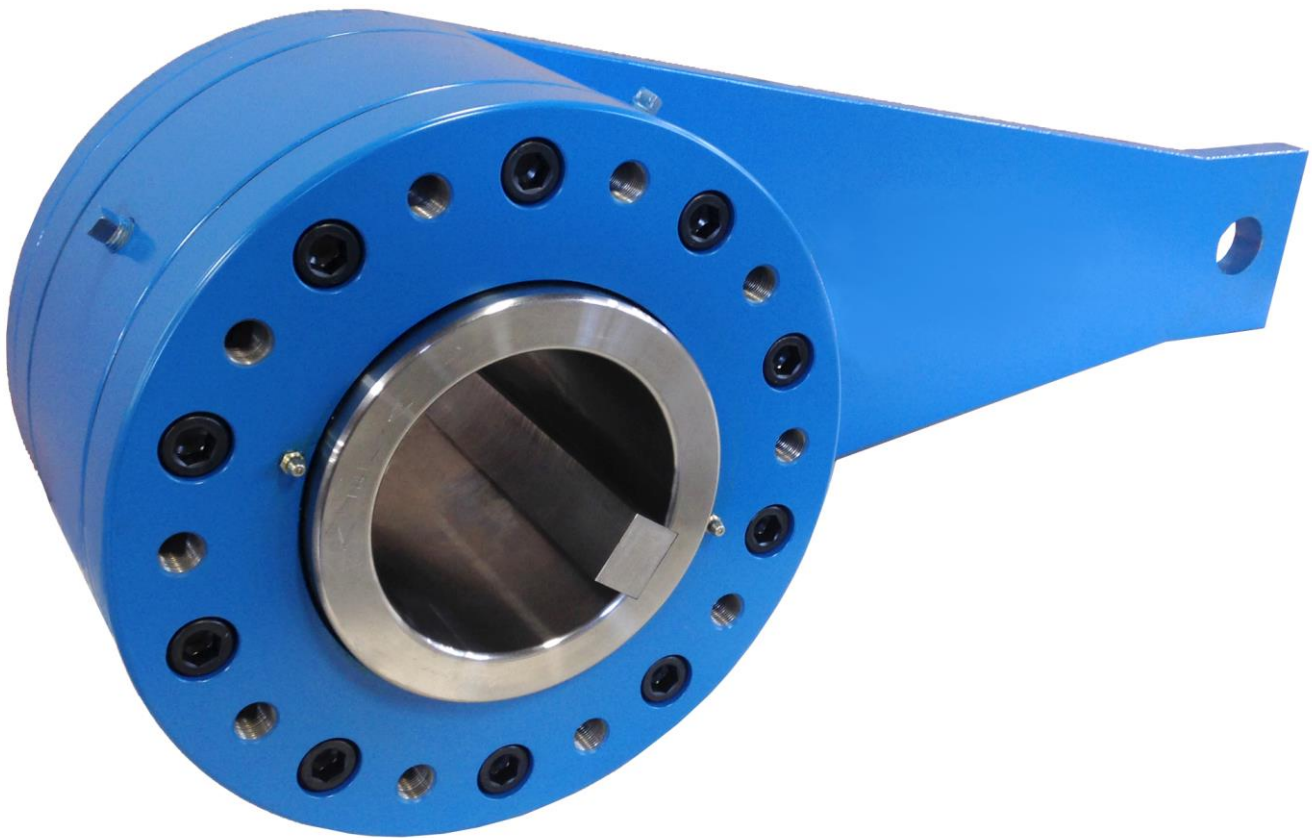


# **RINGSPANN® CORPORATION**

**Power Transmission**

**Installation and Operating Instruction for  
Complete Low-Speed Backstops  
FRHM 700 THRU FRHM 1000**

**E 08.778e**



## **RINGSPANN CORPORATION**

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## Important

- Please read these instructions carefully before installing and operating the product. Your particular attention is drawn to the notes on safety.
- These installation and operating instructions are valid on condition that the product meets the selection criteria for its proper use. Selection and design of the product is not the subject of these installation and operating instructions.
- Disregarding or misinterpreting installation and operating instructions invalidate any product liability or warranty by RINGSPANN CORPORATION. The same applies if the product is taken apart or changed.
- These installation and operating instructions should be kept in a safe place and should accompany the product if it is passed on to others – either on its own or as part of a machine – to make it accessible to the user.

