

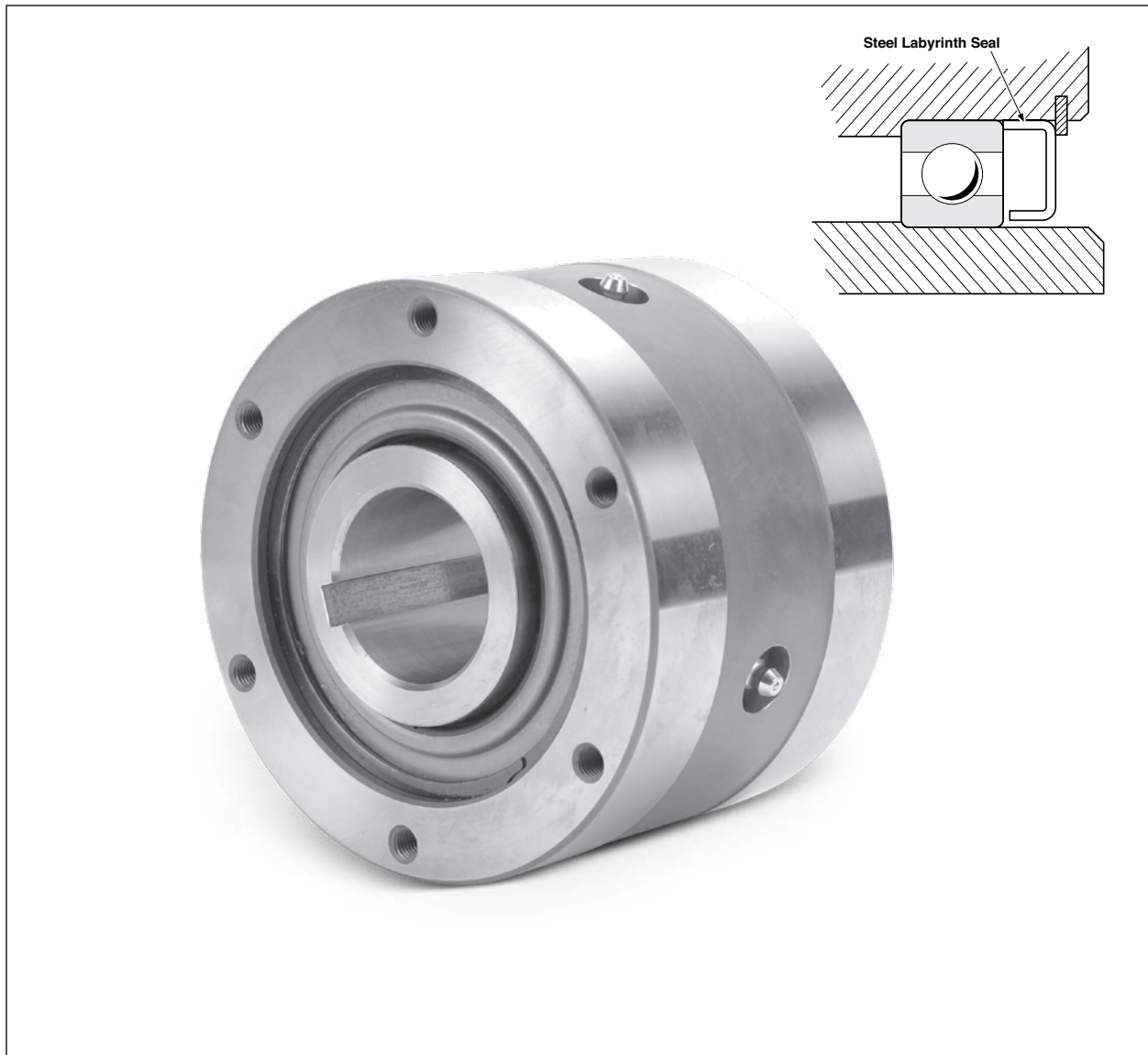
# Models FSO-500, 600, 700, 750 and 800

For Ski Lift Backstop Applications with Steel Labyrinth Seals

P-222-24

BULLETIN A-3040

Service & Installation Instructions



## Introduction

The FSO-500, 600, 700, 750 and 800 clutches feature Formchrome® sprags and Formsprag's exclusive "Free-Action" Retainer for long life and instant engagement.

- Formsprag clutches mount on a through-shaft with the inner race driven by a key.
- The outer race is designed as a mounting surface for the customer's torque arm.

## Pre-installation Check

Before installing, check:

1. Shaft to Bore fit:

Clutch Bore Diameter	Recommended Shaft/Bore Fit*
up to 2 in.	line to .0015 in loose
2 to 4.5 in.	line to .002 in loose

\*If a press fit is necessary under special circumstances, do not exceed .001 in. tight.

