

How to Use This Manual

This manual provides detailed instructions on installation and removal of interference fit hubs.

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

INTRODUCTION

Use this manual as a supplement to the manual furnished with the coupling when mounting interference fit hubs. Clean all parts using a non-flammable solvent. Check shaft, hub bore, and key for nicks and burrs and remove.

CAUTION: Consult applicable local and national safety codes for proper guarding of rotating members. Observe all safety rules when installing or servicing couplings. During assembly, seal keyways to prevent leakage.

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

Couplings are normally furnished with an average interference fit of .0005" per inch of shaft diameter.

CHECK FIT OF KEY & MOUNT COUPLING PARTS

Check fit of key in both keyways. The key should fit snugly against the sides of keyway. A slight clearance should be present from top to bottom when the hub is on the shaft. Insert key flush with end of shaft.

Mount sleeves, seals (lightly coated with grease), end plates, and Type T20 covers on shafts before mounting hubs. Locate seals on shafts so they do not come in contact with the hot hubs.

HEAT HUBS

Heat hubs to 275°F (135°C) using one of the following methods:

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

OXY-ACETYLENE OR BLOW TORCH — Mark the hub with a 275°F (135°C) temperature sensitive crayon (melts at prescribed temperature) in several places near the teeth (Figure 1). Direct the flame toward the hub bore and keep in motion while heating to avoid overheating an area (Figures 2 and 3). Do not apply heat directly to the hub teeth. When using an oxy-acetylene torch use an excess acetylene mixture.

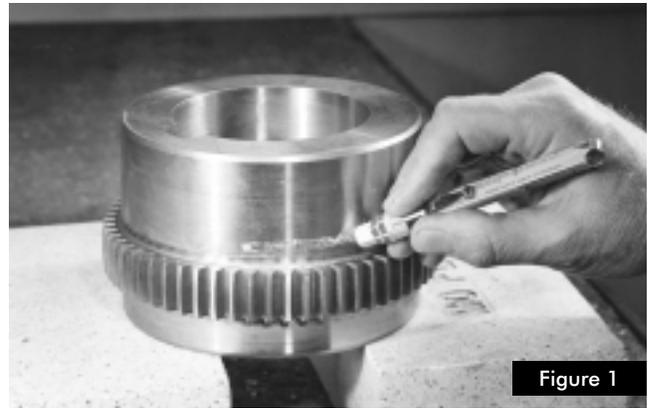


Figure 1

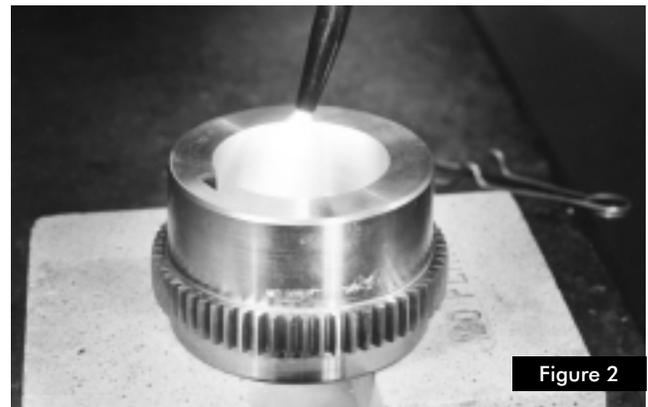


Figure 2



Figure 3

OVEN HEATING — Set the oven thermostat at 275°F (135°C) and heat the hub at least one hour for each inch of wall thickness. Do not allow hub teeth to come in contact with heat source (Figure 4).

$$\text{Wall Thickness} = \frac{\text{shank dia minus bore}}{2}$$



Figure 4

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.

MOUNT HUBS

Mount the hub on the shaft as quickly as possible to avoid heat loss. Make certain that position of hub teeth relative to shaft end is correct BEFORE assembling. Carefully line up bore and keyway with shaft and key and slide hub onto shaft until hub face is flush with end of shaft. If it is necessary to drive the hub into position, lightly tap with a soft brass or lead hammer. DO NOT strike hub teeth. Avoid excessive pounding which can cause damage to bearings or connected equipment. On inclined or vertical shafts hold hubs in place until the assembled position can be maintained.

Allow the hubs to cool. Insert setscrews (if required) and tighten. Then follow alignment and assembly instructions furnished with the coupling.

REMOVAL OF INTERFERENCE FIT HUBS

Introduction

The following instructions apply to all Falk shaft couplings with standard interference fits. Refer to the Factory if couplings were furnished as specials.

