

How to Use This Manual

The following instructions and recommendations apply to all standard Falk NRTH backstops.

Their performance and life depend largely upon how they are installed and serviced. Drawings are representative of this series of backstops and may not agree in detail with all backstop sizes.

When requesting information specify the M.O. number, backstop size, model number, maximum running rpm, torque rating, torque arm angle degrees and date stamped on the backstop nameplate.

This manual provides detailed instructions on installation, maintenance and parts identification. Use the following Table of Contents to locate required information.

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

Introduction

WARRANTY — Rexnord Industries, LLC (the "Company") warrants that Drive One gear drives (I) conform to Company's published specifications, and (II) are free from defects of material for three years from the date of shipment.

Company does not warrant any non-Company branded products or components (manufacturer's warranty applies) or any defects in, damage to, or failure of products caused by: (I) dynamic vibrations imposed by the drive system in which such products are installed unless the nature of such vibrations has been defined and accepted in writing by Company as a condition of operation; (II) failure to provide suitable installation environment; (III) use for purposes other than those for which designed, or other abuse or misuse; (IV) unauthorized attachments, modifications or disassembly, or (V) mishandling during shipping.

Safety Codes & General Precautions

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.

DISMANTLING, REPAIR & PARTS REPLACEMENT

— See Figure 1, Page 2. 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. (A pinch point occurs at the contact point between the backstop torque arm and support, and between the torque arm and stirrup.)

Carefully read and follow all supplementary instructions and tags attached to the backstop and then file for future reference.

Operate the backstop within the torque rating, overrunning speed, ambient temperature range and torque arm angle

degrees listed on the nameplate. Follow lubrication instructions in this manual.

When removing backstop from shaft, do not apply heat to the backstop. Apply axial force to the hub of the backstop only.

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, the backstop may have been damaged. Return the backstop to the Factory for inspection.

Falk NRTH backstops use a precision Roller Ramp design that does not allow motion in one direction and overruns in the other direction.

TABLE 1 — Backstop/Torque Arm Rating Chart

BACKSTOP SIZE	1055 NRTH	1065 NRTH
Backstop Rating	4360 lb-ft/5900 Nm	7260 lb-ft/9830 Nm
Torque Arm Rating		
Single	6540 lb-ft/8855 Nm	10890 lb-ft/14745 Nm
Double	8720 lb-ft/11807 Nm	14520 lb-ft/19660 Nm
Torque Arm Reaction Force ★	2130 lbs/10,300 N	3840 lbs/17,100 N

★ Reaction force is based on the minimum arm length and 1.5 times the backstop selection guide rating. Force = $\frac{1.5 \times \text{Rating} \times (12)}{34}$

Application Requirements

BACKSTOP APPLICATION — The NRTH backstop is designed to prevent reverse rotation in applications such as inclined conveyors, bucket elevators, fans, rotary pumps and kilns. If local safety codes permit, the backstop may be used as a backup or a brake on these applications, but NOT in people conveying systems such as elevators, manlifts, ski tows or ski lifts. Also DO NOT use the backstop as a substitute for a brake.

OPERATING TEMPERATURES — Enclosure of the backstop may cause overheating. Provide adequate ventilation. Backstop operating temperatures, at maximum overrunning speed, may exceed 200°F (93°C). Determine the effect of this temperature on the driven equipment and provide cooling if necessary.

If a backstop operates in the sun at ambient temperatures over 100°F (38°C), then special measures should be taken to protect the backstop from solar energy. This protection can consist of a canopy over the backstop or reflective paint on the backstop. If neither is possible, a cooling device such as a fan may be required to prevent the sump temperature from exceeding the allowable maximum of 200°F (93°C) for ISO oils or 225°F (107°C) for Mobil SHC 624 synthetic oil or equivalents.

INDEXING — NRTH backstops can be used for indexing service. Refer application data to the Factory for selection. Indexing is defined as continuous cyclic or periodic application of the backstop as encountered in conversion of reciprocating or oscillating motion into intermittent linear motion.

JOGGING — Defined as start/stop movement with jerking or jolting motion is permissible. NOTE: There must be at least one complete overrunning revolution between backstop operations or it is considered an indexing application.

EXPLOSIVE ATMOSPHERES — The purchaser is responsible for taking adequate precautions to prevent spark generation in explosive atmospheres. Consideration should be given to spark generation that may occur when the torque arm strikes the stirrup.

