

## How to Use This Manual

This manual provides detailed instructions on installation of internal backstops. Use the table of contents below to locate required information.

**CAREFULLY FOLLOW THE INSTRUCTIONS IN THIS MANUAL FOR OPTIMUM PERFORMANCE AND TROUBLE FREE SERVICE.**

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## Introduction

The following instructions for Sizes 1020 thru 1090 also apply to Sizes 20 thru 90, Model M, respectively. For example: Sizes 1020 and 20, 1030 and 30, etc.

To prevent damage to backstop due to incorrect motor shaft rotation at start up, couplings are NOT assembled when drives are furnished with backstops. After completing the electrical connection, check motor and drive shaft rotations. Then complete alignment and assembly of coupling.

If backstop slippage occurs, return the backstop to the Factory for inspection and replacement.

**IMPORTANT:** Attach a "Returned Material Authorization" tag which is available from Rexnord-Falk Representatives and the Factory.

**BACKSTOP APPLICATION** — Backstops are designed to prevent reverse rotation or backrun without backlash in applications such as conveyors, bucket elevators, fans, rotary pumps and kilns. Backstops are not approved for use on systems that are designed for handling of peoples such as elevators, manlifts, ski tows and ski lifts. DO NOT use a backstop as a substitute for a brake. Backstops are not available for drives with 1.5:1 through 4.13:1 ratios.

**INDEXING** — DO NOT use the backstop for indexing applications. The backstop is designed to prevent reverse rotation five times or less in eight hours, with one minute or more in the overrunning direction between backstopping load applications. If backstopping operations are more frequent, or the time between operations is less than one minute, the backstop is classified as an indexing device and must be referred to the Factory.

## Backstop Replacement

If backstop is to be replaced, the low speed pinion must also be replaced. Refer to the appropriate manual listed below for instructions regarding low speed pinion replacement.

Sizes 1020 thru 1050FC and FZ . . . . . Manual 318-120

Sizes 1060 thru 1130FC and FZ . . . . . Manual 318-130

## Original Backstop Installation

**WARNING:** Consult applicable local and national safety codes for proper guarding of rotating members. Lock out power source and remove all external loads from drive before servicing drive or accessories. Drain oil from drive.

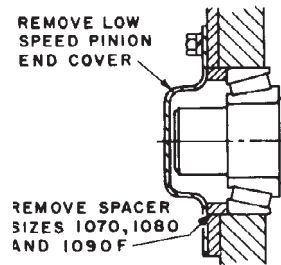


Figure 1-  
Sizes 1020 thru 1090

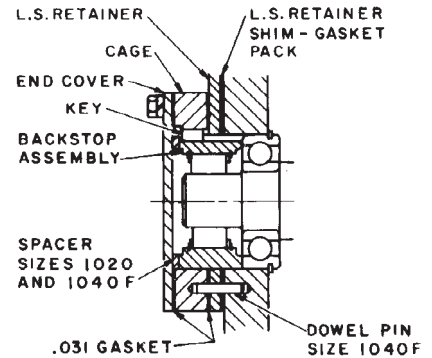


Figure 2-  
Sizes 1020 thru 1040

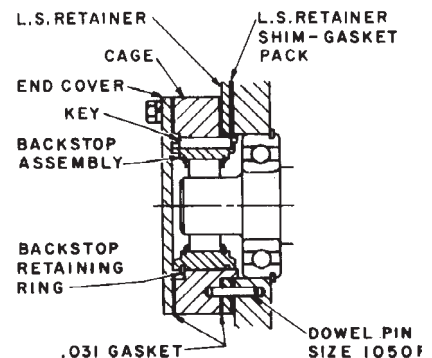


Figure 3-  
Sizes 1050 thru 1060

1. **DRIVE SIZES 1020 THRU 1060** — Figures 1, 2 and 3. For Sizes 1040 and 1050, press the dowel pin into the backstop cage before proceeding.
  - A. Remove and discard the low speed pinion end cover located below the low speed shaft, Figure 1. Remove old gasket material from the low speed retainer. Do not disturb the fasteners located around the low speed shaft; four on Size 1020 and five on Sizes 1030 thru 1060.
  - B. Install one .031" thick gasket against the low speed retainer.
  - C. Remove preassembled backstop from package and wipe off any excess lubricant. The lubricant is oil soluble and need not be removed completely.
 

