Draftguard™ Anti-Rotation Device

Installation and Maintenance Instructions

Introduction

Gates Draftguard™ anti-rotation device prevents back-drafting of Air Cooled Heat Exchanger (ACHE) fan applications with vertical shafts. The Draftguard assembly consists of a one-way clutch (with ball bearings, integral seals, and housing), torque arm and flange plate adapter. Versatile mounting holes allow attachment of the unit to a variety of pulleys with either Taper-Lock® or QD® bushings.

WARNING: Failure to fully read and follow all instructions may result in product damage, equipment damage, and serious or fatal injury.

Pre-Installation Instructions

Review Figure 1 to identify the nomenclature for the various components of the Gates Draftguard™ Anti-Rotation Device assembly.

A. Taper-Lock (TL) Bushing 3020, 3525, 3535 and 4030 Mounting

Draftguard will mount to pulley assemblies with Taper-Lock bushing sizes 3020, 3525, 3535 or 4030. The standard screws connecting the pulley and TL bushing are removed and replaced with new, longer screws attaching the Draftguard flange plate to the bushing. For shafts that extend out 15/16 inch or more from the face of the TL bushing, additional spacers (sold separately) are required for proper fit. For TL bushing installs it is critical to the performance of the unit that the pressure from the face of the flange plate is touching the bushing face and also that the flange plate does not bottom out on the end of the shaft.
B. QD Bushing E, F, and J Mounting

Draftguard will mount to pulley assemblies with QD bushing sizes E, F, or J. The standard screws connecting the pulley and QD bushing remain in place. The Draftguard flange plate bolts to the open jack screw holes in either the bushing or pulley. No spacers are required for mounting to a QD bushing. The following procedure is used to calculate the length of the mounting screws (not included) required.

Procedure for Determining Spacers and Screw Length for TL Bushings (measure in inches)

1. Measure length of shaft extending from the bushing
2. Subtract 7/16 inch for the depth of the flange plate counter bore - 7/16 inch
3. Divide result by thickness of one spacer ÷ 1/2 inch
4. Round up to whole number to get number of spacers
5. Multiply number of spacers by thickness of one spacer X 1/2 inch
6. Add thickness of flange plate + 1 inch
7. Add the bushing thread depth from Table 1 +

Length of socket head cap screws required

<table>
<thead>
<tr>
<th>Bushing</th>
<th>Size</th>
<th>Thread Depth (inch)</th>
<th>Qty</th>
<th>Torque (lb-in)</th>
<th>Spacer Product No</th>
</tr>
</thead>
<tbody>
<tr>
<td>3020</td>
<td>5/8-11</td>
<td>1 1/4</td>
<td>2</td>
<td>800</td>
<td>7814-0001</td>
</tr>
<tr>
<td>3525</td>
<td>1/2-13</td>
<td>1 1/2</td>
<td>3</td>
<td>1000</td>
<td>7814-0002</td>
</tr>
<tr>
<td>3535</td>
<td>1/2-13</td>
<td>1 1/2</td>
<td>3</td>
<td>1000</td>
<td>7814-0002</td>
</tr>
<tr>
<td>4030</td>
<td>5/8-11</td>
<td>1 3/4</td>
<td>3</td>
<td>1700</td>
<td>7814-0002</td>
</tr>
</tbody>
</table>

B. QD Bushing E, F, and J Mounting

Draftguard will mount to pulley assemblies with QD bushing sizes E, F, or J. The standard screws connecting the pulley and QD bushing remain in place. The Draftguard flange plate bolts to the open jack screw holes in either the bushing or pulley. No spacers are required for mounting to a QD bushing. The following procedure is used to calculate the length of the mounting screws (not included) required.

Procedure for Determining Screw Length for QD Bushings (measure in inches)

1. Measure length of shaft extending from the bushing
2. Subtract 1/2 inch for the depth of the flange plate counter bore - 1/2 inch
3. Add thickness of flange plate + 1 inch
4. Add the bushing thread depth from Table 2 +

Length of hex head bolts required
Shaft Sizes, Keys, and Direction of Rotation

The Draftguard unit can fit shaft sizes up to a maximum of 3 inch diameter. Shaft keys that stick down past the pulley will have to be slid up or trimmed off to avoid interference.

Fan Shaft Rotation

The Draftguard unit is configurable to work with fans operating in either direction of rotation. The majority of vertical shaft ACHE units have the fan running in the counter clock wise (CCW) direction when viewed from under the fan unit where the belt drives are typically located. As shipped, the Draftguard assembly is set up to operate in this configuration.

Draftguard can also operate with fan rotation in the clock wise (CW) direction or if the belt drive assembly is on top by simply installing the clutch assembly upside down.

