

## How to Use This Manual

For HFD25 & HFDD25 (Sizes 370, & 1420 thru 1760 and 2760), use this manual in conjunction with Disc Coupling manual 478-210.

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

Falk Type HF fluid couplings are designed for horizontal operation. Falk disc couplings provide limited end float, without mechanical stops, for most applications where a limited end float coupling is required. Refer to Factory for coupling operation other than horizontal or for restricted 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 & 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.

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 drain plugs, filler plugs or metering orifice seal plugs of a fluid coupling should be done after the coupling has cooled down. When opening the plugs of a warm or hot fluid coupling is absolutely necessary, place a rag over the plug/plug hole, and loosen the plug slowly to relieve any internal pressure.

**WARNING:** Consult applicable local and national safety codes for proper guarding of rotating members. Guard must

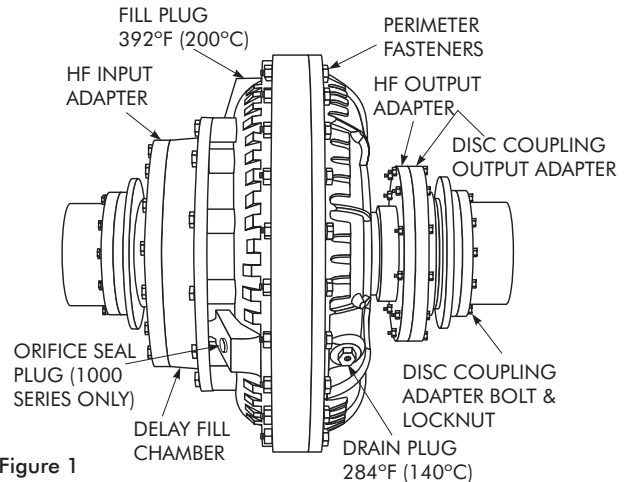


Figure 1

not restrict free flow of air, but the portion of the guard in line with 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:** DO 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 Rexnord 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.

Disc Coupling — Refer to disc coupling service manual, 478-210.

Fluid Coupling — Size and Type are stamped on coupling perimeter. Refer to the Factory for replacement parts.

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

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

### Annual Maintenance

1. Check shaft coupling alignment on a regular basis. Excessive misalignment will transfer damaging loads to the connected equipment and may cause failure.
2. 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).
3. Check outer blades of discpacks near bushings for fatigue cracks. Discpacks can be checked while coupling is in operation by using a strobe light. Replace cracked discpacks per disc coupling service manual and recheck alignment. A slight bowing or "S" like distortion is normal.
4. Check tightening torques of all drive bolts.

**TABLE 2 — Type HF Perimeter Fastener Size & Tightening Torques/Threaded Rod Diameter**

COUPLING SIZE	370	1420	1480	1584	1660	1760 2760
Torque lb-ft	33	33	33	88	81	140
Size (mm)	M10 x 80	M10 x 80	M10 x 80	M14 x 100	M14 x 120	M16 x 160
Threaded Rod — Dia-in	.375		.500		.625	

### Lifting

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

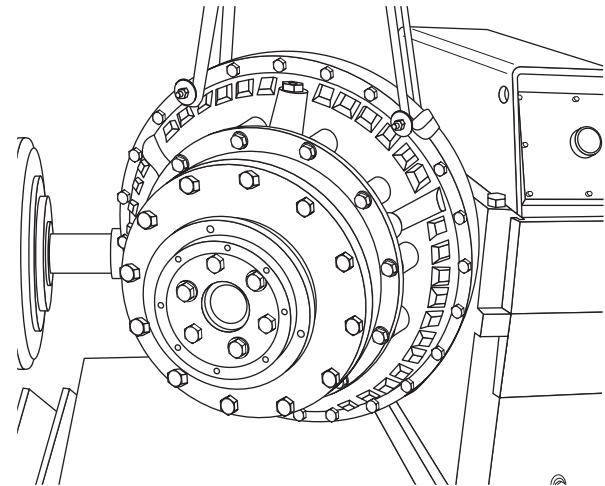


Figure 2

### 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 Figure 4, 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.
- After initial installation, store clamping bolts so they are available if the fluid coupling should need to be removed.
- 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 Falk fluid couplings.

The discpack drive bolts have been Factory tightened to the required elongation indicated in Manual 478-210.

**INTERFERENCE FIT HUBS** — Unless otherwise specified, Falk disc 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, as well as a rose bud tip. 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 end or as otherwise specified and tighten set screws.

### 1. Install Type FD Shaft Hubs (A-Hubs)

- A. Lock out starting switch of prime mover.
- B. Determine required distance between shaft ends (BE) from Table 3.
- C. Install Type FD shaft hubs (A-Hubs) on the driving shaft and driven shaft, and align the disc coupling A-Hubs per instructions found in the disc coupling service manual.

