How To Use This Manual

This manual provides detailed instructions on installation, maintenance and parts identification for Falk Lifelign gear couplings, Type GR20. Use the table of contents below to locate required information.

Table of Contents

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

Introduction

This manual applies to standard double engagement Type GR20 shear pin coupling with exposed fasteners. For couplings furnished with special features, refer to assembly drawing furnished with coupling for proper assembly arrangement and any additional installation or maintenance requirements. Type GR20 shear pin couplings are recommended for horizontal applications. Refer to the Factory for vertical applications.

Limited End Float

Where limited end float is required or where sleeve bearing motors are used, refer to the Factory.

CAUTION: *Consult applicable local and national safety codes for proper guarding of rotating members. Observe all safety rules when installing or servicing couplings.*

WARNING: *Lockout starting switch of prime mover and remove all external loads from drive before installing or servicing couplings.*

Lube Fittings

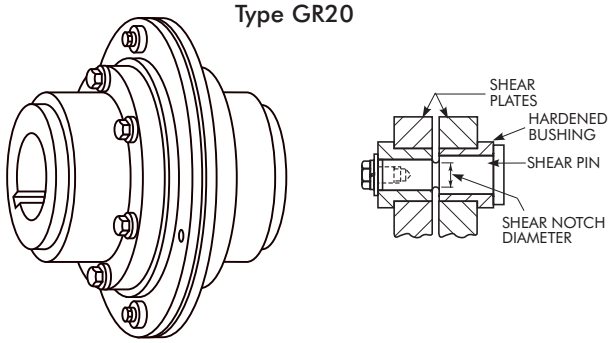
Sleeves have 1/8 NPT lube holes for sizes 1010GR thru 1035GR and 1/4 NPT for sizes 1040GR thru1070GR. Use a standard grease gun and lube fittings.

Lubrication

Adequate lubrication is essential for satisfactory operation. Because of its superior lubricating characteristics and low centrifuge properties, Falk Long Term Grease (LTG) is highly recommended.

Gear couplings initially lubricated with Falk Long Term Grease (LTG) will not require re-lubrication for up to three years.The use of general purpose grease requires re-lubrication of the coupling at least every six months. If coupling leaks grease, is exposed to extreme temperatures, excessive moisture, experiences frequent reversals or axial movements; more frequent lubrication may be required.

Type GR20



USDA Approval

LTG has the United States Department of Agriculture Food Safety & Inspection Service approval for applications where there is no possibility of contact with edible products. (H-2 ratings).

Long Term Grease (LTG)

The high centrifugal forces encountered in couplings separate the base oil and thickener of general purpose greases. Heavy thickener, which has no lubrication qualities, accumulates in the tooth mesh area of gear couplings resulting in premature mesh failure unless periodic lubrication cycles are maintained.

Falk Long Term Grease (LTG) was developed specifically for couplings. It resists separation of the oil and thickener. The consistency of Falk LTG changes with operating conditions. As manufactured it is an NLGI of #1/2 grade. Working of the lubricant under actual service conditions causes it to become semifluid while the grease near the seals will set to a heavier grade, helping to prevent leakage.

LTG is highly resistant to separation, easily out performing all other lubricants tested. The resistance to separation allows the lubricant to be used for relatively long periods of time.

Although LTG grease is compatible with most other coupling greases, the mixing of greases may dilute the benefits of LTG.

CAUTION: *Do not use LTG in bearings.* Do not use LTG for low speed applications. Refer to Table 4, Page 5 for coupling speed range of LTG grease.

Packaging

14 oz (0,4 Kg) CARTRIDGES — Individual or case lots of 10 or 60.

35 lb (16 Kg) PAILS, 120 lb (54 Kg) KEG & 400 lb DRUMS.

Specifications — Falk LTG (Long Term Grease)

TEMPERATURE RANGE — –20°F (–29°C) to 250°F (121°C). Minimum pump = 20°F (–7°C).

MINIMUM BASE OIL VISCOSITY — 3300SSU (715cSt) @ 100°F (38°C).

THICKENER — Lithium soap/polymer.