## Safety Notice

- Installation and operation of this product should only be carried out by skilled personnel.
- Repairs may only be carried out by the manufacturer or accredited RINGSPANN CORPORATION agents.
- If a malfunction occurs, the product, or the machine into which it is installed, should be stopped immediately and either RINGSPANN CORPORATION or an accredited RINGSPANN CORPORATION agent should be informed.
- Switch off the power supply before commencing work on electrical components.
- Rotating machine elements must be protected by the purchaser to prevent accidental contact.
- Supplies abroad are subject to the safety laws prevailing in those countries.

## Warranty

RINGSPANN CORPORATION “seller” agrees to repair or replace (at its sole option), defective materials or workmanship for a period of one year from the date of delivery. Seller must be notified of such a defect within a reasonable time after discovery (not to exceed thirty (30) days), and the defective product must be delivered, prepaid to the seller’s factory with evidence that, it has been properly installed, maintained and operated in accordance with the seller’s instructions. Seller’s limited warranty excludes remedy for damage or defect caused by abuse; failure to resist corrosion or erosion from any corrosive agent or fluid, due to deposits of foreign material from any fluid; modifications not executed by Seller; improper installation or operation; defects or failures arising out of, in any way related to, or as a result either direct or indirect, of the Buyer’s failure to properly advise Seller of all normal and special operating conditions, known to or suspected by Buyer, when Seller is manufacturing the Equipment for a specific operation; or normal wear and tear under usage. This remedy is exclusive and is given in lieu of any warranty of merchantability, fitness, for a particular purpose or any other warranty, whether express or implied. Seller shall not be liable for consequential damages (including but not limited to, loss of use, lost profits, business interruption and the like), incidental damages, indirect damages, whether the claim for such damage is based upon warranty, contract, tort, strict liability or any other theory of recovery.

## Backstop Rebuilding Service

RINGSPANN CORPORATION backstops are precision devices manufactured under careful controls to meet manufacturing standards. When reconditioning is required, backstops should be returned to RINGSPANN CORPORATION for service.



### CAUTION!

Disassembly and repair of RINGSPANN CORPORATION backstops in the field is not recommended and will void any warranty.

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## Introduction

RINGSPANN CORPORATION FRHM backstops are precision built safety devices designed to protect inclined conveyors or vertical elevators from the dangers of gravity accelerated reverse runaway.

To be assured of reliable protection and the longest possible service life, it is important that the following recommendations be observed for the installation, lubrication, and maintenance of RINGSPANN CORPORATION backstops.

As soon as the unit has been received, examine it carefully and report any damage to the Transit Company and RINGSPANN CORPORATION immediately.

All tags and bulletins attached to the backstop should be carefully read before placing the backstop into operation and then filed for future reference.

### All units are shipped from factory with lubrication.



#### WARNING!

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



#### 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. The backstop and normal associated equipment (shaft, pulleys, etc.) involve moving parts; therefore consult local, state, OSHA and ANSI safety codes for proper guarding of revolving parts and possible pinch points.

Operate the backstop within its capacities and follow installation and lubrication instructions in this manual. Damage may occur to the backstop if:

- **It remains inoperative under full load for extended periods of time.**
- **If the shaft was accidentally rotated in the wrong direction of rotation at start-up.**

If either has occurred the backstop may have been damaged and should be returned to RINGSPANN CORPORATION for inspection.

#### NOTE:

***Although backstops are lubricated in factory, operational lubrication levels must be checked prior to start-up.***

## Long Term Storage



#### WARNING!

Backstops out of service or in storage for (2) or more years, require new seals before being put into operational service.