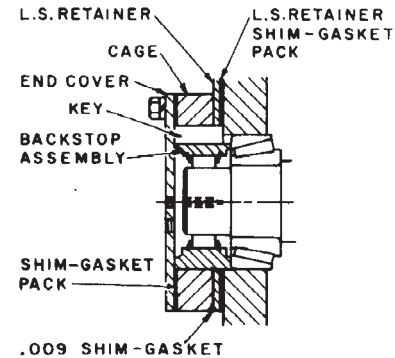
**CAUTION:** Before installing backstop, note backstop overrunning (free rotation) direction indicated by the arrow etched on each side of the backstop.
  - D. For Sizes 1050 and 1060, assemble the retaining ring into the outer groove on the outside end of the backstop. For all sizes, insert backstop with key into the backstop cage.

- E. Oil backstop sprags and low speed pinion shaft extension. Gently slide the backstop assembly onto the shaft and into the housing bore while rotating the shaft in the overrunning direction. **DO NOT FORCE OR HAMMER . . .** this may damage the shaft surface or misalign sprags.
- F. Install two 2 inch long headless set screws or studs through the backstop cage and into the drive. Refer to Table 1 for diameter of set screws and studs.
- G. Check operation of backstop by turning the input shaft in the required direction of rotation by hand. If the shaft does not rotate in the required direction, remove backstop, reverse it and reinstall as instructed in the preceding steps.
- H. Rotate input shaft in the required direction of rotation and then reverse the rotation to lock up the backstop. Observe the position of the sprags. All sprags must be engaged and lay in the same relative position around the shaft. If the sprags are not uniformly positioned, lightly tap the backstop cage to centralize all of the sprags around the shaft and cage. If sprags cannot be uniformly positioned in this manner, remove the backstop and run a finger around the sprags in the overrunning direction. Reinstall backstop as instructed in the preceding steps.
- Check the position of the sprags several times by overrunning and locking the sprags. If all sprags move uniformly, hold the backstop in the locked position and proceed to the next assembly sequence.
- J. Install one .031" thick gasket between the backstop cage and end cover. For drive Sizes 1020 and 1040 only, install spacer inside backstop cage against backstop. Install end cover and fasteners with lock washers; torque to value shown in Table 1.  
**IMPORTANT:** Use only the fasteners provided in the kit.
- K. Remove set screws or studs and install fasteners (with lock washers); torque to value shown in Table 1.
- L. Affix high speed shaft rotation arrow to the high speed end of drive. Affix backstop caution labels to drive.
- M. Refer to Service Manual 128-010 for recommended lubricants.

**CAUTION:** Do not use extreme pressure lubricants in drives equipped with internal type backstops.

2. **DRIVE SIZES 1070 & 1080** — Figures 1 & 4.
- A. Remove and discard the low speed pinion end cover and spacer located below the low speed shaft, Figure 1. Remove old gasket material from the low speed retainer. Do not disturb the six fasteners located around the low speed shaft.
- B. Install one .009" thick shim-gasket against the low speed retainer.

Figure 4-  
Sizes 1070 and 1080



- C. Remove preassembled backstop from package and wipe off any excess lubricant. The lubricant is oil soluble and need not be removed completely. **DO NOT REMOVE BACKSTOP ASSEMBLED IN CAGE.**
- CAUTION:** Before installing backstop, note backstop overrunning (free rotation) direction indicated by the arrow etched on each side of the backstop. If rotation is opposite to that specified, replace subassembly with one of opposite rotation, because backstop is subassembled and matched with cage.
- D. Oil backstop sprags and low speed pinion shaft extension. Gently slide the backstop subassembly onto the shaft and into the housing bore while rotating the shaft in the overrunning direction. **DO NOT FORCE OR HAMMER . . .** this may damage the shaft surface or misalign sprags.
- E. Refer to Table 2 for a listing of shim-gaskets and their compressed values. Install up to .167" (compressed thickness) of shim-gaskets between the backstop cage and end cover to ensure bearing float. Include only one .015" shim-gasket in the pack and mount that .015" shim-gasket against the end cover. **NOTE:** Use only Rexnord shim-gaskets. Install end cover and fasteners with lock washers; torque to value shown in Table 1.  
**IMPORTANT:** Use only the fasteners provided in the kit.
- F. Remove the plugs from the two holes in the end cover. Insert a .375-16UNC diameter eye bolt in the low speed pinion shaft end to serve as a push-pull device. Insert dial indicator probe in the other hole. Rotate shaft in the overrunning direction while applying axial force in both directions and measure axial float. Subtract .002" to .004" (specified axial float) from the measured float. Shim-gasket removal must total a value within those limits.
- Do not remove the one .015" shim-gasket mounted against the end cover.