CENTRIFUGE SEPARATION CHARACTERISTICS — ASTM #D4425–84 (Centrifuge Test) — K36 = 2/24 max., very high resistance to centrifuging.

NLGI GRADE (ASTM D-217) — 1/2

CONSISTENCY (ASTM D-217) — 60 stroke worked penetration value in the range of 315 to 360 measured @ 77°F (25°C).

DROPPING POINT — 350°F (177°C) minimum.

MINIMUM TIMKEN EP O.K. LOAD — 40 lbs. (18 kg).

ADDITIVES — Rust and oxidation inhibitors that do not corrode steel or swell or deteriorate synthetic seals.

General Purpose Grease

BI-ANNUAL LUBRICATION — The following specifications and lubricants for general purpose grease apply to gear couplings that are lubricated bi-annually and operate within ambient temperatures of –30°F (–34°C) to 200°F (93°C). For temperatures beyond this range, refer to Factory. For normal service, use a NLGI #1 extreme pressure (EP) grease EXCEPT when the coupling speed is less than the minimum specified in Table 4, Page 5. At these lower speeds, use a NLGI #0 extreme pressure (EP) grease. When one or more gear couplings in an application require NLGI #0 grease, the same grease may be used in all of the couplings. DO NOT use cup grease.

If coupling leaks grease, is exposed to extreme temperatures, excessive moisture or experiences frequent reversals or axial movements; more frequent lubrication may be required.

Lubricants listed in Tables 1, 2, & 3 are typical products only and should not be construed as exclusive recommendations.

Specifications — General Purpose Coupling Lubricants

COUPLING SPEED RANGE — See Table 4, Page 5.

TEMPERATURE RANGE — –30°F to +200°F(–34°C to +93°C)

WORKED PENETRATION AT 77°F(25°C) —
NLGI #1 . . . . . .310-340 (See Table 1)
NLGI #0 . . . . . .355-385 (See Table 2)

DROPPING POINT — 300°F(149°C) or higher

TEXTURE — Smooth or fibrous

MINIMUM TIMKEN O.K. LOAD — 30 lb.

SEPARATION AND RESISTANCE — Low oil separation rate and high resistance to separation from centrifuging.

LIQUID CONSTITUENT — Possess good lubricating properties . . . equivalent to a high quality, well refined petroleum oil with EP additives.

INACTIVE — Must not corrode steel or cause swelling or deterioration of synthetic seals.

Oil Lubrication

EP oils may be a more effective lubricant than grease when the required coupling speed is one half of the minimum speed range of NLGI #1 grease listed in Table 4, Page 5 (Minimum rpm ÷ 2). Oil lubricated couplings must be sealed to prevent leakage, i.e. keyways, etc. Couplings must be drained and refilled with new oil every six months for operating temperatures up to 160°F (71°C) and every three months for couplings operating at temperatures of 160°F (71°C) up to 200°F (93°C). For temperatures beyond this range, refer to Factory. The minimum operating temperature must not be lower than the pour point of the oil. The specified amount of grease listed in Table 4, Page 5, is in pounds and also applies to the volume of oil in pints.

Specifications

Type: Mild EP gear oil that meets AGMA Specifications 250.04.

Grade: AGMA #8EP (ISO VG 680).

Viscosity: 612-748 cSt @ 104°F (40°C).

Pour Point: 20°F (–7°C) Maximum.

Must not corrode steel or swell or deteriorate synthetic seals.

TABLE 1 — NLGI #1 Grease

Manufacturer	Lubricant ★
Amoco Oil Co. BP Oil Co. Chevron U.S.A., Inc. Citgo Petroleum Corp. Conoco Inc.	Rykon Grease #1 EP Energrease LS-EP1 Dura-Lith EP1 Premium Lithium Grease EP1 EP Conolith Grease #1
Exxon Company, U.S.A. Imperial Oil Ltd. Kendall Refining Co. Keystone Div., Pennwalt Corp. Lyondell Lubricants	Lidok EP1 Ronek EP1 Lithium Grease L-416 Zeniplex-1 Litholine Complex EP1
Mobil Oil Corp. Petro-Canada Products Phillips 66 Co. Shell Oil Co. Shell Canada Ltd.	Mobilux EP1 Multipurpose EP1 Philube Blue EP Alvania EP Grease 1 Alvania Grease EP1
Sun Oil Co. Texaco Lubricants Unocal 76 (East & West)	Sun Prestige 741 EP Multifak EP1 Unoba EP1

