

How To Use This Manual

This manual applies to standard Falk Types HFN10/20, HFD20 and HFDD20 couplings and is to be used in conjunction with Manual 458-110. Unless otherwise stated, information for Sizes 1420 thru 1760 applies to Sizes 420 thru 760 respectively, e.g. 1420 = 420, 1760 = 760, etc.

This manual provides detailed instructions on installation, maintenance and parts identification. Use the following Table of Contents to locate required information.

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

INTRODUCTION

Type HF couplings are designed for horizontal operation. Refer to Rexnord for coupling operation other than horizontal or for limited end float requirements.

Each fluid coupling is shipped from Rexnord with an angle finder (P/N 1224653). Simply place the angle finder on the filler plug boss and rotate the coupling to the required fill angle as instructed in the "Fill Fluid Coupling" section of these instructions.

Maximize Performance and 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 meets 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.

It is recommended that final alignment be checked using either an alignment computer or graphical analysis. Both methods allow the incorporation of "cold offsets", which will compensate for shaft position changes due to thermal growth.

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

WARNING: Opening of the drain plugs or filler plugs is not recommended. When opening the drain plug, filler plug, or metering orifice seal plug of a warm or hot fluid coupling is absolutely necessary, place a rag over the drain or filler plug hole and loosen the plug slowly to relieve any internal pressure.

CAUTION: Consult applicable local and national safety codes for proper guarding of rotating members. Guard must not restrict free flow of air, but the portion of the guard in line with

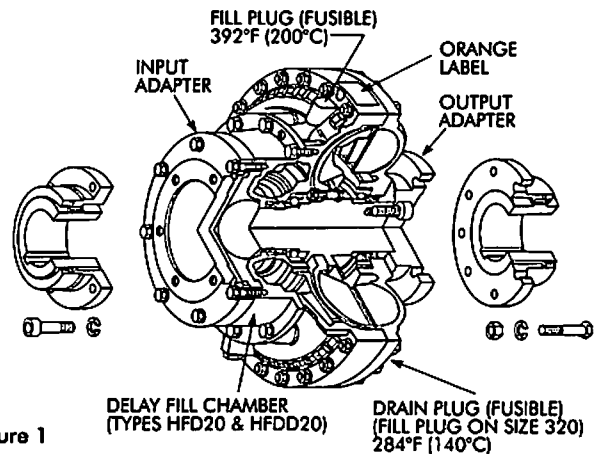


Figure 1

fusible plugs must be solid construction. Observe all safety rules when installing or servicing couplings.

CAUTION: DO NOT PAINT fluid coupling. Painting will reduce fluid coupling thermal heat dissipation characteristics.

CAUTION: No not spray water on a hot fluid coupling, as this may result in cracking of aluminum components.

IDENTIFICATION:

Coupling size and M.O. Number (Mfg Order Number) are stamped on the perimeter of the coupling. Where Falk has been provided application data (HP, speed, start factor, driven equipment), the coupling will also include an orange label on the perimeter, indicating the approximate fill quantity in fluid ounces, and the correct fill angle. Provide coupling size and M.O. number when ordering spare parts.

- HFN10 — Non-delay fill, shrouded bolt gear coupling (G10)
- HFN20 — Non-delay fill, exposed bolt gear coupling (G20)
- HFD20 — Standard delay fill chamber, exposed bolt gear coupling (G20)
- HFDD20 — Extended delay fill chamber, exposed bolt gear coupling (G20)

Keep Records for Future Reference

Future maintenance of the fluid coupling can be greatly simplified by keeping good records. It is strongly suggested that the Fluid Coupling Data Record, Table 7, be completed and stored in the maintenance files.

RECOMMENDED FLUIDS

The following specifications and fluids listed in Table 1 apply to Rexnord fluid couplings. Refer to the Factory for use of fire resistant fluids. NOTE: Fluids listed are typical products ONLY and should not be construed as exclusive recommendations.

ISO Viscosity Grade, Petroleum Oils (R & O) 46

ISO Viscosity Grade, Synthetic Oils 32

Viscosity at 104°F(40°C) — 46 cSt (215 SSU)

Viscosity Index — Equal to or greater than 95.

Pour Point — Must be 5°F(3°C) lower than minimum ambient starting temperature.