In some cases, builders of equipment in which a Formsprag backstop is used specify other shaft fit limits than those listed. In this event, direct questions concerning fit limits to the equipment manufacturer.

2. Key and keyseat

Hardness: Use a hardened key from 30 to 40 Rockwell "C" scale. Use material AISI 1141, 1045 or 4130.

Fit: Break edges of the key before installing to prevent any load bearing at these points. Install with a push fit. Be sure the key seats squarely. **Do not use a force fit.**

Length: The key must be equal to the length of the inner race for proper engagement.

3. Rotation

Check the clutch for the proper rotation in each application. Turn the inner race to check overrunning direction.

## Typical Backstop Installation for Ski Lift Drive

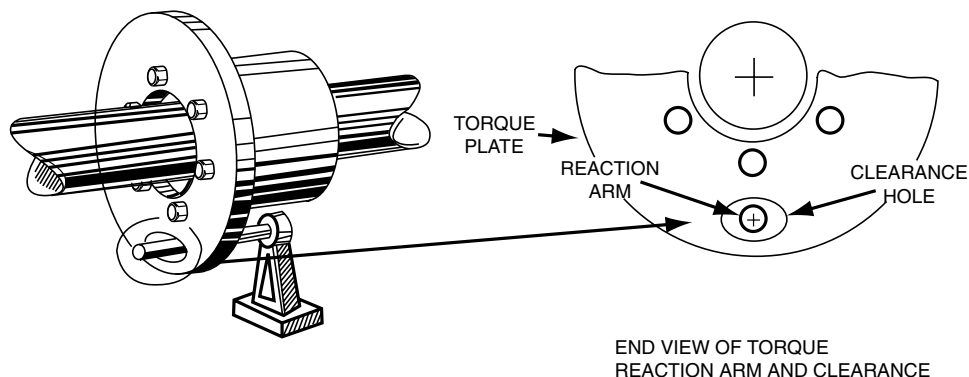


Figure 1

4. For vertical shaft mounted applications, contact Formsprag Clutch prior to installation.

## Installation

1. Mount the clutch and key on the shaft.
2. **Apply pressure to end face of the clutch inner race only.**

Application of pressure to the outer race could preload the bearings excessively causing permanent damage.

3. Secure the clutch in position on the shaft.

**Use a lock washer and nut, a flat washer fastened to the shaft end with a screw, snap rings, collars, etc. to keep the clutch in position on the shaft.**

4. Mount the torque plate onto the clutch outer race as required by the application. Tapped mounting holes are provided in each end of the outer race for mounting purposes.

1. All fasteners are recommended to be grade 8 bolts.

**Note:** The FSO-500 and 600 clutch outer races have 5/16" - 24 N.F. threaded holes with 5/8" effective thread length to mount attaching parts.

**The FSO-700 clutch outer race has 3/8" - 24 N.F. threaded holes with 3/4" effective thread length to mount attaching parts.**

**The FSO-750 and 800 clutch outer races have 1/2" - 20 N.F. threaded holes with 1.0" effective thread length to mount attaching parts.**

**Note:** For the FSO-700 clutch six (6) hardened mounting screws are adequate for torque loads up to 3,000 lb.-ft. Use eight (8) hardened mounting screws for torque loads above this value.

**Note:** Allow .25 to .50 inch circumferential clearance between the torque plate and torque reaction arm. (see Figure 1).

**Minimum torque reaction arm diameter is 0.75 inches for the FSO-500 and 600 clutch and 1.0 inches for the FSO-700 and 750 clutch. For FSO-800 and larger, contact Formsprag Clutch.**

Avoid excessive over-hung loads. Check with Formsprag if the clutch must support large loads during the overrunning cycle of the operation.

5. All Formsprag clutches are lubricated before leaving the factory. However, check the clutch for proper lubrication before installation. Add grease if required.
6. Check for proper installation by overrunning (free-wheeling) the clutch by hand.

## Lubrication

Proper lubrication and lubricant maintenance are the most important maintenance factors for long, effective, trouble-free clutch operation. Read the following instructions and follow them carefully for maximum performance and utilization of Formsprag overrunning clutches.

For oil lubricated clutches refer to Bulletin 2219.

