Series 63 *High Performance Couplings*

Thomas® *Installation Instruction*

Warning: All rotating power transmission products are potentially dangerous and must be properly guarded in compliance with OSHA standards for the speed and applications for which they are intended. It is the responsibility of the user to provide proper guarding.

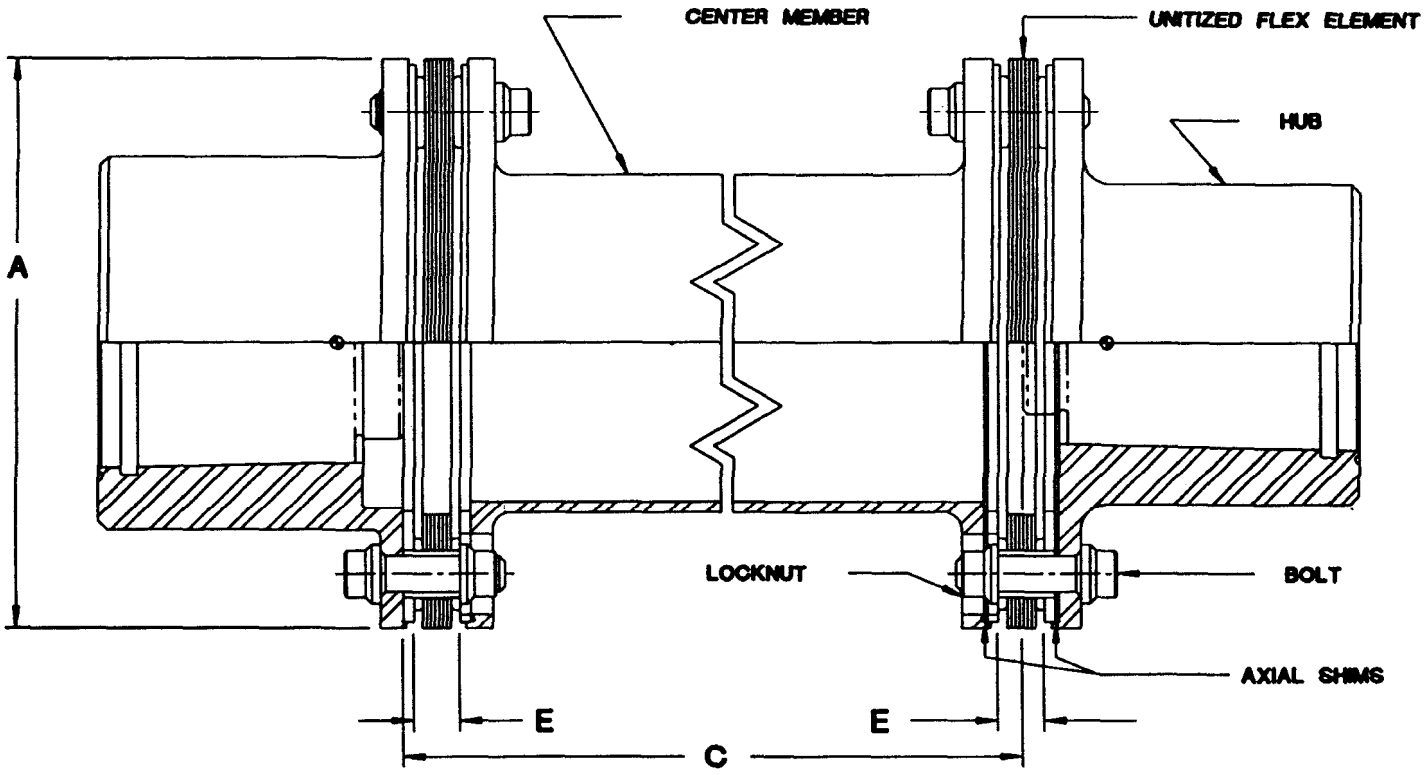


Figure 1

I. **Purpose:** These instructions are intended to help you to install, align, and maintain your Thomas high performance coupling. The series 63 is a precision-machined coupling designed for long life. It requires care during handling, installation, and alignment.

II. **Scope:** Covered here will be general information, hub mounting, alignment, assembly, locknut torquing, and disc pack replacement. Refer to assembly drawing for part numbers.

III. **General Information:** Refer to the assembly drawing as well as these instructions. The coupling, as received, is assembled. Examine the parts to assure there is no visible damage. Remove the bolts and locknuts that attach the hubs to the unitized disc packs. Remove the hubs.

