

**⚠ WARNING**

- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Read and follow all instructions carefully.

**⚠ CAUTION**

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

**Pre-Assembly Inspection**

All parts should be examined for any damage during shipping and handling. Measurements should be taken to verify correctness of parts to meet application requirements, such as hub and shaft fits, shaft separation etc. All parts must be clean and free of any foreign materials before attempting assembly.

**Installation**

1. Install keys in respective shafts. Keys should fit shaft keyseat with a tight fit on the sides and slight clearance over the key. Coat the shafts with an anti-galling lubricant and use plastic oil sealing compound around keys to prevent loss of lubricant. Follow machinery manufacturers recommendations for preparation, mounting and dismounting of keyless hub to shaft fits. Insure that seal, buffer ring and pipe plugs are in place in gear sleeve. Smear grease around sleeve gear teeth and seal surface and place over respective shaft. Wrap shaft on which sleeve will rest during hub installation.

**CAUTION:** On balanced couplings corresponding match marks should be in line.



2. Determine the mounting arrangement of the hubs as shown in figure and fit per following recommendations:

**Straight Bore Hubs:** Hub bores must be expanded prior to mounting. Note, certain mill motor sizes require the standard hub be mounted in reversed position. Sizes are 1 1/2 and 2 - all motor frames and 2 1/2 - motor frames 410, 610, 810, and AC 18.

Clean the shaft and hub. Straight bored hubs may be coated with a suitable anti-galling lubricant. Taper bored hubs must be installed without lubricant.

Expand hub in an oven until the bore is substantially larger than the shaft diameter. Straight bored hubs are normally bored for an interference fit of approximately 0.0005 in/in of shaft diameter. For most values of interference, this will require a hub temperature of about 300°F (150°C). Never exceed 600°F (300°C).

**WARNING!** To avoid the risk of explosion, fire, damage to coupling and equipment, and/or injury to personnel, do not use an open flame or oil bath to expand the hub.

Remove HUB from oven and position quickly on shaft, with hub end flush with shaft end. Refer to Illustration.

**Taper Bored Hubs:** Do not require preheating for assembly. Mount hub and align on shaft before drawing hub up on shaft the required distance. In most applications the hub face will project beyond the small end of the shaft taper. Lock hub in place with proper locking device provided with shaft.

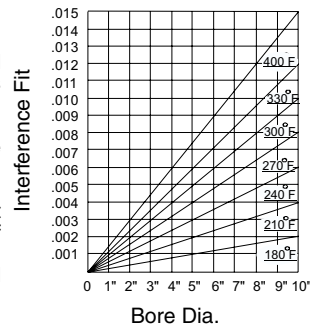
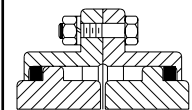
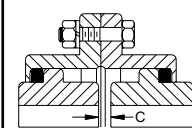


Figure 1 — Temperature Chart

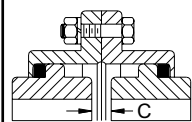
Table 1 - Interference Fit Limitations	
(Interference Per Inch Max.)	
Type of Fit	
Keyless	Keyed
.00125"	.00075"



Standard



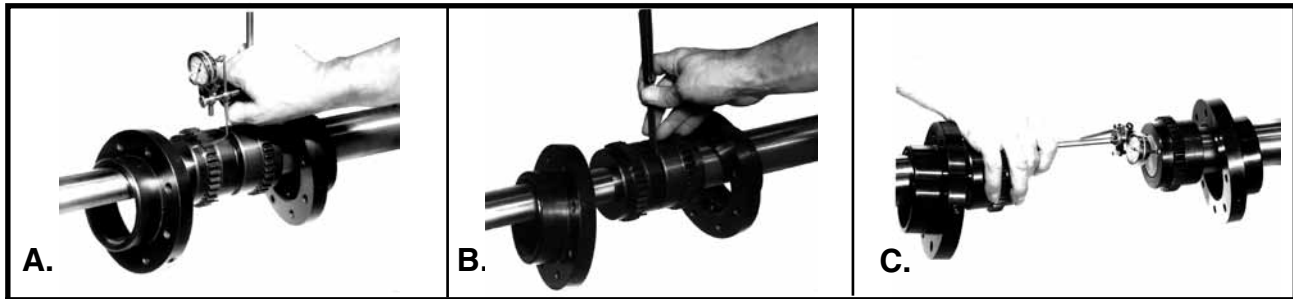
Std./Reversed



Reversed

Mounting Arrangements

## Alignment



**3.** Although the shafts may be perfectly aligned at installation they should be realigned after mounting of couplings. "C" in Table 2. Align couplings per following methods:

### Angular Alignment-

**A.** Instrument method, the most accurate, is recommended. Attach dial base to one of the hubs and the indicator needle against the face of the other hub. Rotate both hubs 360°, taking indicator readings at four points 90° apart. Adjust machines until all four readings are identical, referring to Figure 2 for maximum angular misalignment. Relocate the dial base to the opposite hub and repeat the procedure.

