

# **FORMSPRAG CLUTCH™**

**Formsprag Fan Backstops**  
**Models LCB-200 & LCB-400 GEN 3**  
**Installation and Maintenance Manual**

**Regal Rexnord**  
[regalrexnord.com/formsprag](https://regalrexnord.com/formsprag)

**F O R M**  
**MCM-P-4051-FC**  
**Form P-TBC**  
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## SAFETY MESSAGE DEFINITIONS

**⚠ WARNING** Indicates a hazard which, if not avoided, could result in serious injury or death.

## GENERAL SAFETY INSTRUCTIONS

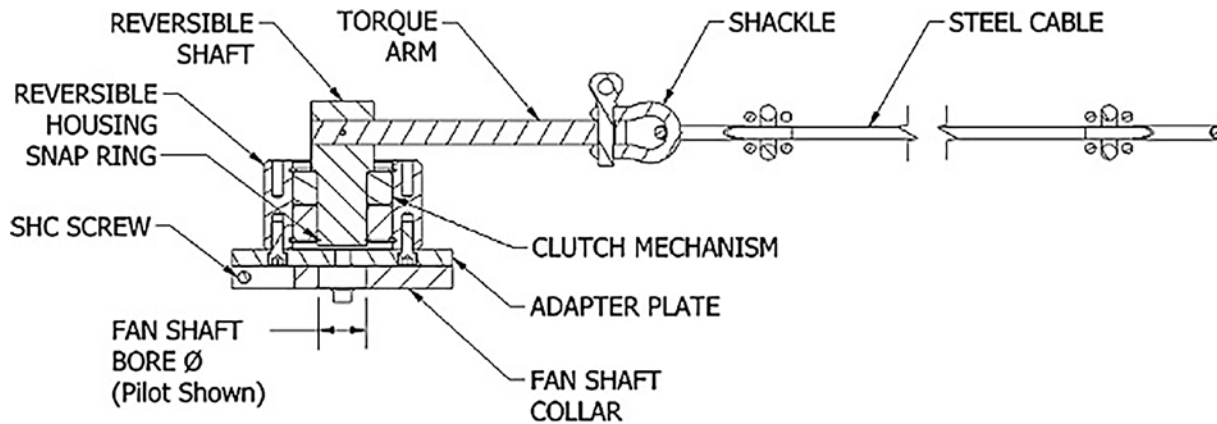
### ⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock out power before installation and maintenance. Working on or near energized equipment can result in severe injury.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Read and understand the information in this section and in this manual completely before installing, operating or maintaining this equipment. Failure to follow this instruction could result in severe injury or death.

## INTRODUCTION

The original Formsprag Fan Backstops, Models LCB-200 and LCB-400 were designed to economically solve the “wind-milling” problems in fan applications. When a fan is turned off, the positive air pressure from other fans present in the system, or environmental winds, may cause the fan to rotate in the opposite direction. This so called “back-drive” becomes very harmful at the starting of the fan because overcoming the inertia from reverse rotation can impose an overload torque on the driving motor that damages the motor, coupling and in the case of a belt driven fan it drastically reduce the service life of the belts. Formsprag Fan Backstops Model LCB make use of proven sprag clutch technology, with integrated bearings and lip seals, internal to the torque housing to prevent the reverse rotation. The reaction torque of the clutch mechanism is transferred to the torque arm which in turn puts tension in the clamping cable assembly that is grounded to the application frame. This design prevents the reverse rotation of the shaft in fan applications with small to medium shaft diameters and low backstopping torque requirements whilst allowing the fan to operate normally in the driving direction with little to no additional drag as the clutch mechanism allows overrunning to occur.

Figure 1



### ⚠ WARNING

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

## PRE-INSTALLATION CHECK

Before installing, note the following:

- Review Figure 1 as it identifies the nomenclature for all the components of the model LCB Fan Backstop.
- Mating Shaft: The shaft of the fan must fit into the bore of the Fan Shaft Collar of the backstop. Make sure that the diameter of the shaft matches the diameter of the bore.
- For LCB-201 or -401 with a flanged Fan Shaft Collar, verify bolt pattern to be used for clamping and connecting the shaft onto and prepare the hardware required
- Optional Fan Shaft Collars with QD Bushing Bolt patterns are available and have the following shaft collar but not limited to:
  - 3X 4030 Taper-Lock 5/8-11 X 1-3/4
  - 3X 3525 Taper-Lock 1/2-13 x 1-1/2
  - 3X E QD Bushings 1/2-13 X 2-3/4
  - 3X F QD Bushings 9/16-12 X 3-5/8.
- Retaining the assembly:
  - The length of the Torque Arm combined with the length of the retaining cable must be enough to allow a secure restraint of the backstop. Formsprag supplies a standard length cable, but this can be replaced by the user should a longer length be required.
  - For shorter lengths simply adjust the cable clamps on the cable to suit
- Installation Instructions: Make sure that you read carefully and understand the Installation Instructions provided in this bulletin. Failure to do so may result in voiding the warranty because of product damage and in serious or fatal injury to personnel.