CHEMICAL ATMOSPHERES — The backstop may be damaged if exposed to certain types of chemicals or vapors: for example, potash dust, chlorine gas, carbon tetrachloride, etc. These materials may cause deterioration of the seals.

AXIAL RETAINING — Axial retention of the backstop is required to prevent movement of the unit on the shaft and preloading of the bearings. A setscrew located 120° from the key is provided on each end of the backstop for retention.

TABLE 2 — Backstop Shaft Fits

Nominal Diameter	Nominal Shaft Tolerance	Nominal Bore Dia Tolerance	Bore - Shaft Min-Max Clearances
Inch			
1.7500-2.9375 3.0000-5.0000	+ .0000 - .0005 + .0000 - .0010	+ .0005 + .0015 + .0010 + .0025	.0005 - .0020 .0010 - .0035
Metric			
44 to 50 mm Over 50 to 80 mm Over 80 to 120 mm	+ .0000 to .0007 k6 + .0004 to .0012 m6 + .0005 to .0014 m6	+ .0010 to + .0020 F7 + .0024 to + .0035 F7 + .0028 to + .0042 E7	.0003 to .0020 .0012 to .0031 .0014 to .0037

General Instructions

BACKSTOP-SHAFT FITS — The shaft must have a 125 micro inch (or finer) finish and clearance fits specified in Table 2 above.

KEYS & KEYWAYS — Keys to be used with NRTH backstops are furnished by Rexnord. They are cold drawn 1045 steel or heat treated alloy steel (310-350HB). The keys are side-fitted, full length, and must not be excessively tight in order to avoid distortion of the hub. Use a side-fitted key that has slightly chambered corners and can be inserted with a snug, push fit.

BACKSTOP MOUNTING POSITIONS — The backstop rotational axis must be horizontal within 5° for all applications. The NRTH backstop torque arm is capable of being mounted at any desired angle, however a horizontal mounting at 0° or 180° is preferred. The mounting angle must be specified at the time of purchase.

TORQUE ARM STOPS (OR STIRRUP) — The torque arm stops must be designed to resist the force developed by the actual

torque applied to the backstop.

The minimum recommended distance to the torque arm stop is as illustrated in Figure 2, Page 3. Use torque arm stops capable of withstanding the torque arm reaction force tabulated Table 1, Page 1 (Torque Arm Rating).

The torque arm must be free to move within the stirrup or on pin. Provide clearance on three sides per Figure 3, Page 3.

DO NOT restrict torque arm movement by welding or securing the torque arm to any supporting structure.

Locate the torque arm support surface parallel ($\pm 1/2^\circ$) to the torque arm surface.

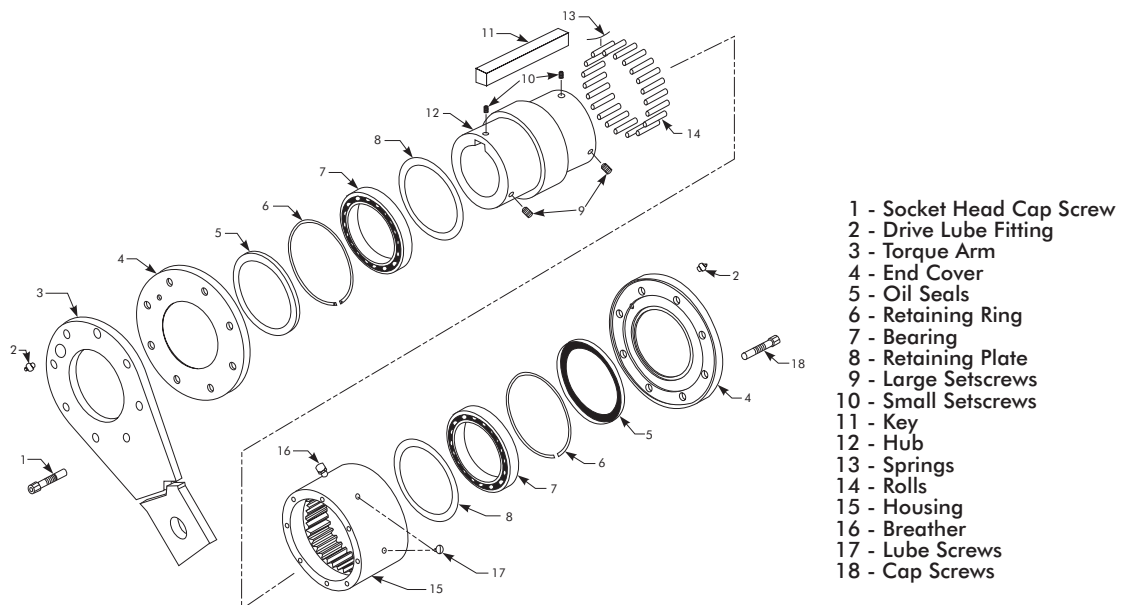
Prevent accumulation of any foreign material or ice around torque arm and torque arm stirrup which could restrict free movement of the torque arm.

