow subassembly into the Quadrive housing at location #3 as shown in Figure 2.

MAINTENANCE INSTRUCTIONS

AirMax Breather — Falk AirMax Plus breathers have visual indication when they need to be changed. As the breather functions, the silica gel material changes color from blue to pink as it absorbs moisture. When all the material has turned pink in color, it is time to replace the breather. Breather life is dependent on operating conditions and ambient conditions (humidity). Breather should be changed every twelve (12) months regardless of color

Oil Sampling — The oil sampling port that is included allows users to easily draw oil samples for lubrication analysis. Refer to the Oil Analysis Report section in Appendix A of this document for detailed recommendations on oil content. The oil sample port has a screw on cover that needs to be unscrewed in order to access the valve to the sampling port. The valve can then be actuated by screwing on the threaded oil sample port adapter included in our Oil Sample Kit (sold separately; see Table 2). The sampling bottle is composed of PET (polyethylene terephthalate) which is compatible with most industrial lubricants; however, user should confirm compatibility prior to use. It should be noted that the cleanliness of the bottle can greatly affect the results of an oil sample analysis; therefore user is cautioned to use care to avoid contamination of the sample.

The oil sample should be taken shortly after the unit has been shut down to ensure the oil is properly mixed. It is important to initially purge some oil from the oil sampling port and discard this purge, prior to collecting the sample. Be sure to check the oil level in the drive after the sample has been collected (additional oil may need to be added to ensure proper level).

TABLE 2 — Sample Port Adapter, Sampling Kit and Breather for use by Maintenance Professionals

Part Description	Part Number
Oil Sampling Kit (includes oil sample port adapter, case of 12 sample bottles, vacuum pump, 20' of tubing and labels)	10097025
AirMax Plus HG-1 Breather	10097978

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