

**BULLETIN 2212**

**P-222-5**

**Installation Instructions**

**HPO Outer Race  
Overrunning Clutches**

**Models HPO 720  
thru 1027**



*An Altra Industrial Motion Company*

The HPO model high performance overrunning clutches are especially designed for high speed, Outer Race overrunning applications. They feature Formchome® sprags and special retainers for maximum service, life and speed capability. HPO clutches are grease lubricated and use steel labyrinth seals.

- Formsprag HPO clutches mount on a through-shaft with the inner race driven by a key.
- The O.D. of the outer race is designed as a mounting surface, or pilot, for attaching the driven member.
- The O.D. of the outer race is ground to control concentricity to the bore, and provides for proper alignment during installation.

### Pre-installation Check

Before installing check:

#### 1. Shaft to Bore fit:

Clutch Bore	Shaft Fit Guide*
to 2 inches dia.	Line fit to .002 inches loose
2 to 4 inches dia.	Line fit to .0025 inches loose
4 to 7 inches dia.	Line fit to .003 inches loose

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

In some cases, builders of equipment in which a Formsprag clutch 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 materials AISI 1141, 1045 or 4130.

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

**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 force fit.**

#### 3. Rotation

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

4. For vertical shaft mounted applications, contact Formsprag 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 load the bearings excessively causing permanent damage. To simplify mounting if a .001 inch tight fit is required, place a heat lamp inside the bore of the inner race for 1/2 hour before mounting. Care should be taken to insure that the bore of the inner race does not exceed 200°F (93°C).

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.

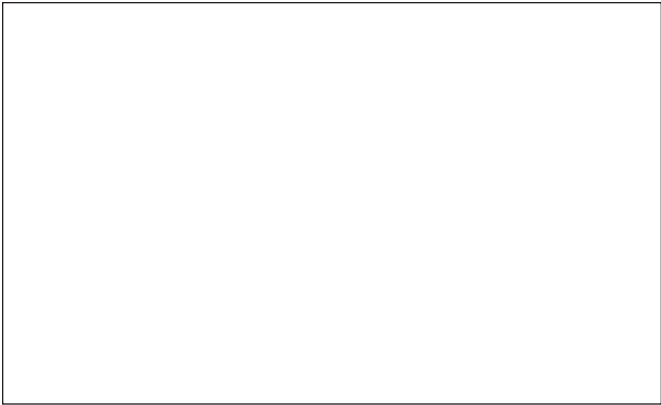
4. Mount attaching parts to the clutch outer race as required by the application.

Tapped mounting holes are provided in each end of the outer race. Center the gear, pulley or sheave on the outer race. Avoid excessive over-hung loads.

Check with Formsprag if the clutch must support large side loads during overrunning cycle of 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 (freewheeling) the clutch by hand.

**Note:** Flange stub shaft adapters, available from your Warner Electric Distributor or from Formsprag, are available to simplify the mounting of bored components such as couplings. Secure the adapter to the end face of the clutch with cap screws furnished with the adapter. A typical mounting is shown in the figure.



**Lubrication**

Proper lubrication and lubricant maintenance are the most important single 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.

**Grease Lubrication**

Use greases selected from the following table:

- Fiske Bros. Aero-Lubriplate
- Shell Alvania No. 1

**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.

- Use no other greases unless a specific recommendation has been made by Formsprag.
- Grease lubricated HPO clutches should not be operated at ambient temperatures below 20°F (-7°C).

If operation at temperatures below 20°F (-7°C) is required, consult Formsprag Clutch.

- Modified or special order clutches, designated by a “CL” number following the model number, may be lubricated with other greases for specific applications. For information regarding these products, contact Formsprag Clutch giving both the model and “CL” numbers.

**⚠CAUTION** Do not use lubricants of the EP/AW type (extreme pressure or anti wear characteristics) or those containing slippery additives.

**⚠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**

Regrease	Regrease Under Rugged Conditions*
Once a month	Every two weeks

\*24 hours per day or operation in severe abrasive dust conditions. **Use Recommended Greases Only.**

- If the clutch has been out of service or in storage for six months or more, regrease according to the grease lubrication procedure.

**Grease Lubrication Procedure**

**Use Recommended Greases Only**

1. Select one grease fitting on the clutch for regreasing and wipe it clean.
2. Remove one adjacent fitting.
3. Pump fresh grease into the clutch until clean grease runs out the open hole.
4. Reinstall the fitting, tightening securely.
5. Continue to pump grease into the clutch until clean grease flows out completely around the seals on both sides of the clutch.

Labyrinth seals are designed in such a way as to allow purging of the old grease and dirt from seals during regreasing.

6. After each lubrication, 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.

## Amount of Grease Required (Approx.)

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HPO-720	6.0 oz.
HPO-750	7.5 oz.
HPO-800	15.0 oz.
HPO-900	16.0 oz.
HPO-1027	32.0 oz.

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## Oil Lubrication

For applications where oil lubrication is necessary, consult Formsprag Clutch. Oil lubricated HPO clutches must be pressure lubricated or operated in an oil bath. Formsprag Clutch will be happy to assist in working out details of a satisfactory application.

## 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 packaging is opened, wrap the box with a waterproof covering.

## Clutch Rebuilding Service

**⚠CAUTION** 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.)

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.

For additional technical and dimensional information on HPO clutches refer to Formsprag Overrunning Clutch Catalog P-956 or for Warner Electric's Automated Techfax call, 1-800-234-3369.

## Rotating Equipment

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

## Warranty

Formsprag 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.



**Formsprag Clutch**  
23601 Hoover Road · Warren, MI 48089  
586-758-5000 · Fax: 586-758-5204