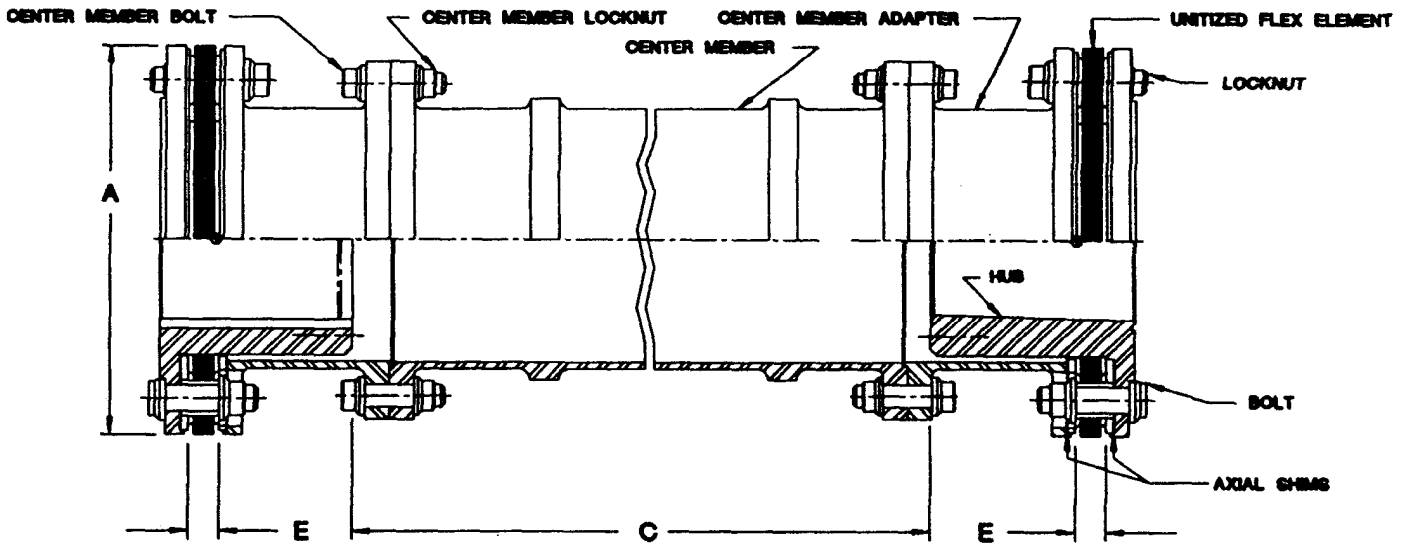


Figure 2

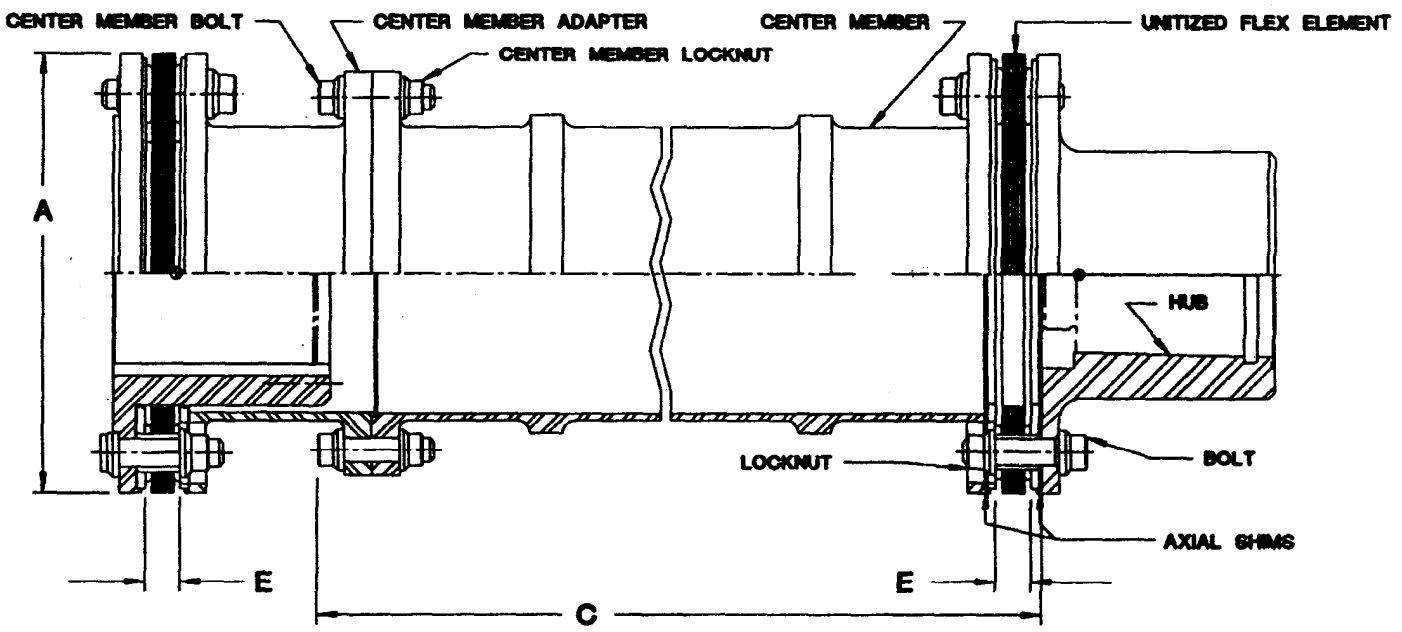


Figure 3

IV. Hub Mounting:

A. General. Clean hub bores and shafts. Remove any nicks or burrs. If bore is tapered, check for good contact pattern.

Taper Bore Bluing Check

1. Remove all burrs and nicks
2. Degrease all mating surfaces
3. Apply thin, translucent film of soft bluing to entire hub bore
4. Install hub onto shaft - seat hub Do not rotate hub relative to shaft
5. Remove hub - observe transfer to shaft
6. Record transfer using scotch tape
7. Transfer should be uniform and complete

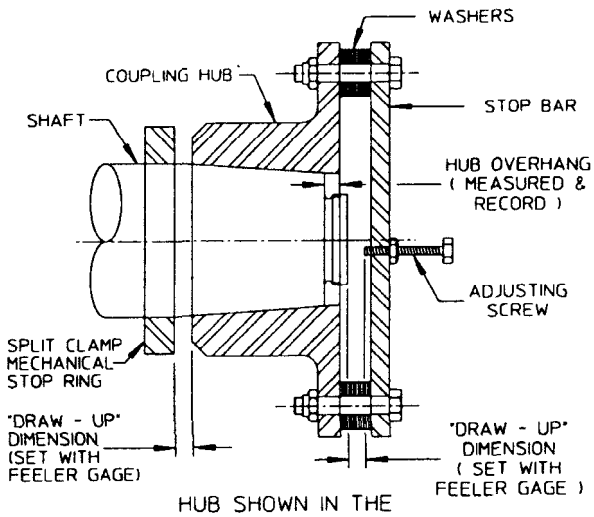
If the bore is straight, measure the bore and shaft diameters to assure proper fit. The key(s) should have a snug side-to-side fit with a small clearance over the top. Sharp corners should be removed from the sides of the key.

B. Standard Design

1. **Straight Bore.** Install key(s) in the shaft. Heat the hub in an oil bath or oven until bore is sufficiently larger than the shaft. 350 degrees F. is usually sufficient. An open flame is not recommended. However, if flame heating is

necessary, use a very large rose bud tip to give even heat distribution. A thermal heat stick will help determine hub temperature. **DO NOT SPOT HEAT THE HUB OR DISTORTION MAY OCCUR.** With the hub expanded, slide it quickly up the shaft to the desired axial position. A pre-set axial stop device can be helpful. See figure 4.

MECHANICAL STOP DEVICE



HUB SHOWN IN THE METAL-TO-METAL POSITION

Figure 4

2. **Taper Bore with Key(s).** Put the hub on the shaft without key(s) in place. Lightly tap hub with a soft hammer. This will assure a metal-to-metal fit between shaft and hub. This is the starting point for the axial draw. Record this position, between shaft end and hub face, with a depth micrometer. See figure 5. Mount a dial indicator to read axial movement of the hub. Set the indicator to "0". Remove hub and install key(s). Remount hub, drawing it up the shaft to the desired position on the shaft. The hub may have to be heated in order to reach this position. **DO NOT SPOT HEAT THE HUB OR DISTORTION MAY OCCUR.** Use the indicator as a guide only. A pre-set axial stop device can be helpful. See figure 4. Check the final results with depth micrometer. Install shaft locknut to hold hub in place.

3. **Taper Bore Keyless.** For keyless application, see "Keyless Hydraulic Hub Mounting and Dismounting" dated 5/97.

C. **Reduced Moment Design.** Note: On all reduced moment hub arrangements, the disc pack should be assembled onto the hub with the locknuts snugged up (not torqued) before final hub mounting on the shaft.