**TABLE 3 — Disc Coupling Clamp Bolt Size**

FLUID COUPLING SIZE	DISC COUPLING SIZE	BE		Disc Coupling Adapter Bolt Tightening Torque lb-ft	Clamping Bolt No.— Size (Grade 5 or Better) See Figure 3
		HFD25	HFDD25		
<b>370</b>	190	15.60	16.98	12	(6) .3125-18UNC x 1.375 ★
<b>1420</b>	190	17.12	20.23	12	(6) .3125-18UNC x 1.375 ★
<b>1480</b>	340	19.50	22.92	25	(6) .3750-20UNC x 1.750 †
<b>1584</b>	625	22.18	26.00	43	(6) .3125-18UNC x 2.000 †
<b>1660</b>	1080	25.25	29.58	103	(6) .3750-16UNC x 2.250 †
<b>1760/2760</b>	1700	28.88	33.72	103	(6) .3750-16UNC x 2.500 †

★ Socket head cap screws.

† Hex head cap screws.

### 2. Install Type HFD25 or HFDD25 Fluid Coupling

- A. The fluid coupling is shipped with input and output adapters, discpacks and coupling adapters assembled as shown in Figure 1, Page 1.
- B. Remove clamping bolts and plastic spacer tubes on both ends between coupling adapter and input/output adapter, see Figure 3a. Properly discard spacer tubes while keeping the clamping bolts for use in the following steps. See Table 3 for clamping bolt size and number.

**CAUTION:** Plastic spacer tubes must be removed from coupling at time of installation.

- C. Re-insert clamping bolts on both ends between coupling adapter and input/output adapter as shown in Fig. 3b.

- D. Evenly tighten bolts 1 1/2 turns from “Finger Tight” to compress discpacks. **DO NOT OVER TIGHTEN.** Discpacks are now modestly compressed to aid the subsequent assembly process.

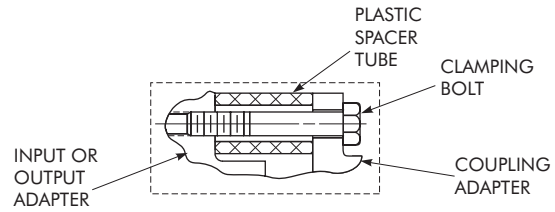


Figure 3a

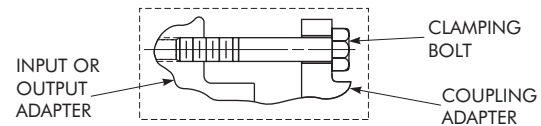


Figure 3b

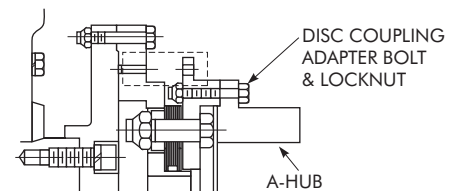


Figure 3c

- E. Position fluid coupling assembly between disc coupling hubs as close to the centerline as possible, Figure 4.
- F. With fluid coupling suspended from the sling, align the holes of the disc coupling A-Hubs with the holes in the adapters, and insert the adapter bolts on both sides (Figure 3c).
- G. Slowly remove clamping bolts between coupling adapters and input/output adapters to decompress the discpacks. Make sure disc coupling A-Hubs are properly seated in adapter registers (see Figure 3c). Store clamping bolts so they are available if the fluid coupling should need to be removed.

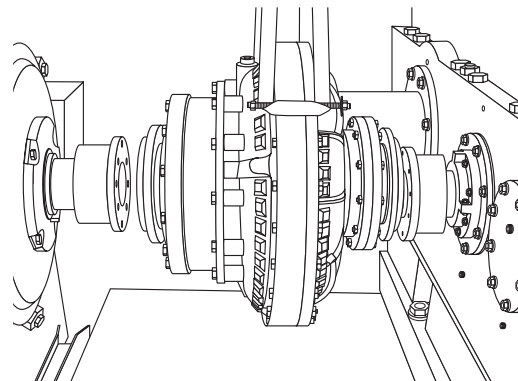


Figure 4

- H. Install locknuts and tighten bolts/locknuts on output side first according to the required adapter bolt tightening torque specified in Table 3. Repeat for input side.

**CAUTION:** Clamping bolts must be removed from coupling before operation.

- I. Reinstall perimeter fasteners and washers. Tighten to torque specified in Table 2, Page 2
- J. Recheck final alignment per disc coupling service manual.

**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 the fill or the drain plugs.
- 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 date 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.
- 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 5.
- C. Slowly rotate fluid coupling until the required fill angle is achieved, Figure 6. Fluid must appear at the lip of the hole. Add or drain fluid until level is correct. Figure 7 shows fill angle examples.
- D. Reinstall fill plug with seal ring and tighten to require torque: Sizes 370-1660, 33 lb-ft (44.75 Nm); Sizes 1760/2760, 59lb-ft (80.00 Nm). **DO NOT EXCEED SPECIFIED TIGHTENING TORQUE**, as aluminum threads may strip.