TABLE 2 — NLGI #0 EP Grease

Manufacturer	Lubricant ★
Amoco Oil Co. BP Oil Co. Chevron U.S.A., Inc. Citgo Petroleum Corp. Conoco Inc.	Rykon Premium Grease 0 EP Energrease LS-EP 0 Dura-Lith EP 0 Premium Lithium Grease EP 0 EP Conolith Grease #0
Exxon Company, U.S.A. Kendall Refining Co. Keystone Div., Pennwalt Corp. Mobil Oil Corp. Petro-Canada Products Phillips 66 Co. Shell Oil Co. Shell Canada Ltd.	Lidok EP 0 Lithium Grease L-406 Zeniplex-0 Mobilux EP 0 Multipurpose Lotemp EP Grease Philube Blue EP Alvania EP Grease RO Alvania Grease EPW
Sun Oil Co. Texaco Lubricants Unocal 76 (East & West)	Sun Prestige 740 EP Multifak EP 0 Unoba EP 0

TABLE 3 — Oil Lubricants

Manufacturer	Lubricant ★
Amoco Chevron, U.S.A. Exxon Co., U.S.A. Gulf Oil Co.	Permagear EP 160 NL Gear Compound 680 Spartan EP680 EP Lubricant HD 680
Mobil Oil Co. Shell Oil Co. Texaco Inc. Union Oil Co. of Calif.	Mobilgear 636 Omala Oil 680 Meropa 680 Extra Duty NL Gear Lube 8EP

★ Lubricants listed may not be suitable for use in the food processing industry; check with lube manufacturer for approved lubricants.

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Horizontal Coupling Installation, All Types

Only standard mechanics tools, torque wrenches, inside micrometer, dial indicator, straight edge, spacer bar and feeler gauges are required to install gear couplings. Clean all parts using a non-flammable solvent. Check hubs, shafts and keyways for burrs. DO NOT heat clearance fit hubs. Use a lubricant that meets the specifications on Page 2. Pack sleeve teeth with grease and lightly coat seals with grease BEFORE assembly. The required amount of grease is listed in Table 4. Apply Loctite 242 or equivalent to flange fasteners and then make certain flange fasteners are tightened to the required torque listed in Table 4 on Page 5.

Interference Fit Hubs — Unless otherwise specified, gear couplings are furnished for an interference fit without set screws. Heat hubs to 275°F(135°C) using an oven, torch, induction heater or an oil bath.

CAUTION: To prevent seal damage DO NOT heat hubs beyond a maximum temperature of 400°F (205°C).

When an oxy-acetylene or blow torch is used, use an excess acetylene mixture. Mark hubs near the center of their length in several places on hub body with a temperature sensitive crayon, 275°F (135°C) melt temperature. Direct flame towards hub bore using constant motion to avoid overheating an area.

WARNING: If an oil bath is used, the oil must have a flash point of 350°F (177°C) or higher. Do not rest hubs on the bottom of the container. Do not use an open flame in a combustible atmosphere or near combustible materials.

Maximize Performance & Life

The performance and life of couplings depend largely upon how you install and maintain them. Before installing couplings, make certain that foundations of equipment to be connected meet manufacturers' requirements. Check for soft foot. The use of stainless steel shims is recommended. Measuring misalignment and positioning equipment within alignment tolerances is simplified with an alignment computer. These calculations can also be done graphically or mathematically, and allow the incorporation of "cold offsets", which will compensate for shaft position changes due to thermal growth.

Bi-Annual Maintenance

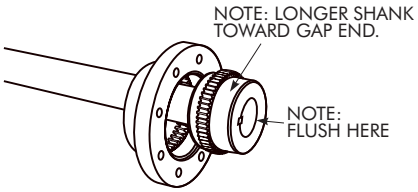
Re-lubricate coupling if using general purpose greases. If coupling leaks grease, is exposed to extreme temperatures, excessive moisture or frequent reversals; frequent lubrication may be required.