1. **Straight Bore** (Reduced Moment). Proceed as per item IV. B. 1. after disc pack is assembled to the hub per VI. B. 1. through VI. B. 4.

HUB TO SHAFT AXIAL POSITION CHECK

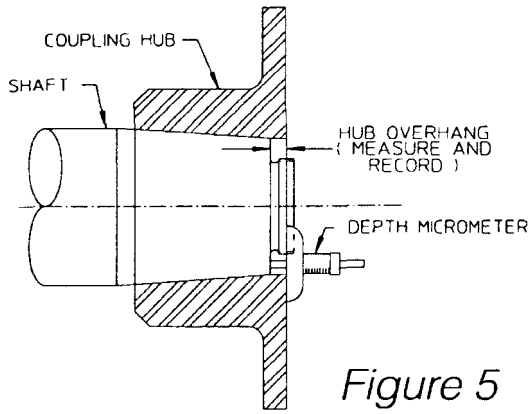


Figure 5

2. **Taper Bore (Reduced Moment).**

Proceed as per item IV. B. 2. with the following additions. After the contact pattern is checked and the start point for hub draw is determined, assemble the disc pack to the hub per VI. B. 1. through VI. B. 4.

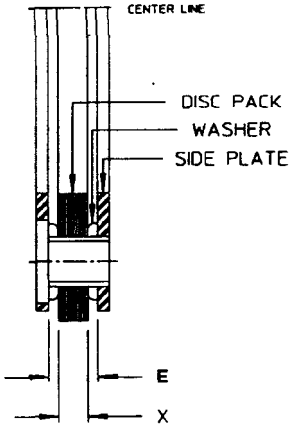
V. SHAFT ALIGNMENT. Move equipment into place.

A. Soft Foot. The equipment must sit flat on its base. Any soft foot must be corrected now.

B. Axial Spacing. The axial spacing of the shafts should be positioned so that the disc packs (flexing elements) are flat when the equipment is running under normal operating conditions. This means there is a minimal amount of waviness in the disc pack when viewed from the side. This will result in a flexing element that is centered and parallel to its mating flange faces. Move the connected equipment or adjust the axial shims provided to accomplish the above. As a guide, maximum and minimum values for dimension "E" are given in Table 1. See Figure 1 and the assembly drawing for number of shims at each location. For a more exact number for "E" see figure 6.

DISC PACK "E" MEASUREMENT

CPLG SIZE	WASHER THICKNESS	NOMINAL DISC PACK THICKNESS
162	.078	.216
200	.094	.276
225	.094	.288
262	.094	.336
312	.125	.396
350	.156	.444
375	.156	.480
425	.188	.525
450	.188	.555
500	.188	.630
550	.233	.702
600	.344	.774
700	.281	.882
750	.312	.954



TO CALCULATE THE "E" DIMENSION OF THE ACTUAL COUPLING IN QUESTION MEASURE THE DISC PACK THICKNESS "X" IN FOUR PLACES TAKING THE AVERAGE DIMENSION. ADD TO THIS THE VALUE FOR TWO WASHER THICKNESSES. THIS WILL BE THE "E" DIMENSION IN THE AXIALLY NEUTRAL DISC PACK POSITION.

Figure 6

Note: When axial adjusting shims are provided, the final axial adjustment is easier to obtain. See VI and assembly drawings for installation.