The illustration and photos show how heat, in conjunction with mechanical or hydraulic pullers, are used to remove interference fit coupling hubs. These applications and systems depict typical field dismantling procedures and suggested tooling.

In setting up similar systems to fit your operation, care must be taken to select the proper components and design to ensure appropriate integration with your operations and existing equipment. Appropriate safety measures must be used to avoid the risk of personal injury and property damage during the removal process.

The Falk Corporation cannot be responsible for damage or injury caused by unsafe use of hydraulic or mechanical equipment that is suggested in this manual. Contact the manufacturer of hydraulic pullers for guidance when you are in doubt as to the proper safety precautions to be taken in designing and setting up your particular application.

Select the correct procedure based on the coupling size as follows:

SMALL SIZE COUPLINGS — Bore range of 2" to 9" and a weight range of 8 lb to 400 lb.

LARGE SIZE COUPLINGS — Bores over 9" and weights over 400 lb.

SMALL SIZE COUPLINGS

Parts Identification

Refer to the appropriate Falk Service Manual(s) for parts identification and maintenance information to supplement this manual.

Required Equipment

- In addition to standard mechanic's tools, the following is required:
- A suitable size mechanical or hydraulic puller (having 10 ton minimum capacity) with an adjusting assembly and a crosshead leg assembly (SAE Grade 8 studs required).
 - Two rosebud torches.
 - Metal slings.
 - Heat resistant gloves.
 - Fire extinguisher.

Procedure

The procedure for removing small size couplings, with a bore range of 2" to 9" and a weight range of 8 lb to 400 lb, is as follows:

1. Make sure driven equipment is safely locked out.
2. Work area should be free from clutter and have the proper equipment on hand.
3. Disassemble coupling and thoroughly clean hubs of grease and solvents to avoid combustion when heat is applied.
4. Drill and tap the face of the coupling hub for the puller leg thread size, as shown in Figure 5.

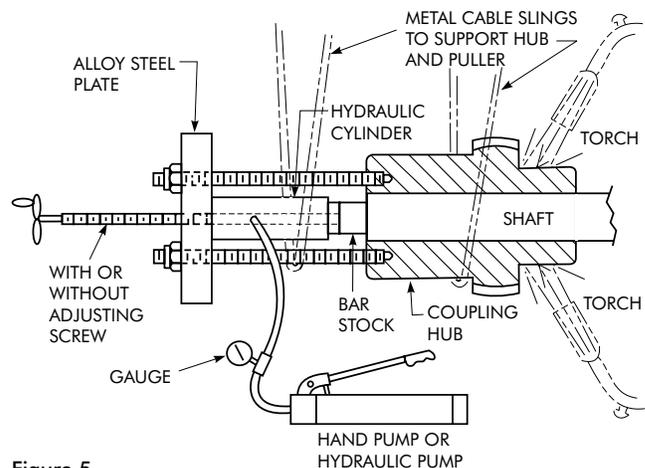


Figure 5

5. Assemble puller as shown in Figure 6. Check to make sure that the puller has enough stroke to pull the hub off.



Figure 6

6. Heat the hub evenly with rosebud torch to approximately 300° to 500°F (149° to 260°C) while applying pressure, as shown in Figure 7. The temperature may be measured with a heat sensitive crayon. Avoid placing the flame directly on the hub teeth. Apply puller pressure until the hub clears the shaft as shown in Figure 8.



Figure 7



Figure 8

LARGE SIZE COUPLINGS

Parts Identification

Refer to the appropriate Falk Service Manual(s) for parts identification and maintenance information to supplement this manual.

Required Equipment

In addition to standard mechanic's tools, the following is required:

- A hydraulic puller (having 50 ton minimum capacity) with the required stroke, and a hand pump or an electric powered pump.
- An alloy steel plate at least 2" thick.
- Two Grade 8 studs, threaded to fit puller holes in the hub and four Grade C nuts.
- Two rosebud torches.
- Metal slings.
- Heat resistant gloves.
- Fire extinguisher.

- NOTE:** A. The alloy steel plate thickness and maximum permitted pressure should be determined by a qualified individual.
- B. It is also recommended that the pump be equipped with a pressure gauge, so the user will know how much of the capacity he is using.