Pre-Installation Check

1. Check lubrication holes' position relative to torque arm mounting angle. Two of the lubrication holes should be as close as possible to the 12 o'clock and 6 o'clock positions when arm is installed. (If not remove torque arm mounting bolts and rotate Torque Arm ★ and End Cover together. Install breather in 12 o'clock position. Re-install bolts and torque to 64 lb-ft. (87 Nm) on 1055NRTH (Bolts: M10 x 1.5 x 40mm, grade 12.9) and 110lb-ft. (150 Nm) on 1065NRTH (Bolts: M12 x 17.5 x 45mm, grade 12.9).
2. Check torque arm mounting for the correct mounting side of backstop for your application. (If not, remove torque arm and reinstall on the correct side, being mindful of End Cover ★ position relative to torque arm position). Re-torque bolts to 64 lb-ft. (87 Nm) on 1055NRTH (Bolts: M10 x 1.5 x 40mm, grade 12.9) and 110 lb-ft. (150 Nm) on 1065NRTH (Bolts: M12 x 17.5 x 45mm, grade 12.9). The side with only the end cover requires a bolt torque of 36 lb-ft. (51Nm) on the 1055NRTH (Bolts: M10 x 1.5 x 20mm, grade 8.8) and 65 lb-ft. (89 Nm) on the 1065NRTH (Bolts: M12 x 1.75 x 20mm, grade 8.8).

★ Torque Arm has a hole which must be aligned so that the grease fitting on the End Cover is exposed.

FIGURE 1



- 1 - Socket Head Cap Screw
- 2 - Drive Lube Fitting
- 3 - Torque Arm
- 4 - End Cover
- 5 - Oil Seals
- 6 - Retaining Ring
- 7 - Bearing
- 8 - Retaining Plate
- 9 - Large Setscrews
- 10 - Small Setscrews
- 11 - Key
- 12 - Hub
- 13 - Springs
- 14 - Rolls
- 15 - Housing
- 16 - Breather
- 17 - Lube Screws
- 18 - Cap Screws

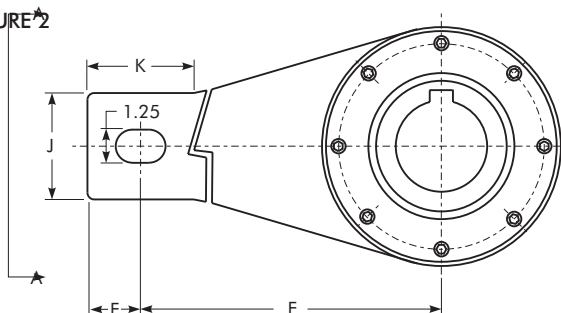
TABLE 3 — Backstop Keyway Dimensions

BACKSTOP SIZE	Nominal Shaft Diameter (over - incl.)	Keyway W x D	Key ★	Min Key Engagement
Inch				
1055	1.75-2.25	.500 x .250	.500 x .500 x 7.00	4.75
	2.25-2.75	.625 x .312	.625 x .625 x 7.00	4.75
	2.75-3.00	.750 x .375	.750 x .750 x 7.00	4.75
	3.00-3.25	.750 x .250	.750 x .500 x 7.00	4.75
1065	2.50-2.75	.625 x .312	.625 x .625 x 7.00	5.00
	2.75-3.25	.750 x .375	.750 x .750 x 7.00	5.00
	3.25-3.75	.875 x .437	.875 x .875 x 7.00	5.00
	3.75-4.00	1.000 x .375	1.000 x .750 x 7.00	5.00
Metric – mm				
1055	44-50	14 x 3.8	14 x 9 x 178	121
	50-58	16 x 4.3	16 x 10 x 178	121
	58-65	18 x 4.4	18 x 11 x 178	121
	65-75	20 x 4.9	20 x 12 x 178	121
1065	63-65	18 x 4.4	18 x 11 x 190.5	127
	65-75	20 x 4.9	20 x 12 x 190.5	127
	75-85	22 x 5.4	22 x 14 x 190.5	127
	85-95	25 x 5.4	25 x 14 x 190.5	127
	95-100	28 x 6.4	28 x 16 x 190.5	127

Installation

MOUNT BACKSTOP — CAUTION: Before installing backstop, check direction of shaft free rotation and required rotation of motor. The backstop overrunning (or free rotation) direction is indicated by a rotation arrow on each side of the backstop on the hub.