**B.** Feeler gage may be used when dial indicator is unavailable or shaft separation is too small. Check with feeler gage at four points 90° apart. Adjust machines until all four readings are identical. Refer to Figure 2 for maximum angular misalignment.

**C.** Couplings with spacers or floating shafts have a greater hub separation than shown in Table 2. Refer to application for shaft separation and use either a dial indicator (as shown) or inside micrometer, taking readings as in 3A.



### 4. Parallel Offset Alignment-

**D.** Again the dial indicator is recommended as being most accurate. Attach dial base to one hub and set dial indicator button in contact with surface (O.D.) of opposite hub as shown. Rotate hub on which indicator is mounted 360°, taking indicator readings at four points 90° apart. Adjust machines until all four readings are identical, referring to Figure 2 for maximum misalignment. Relocate dial base to opposite hub and repeat the procedure. Recheck angular alignment.

**E.** A straight edge and feeler gage may be used as shown if dial indicator is not available. Adjust machines until straight edge appears to be at right angle to shafts and rests squarely on both hubs. Repeat procedure at three additional points 90° apart. Recheck angular alignment.

**F.** Couplings with spacers or floating shafts have a greater hub separation than shown in Table 2. Refer to application for shaft separation and use either a dial indicator (as shown) or straight edge per instruction in 4D or 4E. Recheck alignment after a few hours of operation to insure proper alignment at operating temperatures.

## Assembly



**5.** Coat hub teeth and body as well as inside of sleeve with coupling grease. Slide each sleeve onto its respective hub, making sure that gear teeth mesh properly. Apply light spots of grease to one side of the gasket. **G.** Install gasket between the sleeves, align the bolt holes and press side with grease against flange. Move sleeves together, with lube plugs 90° apart. When using spacer type coupling two gaskets are required, one on each end of spacer.

**Limited end float (LEF) couplings** include a center plate and button, plus pilot rings for spacer couplings, that must be set in place before installing gasket. Install gasket as in above instructions for standard coupling making sure that bolt holes are aligned and lube plugs are 90° apart.

**Insulated Couplings** do not require a gasket. Instead place insulating plate between flange faces and move sleeves together. **Note: Always check to insure that seals have not rolled or Crimped.**

**Full Flex, Spacer and LEF Couplings: H.** Install bolts and locknuts, tightening alternately and evenly to recommended torque in Table 2.

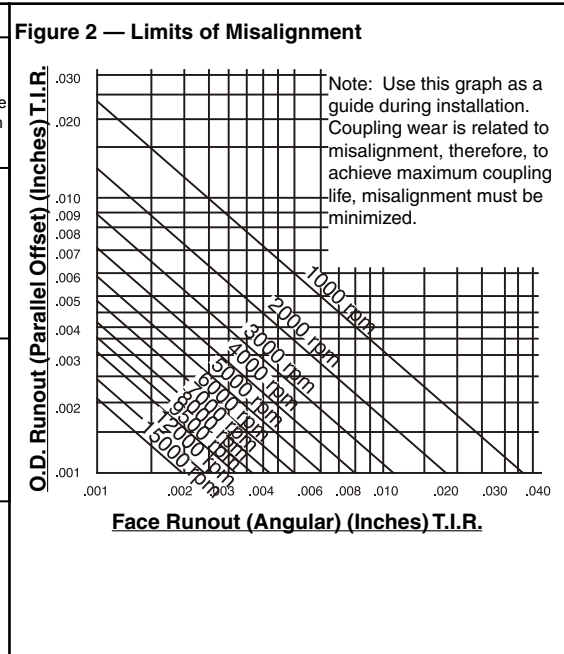
**(Insulated) Couplings:** Place a steel washer, insulating washer and insulating bushing on each bolt and insert through bolt holes. Add locknut and tighten alternately and evenly to recommended torque in Table 2.