Flash Point — 400°F(204°C) when using 140°C and/or 180°C fusible plugs.

Flash Point — 425°F (218°C) when using 200°C fusible plugs at both fill and drain holes.

Specific Gravity — 0.87

Antioxidant and Anti-foaming Additives

TABLE 1 — Fluids & Operating Temperatures

| Petroleum Oils (R & O) For Ambient Temperatures 20°F to 125°F (-6°C to 52°C) | |
|--|----------------------------|
| Manufacturer | Fluid |
| Amoco Oil Company | American Industrial Oil 46 |
| BP Oil Company | HL-C46 |
| Chevron Products Company | Hydraulic Oil AW 46 |
| Exxon Company, USA | Teresstic 46 |
| Mobil Oil Corporation | Mobil Fluid 424 |
| Petro-Canada Products | Harmony 46 |
| Shell Oil Company | Turbo T 46 |
| Texaco Lubricants Company | Rando Oil HD 46 |
| 76 Lubricants Company | 76 Unax AW 46 |
| Petroleum Oils (R & O) For Ambient Temperatures -20°F to 125°F (-28°C to 52°C) | |
| Manufacturer | Fluid |
| Amoco Oil Company | American Industrial Oil 46 |
| Mobil Oil Corporation | Mobilfluid 424 |
| Synthetic Oils and Synthetic Transmission Fluids For Ambient Temperatures -40°F to 125°F (-40°C to 52°C) | |
| Manufacturer | Fluid |
| Conoco Incorporated | Syncon R&O 32 |
| Exxon Company, USA | Teresstic SHP 32 |
| Mobil Oil Corporation | SHC 624 |
| Texaco Lubricants Company | Pinnacle 32 |
| Mobil Oil Corp. | Synthetic ATF |
| Chevron | Synthetic All Weather THF |
| Citgo | Transgard Fluid 250 |
| Automatic Transmission Fluids (Dexron or Mercon Oils, etc.) For Ambient Temperatures -40°F to 125°F (-40°C to 52°C) | |
| NOTICE: Automatic Transmission Fluids below can only be used with two 140°C fusible plugs | |
| Manufacturer | Fluid |
| Mobil | Multi-purpose ATF |
| Texaco (Havoline) | Mercon/Dexron-III or ATF |
| Citgo | Transgard ATF, Type F |

ATF Type A and Type Dexron II, IID, IIE, III, Mercon M-891205 and M-921253

Annual Maintenance

Check shaft coupling alignment on a regular basis. Excessive misalignment will transfer damaging loads to the connected equipment and may cause failure.

An annual check of the coupling and fluid is recommended. For extreme or unusual operating conditions, or when the coupling is subjected to overheating, check the coupling and fluid more frequently. Overheated fluid which becomes dark in color and gives off a burnt odor, must be changed. Fluid suppliers can test coupling fluid samples periodically and recommend economical change periods based on the rate of degradation. Continuous operating temperature must not exceed 212°F (100°C). Check bolts for proper tightening torque.

Lifting

Remove two perimeter fasteners (metric) approximately 90° apart. Insert threaded rod (Table 3, Page 4) with washers and nuts, then sling coupling as shown in Figure 2.

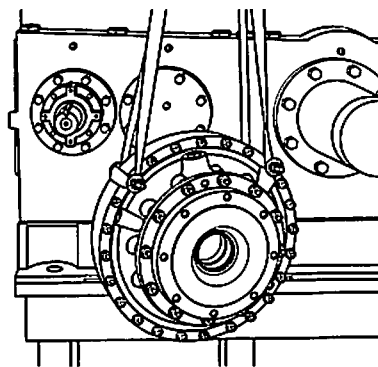


Figure 2

Key Installation Tips

- Do not exceed specified tightening torques for fusible plugs at fill and drain holes (Step 4D). Excessive tightening may strip aluminum threads.
- Mount the fluid coupling as shown in Figures 3 & 5, the output adapter side of the coupling must be connected to the driven equipment. Attaching the output adapter side of the fluid coupling to the driver (usually a motor) will result in degraded performance, or in some cases inadequate performance.
- Mount gear coupling sleeves before mounting gear coupling hubs.
- Carefully follow the instructions in this manual.