- Backstop units should be completely filled with **DEXRON VI** or **equivalent Automatic Transmission Fluid**.
- Store backstop in a protected, clean, and dry area.
- Once every two months the inner race should be rotated by hand several times to lubricate internal components.
- Exposed, unpainted surfaces should be **“brush painted”** with a **“rust preventative”**.
- Before placing backstop in operation, completely drain and properly refill with oil per **“Lubrication”** instructions.



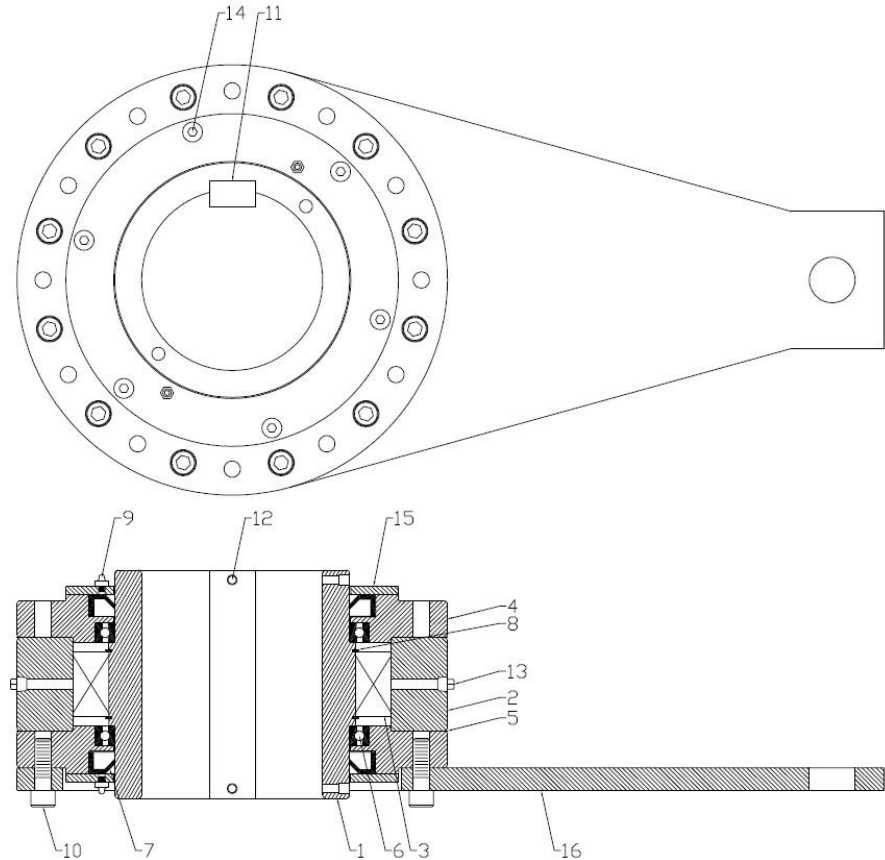
#### CAUTION!

Lubricants of the EP type (extreme pressure characteristics) should be approved by RINGSPANN CORPORATION. Those containing solid additives such as graphite or molybdenum disulphide should not be used.

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**Design** – Backstops are designed with these essential functional components

- 1) Inner Race
- 2) Outer Race
- 3) Sprag Cage
- 4) Cover Plates
- 5) Gaskets
- 6) Bearings
- 7) Seals
- 8) Retaining Clips
- 9) Grease Fittings
- 10) Fasteners
- 11) Shaft Key
- 12) Set Screws
- 13) Oil Plugs
- 14) Fasteners
- 15) Seal Retainer
- 16) Torque Arm



**ATTENTION!**

Before securing into place, check for proper rotation. As the clutch is symmetrical, in determining the proper direction of free rotation, orientate the clutch to match the directional arrows marked **“FREE”** on either face of the inner race and then verify by spinning the backstop by hand. The torque arm (Item 16) may be installed to either face of freewheel unit.