Inspect coupling periodically for broken, loose fitting or missing bolts. When disassembling and reassembling coupling insure that all bolts fit snugly and locknuts tighten securely, any parts showing signs of wear or damage should be replaced.

**J.** Remove the two lube plugs and fill coupling with recommended amount of coupling grease indicated in Table 2. Replace lube plugs and tighten securely. **Note:** When using spacer, insulating plate and/or limited end float plate remove the two lube plugs and fill each sleeve with half of the recommended amount of grease. Do not attempt to fill spacer interior. Replace lube plugs and tighten securely.

Coupling Size	"C" End Gap (inches) ★					BOLT TIGHTENING TORQUE (ft. lbs.)		Amount of Lubricant Required To Fill Couplings ★	Minimum Speed for Std. Grease Lubrication (RPM) ▲
	Full-Flex & Mill Motor ♦			LEF	INSULATED	EXPOSED	SHROUDED		
	STD	STD/REV	REV						
1	1/8	3/8	5/8	3/16	1/4	7	7	1.5 oz.	529
1 1/2	1/8	9/16	1	3/16	1/4	27	27	2.0 oz.	463
2	1/8	13/16	1 1/2	3/16	1/4	65	27	4.0 oz.	411
2 1/2	3/16	29/32	1 5/8	9/32	5/16	132	65	6.0 oz.	380
3	3/16	1 1/32	1 7/8	9/32	5/16	132	65	8.0 oz.	348
3 1/2	1/4	1 5/16	2 3/8	13/32	3/8	230	132	12.0 oz.	321
4	1/4	1 7/16	2 5/8	13/32	3/8	230	132	16.0 oz.	301
4 1/2	5/16	1 5/8	2 15/16	17/32	7/16	230	132	22.0 oz.	285
5	5/16	1 11/16	3 1/16	17/32	7/16	367	230	34.0 oz.	268
5 1/2	5/16	1 7/8	3 7/16	17/32	7/16	367	230	44.0 oz.	257
6	5/16	2 5/16	4 5/16	19/32	7/16	367	●	48.0 oz.	240
7	3/8	2 3/16	4	25/32	1/2	561	●	76.0 oz.	227

♦ Mill Motor - Inboard dimension only.  
 ★ Amount by volume.  
 ▲ Couplings operating below these speeds should use a grease having a NLGI rating of "0" or "00".  
 ● Shrouded style bolts not available - exposed bolt only.  
 ★ WSP - Per Application.



### Maintenance

Following an initial break-in period of about 3 million revolutions (80hr @ 600 rpm) it is recommended that the coupling be completely flushed and re-lubricated. Thereafter, a regular relubrication schedule should be maintained. Each application should be evaluated based on its environment and operating conditions, relubrication every 6 months should suffice with periodic visual inspections to insure that neither the quality nor the supply (due to leakage) of the lubricant has deteriorated to an unacceptable level.

Many lubricants will perform satisfactorily under average industrial operating conditions. As long as the temperature range of the application is within the limits shown for the lubricant and the coupling speed is above the minimum speed for grease lubrication shown in Table 2. Although some lubricants will maintain their lubricity at elevated temperatures, the thermal limit of the coupling is 250°F. For applications where coupling is exposed to sustained temperatures above 250°F, consult Emerson Power Transmission. For low speed operation (below min. speed for grease lubrication, Table 2), use a grease having an NLGI rating of "0" or "00". Lubricants required for severe operating conditions should be referred to a lubrication manufacturers representative for recommendations.

During relubrication cycle or at least yearly, whichever comes first, the coupling should be disassembled and thoroughly cleaned of all old grease. Remove and visually inspect all parts; gear teeth for signs of abnormal stress and wear, the seals and gaskets for any cracks or breaks. All bolts should fit snugly and nuts and lockwashers should tighten securely.

Any parts showing signs of wear or damage should be replaced. These parts are available for purchase by referencing the coupling serial number, size, type and bolting style. Hubs and sleeves should be replaced as half couplings whenever possible.

Component parts used in "Balanced" couplings may be replaced, however it is necessary that all reusable parts be returned to the factory for reassembly and rebalancing with replacement parts.

### Important Safety Instructions Before start-up . . . for reasons of safety and to extend shaft coupling life, follow these requirements.