Procedure

The procedure for removing large size couplings, with a bore range over 9" and a weight range over 400 lb, is as follows:

1. Make sure driven equipment is safely locked out.
2. Work area should be free from clutter and have the proper equipment on hand.
3. Disassemble the coupling and thoroughly clean hubs of grease and solvents to avoid combustion when heat is applied.
4. In some cases, the key will have to be drilled out to facilitate hub removal, as shown in Figure 9.

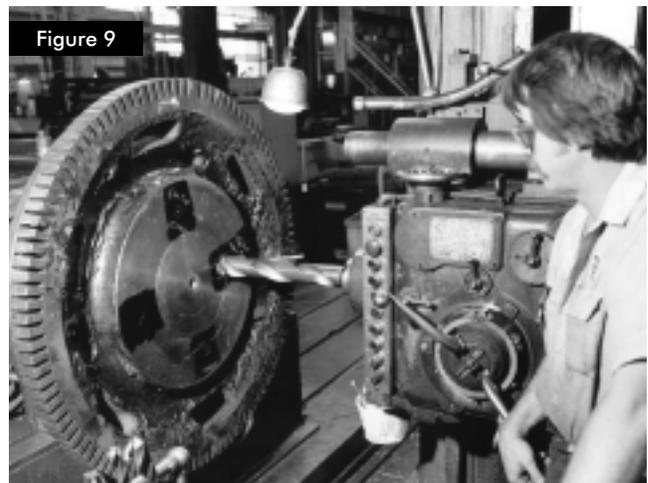


Figure 9



Figure 10

5. For hubs without puller holes, drill and tap two holes in the hub to receive the threaded stud bolts, Figure 10. Assemble the alloy tool steel plate on the threaded stud bolts as shown in Figure 11. Refer to Tables 1 thru 8 for a listing of Falk recommended puller bolt hole sizes.



Figure 11

6. Position the hydraulic puller as shown in Figure 12.



Figure 12

7. Apply heat to the hub, using one or more rosebud torches, as shown in Figure 13. Heat should be applied evenly, until the hub reaches a temperature of 300° to 500°F (149° to 260°C). Heat-sensitive crayons or paint can be used to indicate the hub temperature. Heat the outside of the hub first, then move slowly towards the shaft. As this is being done, start applying pressure with the puller. Be patient in doing this, since the heating-pulling operation on a large hub could take 30 or more minutes. A distinct cracking sound will be heard as the hub releases from the shaft. Continue the pulling action as needed until removal is complete, making sure the hub is securely supported by the sling.



Figure 13

TABLE 1 — Type T Steelflex® Coupling Puller Bolt Holes (2 @ 180° Apart)

COUPLING SIZE	T-Hub		Shaft Hub	
	B.C. ★	Tap Size – UNC	B.C. ★	Tap Size – UNC
1020T	1.531	# 6-32 x .38	2.812	.375-16 x †
1030T	1.875	# 6-32 x .38	3.125	.375-16 x †
1040T	2.125	# 10-24 x .38	3.875	.375-16 x †
1050T	2.500	# 10-24 x .38	4.250	.375-16 x †
1060T	2.875	.250-20 x .38	4.938	.375-16 x †
1070T	3.312	.250-20 x .38	5.250	.375-16 x †
1080T	3.937	.250-20 x .38	4.062	.375-16 x .50
1090T	4.562	.3125-18 x .44	4.625	.375-16 x .50
1100T	5.250	.375-16 x .50	5.750	.625-11 x .82
1110T	5.875	.4375-14 x .62	6.562	.625-11 x .82
1120T	6.625	.4375-14 x .62	7.500	.750-10 x .94
1130T	7.750	.625-11 x .82	8.188	.750-10 x .94
1140T	9.125	.625-11 x .82	9.250	.750-10 x .94
1150T	10.375	.750-10 x .94		
1160T	11.750	.875-9 x 1.06		
1170T	13.250	1.125-7 x 1.25		
1180T	14.875	1.250-7 x 1.50		
1190T	16.250	1.500-6 x 1.75		
1200T	17.937	1.500-6 x 1.75		
1210T	19.562	1.500-6 x 1.75		
1220T	21.312	1.500-6 x 1.75		
1230T	23.062	1.500-6 x 1.75		
1240T	24.938	1.500-6 x 1.75		
1250T	27.188	1.500-6 x 1.75		
1260T	29.500	1.500-6 x 1.75		

★ Locate Puller Bolt Holes 90° from keyway except as noted by footnote (†).
† Drill and tap thru flange between existing holes. Relation to keyway may vary freely.