**Do Not Force Backstop Onto Shaft!**

Evidence of damage during assembly caused by disregard of the above instructions is readily traceable and RINGSPANN CORPORATION will not be held responsible for failure of such affected part or parts.

**Pre-installation Check**

**1. Shaft to Bore fit:**

Machine Builders may use non-standard shaft fits to mount RINGSPANN CORPORATION backstops. In this event, direct any questions concerning shaft fit to the machine builder.

**Backstop Mounting Fit on Shaft**

- Backstop bores are finished to size for an *“easy push fit”* on a shaft that is straight and not tapered.
- Shafts should be smooth and free of burrs.
- Coat the shaft with an anti-seizing agent for easy mounting and future removal of the backstop.

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<b>Bore Diameter</b>	<b>Bore Tolerance</b>	<b>Shaft Tolerance</b>	<b>Resulting Fit</b>
1.9375 to 7.00 inches	+ .001 / +.0025 inches	+ .000 / -.001 inches	.001 / .0035 inch clearance

**Note:** *The bore tolerance can be varied in cases which shaft diameter is not to the recommended guidelines. The backstop bore should always result in clearance fit to shaft for ease of mounting.*

## 2. Key and Key-seat

### Install the Key

- Install the key provided into the keyway. If necessary, the key may be **“field-dressed”** for proper fit.
- The key should be **“side-fitted”**.
- To provide for adequate top of key clearance, the straight keyway in the bore of the backstop has been made slightly deeper than standard.
- Overall length of the key should not exceed the length of the inner race



**WARNING!**  
DO NOT use Tapered Keys, Keys Must Be Straight.

## 3. Rotation

1. The backstop is symmetrical, which allows it to be mounted for the desired direction of free shaft rotation.
2. Check to **make certain** that the arrow, marked **“FREE”**, on the backstop inner race face is in the same direction as the desired free shaft rotation.

## 4. Mounting the Backstop and Key onto the Shaft

- Backstop bores are finished to size for an **easy push fit** on a shaft that is straight and not tapered.
- Shafts should be smooth and free of burrs.
- Coat the shaft with an anti-seizing agent for easy mounting and future removal of the backstop.
- Slip inboard torque arm endplate onto shaft **prior** to mounting the backstop.
- Push the backstop onto the shaft.
  - Taking care to push only on the face of the inner race.
  - This eliminates undue abuse on the bearings within the backstop during installation.
  - Rotate outer race by hand and mount visual oil gauge. (**See page 6 for instructions**)