## Grease Lubrication

Use greases selected from the following table:

- Fiske Bros. Aero Lubriplate
- Shell Aeroshell No. 7
- Shell Aeroshell No. 16

**Important: Do not mix the above greases, they are not compatible. When switching from one brand to another, pump a sufficient amount of grease into the clutch to insure that all the previous grease has been purged out.**

**The use of grease lubricated clutches in low temperature applications require that the clutch must be overrun 15 minutes before any torque load is applied to the clutch.**

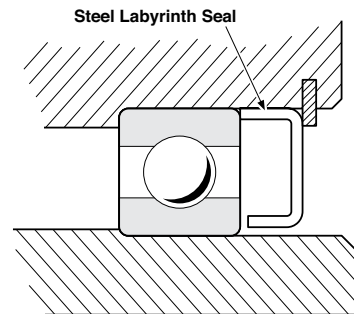
- Use no other greases unless a specific recommendation has been made by Formsprag.
- Do not attempt to substitute grease lubrication in a standard oil lubricated clutch. The use of grease lubrication is a clutch intended for oil could cause a malfunction.
- Formsprag can convert in-service clutches from oil to grease lubrication. Changes in internal construction are usually required. Consult Formsprag

Service Department, giving complete model number.

**⚠ WARNING** The use of lubricants in clutch assemblies, other than those shown, can result in improper sprag engagement. Improper sprag engagement may cause personal injury or property damage.

Formsprag is not responsible for any changes made by the manufacturers in their lubricants.

The use of any lubricants, other than those listed in this bulletin, will automatically void any warranty.



## Grease Lubrication Maintenance

1. The clutch should be fully purged with new grease at each of the grease fittings, prior to the opening of the ski lift season.
2. The clutch should be relubricated every 3 months during the ski lift operation season.
3. At the end of the ski lift operating season, the clutch should be fully purged with new grease at each grease fitting to prevent condensation and corrosion of the internal clutch surfaces.
4. After each relubrication, the clutch should be overrun for 5 minutes to properly distribute the grease.

## Grease Lubrication Procedure

### Use Recommended Greases Only

1. Relubrication should be done with the clutch at normal operating temperature.
2. Wipe all the grease fittings clean. Pump new grease into all fittings until clean new grease flows out completely around the seals on both sides of the clutch.
3. After each relubrication, the clutch should be overrun for 5 minutes to properly distribute the grease.

**Note:** It is normal for a clutch to leak or sling grease from around the seals for a short period of time (approximately 1/2 to 1 hour) during operation after relubrication.

## Packaging

Your Formsprag clutch is carefully wrapped in Vapor Inhibitor type activated paper for corrosion protection and packed in a shipping box conforming to the requirements of Rule 41, Uniform Freight Classification. It may be stored for up to two (2) years and reshipped without added packaging. To store in an unprotected area, or if the original package is opened, wrap the box with a waterproof covering.

## Clutch Rebuilding Service

**Disassembly and repair of formsprag clutches in the field is not recommended.** Formsprag clutches are precision devices manufactured under careful controls to meet exacting standards. When reconditioning is required, clutches should be returned to Formsprag (Purchase Orders must go directly through your local Warner Electric Distributor or through the Original Equipment Manufacturer).

**Note:** It is recommended that after six (6) years, or eight thousand (8000) hours, whichever comes first, of ski lift operation, the clutch be replaced and returned to Formsprag Clutch for inspection and possible factory reconditioning. Return the clutch to the nearest distributor for handling and mark on all paperwork that the clutch is used on a ski lift operation. This clutch will be inspected and factory reconditioned at the nominal charge.

These instructions cannot cover all details or variations in equipment and applications nor provide for every possible contingency which may be met in installation, operation or maintenance. Should further information be needed, contact Formsprag Clutch.

## Rotation Equipment

Rotating equipment is potentially dangerous and should be properly guarded. The user should check for all applicable safety codes in his area and provide a suitable guard.

For additional technical and dimensional information on FS/FSO clutches refer to Formsprag Overrunning Clutch Catalog P-956 or web site [www.fromsprag.com](http://www.fromsprag.com).

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## Warranty

Formsprag Clutch LLC warrants that it will repair or replace (whichever in its sole discretion it deems advisable) any product it manufactured and sold which proves to be defective in material or workmanship within a period of one (1) year from date of original purchase for consumer, commercial or industrial use. This warranty extends only to the original purchaser and is not transferable or assignable without Formsprag LLC's prior consent.

This warranty covers normal use and does not cover damage or defect which results from alterations, accident, neglect, disassembly, or improper installation, operation, or maintenance.

Formsprag LLC's obligation under this warranty is limited to the repair or replacement of the defective product. In no event shall Formsprag LLC be liable for consequential, indirect or incidental damages of any kind incurred by reason of manufacture, sale or use of any defective product. Formsprag LLC neither assumes nor authorizes any other person to give any other warranty or to assume any other obligation or liability on its behalf.



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