- Clean the shaft and remove burrs. Minimum shaft engagement 1055NRTH 5.38" (137mm), 1065NRTH 5.75" (146mm).
- Coat shaft and key with a light oil to ease installation of key, as well as backstop. Install the key furnished with the backstop.
- Lift backstop and slide it onto shaft. Apply axial force only to the hub face of the backstop. Do not press on torque arm or end cover as damage to the bearing will occur. The backstop must be positioned to meet certain minimum engagement requirements which vary with backstop and bore size. Minimum required key length is shown in Table 4.
- After backstop is in place and properly centered between stirrups and/or pin, tighten the two setscrews to secure both the key and backstop from moving axially on the shaft, preventing the torque arm from binding.

FIGURE 2

TABLE 4 — Minimum Key Length

BACKSTOP SIZE	1055NRTH	1065NRTH
Inches (mm)	4.75 (121 mm)	5.00 (127 mm)

Maintenance

LUBRICATION — Any machine oil, R&O type with no anti-wear or extreme pressure additives of an equivalent viscosity of ISO 32, 46, or 68 depending on ambient temperature as per Table 5 below.

TABLE 5 — Lube Oil Recommendations †

Operating Ambient Temp. in °F / °C	ISO Grade Spec. / AGMA
-40 to 80°F / -40 to 27°C	32 / -0
80 to 120°F / 27 to 49°C	46 / 1
120 to 160°F / 49 to 71°C	68 / 2

† DO NOT use SAE Automotive oils.

HIGH SPEED OPERATION — Drives running at speeds over 1000 rpm will run at temperatures between 200-225°F (93-107°C). For these conditions a high temperature synthetic lube oil such as Mobil SHC 624 is required.

Under normal conditions, relubrication is recommended every six months. More frequent relubrication is recommended at speeds over 1000 rpm or temperatures over 200°F (93°C). Check alignment of the torque arm whenever the lubricant is changed. Maintain clearances between torque arm and support as specified in the TORQUE ARM STOPS OR STIRRUP (Page 2). After first week of operation, drain lubricant as outlined in the following section. Severe operating conditions may require more frequent flushing.

Flushing Procedures

- Remove all four oil plugs and drain lubricant.
- With one plug hole in the near 12 o'clock position, fill with twice the amount listed for lubrication quantity of Exxon Durasol or Mobil Solvsol.
- Rotate slowly for several minutes to dissolve any evaporation residue.
- Remove all plugs. Drain completely. Replace bottom plug and refill with recommended lubricant and amount listed for your unit in Table 6 below.

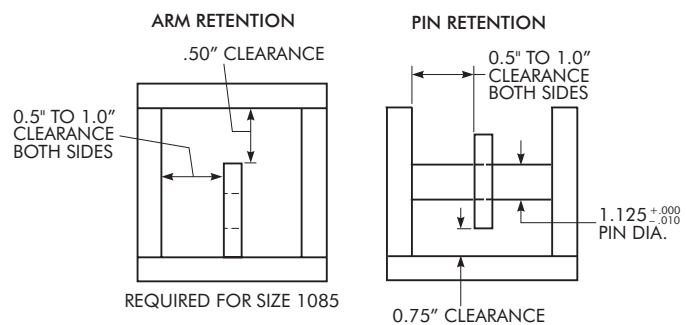
FIGURE 3


TABLE 6 — Oil Level

BACKSTOP SIZE	1055 NRTH	1065 NRTH
Oil required in backstop (volume)	100 ml / 3.4 oz	140 ml / 4.75 oz

GREASE PURGED SEALS — Backstops are furnished with greased purged double lip seals which, when greased, provide maximum protection under the most unfavorable conditions such as atmospheres laden with taconite or similarly severe abrasive dusts.

CAUTION: DO NOT use pressurized grease guns.

