

# Overrunning Clutches Models FSA 1051 thru 5000

P-222-20

BULLETIN 3032

Service & Installation Instructions



 **Formsprag®**  
Clutch

*An Altra Industrial Motion Company*

**TEKMATIC**

Distribuidor exclusivo para la República Argentina  
T. 011 4222 5040 - F. 011 4201 2478  
www.tekmatic.com.ar - info@tekmatic.com.ar

## Introduction

The FSA model is a special purpose ball bearing clutch suitable for low speed overrunning, backstopping and indexing applications. They feature Formchrome<sup>®</sup>, sprags and Formsprag's exclusive "Free-Action" retainer for long life and instant engagement.

- Formsprag ball bearing clutches mount on a through-shaft with the inner race driven by a key.
- The FSA is designed with a special flange to be used as a mounting surface for attaching the driven member.
- The O.D. of the flange is ground and concentric with the bore for proper alignment and installation.

**⚠ WARNING** Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

## Pre-installation

Before installing, check:

### 1. Shaft to Bore Fit

Clutch Bore	Shaft Fit Guide*
4 to 12 inches	.001 in. loose to dia. .004 in. loose
over 12 inch dia.	.001 in. loose to .005 in. loose

\*If an interference fit is required under special circumstances, do not exceed .001 tight.

Equipment manufacturers using Formsprag Clutches sometimes specify other shaft fits than those listed.

### 2. Key and Keyseat

A key is furnished with each clutch. The key is hardened to 25 to 40 Rockwell "C" scale, and is as long as the inner race keyseat for proper engagement.

## Overrunning and Backstopping

**Fit:** Break edges of the key before installing, to prevent any bearing at these points. Install with a push fit. Be sure the key seats squarely.

**Do not use a force fit.**

## Indexing

**Fit:** Fit the key up to .001 inches interference on width dimension to prevent loosening in indexing service.

**Do not exceed** .001 inch tight.

## Installation

**Turn the clutch inner race to check for the proper rotation.**

1. Coat clutch bore, shaft, and key with an anti-seize compound to facilitate installation and removal.
2. Mount the clutch and key on the shaft, applying pressure to the end face of the clutch Inner Race Only. Application of pressure to the outer race could preload the bearings excessively. For oil lubricated clutches, if a .001" interference fit is required, (this is the tightest allowable) immerse the clutch in hot clean oil (not to exceed 200°F/93°C) for ten to fifteen minutes before mounting.

**Note:** Oil lubricated clutches should be mounted on horizontal shafts only. For vertical shaft mountings of oil lubricated clutches, contact Formsprag Clutch.

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, or set collars, etc., to keep the clutch in position on the shaft.
4. Mount attaching parts to the clutch adapter as required by the application.
  1. All fasteners are recommended to be grade 8 bolts.
5. All Formsprag clutches are lubricated before leaving the factory. However, check the following lubricant table for the proper lubricant and fill level for each application type and ambient operating temperature range. If required, change or add lubricant to the proper level.

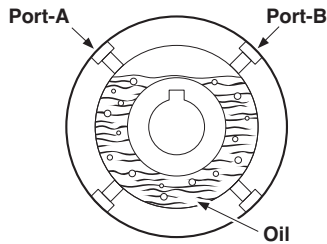
## Lubrication

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.

## Oil Lubrication Filling Procedure

1. Rotate the clutch outer race to locate two oil ports at positions (A) and (B) as shown in (Figure 1).

### Overrunning, Indexing & Backstopping



**Figure 1**

2. Remove (A) and (B) plugs and add oil through (A) until oil flows from (B). The clutch will then be 7/8 full. Use a pressure can for faster filling.
3. Install both plugs and tighten to prevent leakage. Plugs on some models consist of a buttonhead screw and leather washer. Be sure the washer is in place.

## Flushing Procedure

1. Rotate clutch outer race to locate one oil port at lowest point of the outer race.
2. Remove the top plug to act as a vent, then remove the bottom plug and drain clutch of oil.
3. Install the bottom drain plug and fill clutch completely full with mineral spirits. Reinstall the top plug.
4. Rotate the clutch slowly for several minutes to break up and dissolve oily residue which may have formed. Indexing clutches may be operated from five to ten minutes to do this.
5. Remove the top plug to act as a vent, then remove the bottom plug and drain all mineral spirits from the clutch assembly.
6. Replace plugs.
7. Relubricate clutch according to Oil Lubrication Filling Procedure.

## Grease Lubrication

### Use greases selected from the following table

Fiske Bros. Lubriplate Low-Temp  
 Fiske Bros. Aero Lubriplate  
 Mobil Mobilith 1  
 Mobil Aero – Low Temp.  
 Standard Rykon No. 1  
 Shell Alvania No. 1  
 Shell Aeroshell No. 7

**Note:** FSA model clutches are packed at the factory with Mobilux #1 grease.

- Use no other greases unless a specific recommendation has been made by Formsprag Clutch.
- If operation at temperatures below +20°F/-7°C is required, consult Formsprag Clutch for special lubricant recommendations.

