

# Fan Backstop Clutches Models HFB & VFB

## Installation Instructions

P-7675-FC-A4  
BULLETIN A-3039



Model HFB for  
Horizontal Shafts

Model VFB for  
Vertical Shafts

 **Formsprag**<sup>®</sup>  
Clutch

An **Altra Industrial Motion** Company

# Introduction

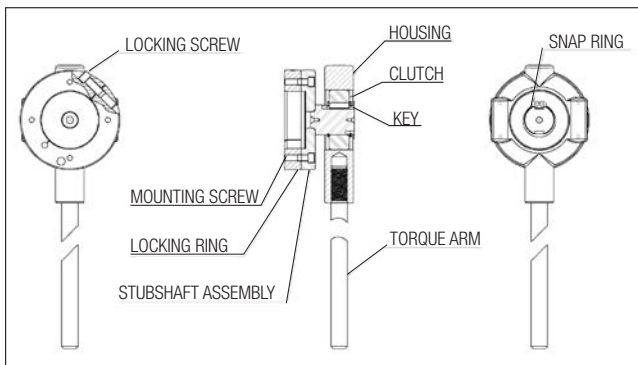
Formsprag fan backstop models HFB and VFB are comprised of a Sprag clutch with integral seals, a clutch housing, stub shaft, locking ring and torque arm. This design prevents reverse rotation of the fan shaft by providing an end of shaft located backstop. Models HFB and VFB offer a larger bore range, for low backstopping torque applications. Clutches are selected by shaft size and torque requirement.

## ⚠ WARNING

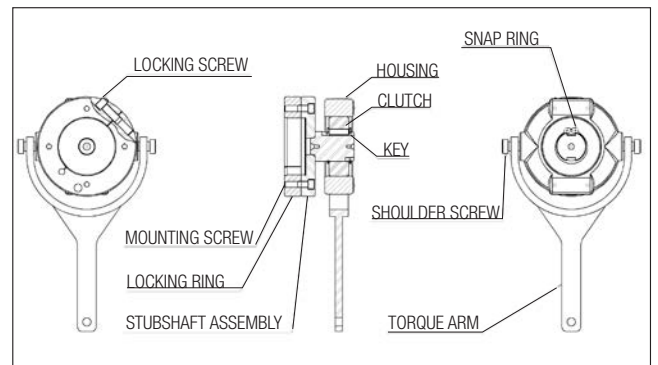
**Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury.**

## Pre-Installation Instructions

Review Figures 1 and 2 below to identify the nomenclature for the various components of the fan backstops. If the backstop was shipped completely assembled, remove the snap ring and separate the stub shaft assembly from the clutch assembly. Keep the key and snap ring for later reassembly



**Figure 1: Model FHB for horizontal shafts**

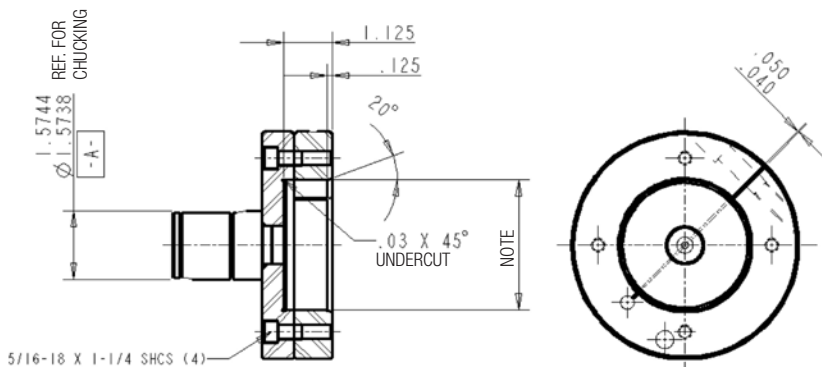


**Figure 2: Model VFB for vertical shafts**

## Bore Machining Instructions.

If the backstop was ordered already bored to size, skip to step 2 below.

The clamp ring and stub shaft need to be machined as shown in the picture below. Ensure that the bore is concentric with the shaft within .002" TIR (.001" TIR for applications above 2,000 rpm)

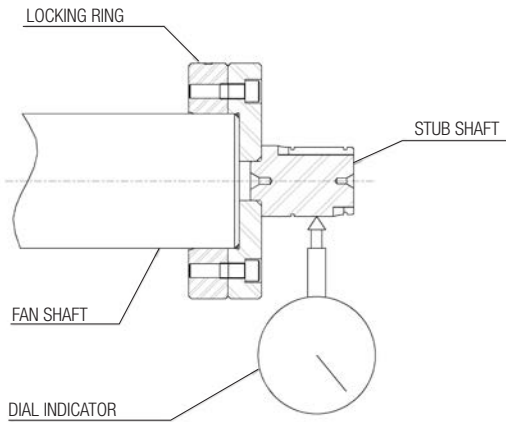


Note I: Bore to shaft diameter  $-0/+.001$ , concentric with stubshaft datum -A- within .002 T.I.R (.001 for speeds above 2,000 RPM)

## **Stub Shaft and Torque Arm Mounting Requirements.**

Before installing the backstop, check the following:

1. **Stub Shaft:** The stub shaft must be concentric with the fan shaft within .002" TIR (.001" TIR in applications above 2,000 rpm). See diagram below for an example of measurement set-up.