Annual Maintenance

For extreme or unusual operating conditions, check coupling more frequently.

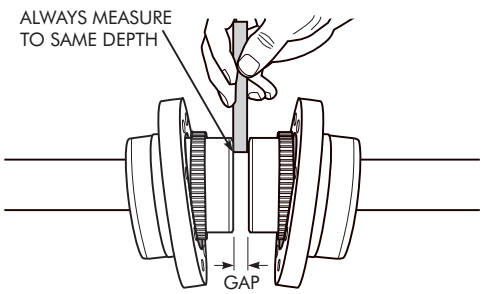
1. Check alignment per Step 6, Page 4. If the maximum operating misalignment values are exceeded, realign the coupling to the recommended installation values. See Table 4, for installation and maximum operating misalignment values.
2. Check tightening torques of all fasteners.
3. Inspect seal rings and gaskets to determine if replacement is required.
4. Re-lubricate coupling if using general purpose grease.

Type GR20 Horizontal Coupling Installation



1 — Mount Flanged Sleeves, Seals & Hubs

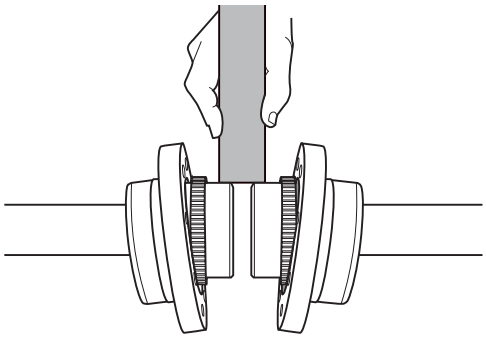
Place the flanged sleeves WITH seal rings on shafts BEFORE mounting flex hubs. Mount hubs on their respective shafts, as shown above, so that each face is flush with the end of its shaft. Allow hubs to cool before proceeding. Seal keyways to prevent leakage. Insert set screws (if required) and tighten. Position equipment in approximate alignment with approximate hub gap specified in Table 4 on Page 5.



2 — Gap & Angular Alignment

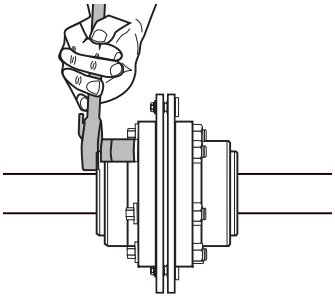
Use a spacer bar equal in thickness to gap specified in Table 4. Insert bar, as shown above, to same depth at 90° intervals and measure clearance between bar and hub face with feelers. The difference in minimum and maximum measurements must not exceed the INSTALLATION ANGULAR limit specified in Table 4.

DIAL INDICATOR — For best results always use a dial indicator. For PARALLEL OFFSET alignment, mount the indicator on one hub and take a 360° sweep on OD of adjacent hub. The total indicator reading (TIR), divided by two must not exceed the Parallel Offset limit in Table 4. For ANGULAR alignment, sweep the face of adjacent hub as near the OD as possible. The TIR must not exceed the ANGULAR limit in Table 4.



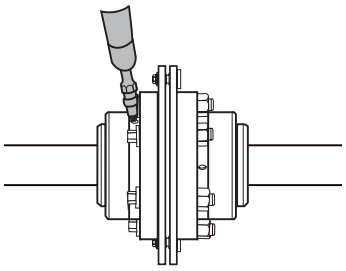
3 — Offset Alignment

Align so that a straight edge rests squarely (or within the limits specified in Table 4) on both hubs as shown above and also at 90° intervals. Check with feelers. The clearance should not exceed the INSTALLATION OFFSET limit specified. Tighten all foundation bolts and repeat Steps 3 and 4. Realign coupling if necessary. Grease the hub teeth.