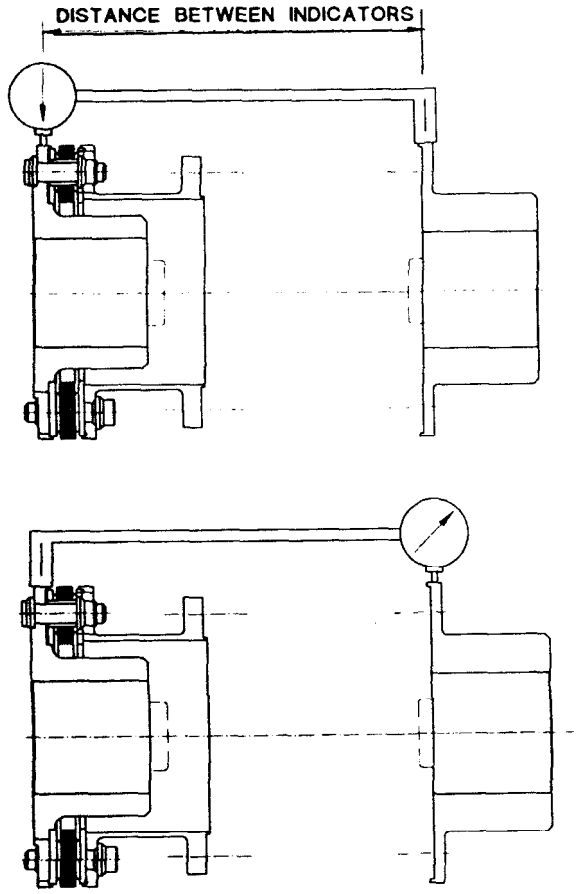


Figure 7

C. **Shaft Alignment.** The reverse indicator method is preferred.

1. Rigidly mount a dial indicator on one hub or shaft, reading the other hub or shaft outside diameter as shown in Figure 7. Compensate for indicator set-up sag. Rotate both shafts together. Adjust the equipment by shimming and/or moving so that the indicator reading is within .001 inch per inch of axial length between indicators.
2. Reverse the set-up as shown in Figure 7 and repeat #1 above.
3. When the results of #1 and #2 above are both within .001 inch per inch of axial length between indicators the shafts are in good alignment.

D. **Alignment Help.** For further help, refer to "Alignment Made Easy", available from Rexnord.

Note: If the driver or driven equipment alignment specification is tighter than this recommendation, the specification should be used. Also, be sure to compensate for thermal movement in the equipment which is furnished by others. The coupling should be in alignment when the unit is running under normal operating conditions. The coupling is capable of approximately four times the above shaft misalignment tolerances. However, close alignment at installation will provide longer service with smoother operation.

VI. **Final Assembly.** The assembly drawing should be used in conjunction with these instructions. Special notes on the assembly drawing may supersede these instructions.

A. **Standard Design.** (See Figure 1 and/or assembly drawing).

1. If there is a shaft end extending beyond a hub flange face due to a threaded extension, start the assembly at that end. If not, start at either end.
2. Insure the pilots are clean and burr-free. Install all the bolts through hub flange bolt holes. (See Figure 8A). Refer again to the assembly drawing for axial shim locations, if any, and install shims as necessary to obtain the proper axial spacing. (See Note II, Page 5)
3. Position unitized flex element over bolts with the match marks aligned. (See Note I, Page 5, and place f'ainst shims and/or hub flange pilot.

   CAUTION: The bolt holes in the unitized flex element side plate must be in line with the hub flange bolt holes. The clearance holes in the side plate must be in line with the hub flange clearance holes. (See Figure 8C.)
4. The unitized flex element side plates will have a light interference fit with its corresponding flange pilot. Seating force must be applied directly to the engaging side plate of the flex assembly. Apply this force to the side plate between bolt and clearance holes using a brass drift pin. See Figure 8B). **WITH THE SIDE PLATE SEATED IN THE FLANGE PILOT, ALL THE BOLTS MUST TURN FREELY BY HAND.** If the bolts do not turn freely, use jacking screws to release pilot fit, then repeat side plate fitting procedure.
5. Back the bolts out until they are flush with face of the installed flex assembly. Install the centermember with match marks aligned. Using the bolts as guide pins and while supporting the free end of the center member, seat the pilot using the method shown in Figure 8B. **WITH THE SIDE PLATE SEATED IN THE FLANGE PILOT, ALL THE BOLTS MUST TURN FREELY BY HAND.** if the bolts do not turn freely, use jacking screws to release pilot fit, then repeat side plate fitting procedure. Install the locknuts. Tighten the locknuts only enough to maintain the assembly. Final torque will be applied after the total coupling is assembled.

6. The assembly just completed in Step 5 must be compressed axially to provide clearance for the second flex assembly installation. This can be accomplished by using "C" clamps. Apply two clamps 180 degrees apart. Compress the joint only enough to provide minimum clearance for the installation of the second flex assembly. (See Figure 8D).

7. Insert the remaining flex element between the hub and center member flange with the match marks aligned. Then install the bolts through the center member flange bolt holes and flex assembly. Also install the bolts through the hub flange bolt holes and flex assembly in the same manner as Step 2 (See Note I.) Release the clamp force at the opposite end and proceed to complete the installation of the second flex assembly similar to Steps 2 through 5. **MAKE SURE ALL BOLTS TURN FREELY BY HAND BEFORE SNUGGING UP THE LOCKNUTS.**

8. At this point make sure locknuts are not tight so that the disc packs are free to equalize any pre-stretch that was necessary when setting the axial spacing.