INSTALLATION

Only standard mechanics tools, torque wrenches, feeler gauges, straight edges and a bevel protractor with spirit level or angle finder (P/N 1224653) are required to install Rexnord fluid couplings.

INTERFERENCE FIT HUBS — Unless otherwise specified, Falk Gear Couplings are furnished for an interference fit without set screw. Heat hubs to a maximum 275°F (135°C) using an oven, torch, induction heater or an oil bath.

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.

CLEARANCE FIT HUBS — Clean all parts using a non-flammable solvent. Check hubs, shafts and keyways for burrs. Do not heat clearance fit hubs. Install keys, mount hubs with flange face flush with shaft ends or as otherwise specified and tighten set screws.

1. Install Type G Shaft Coupling

- Lock out starting switch of prime mover.
- Determine required distance between shaft ends (BE) by accurately measuring distance "K" as shown in Figure 3 and adding to that value the appropriate addition: Type G, Sizes 1010, 1025 and 1030 add .060" (1,52 mm); Sizes 1015 and 1020 add .020" (0,501 mm); Sizes 1035 and 1040 add .120" (3,05 mm); Sizes 1045 and 1050 add .180" (4,57 mm).

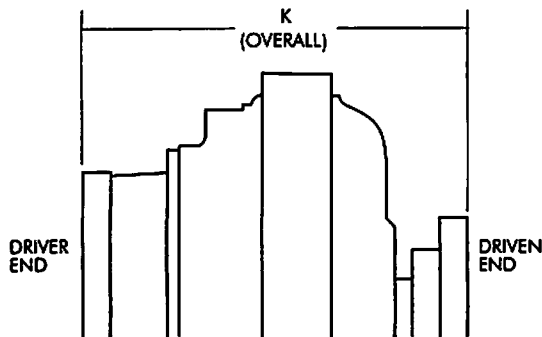


Figure 3

- Install and align the Type G gear coupling sleeves and hubs per Manual 458-110. Refer to alignment instructions for couplings with spacer or short floating shaft/and with flex hubs on driver & driven shaft extensions. Figure 4 herein also shows a method of mounting a dial indicator to perform an alignment check.

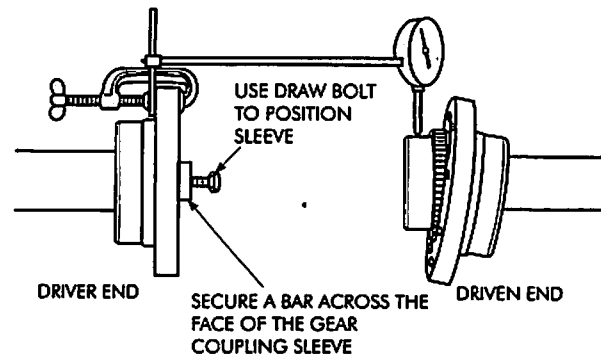


Figure 4
NOTE: ROTATE DRIVER SHAFT BY HAND TO CHECK OFFSET AND ANGULAR ALIGNMENT

2. Install Type HF Fluid Coupling

- The fluid coupling is shipped with input and output adapters assembled as shown in Figure 1, Page 1. NOTE: Size 185 does not require input adapter as gear coupling sleeve is fastened directly to the fluid coupling.
- Check Type G coupling gasket fit in HF adapter flange register. Trim gasket outside diameter if required.
- Position Type G coupling gaskets on sleeve flange faces.
- Lubricate each Type G coupling half per instructions in Manual 458-110.
- Position fluid coupling assembly between Type G hubs as close to the centerline as possible, Figure 5.

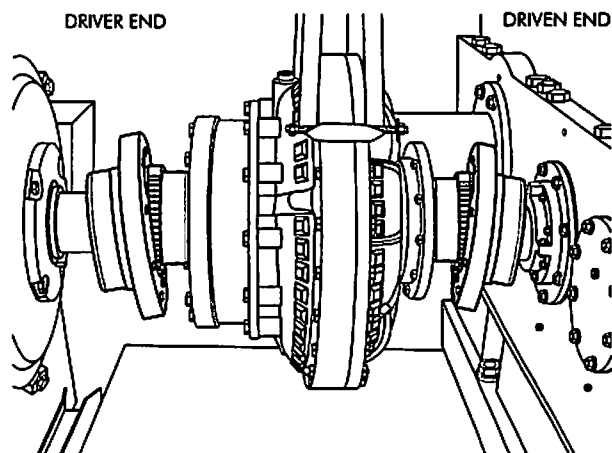


Figure 5

- Insert elastomer gap discs in counter bores of input and output adapters, (not required for Size 1010G).