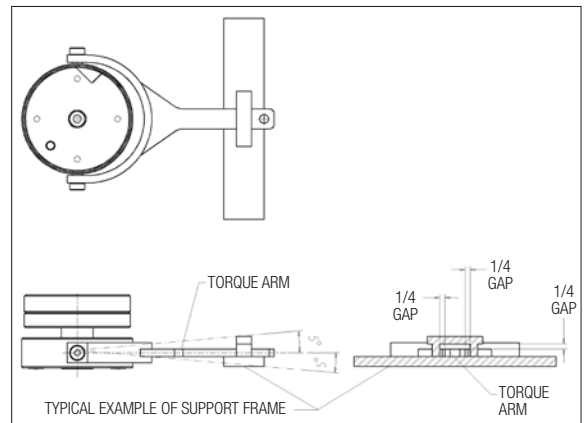


2. **Torque arm stops.** Ensure that appropriate equipment frames or structures are available for fastening stops for the backstop's torque arm as shown in the figures below.

### **Model VFB**

Do not apply a radial load to the torque arm nor mount the torque arm rigidly. Allow the torque arm to float as shown in the picture to the right. Make sure the stops do not contact the corner radii of the torque arm and are dimensioned to support the rated torque of the backstop. Make sure the torque arm is perpendicular to the shaft axis within 10 degrees as shown.

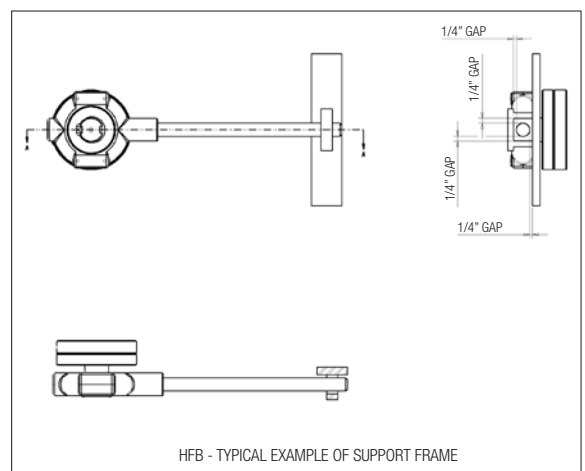
To avoid vibration problems, when used in horizontal shafts position the torque arm horizontally as shown in the top view of the picture to the right.



### **Model HFB**

Do not mount the torque arm rigidly. Allow the torque arm to float as shown in the picture to the right. To avoid vibration problems horizontally as shown in the top view of the picture to the right.

For mounting questions call Formsprag Application Assistance at 1-800-927-3262.



## Installation

1. Dry assemble all components to the fan shaft before completing the assembly with Loctite® to ensure proper fit and that the torque arm is free to move around the shoulder bolts.
2. Ensure the 4 mounting screws are finger tight. Apply Loctite® 262 to the locking screw. While applying axial pressure on the stub shaft against the fan shaft face, torque the locking screw to 250-300 lb-in.
3. Oil the threads of the four mounting screws. Torque to 230-250 lb-in. Ensure that the stub shaft is concentric with the fan shaft within .002" TIR (.001" TIR in applications above 2,000 rpm).
4. Determine the proper direction of rotation for the backstop. Coat the stub shaft with anti-seize compound and slide the backstop assembly onto the stub shaft; install the key and snap ring.

**NOTE: VERIFY SHAFT ROTATION BEFORE INSTALLING CLUTCH ASSEMBLY TO THE STUB SHAFT.**

5. For VFB models, apply Loctite® 262 to the threads of the shoulder bolts and assemble the torque arm. For HFB models apply Loctite® 262 to the threads of the torque arm and install.

**DO NOT RIGIDLY MOUNT THE TORQUE ARM. DO NOT WELD, CLAMP, FASTEN OR FIX THE TORQUE ARM – ALLOW THE TORQUE ARM TO FLOAT. MAKE SURE THE TORQUE ARM IS NOT MORE THAN 5 DEGREES FROM HORIZONTAL AS SHOWN IN THE FIGURE ABOVE.**

Rigidly mounting the torque arm may result in premature failure of the backstop.

6. Attach torque arm stops to equipment frame or supporting structure. The stops are required to prevent rotation of torque arm when holdback torque is applied. Allow clearance between stops and torque arm as shown in figure above. Make sure the torque arm stops can handle the rated torque of the backstop.
7. For VFB models if a cable is used to secure the torque arm, make sure that the arm can rotate freely between 1.0" and 1.5" measured at the hole at the end of the torque arm.

## Vibration Troubleshooting

1. If unacceptable levels of vibration occur upon installation, disassemble and reinstall being sure to tighten fasteners as described; verify that the torque arm is not bound in any way but is free to float against its stops.
2. Verify that the stub shaft diameter runout does not exceed 0.002" (.001" in applications above 2,000 rpm).

## Lubrication and Maintenance

1. Formsprag models HFB and VFB are shipped lubricated for life.

### **CONTACT FORMSPRAG FOR A REPLACEMENT CLUTCH ASSEMBLY**

2. Replace the clutch assembly every five years to ensure uninterrupted service life.

Follow the instructions below:

- a. Remove the two shoulder screws to free the torque arm.
- b. Slide the clutch assembly off the stub shaft adapter. Visually inspect the key.
- c. Clean the stub shaft thoroughly, coat with anti seize, reinstall the clutch assembly (check for correct direction of rotation), slide in the key and install the snap ring on the stub shaft adapter.
- d. Reinstall the torque arm.

## 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 Clutch directly, through the distributor or through the Original Equipment Manufacturer.

## Packaging

Your Formsprag clutch, 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, may be stored for up to two (2) years and reshipped without added packaging.

## 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. For Application Assistance call Formsprag Clutch at 1-800-927-3262.

## 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.

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 at 1-800-927-3262.



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