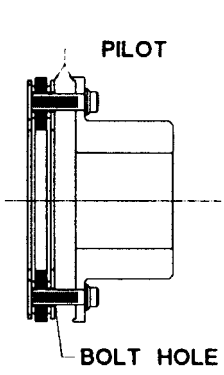


Figure 8 A

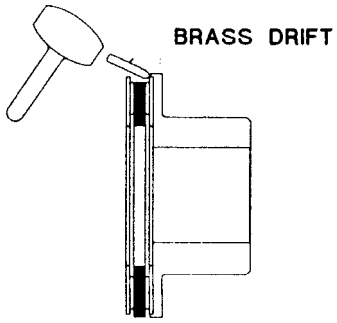


Figure 8 B

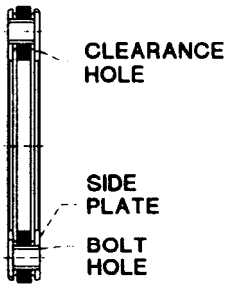


Figure 8 C

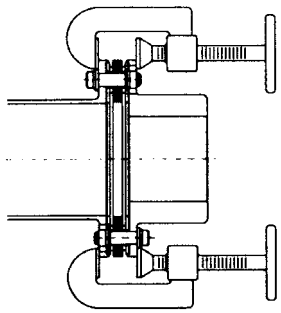


Figure 8 D

9. Torque all locknuts in accordance with Table 1.

10. After coupling has been completely assembled, a final visual check of the disc packs should be made. The disc packs will be parallel and flat in an aligned and properly assembled coupling.

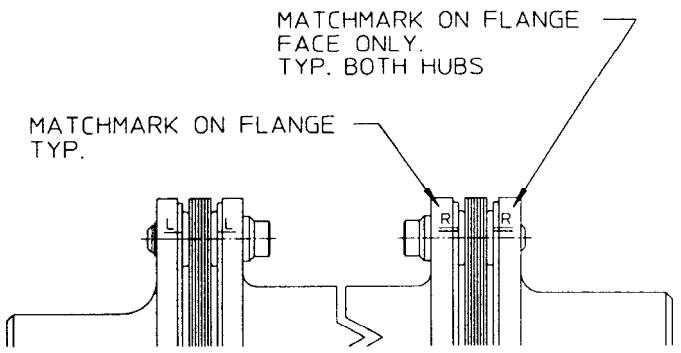


Figure 9

NOTE I: Coupling is dynamically balanced as an assembly with major components matchmarked. Make sure all matchmarks are properly lined up during assembly. See Figure 9. It is also important to note that the sideplates of the unitized disc pack is also match marked.

NOTE II: Axial adjusting shims are designed to pilot on body-ground bolts. Each individual shim will pilot on two bolts. Care must be exercised when installing bolts to insure a smooth, light push fit. Do not drive or force bolts through shims and flanges. (Angular rotation or position of each shim is not critical).

B. Reduced Moment Design. (See Figure 2 and/or Assembly Drawing).

NOTE: Complete steps 1 through 7 prior to mounting hubs on equipment shafts.

1. With the hub on a bench, insure the pilots are clean and burr-free. Install all the bolts through hub bolt holes. (See Figure 9A). Refer again to the assembly drawing for axial shim location, if any. Install shims as necessary to obtain the proper axial spacing (See Note II, Page 5).

2. Position unitized flex element over bolts with the matchmarks aligned (See Note I, Page 5), and place against shims and/or hub flange pilot.

   CAUTION: The bolt holes in the unitized flex assembly side plate must be in line with the hub flange bolt holes. The clearance holes in the side plate must be in line with the hub flange clearance holes. (See Figure 9C).

3. The unitized flex assembly side plates will have a light interference fit with its corresponding flange pilot. Seating force must be applied directly to the engaging side plate of the flex assembly. Apply this force to the side plate between bolt and clearance holes using a brass drift pin. (See Figure 9B). **WITH THE SIDE PLATE SEATED IN THE FLANGE**

PILOT, ALL THE BOLTS MUST TURN FREELY BY HAND. If the bolts do not turn freely, use jacking screws to release pilot fit, then repeat side plate fitting procedure. When *the side plate is fully seated, install the* locknuts. Snug the locknuts. Do not torque them up at this time.