- G. Align the holes of Type G coupling sleeves and gaskets with the holes in fluid coupling and/or adapters and insert fasteners on output side first. Tighten all fasteners to torque specified in Table 2.

- B. Use either an angle finder or a bevel protractor with spirit level set for the required fill angle, and place it on flat boss of filler hole as shown in Figure 6.

TABLE 2 — Type G Flange Fastener Tightening Torques

| Gear Cplg Size | 1010 | 1015 | 1020 | 1025 | 1030 | 1035 | 1040 | 1045 | 1050 |
|------------------------------|----------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Gear Cplg Type | G10 | G20 | G10 | G20 | G20 | G10 | G20 | G20 | G20 |
| Tightening Torque lb-ft (Nm) | 9 (12,2) | 9 (12,2) | 31 (42,04) | 31 (42,04) | 75 (101,7) | 75 (101,7) | 150 (203,4) | 150 (203,4) | 250 (339,0) |

CAUTION: Type G coupling sleeves must be properly seated in fluid coupling registers.

- H. Reinstall perimeter fasteners and washers that were used for lifting. Tighten to torque specified in Table 3.

TABLE 3 — Type HF Perimeter Fastener Size & Tightening Torques/Threaded Rod Diameter

| Coupling Size | 185 | 235 | 270 | 320 | 370 | 1420 | 1480 | 1584 | 1660 | 1760 | 1870 |
|----------------------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------|------------|------------|-------------|-------------|
| Torque lb-ft (Nm) | 6 (8,1) | 6 (8,1) | 15 (20,3) | 15 (20,3) | 33 (44,7) | 33 (44,7) | 33 (44,7) | 88 (119,3) | 88 (119,3) | 140 (189,8) | 279 (379,3) |
| Size (mm) | M6 x 55 | M6 x 70 | M8 x 65 | M8 x 65 | M10 x 80 | M10 x 80 | M10 x 80 | M14 x 100 | M14 x 120 | M16 x 160 | M20 x 180 |
| Threaded Rod — Dia-in (mm) | .188 (4,78) | .250 (6,35) | .375 (9,53) | .500 (12,7) | .625 (15,88) | .750 (19,05) | | | | | |

3. Fill Fluid Coupling.

- A. Rotate fluid coupling until fill plug is on top and remove the fill plug. (Both fill and drain plugs have metric threads). See Figure 1, Page 1. (NOTE: Coupling can be filled through either fill or drain holes except for Size 320.)

- B. Fill with the required amount of fluid. Fill information is found on the orange label that is affixed to the coupling perimeter. Where no orange label is present, refer to fluid coupling Selection Guide 521-110 for fill data. Fluid must meet the specifications listed in Table 1.

Do not remove orange fluid fill label that is affixed to the coupling perimeter. In cases where no orange label is affixed, a blank label is furnished. Fill out the blank orange label once proper fill data has been determined, then affix that label to the coupling.

- C. Before reinstalling fill plug, check fill angle as described in the following step. Also, heed fill plug tightening instructions, Step 4D.

4. Check Fill Angle.

- A. Refer to fluid fill label described in previous step for required fill angle.

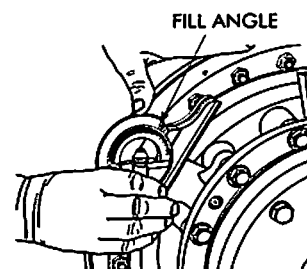


Figure 6

- C. Slowly rotate fluid coupling until the required fill angle is achieved, Figure 7. Fluid must appear at the lip of the hole. Add or drain fluid until level is correct. Figure 8 shows fill angle examples.