## INSTALLATION

- Note that the unit is shipped as a loose parts kit for user customizable direction of rotation on site.
- Confirm the direction of free rotation of the LCB housing (with the reversible shaft held stationary as shown in Figure 2) is in the same direction as the fan's driving direction.
- If the Direction of free rotation is incorrect then remove the Adapter plate, remove the Snap Ring on the shaft, remove the Reversible shaft taking care to keep the key in the clutch, re-install the shaft from the opposite side of the housing and re-install the snap ring. Then install the Adapter plate and check the Direction of free rotation of the housing again to confirm it is correct.
- Make sure that the SHC Screws are tightened on the following interfaces:
  - Adapter plate to the housing
  - Shaft Collar to the Adapter plate
  - Torque Arm Cable clamps at both ends of the cable
- For LCB 200/400 loosen the socket head screw on the Fan Shaft Collar to release the clamping effect and slide the Collar over the shaft of the fan. Make sure that the shaft goes all the way into the bore of the collar and touches the Adapter Plate
- Tighten the socket head screw at the collar to a maximum of 38 to 40 lb-ft (450 to 480 lb-in or 50 to 55 Nm).
- For LCB-201 and -401 with "QD" and "TL" style bushing connection:
  - Ensure bolting is correct as per the bolt pattern chosen.
  - Verify that the run-out at the housing of the backstop is within 0.002" T.I.R to the fan shaft.



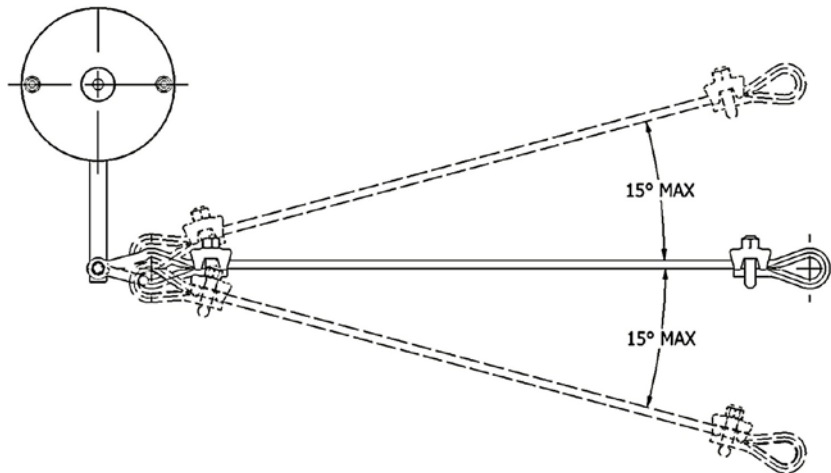
**Figure 2: Direction of Rotation**

### **⚠ WARNING**

Verify the rotation of the shaft to be the correct one. Failure to do so may result in product and equipment damage and in serious or fatal injury to personnel.

- Attach the retaining cable assembly to the mounting structure of the fan or to another rigid structure and make sure that the cable does not interfere with the moving parts of the fan.
- Ensure that the cable is perpendicular to the shaft within 15 degrees as shown in Figure 2

**Figure 2**



### **⚠ WARNING**

Make sure that the pin at the shackle and the nuts at both clips are tightened. Also make sure that the thimbles inside the cable loop of the retaining cable are in place and that the cable is placed snug around them.

- If an adjustment in the length of the cable is necessary, loosen the nuts at the clip positioned the farthest from the backstop and re-adjust the length. Make sure that after the adjustment, the thimble is properly installed and the nuts at the clip are tightened.

### **⚠ WARNING**

Make sure that, after adjusting the length of the cable, the deflection of the cable and the arms is at least 0.75" and not bigger than 1.5" per side or 3" in total. Failure to do so may result in product and equipment damage and in serious or fatal injury to personnel.

- The arm and the retaining cable are not supposed to be rigid. Cable and arm deflection of at least 0.75" and not to exceed 1.5" deflection per side (or 3" total) will allow the retaining assembly to float and, if it is necessary, will permit free axial and angular movement of the whole assembly resulted from shaft run-out and eccentricity.

## VIBRATION

If unacceptable levels of vibration occur after the installation, disassemble and re-install the backstop making sure to respect the procedure described above and to tighten the fasteners as described. Make sure that the shaft end sits flush in the housing of the backstop and that the movement of the retaining assembly is not bound in any way.

## LUBRICATION AND MAINTENANCE

The standard model LCB comes from the factory lubricated for life. No regular scheduled maintenance is required for this design, however it is recommended to replace the CSK internal clutch every five years to ensure uninterrupted service of your equipment. Contact Formsprag for replacing the CSK internal clutch.

Optional LCB variants are available with different lubrication options for very low ambient conditions below -20°F and for high ambient temperatures above 165°F. Please contact Formsprag for Application Assistance.

The clutch is supplied without paint or primer, since it sold as a build kit. The parts are covered in a light coating of oil only. For corrosive environments an application of a Rust Preventative that contains lanolin or wool wax can be applied to the exposed steel surfaces, or the assembly can be painted on the exposed steel areas with a self priming paint that matches the site specific paint codes after the surface is cleaned and de-greased.

## CLUTCH REBUILDING SERVICE

Formsprag clutches are precision devices manufactured under careful controls to meet exacting standards. When reconditioning is required, clutches should be returned to Formsprag Clutch.

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

## ROTATING EQUIPMENT

**WARNING!** 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 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™

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To view our Standard Terms and Conditions of Sale, please visit <https://www.regalrexnord.com/Terms-and-Conditions-of-Sale>.

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