## 5. Axial Retention

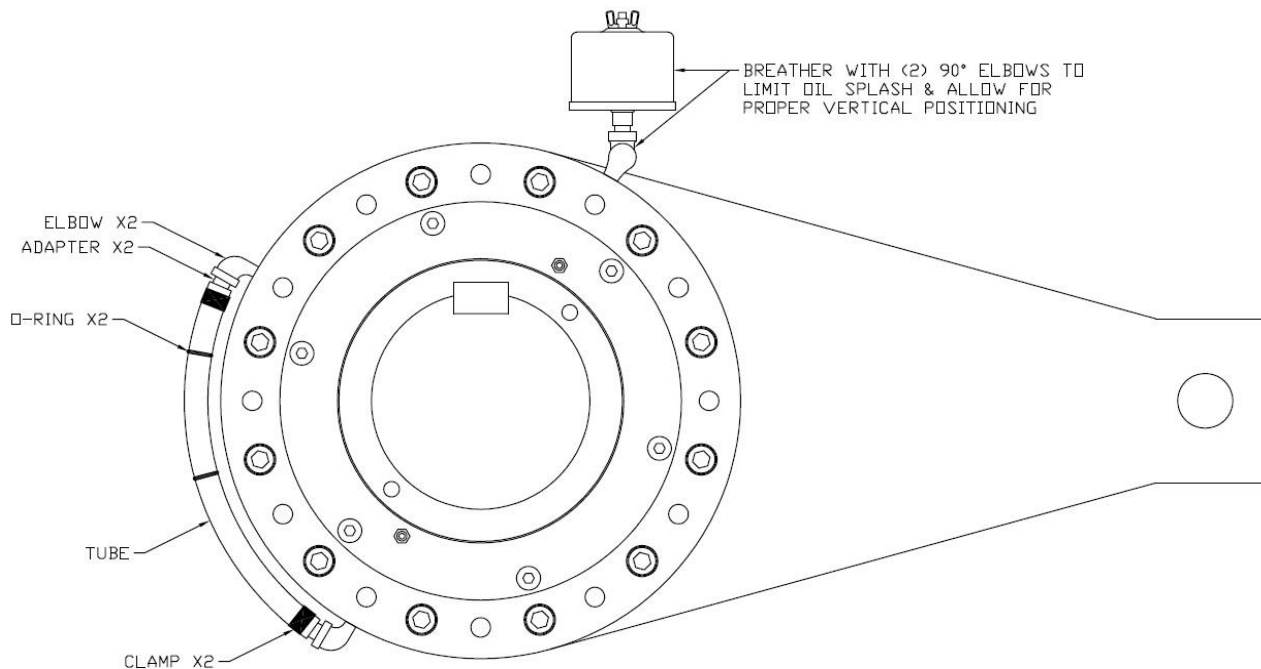
- Backstops are not installed as a tight fit onto shafts; therefore, it is important to utilize the inner race set screws to prevent the backstop from **axial movement** on the shaft.
- **Axial movement** may cause the torque arm to contact the stirrup, resulting in premature bearing failure.
- Set screws are shipped already in the inner race of the backstop.
- Confirm set screws are present and not extending into the bore area prior to mounting the backstop.
- After the backstop is mounted on the shaft, **make certain** all (4) set screws in the inner race are tightened.
- In the event that the backstop is to overhang the shaft, it is permissible to only tighten the two inboard set screws. Set screws should be tightened to 5-7 Lb.-Ft.
- An external keeper plate is recommended as a measure of extra protection.
- **Consult RINGSPANN CORPORATION to determine maximum allowable shaft overhang.**

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**BEFORE ATTACHING TORQUE ARM**  
**Installation Instructions for Visual Oil Gauge**

**Assembly Sequence:**

1. Rotate backstop on shaft until two of the plugs are ABOVE the centerline.
2. Remove plugs and install elbows using a Teflon thread sealer.
3. Tighten elbows and orient so that they face each other.
4. Install the adapters into the elbows using Teflon thread sealer.
5. Mount tube onto one of the adapters and secure with clamp.
6. Slide the two O-rings onto free end of tube.
7. Mount free end of tube onto other adapter and secure with clamp.
8. Rotate backstop so that one plug is near the top and the tube clearly displays the oil level.
9. Attach torque arm to backstop.
10. The tube should display an oil level at the shaft centerline. If not, then add or remove oil from backstop as necessary to obtain "half-full" oil level.
11. Remove the plug near the top and install breather using Teflon thread sealer.
12. Slide upper O-ring on tube to mark static oil level at the shaft centerline.
13. While backstop is operating at normal speed, slide lower O-ring on tube to mark running oil level.
14. If at any time the oil level is below its respective marker, then add oil as this bulletin instructs.



**Above:** Showing piping included for the configuration of visual gauge & breather. T-fitting and elbows included to allow vertical positioning of the breather and avoid oil splash on breather element.

**Attach Torque Arm to Backstop**  
**Before attaching the torque arm assembly**

- Rotate the outer race of the backstop so that one of the oil plugs is near the 12 o'clock position.
- Attach torque arm to backstop using provided fasteners.
  - Take into account the rotational direction and whether the arm will be inboard or outboard before attaching.