TABLE 7 — Greases for Grease Purged Seals
0° to 200°F (-18° to 93°C)

Manufacturer	Lubricant
Amoco Oil Co.	Amoco Rykon Premium Grease No. 2
BP Oil Co.	Energrease LS-EP2
Chevron U.S.A., Inc	Industrial Grease Medium
Ctgo Petroleum Corp.	Premium Lithium Grease No. 2
Conoco Inc.	EP Conolith Grease No.2
Exxon Company, U.S.A.	Unirex N2
E.F. Houghton & Co.	Cosmolube 2
Imperial Oil Ltd.	Unirex N2L
Kendoll Refining Co.	Multi-Purpose Lithium Grease L421
Keystone Div., Pewalt Corp.	Zeniplex 2
Lyondell Petrochemical (ARCO)	Litholine H EP 2 Grease
Mobil Oil Corp.	Mobilith 22
Petro-Canada Products	Multipurpose EP2
Phillips 66 Co.	Philube Blue EP
Shell Oil Co.	Alvanio Grease 2
Shell Canada Limited	Alvanio Grease 2
Sun Oil Co.	Ultra Prestige EP2
Texaco Lubricants	Premium RB Grease
Unocal 76 (East & West)	Unoba EP2
Valvoline Oil Co.	Multilube Lithium EP Grease

* The option of adding grease is the purchaser's. Adding grease to the seals is NOT RECOMMENDED if grease could contaminate the material being processed as in the food and drug industries — use food grade greases.

Dismantling, Repair & Parts Replacement(Seals)

WARNING: DO NOT attempt to service or remove backstop before removing load.

When contacting the Rexnord Service Department concerning required service, state nature of problem and give complete data from backstop nameplate; M.O. number, size date, etc.

SEAL REMOVAL & REPLACEMENT PROCEDURE — Remove backstop from shaft as outlined in "Installation & Maintenance Instructions". If one seal is damaged remove the mounting bolts on the torque arm or end cover depending on which side is leaking. If on torque arm side, lift torque arm off from backstop. Be careful as torque arm is heavy and may shift as bolts are being removed and can fall off when all bolts are removed. Proceed after all bolts have been removed from either side. Using a soft faced hammer remove the end covers by tapping on the edges of the cover. Now the seal should be exposed. Using a straight blade screwdriver or other sharp object, deform the outer perimeter of the seal. **CAUTION: DO NOT DRIVE TOO DEEP THROUGH THE SEAL AS YOU MAY DAMAGE THE BEARING.** After the perimeter of the seal is deformed sufficiently, the seal can be pried out easily.

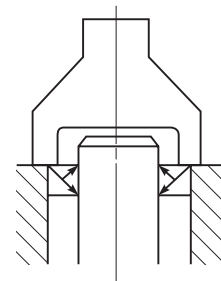
SEAL INSTALLATION — Check the bore for any burrs from seal removal and contamination which may have entered the backstop. Once the housing is clean check the shaft for any nicks, burrs, or grooves. Inspect the new seal for any cuts, dents, tears or defects. Check seal direction before installation making sure new seal faces in the same direction. (Spring side toward the center of the backstop.)

REMOVE SEAL SPRING PRIOR TO ASSEMBLY —

Pre-lubricate the seal lip. Before installation, wipe the seal lip and hub with the oil being used in the backstop.

INSTALLING THE SEAL — Use an arbor slightly smaller than the seal O.D., and large enough to contact backstop housing face as shown in Figure 4. Use a press to get a straight even pressure on the outer seal edge. A soft hammer can be used with the arbor, but extra caution is required not to damage the seal due to uneven pressure being applied.

FIGURE 4



Stored or Inactive Backstops

STORAGE REQUIREMENTS FOR FALK NRTH BACKSTOPS

— Backstops that are to be stored for periods of six months to one year are to be prepared as follows:

Any existing oil should be drained from the backstop. A rust inhibiting oil such as Nox-Rust VCI 10 should be added in an amount of five percent of clutch capacity minimum. After rust inhibitor has been added, the backstop should be rotated several times to distribute a coating of oil throughout the clutch. A light coat of oil should then be applied to all unprotected surfaces of the backstop. The backstop should then be wrapped in wax paper and then rewrapped in beeswax paper. Then box or crate as necessary.

Backstops should then be stored indoors and kept dry. Backstops stored outdoors should have additional protection from the elements to assure they are kept dry.

In the event the backstop is stored for longer periods of time, it is recommended that the backstop have additional VCI crystals or desiccant added to packaging and be wrapped in plastic. The backstop should also be periodically checked (every three to six months) and additional rust inhibitor added. Clutches should also be rotated to redistribute a coating of oil on internal parts.

BEFORE PLACING BACKSTOP IN OPERATION — Drain lubricant. Flush backstop and refill with clean, fresh lubricant per instructions above.