1. Coupling guards protect personnel. **All couplings must be covered with a guard as per OSHA requirements.**
2. Recheck alignment after all foundation bolts and mechanical connections are tightened.
3. Make sure all fasteners are properly installed and tightened.
4. Take the time to double check your work.
5. Only authorized Kop-Flex replacement parts are to be used.
6. Call Kop-Flex for any clarification or questions.

### Recommended Lubricant KSG Coupling Grease

This grease is specifically compounded for standard couplings to provide improved lubrication and resistance to centrifugal separation. When KSG grease is used, lubrication intervals may be extended, based upon operating experience. Balanced couplings or others operating at speeds above 3500 rpm can benefit from our KHP coupling grease. Both KSG and KHP coupling greases are available from us or authorized distributors of Kop-Flex Brand Couplings.

If the coupling is mounted on a reciprocating machine, or if recurrent reverse loading is experienced, a heavy viscous lubricant with a grade of NLGI #0 and EP additives may be required for damping characteristics.

### OTHER GREASES

Alternate lubricating greases should equal or exceed the specification of our KSG

and KHP coupling greases. (Specification sheet 3532 is available upon request.) Greases other than KSG or KHP, should meet these minimum specifications:

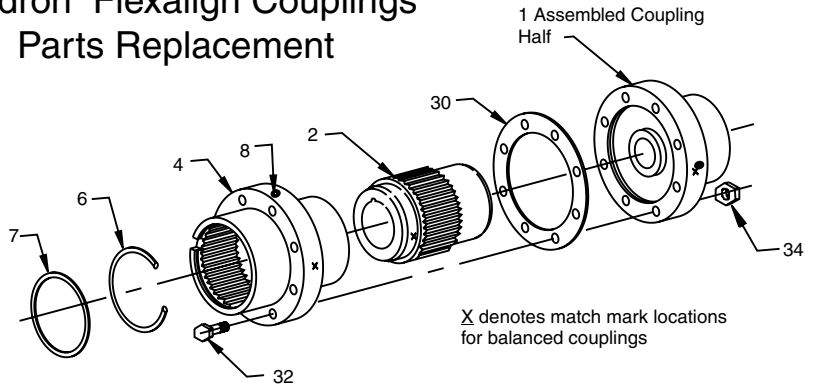
Grade: NLGI #1  
 Base oil Viscosity; Min.: 3000 SSU at 100°  
 160 SSU at 210°  
 Dropping Point, ASTM D-2266: .500mm Maximum  
 Base Oil Content: 87% Minimum  
 K36 Factor, ASTM D-4425; KSG: K36 = 8/24 = .33  
 Required: Rust and Oxidation Inhibitors  
 E.P. Additives

The most reliable test of a suitable lubricant is often the result of user experience and satisfaction. If a lubricant has been known to sludge, separate into heavy components or dry out, consider the use of our greases or one meeting the minimum specifications.

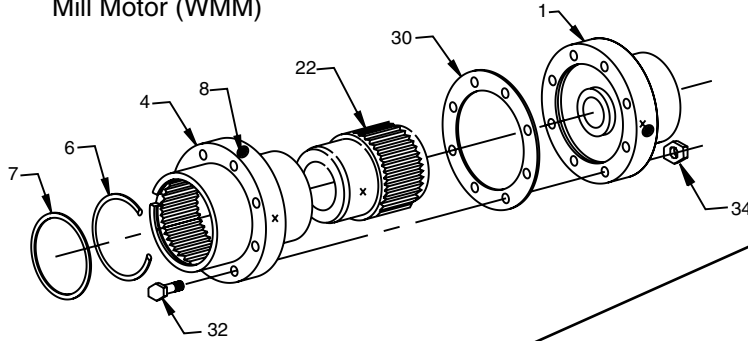
# Waldron Flexalign Couplings Parts Replacement

## Full-Flex

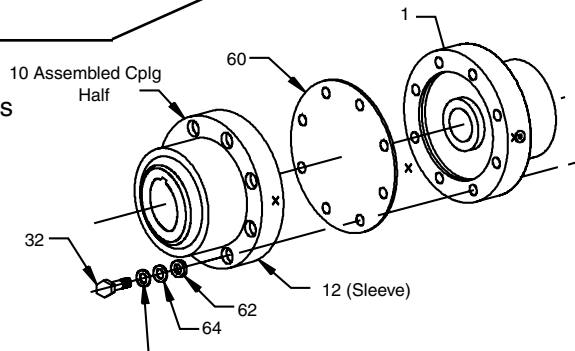
Type EB with Exposed Bolts  
and  
Type SB with Shrouded Bolts