### Grease lubrication may be used if:

- The clutch is inaccessible for frequent maintenance.
- Conditions do not permit the type of maintenance required for oil lubricated clutches.
- The clutch is mounted on a vertical shaft.
- The clutch must be operated continuously.
- The clutch is operated in the presence of severe abrasive dust.
- Do not attempt to substitute grease lubrication in a standard oil lubricated clutch. The use of grease lubrication in a clutch intended for oil could cause a malfunction.
- Formsprag Clutch can convert in-service clutches from oil to grease lubrication. Changes in internal construction are usually required. Consult Formsprag Clutch Service Department, and giving the complete model number.

## Grease Lubrication Maintenance

Application	Add Grease	Add Grease Under Rugged Conditions*
Overrunning	Every 3 months	Every 2 weeks
Backstopping	Every 3 months	Every 2 weeks
Indexing	Once a month	Every 2 weeks

\*24 hours per day or operation in severe abrasive dust conditions may require more frequent lubrication.

### Use recommended greases only!

## Grease lubrication Procedure

1. Select one grease fitting on the clutch for regreasing and wipe it clean.
2. Pump grease into the clutch until clean grease flows out around the seals on both sides of the clutch.

## Oil Lubrication

Use oils selected from the following table according to the application and ambient temperature at the clutch.

**Note: All FSA clutches are shipped from Formsprag 7/8 full of Mobile DTE Heavy Medium Oil.**

Clutch Model No.	Amount of Oil Required (Quarts)
1051	1.1
1250	2.1
1300	2.4
1375	2.8
2000	3.3
2400	3.9
3500	12.0
5000	11.0

Temperature Range	Recommended Lubricant
+20°F to +150°F (-7°C to +65°C) (Max. permissible ambient temperature)	Mobil DTE Heavy Medium High Grade Automatic Transmission Fluid (ATF) Texaco Regal R&O 68 Shell Turbo Oil 68 AMOCO Industrial Oil 68 Gulf Harmony Oil 68 Exxon Terristic Oil 68 Sunoco Sunvis Oil 931
-10°F to + 20°F (-23°C to -7°C)	Mobil Gargoyle Arctic C Heavy Texaco Regal R & O Oil 46 Chevron GST Oil 46 Sunoco Sunvis 921 High Grade Automatic Transmission Fluid (ATF) AMOCO Oil – Industrial 46
-40°F to +150°F (-40°C to +65°F) (Max. permissible ambient temperature)	Mobil Jet Oil 2 Shell Turbine Oil 500 Exxon Turbo Oil 2389 Standard Esso Turbo Oil 2389 Military Oils MIL-L-7808 or MIL-L-23699

**Do not use lubricants containing slippery additives or those having extreme pressure characteristics such as any EP type lubricants. For additional Lube information, see Brochure P-1053.**

## Oil Lubrication Maintenance

1. Check the oil level monthly.  
In INDEXING applications, check the oil level monthly, or every 160 hours of operation, whichever occurs first. If the clutch is indexing in excess of 150 strokes a minute, oiling may be required at shorter intervals.
2. Add oil if necessary to maintain proper fluid level of 7/8 full.
3. Flush the clutch every three months with mineral spirits.  
Flushing will remove waxes and gums formed by vaporization of the oil and assure continued efficiency of operation. See “Flushing Procedure” section.
4. If clutch has been out of service or in storage for six months or more, flush with mineral spirits and relubricate before use.

In cases of dirty or abrasive environment or severe operating conditions (24 hours per day), it is recommended that oil be changed every month.

**⚠ 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 Clutch 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.**

## Packaging

Your Formsprag Clutch, carefully wrapped in vapor type activated paper for corrosion protection and packaged in a shipping box conforming to the requirements of Rule 41, Uniform Freight Classification, may be stored for up to two (2) years and re-shipped without added packaging. All FSA model clutches are packed in wooden, Style 4 shipping boxes with integral skids. (See oil lubrication maintenance for information about clutches which will be stored for extended periods.) To store in an unprotected area or if original package is opened, wrap the box with a waterproof covering.

## **Clutch rebuilding Service**

Disassembly and repair of Formsprag Clutch 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 Clutch directly or through your local Formsprag Distributor or through the Original Equipment Manufacturer.

For additional technical and dimensional information, refer to Overrunning Clutch Catalog P-956.

These instructions cannot cover all details or variations of equipment and applications nor provide every possible contingency which may be met in installation, operation or maintenance. Should further information be needed, contact Formsprag Clutch Application Assistance 1-800-927-3262.

## **Rotating 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.

## 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.



**Formsprag Clutch**  
23601 Hoover Road ■ Warren, MI 48089  
586-758-5000 ■ Fax: 586-758-5204  
[www.formsprag.com](http://www.formsprag.com)  
**An Altra Industrial Motion Company**

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