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### Backstop Torque Arm Support and Positioning

Torque arm end should have a minimum of 1/4" top clearance in its stirrup to make certain that it does not rust in or pack tight with foreign matter. Approximately 1-1/2" clearance should be provided at each side of the torque arm for axial positioning. The torque arm must be in contact with the support bracket in the direction of loading in order to prevent shock loads.

Safe backstop mounting is possible at any desired angle of the torque arm. However, mounting the backstop in a straight vertical position is not recommended. A minimum angle, approximately 5 degrees from vertical, should be maintained.

When mounted downward through a floor slot, a suitable boot or hood should be placed around the torque arm at or above the floor level to keep foreign matter from restricting possible torque arm movement.


### Tighten fasteners as follows


Model & Model Size	Required Torque Per Bolt
FRHM & FRHM 700 thru 800	110-130 Lb. – Ft.
FRHM & FRHM 900 thru 1100	220-260 Lb. – Ft.


Note: These values apply to fasteners as received from supplier, dry, or when lubricated with normal oil. They do not apply if special graphite or moly-disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.


### Lubrication

Proper lubrication and lubricant maintenance are the most important single maintenance factor for long, effective, trouble-free operation of backstops. Read the following instructions and follow them, carefully, for maximum performance and utilization of RINGSPANN CORPORATION backstops.

	<p><b>CAUTION!</b> Lubricants of the EP type (extreme pressure characteristics) should be approved by RINGSPANN CORPORATION. Those containing solid additives such as graphite or molybdenum disulphide should not be used.</p>
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	<p><b>CAUTION!</b> Applications where the ambient temperature falls below +20°F/-7°C or above +120°F/ + 55°C: Consult RINGSPANN CORPORATION for lubricant recommendations.</p>
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	<p><b>CAUTION!</b> Lubrication maintenance should not be performed while equipment is in operation.</p>
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	<p><b>WARNING!</b> Do not mix oils. When switching from one brand or type to another, drain oil and flush backstop with mineral spirits. Do not use any solvent containing carbon tetrachloride.</p>
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**WARNING!**

The use of lubricants in backstop assemblies, other than shown, can compromise proper function that may cause personal injury or property damage and will automatically void any warranty.



**WARNING!**

RINGSPANN CORPORATION is not responsible for any lubrication changes made by others after the backstop leaves the RINGSPANN CORPORATION factory.



**WARNING!**

Do not attempt to convert oil lubricated backstops to grease lubrication or grease lubrication to oil lubrication. Any such conversion may result in malfunction and will void any warranty.

**FRHM Maintenance**

**Note:** Always verify oil level in backstop after installation and before start up.

**Maintenance Procedures**

**Grease Seal Maintenance:**

**Purge grease seals every 3 months as follows:**

**The grease area of the backstop is utilized for secondary sealing and not lubrication of bearings and torque carrying components.**

To prevent airborne particulate matters from migrating into the backstop.

Using non-E.P. NLGI grade 1 or 2 grease such as **Mobilgrease XHP 221** and a manual or low pressure grease gun, add clean grease to all (4) grease fittings. Continue adding clean grease until all “**dirty**” grease is purged from the grease seals.

**Oil Maintenance:**

**Change backstop oil every 3 to 6 months as follows:**

**Recommended Oil Lubricant** - MOBIL DEXRON-VI ATF or Equivalent DEXRON-VI

1. Thoroughly, clean around the breather.
2. Remove and clean breather.
3. Loosen lower hose clamp of visual oil gauge.
4. Drain oil by removing tube from lower fitting.
5. Reattach tube and secure hose clamp.
6. Slowly add clean oil through the breather hole until proper static oil level is achieved.
7. Reinstall breather.

The frequency in which the backstop’s lubrication should be inspected is an important consideration and can only be determined by individual experience. However, it is considered desirable to inspect the oil level of the backstop once a week for the first month of service. The results of these inspections will dictate the frequency of future inspections, but in any event should not exceed six month intervals. Under severe working conditions, it may be necessary to perform more frequent lubrication maintenance on the backstop.