4. Insure the adapter pilots are clean and burr-free. Install all the bolts through the adapter flange bolt holes. Refer again to the assembly drawing for axial shim location, if any, and install shims as necessary to obtain the proper axial spacing. (See Note II.)
5. Position the adapter over unitized flex element just installed on the hub with the matchmarks aligned. *The side plate will have a light interference* fit with the flange adapter pilot. Seating force must be applied directly to the engaging side plate of the flex assembly. Apply this force to the side plate between bolts and clearance holes using a brass drift pin. (See Figures 9B & 9C). **With the side plate seated in the flange pilot, all the bolts must turn freely by hand.** If the bolts do not turn freely, use the jacking screws to release pilot fit, then repeat side plate fitting procedure.
6. *Install only the locknuts that secure the flex* assembly to the adapter. Do not torque these locknuts at this time.
7. Repeat steps 1 through 6 for the second hub.
8. Install each hub assembly on the proper shaft per section IV.
9. Recheck axial spacing per the assembly drawing.
10. Compress both driver and driven end flex elements using two "C"-clamps each end 180° apart, as shown in Figure 9D. Equally compress each end only the amount necessary to install center member.
11. If required, install shims (see assembly drawing). Install center member into place, with the matchmarks aligned (see Notes I and II, page 5). Carefully release "C"-clamps from driver and driven end.
12. Insure pilots are seated and install bolts and locknuts into center member joints. With the pilot seated, bolts should turn freely. Torque *locknuts* to the value shown in Table 1 for the center member.
13. At this point make sure locknuts are not tight so that the disc packs are free to equalize any pre-stretch that was necessary when setting the axial spacing.
14. Now torque the main locknuts to the value shown in table 1.
15. After coupling has been completely assembled, a final visual check of the disc packs should be made. The disc packs will be parallel and flat in an aligned and properly as*sembled coupling.*

REDUCED MOMENT

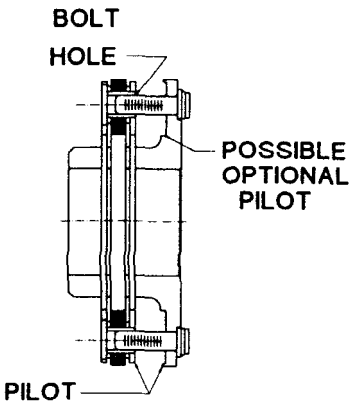


Figure 9 A

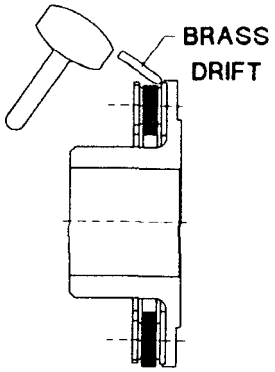


Figure 9 B

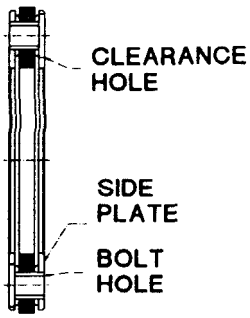


Figure 9 C

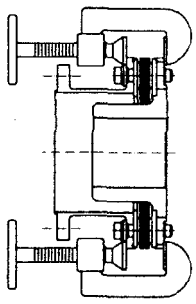


Figure 9 D

C. Semi-Reduced Moment Design. (See Figure 3 and/or Assembly Drawing).

1. *Install the reduced moment end hub assem*bly per section VI. B. 1 through VI. B. 6.
2. Install the standard hub per section IV.
3. Install the standard end unitized flex element per section VI. A. 2. through VI. A. 4.
4. Compress the reduced moment end flex element using two "C"-clamps 180° apart as shown in Figure 9D.
5. Back the bolts out of the standard end until they are flush with the face of the installed *flex assembly. Install the center member with* matchmarks aligned. Using the bolts as guide pins and while supporting the free end of the center member, seat the pilot using the method shown in Figure 8B. **With the side plate seated in the flange pilot, all the bolts must turn freely by hand.** If the bolts do not turn freely, use jacking screws to release pilot fit, then repeat side plate fitting procedure.

Install the locknuts and tighten only enough to maintain the assembly. Final torque will be applied after the total coupling is assembled.

6. Carefully release the "C"-clamps aligning the pilot fit and the matchmarks between center member and adapter.
7. Insure pilot is seated and install the bolts and locknuts into the center member adapter joint. **With the pilot seated, bolts should turn freely.** Torque the locknuts to the value shown in Table 1 for the center member.
8. Torque all disc pack locknuts to their respective value shown in Table 1.
9. After coupling has been completely assembled, a final visual check of the disc packs should be made. The disc packs will be parallel and flat in an aligned and properly assembled coupling.