TABLE 2 — Type F Steelflex Coupling Puller Bolt Holes (2 @ 180° Apart)

COUPLING SIZE	F-Hub	
	B.C. ★	Tap Size – UNC
3F	1.312	.250-20 x .38
4F	1.562	.250-20 x .38
5F	1.812	.312-18 x .50
6F	2.312	.312-18 x .50
7F	2.625	.375-16 x .62
8F	3.250	.375-16 x .62
9F	3.500	.375-16 x .62
10F	4.062	.500-13 x .75
11F	4.437	.500-13 x .75
12F	4.750	.625-11 x 1.00
13F	5.250	.625-11 x 1.00
14F	5.750	.750-10 x 1.12
15F	6.250	.750-10 x 1.12
16F	7.125	.750-10 x 1.12
17F	8.000	.875-9 x 1.38
18F	9.000	.875-9 x 1.38
190F	9.750	1.000-8 x 1.50

★ Locate Puller Bolt Holes 90° from keyway.

TABLE 3 — Type A Airflex Coupling Puller Bolt Holes (2 @ 180° Apart)

COUPLING SIZE	B.C. ★	Tap Size – UNC
15A	3.000	.312-18 x .50
16A	3.188	.375-16 x .62
18A	3.625	.375-16 x .62
21A	4.375	.500-13 x .75
24A	5.250	.500-13 x .75
28A	6.500	.750-10 x 1.12
33A	7.375	.750-10 x 1.12
39A	9.125	1.000-8 x 1.50
46A	10.500	1.000-8 x 1.50
53A	11.750	1.000-8 x 1.50
62A	13.500	1.000-8 x 1.50
72A	15.500	1.000-8 x 1.50
85A	17.000	1.000-8 x 1.50

★ Locate Puller Bolt Holes 90° from keyway.

TABLE 4 — Type WA Torus® Coupling Puller Bolt Holes (2 @ 180° Apart)

COUPLING SIZE	No. 1 & No. 6 Hub	
	B.C. ★	Tap Size – UNC
1020WA	2.750	.3125-18 x .44
1030WA	3.000	.3125-18 x .50
1040WA	3.625	.375-16 x .62
1050WA	4.125	.375-16 x .62
1060WA	4.875	.375-16 x .62
1070WA	5.250	.375-16 x .62
1080WA	6.000	.500-13 x .88
1090WA	7.250	.500-13 x .88
1100WA	8.875	.500-13 x .88
1110WA	8.875	.500-13 x 1.00
1120WA	8.750	.625-11 x 1.12
1130WA	9.000	.750-10 x 1.25
1140WA	8.875	.750-10 x 1.30
1150WA	9.375	.875-9 x 1.50
1160WA	9.875	.875-9 x 1.50

★ Locate Puller Bolt Holes 90° from keyway.



TABLE 5 — Type G Gear Coupling Puller Bolt Holes (2 @ 180° Apart)

COUPLING SIZE	B.C. ★		Tap Size — UNC
	Flex Hub	Rigid Hub	
1010G/GC †	2.060	2.625	.375-16 x .50
1015G/GC †	2.750	3.375	.375-16 x .50
1020G/GC	3.500	4.250	.375-16 x .50
1025G/GC	4.440	5.240	.375-16 x .50
1030G/GC	5.060	6.160	.375-16 x .50
1035G/GC	6.000	7.180	.500-13 x .62
1040G	7.125	8.260	.625-11 x .75
1045G	7.875	9.180	.625-11 x .75
1050G	8.500	10.200	.750-10 x .88
1055G	9.375	11.200	.750-10 x .88
1060G	10.375	12.460	.750-10 x .88
1070G	12.250	14.500	1.000- 8 x 1.18
1080/2080G	12.500	15.438	1.000- 8 x 1.18
1090/2090G	14.000	17.250	1.250- 7 x 1.50
1100/2100G	15.500	18.750	1.500- 6 x 1.75
1110/2110G	17.500	20.500	1.500- 6 x 1.75
1120/2120G	19.500	22.625	1.500- 6 x 1.75
1130/2130G	21.000	24.688	1.500- 6 x 1.75
1140/2140G	23.000	26.188	1.500- 6 x 1.75
1150/2150G	25.000	28.312	1.500- 6 x 1.75
1160/2160G	27.000	29.875	1.500- 6 x 1.75
1180/2180G	30.500	33.875	1.500- 6 x 1.75
1200/2200G	34.000	37.375	2.000-4.5 x 2.38
1220/2220G	37.500	41.875	2.000-4.5 x 2.38
1240/2240G	41.000	44.375	2.000-4.5 x 2.38
1260/2260G	45.000	...	2.000-4.5 x 2.38
1280/2280G	49.000	...	2.000-4.5 x 2.38
1300/2300G	53.000	...	2.000-4.5 x 2.38