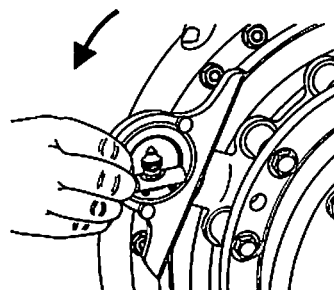


Figure 7

- D. Reinstall fill plug with seal ring and tighten to required torque: Sizes 185-270, 22 lb-ft (29,83 Nm); Sizes 320-1660, 33 lb-ft (44,75 Nm); Sizes 1760 and 1870, 59 lb-ft (80,00 Nm). DO NOT EXCEED SPECIFIED TIGHTENING TORQUE, as aluminum threads may strip.

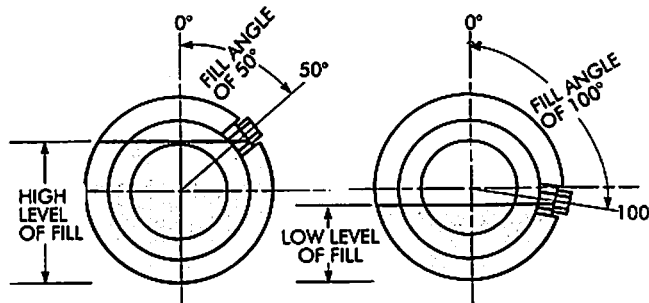


Figure 8

5. Orifice Plugs (Sizes 1420-1870, Types HFD & HFDD only).

The 1000 Series fluid couplings contain 3 orifice plugs (metric threaded) located near the outer part of the casing. They are located behind three metric hex socket seal plugs (see Figure 9). The function of these orifice plugs is to meter the fluid exiting from the delay fill chamber into the working circuit of the fluid coupling. These plugs are initially furnished with a 2.5mm hole (Sizes 1420-1660HF) and 3.5mm on the Size 1760HF, which results in acceptable starting times for most applications. Should your application require increased or reduced starting times, refer to Table 4 for other orifice hole sizes and their estimated effect on starting time. These estimates are based on the change in flow rate for the fluid to exit the delay fill chamber. Sizes 1420-1870HF are furnished with a spare set of orifice plugs (undrilled).

CAUTION: Increasing the starting time can result in overheating the fluid coupling and blowing the fusible plugs.

Refer to Table 5 for orifice, seal plug sizes, tightening torques, and required metric hex "Allen" wrench sizes. Apply anti-seize compound to the orifice plugs prior to their assembly. This will assist in the event of future removal. Typical compounds (or equal) are as follows:

Loctite Anti-Seize Thread compound #767

Dow Corning 1000 High Temperature Anti-Seize Paste

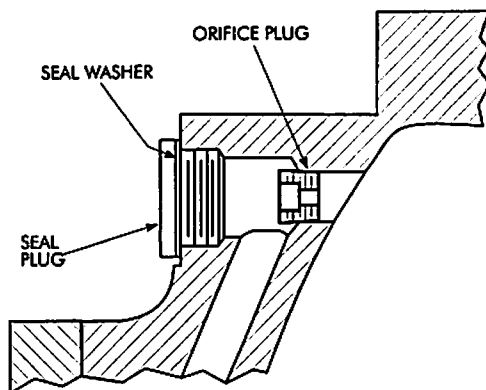


Figure 9

TABLE 4 — Fluid Coupling Starting Times

| Orifice Hole Diameter | Estimated Starting Time - % of Original | |
|-----------------------|---|--------|
| | 1420HF - 1660HF | 1760HF |
| 3/64" (0.0469) | 440 | 860 |
| 1/16" (0.0625) | 250 | 490 |
| 5/64" (0.0781) | 160 | 310 |
| 3/32" (0.0937) | 110 | 220 |
| 2.5mm (0.0984) | 100 | 200 |
| 7/64" (0.1094) | 80 | 160 |
| 1/8" (0.1250) | 60 | 120 |
| 3.5mm (0.1380) | 50 | 100 |
| 5/32" (0.1562) | 40 | 80 |
| 3/16" (0.1875) | 30 | 50 |