**EXAMPLE:**

1. A Size 1070 low speed pinion shaft has a measured axial float of .080". The specified axial float is .002" to .004" for Sizes 1070 and 1080.
2. Total required shim removal is:  
0.76" to .078" or (.080" - .004") to (.080" - .002").
3. Assuming shim pack is composed of:
  - (3) .007" (.006" compressed) = .018"
  - (3) .009" (.008" compressed) = .024"
  - (1) .015" (.013" compressed) = .013"
  - (3) .031" (.028" compressed) = .084"
  - TOTAL** = .139" compressed
4. Remove:
  - (2) .007" (.006" compressed) = .012"
  - (1) .009" (.008" compressed) = .008"
  - (2) .031" (.028" compressed) = .056"
  - TOTAL** = .076"
5. Therefore, .080" axial end float minus .076" of shim removal results in .004" axial end float.

**G. Remove the end cover and shim-gasket pack.**

**CAUTION:** The drain back hole must be open.

Make certain that the oil drain back hole through the backstop cage and drive housing wall is open to provide lubrication to the backstop. The radial slots in the backstop and backstop cage must be aligned and face the end cover.

- H. Install two 2 inch long headless set screws or studs through the backstop cage and into the drive. Refer to Table 1 for diameter of set screws and studs.
- J. Check operation of backstop by turning the input shaft in the required direction of rotation by hand. If the shaft does not rotate in the required direction, remove backstop, reverse it and reinstall as instructed in the preceding steps.
- K. Rotate input shaft in the required direction of rotation and then reverse the rotation to lock up the backstop. Observe the position of the sprags. All sprags must be engaged and lay in the same relative position around the shaft. If the sprags are not uniformly positioned, lightly tap the backstop cage to centralize all of the sprags around the shaft and cage. If sprags cannot be uniformly positioned in this manner, remove the backstop and run a finger around the sprags in the overrunning direction. Reinstall backstop as instructed in the preceding steps.

Check the position of the sprags several times by overrunning and locking the sprags. If all sprags move uniformly, hold the backstop in the locked position and proceed to the next assembly sequence.

- L. Reinstall previously selected shim-gaskets with the .015" shim-gasket against the end cover. Install end cover and fasteners with lock washers; torque to value shown in Table 1.
- M. Remove set screws or studs and install fasteners (with lock washers); torque to value shown in Table 1. After all fasteners are installed, make certain that the low speed pinion shaft axial float is .002" to .004". Readjust if necessary.

**TABLE 1 — Fastener Tightening Torques**

Drive Size	Quantity	SAE Grade	Diameter & Length	Torque lb-in
<b>1020</b>	4	5	.312 - 1 8UNC x 1.250	185
<b>1030</b>	5	5	.312 - 1 8UNC x 1.500	185
<b>1040</b>	5	5	.312 - 1 8UNC x 1.750	185
<b>1050</b>	6	5	.375 - 1 6UNC x 2.250	330
<b>1060</b>	6	8	.500 - 1 3 UNC x 2.500	1100
<b>1070</b>	6	5	.625 - 1 1UNC x 2.750	1640
<b>1080</b>	7	8	.625 - 1 1UNC x 3.000	2190
<b>1090</b>	8	8	.625 - 1 1UNC x 3.000	2190

**TABLE 2 — Shim-Gasket Compressibility**

Falk Shim-Gaskets	Thickness – Inches	
	New	Compressed
Black Rubber Coated	.007	.006
Black Rubber Coated	.009	.008
Gray	.015	.013
Gray	.031	.028

N. Affix high speed shaft rotation arrow to the high speed end of drive. Affix backstop caution labels to drive.

O. Refer to Service Manual 128-010 for recommended lubricants.

**CAUTION:** Do not use extreme pressure lubricants in drives equipped with internal type backstops.

**3. DRIVE SIZE 1090 — Figures 1 & 5.**

- A. Remove and discard the low speed pinion end cover and spacer located below the low speed shaft, Figure 1. Remove old gasket material from the housing surface.
- B. Refer to Table 2 for a listing of shim-gaskets and their compressed values. Install up to .111" (compressed thickness) of shim-gaskets against the drive housing to ensure bearing float. Include only one .015" shim-gasket in the pack and mount that .015" shim-gasket against the housing. Note: Use only Rexnord shim-gaskets.
- C. Install the backstop cage without backstop. Place one .015" shim-gasket between the backstop cage and end cover. Install end cover and fasteners with lock washers; torque to value shown in Table 1.  
IMPORTANT: Use only the fasteners provided in the kit.
- D. Remove the plugs from the two holes in the end cover. Insert a .375-16UNC diameter eye bolt in the low speed pinion shaft end to serve as a push-pull device. Insert dial indicator probe in the other hole. Rotate shaft while applying axial force in both directions and measure axial float. Subtract .002" to .004" (specified axial float) from the measured float. Shim-gasket removal must total a value within those limits. Do not remove the one .015" shim-gasket mounted against the drive housing.