4 — Insert Gasket, Shear Plate Assembly, and Join Flanged Sleeves

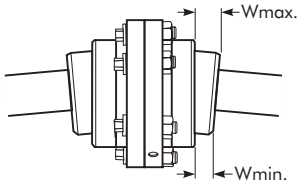
Position gaskets on sleeve flange faces. Position shear plate assembly between hubs. Assemble sleeves to shear plate assembly and draw flanged sleeves into position. Check register fits for proper engagement. Use only the fasteners furnished with the coupling. IMPORTANT: Apply Loctite 242 or equivalent to flange fasteners and then tighten fasteners to torque specified in Table 4.



5 — Lubricate

Fill BOTH halves with recommended grease until an excess appears at an open hole; then insert plug. Continue procedure until all plugs have been inserted. ***CAUTION:*** *Remove grease fitting and make certain all plugs are inserted after lubricating.* Assemble all shear pin covers.

"W" = Wmax. – Wmin.



Check "W" at each flexible hub.

6 — Assembled Coupling Alignment Check – All Styles

The alignment can be checked without disassembling the coupling as shown above. Determine “W” by measuring distances “W” max. and “W” min. between flex hub and sleeve using a depth micrometer or feeler gages. The difference between “W” max. and W” min. must not exceed the “W” value given in Table 4. Check “W” at each coupling end.

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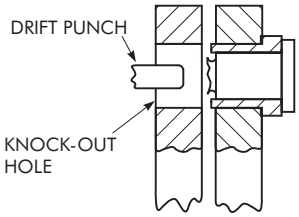
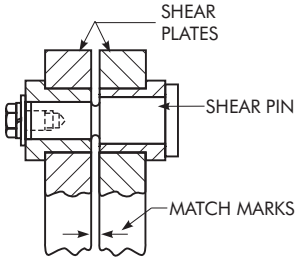
Type GR20 Shear Pin Replacement





A — Remove Broken Shear Pins

Remove all shear pin covers. There are two (2) shear pin knock-out holes 180° apart in both shear plates. Line up knock-out holes of one shear plate with the broken shear pin halves in the other shear plate and drive out pin. Repeat procedure until all the broken pin halves are removed. NOTE: Damaged bushings must be replaced.

B — Install Shear Pins

Install the same number of shear pins with the same shear ratings as were removed unless otherwise instructed. The shear pin bushing holes are stamped #1 thru #4 on both shear plates. There are match-marks (→←) at hole #1 on the shear plate outside diameter. Line up these match-marks and insert shear pins. The shear pins are a clearance fit. Cooling with dry ice or CO_2 will aid assembly. DO NOT bend shear pins when driving them in. The shear pin shoulder must be seated against bushing face. Install fastener in the tapped hole in the end of the shear pins. Assemble all shear pin covers.

TABLE 4 — Installation & Alignment Data For Type GR20 ★ — Dimensions – Inches (Metric – mm)

COUPLING SIZE			1010	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1070
Gap			1.406 (36)	1.562 (40)	1.819 (46)	1.875 (48)	2.040 (52)	2.375 (60)	2.375 (60)	2.375 (60)	3.470 (88)	3.470 (88)	3.470 (88)	3.470 (88)
Installation Limits •		Angular Offset Max	.006 (0,15)	.007 (0,19)	.009 (0,23)	.011 (0,28)	.013 (0,33)	.015 (0,39)	.018 (0,46)	.020 (0,51)	.022 (0,55)	.024 (0,61)	.026 (0,66)	.031 (0,78)
		Parallel Offset Max	.004 (0,10)	.004 (0,10)	.005 (0,13)	.006 (0,15)	.007 (0,18)	.008 (0,21)	.009 (0,24)	.010 (0,26)	.012 (0,31)	.014 (0,35)	.014 (0,35)	.016 (0,41)
"W"	Installation Check	All Types	.006 (0,15)	.007 (0,19)	.009 (0,23)	.011 (0,28)	.013 (0,33)	.015 (0,39)	.018 (0,46)	.020 (0,51)	.022 (0,55)	.024 (0,61)	.026 (0,66)	.031 (0,78)
"W"	Operating Limit Check	All Types	.035 (0,90)	.045 (1,13)	.054 (1,38)	.067 (1,71)	.079 (2,00)	.092 (2,33)	.108 (2,74)	.121 (3,08)	.131 (3,33)	.144 (3,66)	.157 (3,99)	.183 (4,66)
Coupling Speed Range (rpm)	NLGI #0 Grease-Max ‡		5000	4000	3600	2700	2400	2100	1900	1800	1750	1500	1400	1250
	Falk LTG or NLGI #1 Grease	Min■	1030	700	550	460	380	330	290	250	230	210	190	160
		Max	5000	4000	3600	2700	2400	2100	1900	1800	1750	1500	1400	1250
Grease - pounds (kg) — Per coupling Half			.05 (0,023)	.09 (0,041)	.15 (0,068)	.26 (0,12)	.40 (0,18)	60 (0,27)	1.03 (0,47)	1.25 (0,57)	2.00 (0,91)	2.50 (1,13)	3.75 (1,70)	5.00 (2,27)
Flange Bolt Torque - lb-in (Nm)			108 (12)	372 (42)	900 (42)	1800 (102)	1800 (102)	3000 (203)	3000 (203)	3000 (203)	3000 (339)	3000 (339)	3000 (339)	3000 (339)