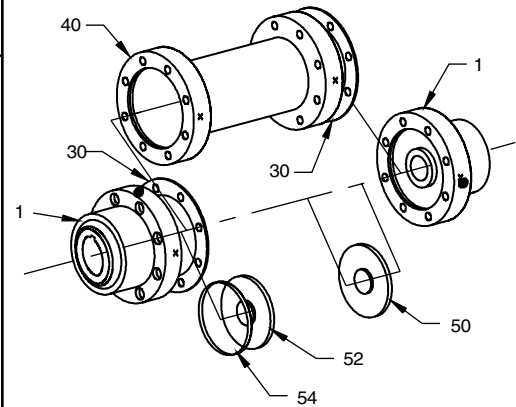
## Waldron Couplings Mill Motor (WMM)



## Waldron Couplings Insulated (WI)



## Waldron Couplings Spacer Type (WSP) Spacer W/LEF (WSPLEF) and Limited End Float (LEF)



Reference	Name of Part	Number Required					
		W*	WLEF	WI	WMM	WSP	WSPLEF
1	HALF COUPLING ASS.★	2	2	1	1	2	2
2	▲ Hub	2	2	1	1	2	2
4	▲ Sleeve◆	2	2	1	1	2	2
6	▲ Buffer Ring	2	2	1	1	2	2
7	▲ Coupling Seal	2	2	1	1	2	2
8	▲ Pipe Plug	4	4	2	2	4	4
10	INSULATED HALF COUPLING ASSY.★	***	***	1	***	***	***
2	▲ Hub	***	***	1	***	***	***
12	▲ Insulated Sleeve	***	***	1	***	***	***
6	▲ Buffer Ring	***	***	1	***	***	***
7	▲ Coupling Seal	***	***	1	***	***	***
8	▲ Pipe Plug	***	***	2	***	***	***
20	WMM HALF CPLG. ASSY.★	***	***	***	1	***	***
22	▲ WMM Hub	***	***	***	1	***	***
4	▲ Sleeve◆	***	***	***	1	***	***
6	▲ Buffer Ring	***	***	***	1	***	***
7	▲ Coupling Seal	***	***	***	1	***	***
8	▲ Pipe Plug	***	***	***	2	***	***
	ACCESSORY KIT★★	1	1	***	1	2	2
30	▲ Gasket	1	1	***	1	2	2
32	▲ Hex Head Bolt	†‡	†‡	‡	†‡	■	■
34	▲ Hex Nut and Lockwasher	†‡	†‡	‡	†‡	■	■
40	Spacer◆	***	***	***	***	1	1

Reference	Name of Part	Number Required					
		W*	WLEF	WI	WMM	WSP	WSPLEF
	LEF PARTS						
50	Center Plate▶	***	1	***	***	***	***
52	Center Plate w/Flg. Button	***	***	***	***	***	2
54	Pilot Ring	***	***	***	***	***	2
	INSULATING PARTS						
60	Insulating Plate	***	***	1	***	***	***
62	Insulating Bushing	***	***	‡	***	***	***
64	Insulating Washer	***	***	‡	***	***	***
66	Steel Washer	***	***	‡	***	***	***

- \* Includes reversed hub styles
- ★ Assemblies and kits include parts listed immediately below marked "▲".
- ▲ Parts marked "▲" are included in assemblies and kits under which they are listed.
- ▶ Center plate is furnished with button installed on sizes 3 1/2, 4 1/2, 5, 5 1/2, 6 and 7.
- ◆ Couplings are standard with exposed bolts. Shrouded bolts are optional. Specify bolt type when ordering parts.
- † Exposed bolting style: sizes 1, 2 & 2 1/2 - 6 req'd.; sizes 1 1/2, 3, 3 1/2, 4 & 5 - 8 req'd.; sizes 4 1/2 - 10 req'd.; sizes 5 1/2 & 6 - 14 req'd.; sizes 7 - 16 req'd.
- ‡ Shrouded bolting style size 1-6 req'd.; size 1 1/2 - 8 req'd.; sizes 2 & 2 1/2 - 10 req'd., sizes 3 & 3 1/2 - 12 req'd.; sizes 4, 4 1/2 & 5 - 14 req'd.; sizes 5 1/2, 6 & 7 - exposed bolt style only
- Spacer coupling requires double the number used for standard Full-Flex Coupling.

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