★ Locate Puller Bolt Holes 90° from keyway.
 † Size 1010G Max Bore: Size 1015G Max Bore:
 Flex Hub = 1.500 Flex Hub = 2.125
 Rigid Hub = 2.000 Rigid Hub = 2.750

TABLE 6 — Type GF Gear Coupling Puller Bolt Holes (2 @ 180° Apart)

COUPLING SIZE	B.C. ★		Tap Size UNC
	Flex Hub	Rigid Hub	
1GF	...	2.625	...
1-1/2GF	...	3.375	...
2GF	3.375	4.250	.31-24 x .5 DP.
2-1/2GF	3.938	5.250	.38-24 x .56 DP.
3GF	4.812	6.160	.5-20 x .75 DP.
3-1/2GF	5.562	7.180	.62-18 x .94 DP.
4GF	6.438	8.260	.62-18 x .94 DP.
4-1/2GF	7.250	9.180	.62-18 x .94 DP.
5GF	8.000	10.200	.75-16 x 1.12 DP.
5-1/2GF	8.938	11.200	1-14 x 1.5 DP.
6GF	9.750	12.460	1-14 x 1.5 DP.
7GF	11.250	14.500	1-14 x 1.5 DP.

★ Locate Puller Bolt Holes 90° from keyway.

TABLE 7— Type FD Disc Coupling Puller Bolt Holes (2 @ 180° Apart)

SIZE	A-Hub		N-Hub	
	B.C. •	Tap Size — UNC	B.C. •	Tap Size — UNC
8FD04	...	...	2.440	.375-16 x ♦
23FD04	...	...	3.120	.375-16 x ♦
43FD04	...	...	3.750	.375-16 x ♦
85FD06	3.940	.375-16 x .75	3.810	.375-16 x ♦
190FD06	4.500	.375-16 x .75	4.090	.375-16 x ♦
340FD06	5.310	.375-16 x .75	4.750	.375-16 x ♦
625FD06	6.000	.500-13 x 1.0	5.000	.375-16 x ♦
1080FD06	7.000	.500-13 x 1.0	6.000	.375-16 x ♦
1700FD06	8.250	.625-11 x 1.2	5.500	.375-16 x .75
2500FD08	7.250	.500-13 x 1.0	6.600	.375-16 x .75
3160FD08	8.600	.625-11 x 1.2	7.400	.500-13 x 1.0
4630FD08	9.750	.625-11 x 1.2	8.200	.625-11 x 1.2
6470FD08	10.750	.750-10 x 1.5	8.800	.625-11 x 1.2
8770FD08	11.750	.750-10 x 1.5	9.600	.625-11 x 1.2

♦ Drill and tap thru flange between existing holes.
 • Locate Puller Bolt Holes 90° from keyway except as noted by a (♦).

TABLE 8 — Type FDC Coupling Puller Bolt Holes)

SIZE	Falk Preferred (Std)			For API 610 (.375 Dia Min)		
	Max Bore	B. C. ★	Tap Size — UNC	Max Bore	B. C. ★	Tap Size — UNC
112FDC	.750	1.160	0.250-20 x 0.50	...	...	...
162FDC	1.375	1.840	0.250-20 x 0.50	1.000	1.660	0.375-16 x 0.75
187FDC	1.625	2.190	0.312-18 x 0.62	1.375	2.060	0.375-16 x 0.75
225FDC	2.125	2.690	0.312-18 x 0.62	1.875	2.560	0.375-16 x 0.75
262FDC	2.500	3.160	0.375-16 x 0.75	2.500	3.160	0.375-16 x 0.75
300FDC	3.000	3.690	0.375-16 x 0.75	3.000	3.690	0.375-16 x 0.75
350FDC	3.750	4.380	0.375-16 x 0.75	3.750	4.380	0.375-16 x 0.75
400FDC	4.250	5.000	0.437-14 x 0.88	4.250	5.000	0.437-14 x 0.88
450FDC	4.625	5.500	0.500-13 x 1.00	4.625	5.500	0.500-13 x 1.00
500FDC	5.250	6.090	0.500-13 x 1.00	5.250	6.090	0.500-13 x 1.00

★ Locate Puller Bolt Holes 90° from keyway.