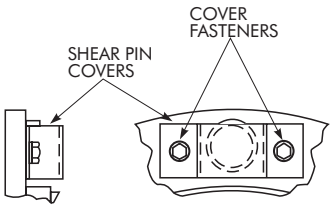
★ Refer to Selection Guide 451-110 for maximum bores and Engineering Manual 427-108 for reboring instructions.
‡ Couplings with NLGI #0 grease may be operated at any speed between zero and the maximum shown.
• Flexible couplings are designed to accommodate changes in operating conditions. coupling life expectancy between initial alignment and maximum operating limits is a function of load, speed, and lubrication. Application requirements in excess of $^3/_4°$ misalignment per flex-half coupling should be referred to Factory for review.
■ NLG1 #0 grease MUST be used when speeds are BELOW minimum shown; refer to LUBRICATION section.

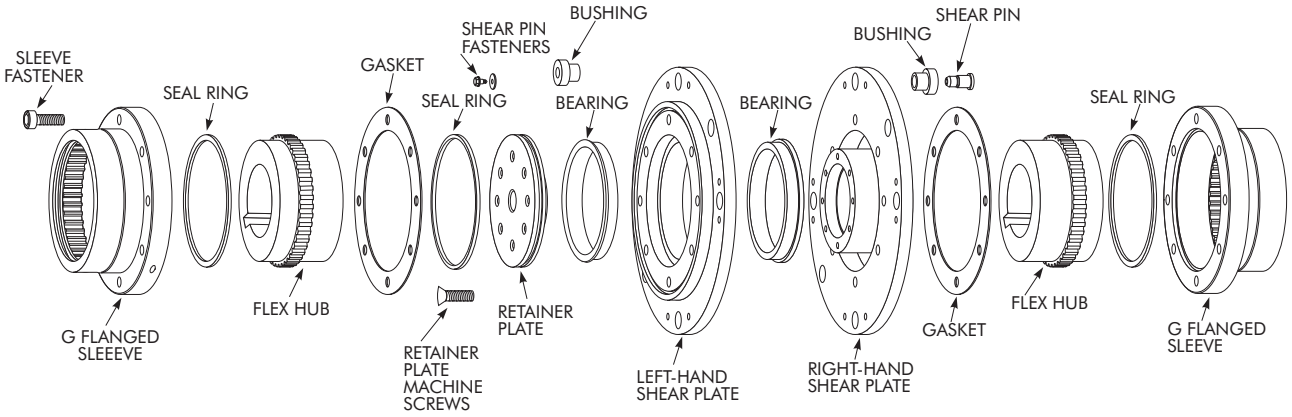
Part Identification And Part Number Location

Coupling parts have identifying size and part numbers as illustrated below. When ordering parts, always SPECIFY SIZE, TYPE, HUB BORE, KEYWAY, and PART NUMBER found on each item. This is especially important when ordering hubs, fasteners, sleeves, and shear pin assembly.

Contact your Rexnord Distributor or Rexnord for price and availability.

EXAMPLE:
2 —1035GR20 Flex Hubs
Bore: 3.000 Keyway: .750 x .375
Bore: 4.000 Keyway: 1.000 x .500





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