TABLE 5 — Orifice & Seal Plug Sizes – mm

| CPLG SIZE | Orifice Plug DIN906 | | | Seal Plug DIN908 | | | Seal Washer DIN7603 Type "A" Copper |
|-----------|-----------------------------|-------------|--------------|-----------------------------|-------------|--------------|-------------------------------------|
| | Tightening Torque ft-lb(Nm) | Thread Size | Hex Key Size | Tightening Torque ft-lb(Nm) | Thread Size | Hex Key Size | |
| 1420 | 7(9,49) | 1/8R BSPT | 5 mm | 33(44,75) | 18 x 1.5 mm | 8 mm | 18 x 22 x 1.5 mm |
| 1480 | 11(14,92) | 1/4R BSPT | 7 mm | 33(44,75) | 18 x 1.5 mm | 8 mm | 18 x 22 x 1.5 mm |
| 1584 | 15(20,34) | 3/8R BSPT | 8 mm | 59(80,00) | 22 x 1.5 mm | 10 mm | 22 x 27 x 1.5 mm |
| 1660 | 15(20,34) | 3/8R BSPT | 8 mm | 59(80,00) | 22 x 1.5 mm | 10 mm | 22 x 27 x 1.5 mm |
| 1760 | 29(39,32) | 1/2R BSPT | 10 mm | 74(100,34) | 27 x 2.0 mm | 12 mm | 27 x 32 x 2.0 mm |

6. Fusible Plugs

- A. Fusible plugs in the fill or drain holes have solder cores that melt at the temperatures shown in Figure 1, Page 1. One extra 284°F(140°C) plug is furnished with each coupling.
- B. If solder in fusible plug melts due to overheating from stalling or overloading, refer to Table 6 and correct the cause of overheating.

CAUTION: DO NOT replace fusible plugs with solid plugs. Use of solid plugs can result in coupling failure from overheating unless used in conjunction with a proximity sensor cutout switch. Refer to the Factory for recommendation.

- C. Refill coupling with clean fluid as instructed in Steps 3 & 4, Page 4.
- D. Replace fusible plugs as instructed in Step 4D. DO NOT EXCEED SPECIFIED TIGHTENING TORQUES, as aluminum threads may strip.

TABLE 6 — Startup & Trouble Shooting

| Problem | Possible Cause | Solution |
|---|---|---|
| Driven shaft fails to reach specified speed. | Drive motor defective or incorrectly connected. | Check motor connection, speed, amperage draw and power draw. |
| | Driven machine jammed. | Check driven machine and remove jam. |
| | Power consumption exceeds coupling capacity at specified fill angle. | ■ |
| | Coupling over or under filled. | Re-check fill angle per Step 4. |
| | Coupling leaking. | Correct source of leakage and re-check fill angle per Step 4. |
| | Orifice Plugs (Sizes 1420-1870, Types HFD & HFDD only) - Orifice plug hole plugged. | Clean orifice plug hole or use larger hole. |
| Fusible plugs melt. | Coupling under filled. | Re-check fill angle per Step 4. |
| | Orifice Plugs (Sizes 1420-1870, Types HFD & HFDD only) - Orifice plug hole too small or plugged | Enlarge orifice hole size (See Table 4 for estimated start time reduction) or clean plugged holes |
| | Coupling leaking. | Correct source of leakage and re-check fill angle per Step 4. |
| | Driven machine jammed. | Check driven machine and remove jam. |
| | Power consumption exceeds coupling capacity at specified fill angle. | ■ |
| Coupling vibration exceeds acceptable limits. | Incorrect shaft coupling alignment. | Re-align per instructions in shaft coupling service manual. |
| | Incorrect shaft coupling alignment due to thermal growth. | Check "HOT" alignment and adjust to compensate for thermal growth. |
| | Worn shaft coupling parts. | Correct cause of wear and replace worn parts. |
| | Loose foundation, shaft coupling or adapter fasteners. | Check and tighten fasteners accordingly. |
| | Damaged fluid coupling bearing. | Return fluid coupling to Falk for bearing replacement. |

■ Increase fluid fill by decreasing fill angle in 5° increments to a minimum of 50°. If driven shaft still does not reach specified speed, refer to the Factory.

TABLE 7 — Fluid Coupling Data Record

| | |
|--|---|
| Equipment Identification | |
| Motor/Brake Hp | @ Input RPM |
| Fluid Coupling Size | |
| Fill Angle | Degrees. Fill Volume Fl. Oz. |
| Fluid Used (Mfg & Fluid Designation) | |
| Falk Master Order Number | Date Installed |