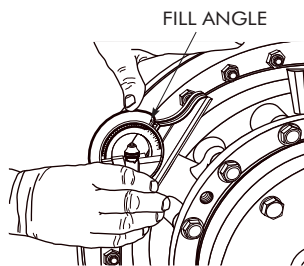


Figure 5

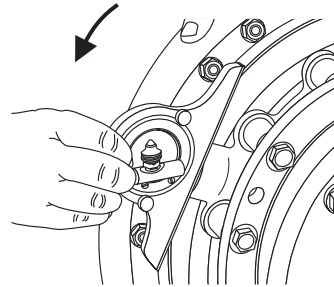


Figure 6

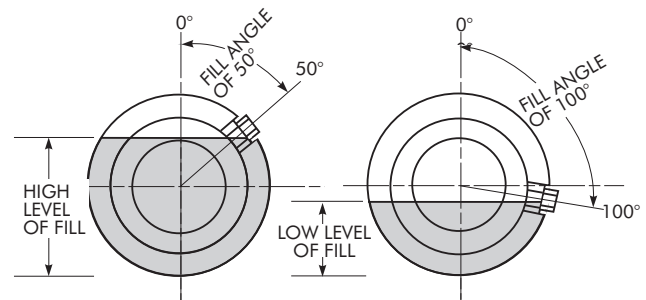


Figure 7

**5. Orifice Plugs (Sizes 1420 through 1760 and 2760 , 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 8). 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 Sizes 1760 and 2760, which results in acceptable starting times for most applications. Should the 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. Couplings 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 plugs 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

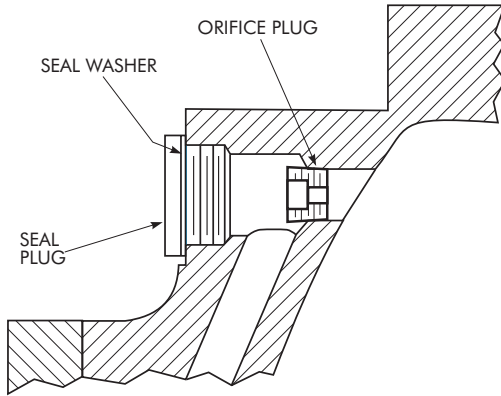


Figure 8

**TABLE 4 — Fluid Coupling Starting Times**

Orifice Hole Diameter	Estimated Starting Time – % of Original	
	1420HF – 1660HF	1760HF/2760HF
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 DIN 906		Seal Plug DIN 908		Seal Washer DIN 7603 Type "A" Copper
	Thread Size	Hex Key Size	Thread Size	Hex Key Size	
1420	1/8R BSPT	5 mm	18 x 1.5 mm	10 mm	18 x 22 x 1.5 mm
1480	1/4R BSPT	6 mm	18 x 1.5 mm	10 mm	18 x 22 x 1.5 mm
1584	3/8R BSPT	8 mm	22 x 1.5 mm	12 mm	22 x 27 x 1.5 mm
1660	3/8R BSPT	8 mm	22 x 1.5 mm	12 mm	22 x 27 x 1.5 mm
1760/2760	1/2R BSPT	10 mm	27 x 2.0 mm	17 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, Page 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 thermal trip switch. Refer to the Factory for thermal trip switch feature.**
- C. Replace fusible plug as instructed in Step 4D.
- D. Refill coupling with clean fluid as instructed in Steps 3 and 4.



**TABLE 6 — Startup & Trouble Shooting**

Problem	Possible Cause	Solution
<b>Driven shaft fails to reach specified speed.</b>	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.
	Size 1420HFD, HFDD, and larger – Orifice plug hole plugged.	Clean orifice plug hole or use larger hole.
<b>Fusible plugs melt.</b>	Coupling under filled.	Re-check fill angle per Step 4.
	Size 1420HFD, HFDD, and larger – 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.	★
<b>Coupling vibration exceeds acceptable limits.</b>	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 Factory for bearing replacement.

★ Increase fluid fill by decreasing fill angle in 5° increments to a minimum of 50° for HFD or 60° for HFDD. If drive shaft still does not reach specified speed, refer to the Factory.

**TABLE 7 — Fluid Coupling Data Record**

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Equipment Identification . . . . .

Motor/Brake Hp . . . . . @ . . . . . Input RPM . . . . .

Fluid Coupling Size . . . . .

Fill Angle . . . . . Degrees.                      Fill Volume . . . . . Fl. Oz.

Fluid Used (Mfg & Fluid Designation) . . . . .

Falk M.O. Number . . . . . Date Installed . . . . .

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