VII. Disassembly Procedure.

A. Standard Design (See Figure 1 and coupling assembly drawing).

1. While supporting the center member, remove the bolts and locknuts from the flex joint that does not have the shaft protruding past the hub.
2. Using "C"-clamps on the opposite end, compress flex joint enough to allow removal of flex element.
3. Using the jack screw tapped holes provided, evenly disengage the two side plates from the hub and center member pilots. Be careful not to drop the disc pack as distortion can occur.
4. Slide the disc pack out.
5. Remove the "C"-clamps.
6. While still supporting center member, remove the bolts and locknuts from remaining end of the coupling.
7. Using jack screws, disengage the piloted fit as in step 3. Remove the center member and unitized flex element.
8. If necessary, remove the hubs. If hydraulically mounted, see "Keyless Hydraulic Hub Mounting and Dismounting" dated 5/97. When using heat, install a hub puller and put some pressure between shaft and hub. The heat should be applied to the hub rapidly, evenly, and in a large enough quantity to heat the hub before heating the shaft. When the hub starts to move axially, quickly apply more pressure to the puller until the hub is off the shaft. **Do not spot heat the hub or distortion may occur.**

B. Reduced Moment Design (See Figure 2)

1. Remove bolts from the center member joints.
2. While supporting the center member, lightly compress the flex joints at each end with "C"-clamps. Use jack screws to disengage the center spool joints. Remove center spool. Now remove the "C"-clamps.
3. The hub, disc pack, and adapter should be removed as an assembly when using hydraulics (See Spec A-18823). When using heat, first remove the adapter from the unitized flex element. Install a hub puller and put some pressure between shaft and hub. The heat should be applied to the hub rapidly, evenly, and in a large enough quantity to heat the hub before heating the shaft. When the hub starts to move axially, quickly apply more pressure to the puller until the hub is off the shaft. **Do not spot heat the hub or distortion may occur.**
4. On the bench, after hub has cooled, remove the remaining flex joint bolts and locknuts.
5. Using the jackscrew tapped holes, evenly disengage the side plate of the disc pack from the hub and pilot.

C. Semi-Reduced Moment Design (See Figure 3).

1. While supporting the center member remove bolts and locknuts from the center joint and flex joint on the "standard end" of the coupling.
2. Using "C"-clamps on the reduced moment end of the coupling, compress flex element enough to allow removal of the center member.
3. Using the jack screw tapped holes, evenly disengage the side plate from the center member flange pilot and the center member to short spool pilot. Remove center member and the unitized flex member from the standard hub end.
4. To remove the reduced moment end hub. Proceed as outlined in section VII. B. 3.
5. On the bench, remove all the flex joint bolts and locknuts.
6. Using the jack screw tapped holes, evenly disengage the side plate of the pack from the hub pilot.
7. To remove the standard hub, proceed as outlined in section VII. A. 8.

D. Replace parts as necessary. Recheck alignment per Section V. Reassemble per Section VI.

Table 1
Locknut Tightening Torques

				DISC PACK		CENTER MEMBER	
Coupling Size	"A" Diameter	Estimated Dimension for "E"	Axial Capacity (in.)	Thread Size	Torque Ft.-Lbs.	Thread Size	Torque Ft.-Lbs.
162	4.25	.37	±0.050	1/4-28 NF	9.5	1/4-28 NF	9.5
200	5.47	.46	±0.070	3/8-24 NF	32	1/4-28 NF	9.5
225	5.72	.48	±0.055	3/8-24 NF	32	1/4-28 NF	9.5
262	6.72	.52	±0.060	7/16-2 NF	45	3/8-24 NF	32
312	8.00	.65	±0.075	1/2-20 NF	70	3/8-24 NF	32
350	8.91	.76	±0.080	5/8-18 NF	145	3/8-24 NF	32
375	9.88	.79	±0.090	5/8-18 NF	145	7/16-20 NF	45
425	10.69	.90	±0.100	3/4-16 N	245	1/2-20 NF	70
450	11.50	.93	±0.110	3/4-16 NF	245	5/8-18 NF	145
500	13.12	1.01	±0.120	7/8-14 NF	385	5/8-18 NF	145
550	14.75	1.17	±0.140	1-12 NF	565	3/4-16 NF	245
600	16.38	1.46	±0.150	1-1/8-12 NF	800	7/8-14 NF	385
700	18.69	1.44	±0.175	1-1/4-12 NF	1090	1-12 NF	565
750	20.31	1.58	±0.190	1-3/8-12 NF	1455	1-12 NF	565

Note: Bolts should be held from rotating while the locknuts are torqued to the values shown.