**EXAMPLE:**

1. A Size 1090 low speed pinion shaft has a measured axial float of .060". The specified axial float is .002" to .004."
2. Total required shim removal is:  
.056" to .058" or (.060" - .004") to (.060" - .002").
3. Assuming shim pack is composed of:
 

(2) .007" (.006" compressed)	=	.012"
(2) .009" (.008" compressed)	=	.016"
(1) .015" (.013" compressed)	=	.013"
(2) .031" (.028" compressed)	=	.056"
<b>TOTAL</b>	=	<b>.097" compressed</b>
4. Remove:
 

(2) .031" (.028" compressed)	=	.056"
<b>TOTAL</b>	=	<b>.056" compressed</b>
5. Therefore, .060" axial end float minus .056" of shim removal results in .004" axial end float.

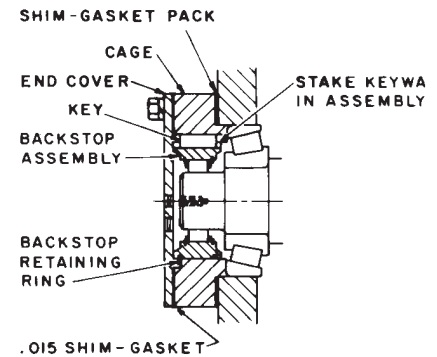
**CAUTION:** The drain back hole must be open

Make certain that the oil drain back hole through the backstop cage and drive housing wall is open to provide lubrication to the backstop. The radial slots in the backstop and backstop cage must be aligned and face the end cover.

- E. Remove end cover, .015" shim-gasket and backstop cage. Do not remove the final shim pack mounted against the drive housing.
- F. Remove preassembled backstop from package and wipe off any excess lubricant. The lubricant is oil soluble and need not be removed completely.
 

**CAUTION:** Before installing backstop, note backstop overrunning (free rotation) direction indicated by the arrow etched on each side of the backstop.
- G. Assemble the retaining ring into the outer groove on the outside end of the backstop. Insert backstop with key into the backstop cage. Stake the keyway in the cage to prevent the key from contacting the bearing.
- H. Oil backstop sprags and low speed pinion shaft extension. Gently slide the backstop assembly onto the shaft and into the housing bore while rotating the shaft in the overrunning direction. **DO NOT FORCE OR HAMMER** . . . this may damage the shaft surface or misalign sprags.
- J. Install two 3 inch long headless set screws or studs through the backstop cage and into the drive. Refer to Table 1 for diameter of set screws and studs.
- K. Check operation of backstop by turning the input shaft in the required direction of rotation by hand. If the shaft does not rotate in the required direction, remove backstop, reverse it and reinstall as instructed in the preceding steps.

Figure 5-  
Sizes 1090



- L. Rotate input shaft in the required direction of rotation and then reverse the rotation to lock up the backstop. Observe the position of the sprags. All sprags must be engaged and lay in the same relative position around the shaft. If the sprags are not uniformly positioned, lightly tap the backstop cage to centralize all of the sprags around the shaft end cage. If sprags cannot be uniformly positioned in this manner, remove the backstop and run a finger around the sprags in the overrunning direction. Reinstall backstop as instructed in the preceding steps.
 

Check the position of the sprags several times by overrunning and locking the sprags. If all sprags move uniformly, hold the backstop in the locked position and proceed to the next assembly sequence.
- M. Reinstall the one .015" thick shim-gasket between the backstop cage and end cover. Install end cover and fasteners with lock washers; torque to value shown in Table 1.
- N. Remove set screws or studs and install fasteners (with lock washers); torque to value shown in Table 1. After all fasteners are installed, make certain that the low speed pinion shaft axial float is .002" to .004". Readjust if necessary.
- O. Affix high speed shaft rotation arrow to high speed end of drive. Affix backstop caution labels to drive.
- P. Refer to Manual 128-010 for recommended lubricants.
 

**CAUTION:** Do not use extreme pressure lubricants in drives equipped with internal type backstops.