NOTE: Before starting the electric motor, turn the fan shaft (by hand) in the correct direction once the torque arm is attached. If the Draftguard is not allowing the fan shaft to turn then you may need to turn the clutch assembly unit over or double check your fan design.

Torque Arm Stops (Not Available from Gates)

Torque Arm Stops should be attached to the equipment frame or supporting structure to prevent rotation of the torque arm when holdback torque is applied. Stops should be designed to handle the rated torque of the Draftguard, 284 lb-ft.

A. Plate

The torque arm should be perpendicular to the shaft axis within +/- 5 degrees and clearance between the torque stop and torque arm should be at least 1/4 inch in both directions.

Clearance is necessary to permit free axial and angular movement of the torque arm resulting from shaft run out and eccentricity. Torque stops should not contact the corner radii of the torque arm.

NOTE: DO NOT RIGIDLY MOUNT THE TORQUE ARM. DO NOT WELD, CLAMP, FASTEN OR FIX THE TORQUE ARM – ALLOW THE TORQUE ARM TO FLOAT.
Prior to Installation of Draftguard

Prior to installation insure that all components are available and that equipment is in a safe state to do a successful installation:

• Insure that power is shut off, locked out and tagged.
• Insure some temporary means of preventing wind milling or back drafting of belt drive system.
• Insure some means to safely hold the fan sheave or sprocket to prevent it from potentially dropping, especially when removing TL Bushing screws.

Check List:

• Draftguard Assembly
  o Flange Plate
  o Clutch
  o Torque Arm
  o Snap Rings
  o Key
• Spacers if required
• Proper length mounting screws
• Loctite® 262 Threadlocker
• Anti-sieze compound
• Locking Ring Mount, if needed
• Power is shut off
• Power is locked out
• Power box is tagged
• Components in safe position
• Fan sheave/sprocket is secured from dropping

Installation

Read and follow all mounting instruction for a successful installation.

1. Disassemble the Draftguard assembly into components
   a. Remove outer snap ring
   b. Slide the clutch assembly off the stub shaft of the flange plate
   c. Retain the key and snap ring for reassembly later

2. Mount the Draftguard flange plate to the vertical fan shaft.
   a. Pulleys with Taper-Lock Bushing 3020, 3525, 3535 or 4030
      i. Remove the standard socket head cap screws connecting the TL bushing to the pulley.
   CAUTION: Make sure sheave or sprocket with bushing is securely supported to eliminate falling and causing personal injury

B. Steel Cable

If a braided steel cable is used instead of a stop, install a shackle into the hole in the end of the torque arm and tie a cable between the shackle and a solid mounting point.
ii. As determined in the pre-installation instructions, slide any spacers required onto the shaft, aligning cutouts as needed to expose TL mounting holes.

iii. Slide Draftguard Flange Plate onto shaft, aligning proper mounting holes with holes in TL bushing.

iv. As determined in the pre-installation instructions, install proper length socket head attachment screws through 2 holes in the flange plate into the bushing and tighten.

CAUTION: The bolt force must be directly on the face of the Taper-Lock bushing. The flange plate surface must not press against the pulley face or fan shaft end. Failure to adhere to these requirements could result in damage to equipment or personal injury.

b. Pulleys with QD Bushing E, F, or J
   i. Slide Draftguard Flange Plate onto the end of the shaft aligning proper mounting holes with the open jack screw holes in the QD bushing or pulley.
   ii. As determined in the pre-installation instructions, install proper length attachment screws through 2 of the holes in the flange plate into the bushing or pulley.

3. Align Draftguard Flange Plate Stub Shaft with Fan Shaft
   a. Using a dial indicator, measure concentricity of flange plate stub shaft and fan shaft.
   b. If shaft concentricity exceeds 0.003 inch TIR, loosen flange plate mounting screws and adjust shaft alignment.

4. Install and Torque All Flange Plate mounting screws
   a. Apply Loctite 262 Threadlocker to end of the screw and install the third mounting screw (except for TL 3020 which uses only 2 screws).
   b. To maintain shaft alignment, one at a time remove the other 2 screws previously installed and re-install with thread locker applied.
   c. Alternately tighten all screws to final torque specification per Table 1 or Table 2.

5. Install Clutch Assembly
   a. Check that inner snap ring is installed on the flange plate stub shaft.
   b. Coat flange plate stub shaft with anti-seize compound.
   c. Install key into the keyway of the flange plate stub shaft.
   d. Slide clutch assembly onto shaft and rotate by hand to check correct direction of rotation for fan rotation.
   e. Install outer snap ring on flange plate stub shaft.

6. Attach Torque Arm Stops
   a. Check that torque arm and stop meet clearance and alignment recommendations outlined in the pre-installation instructions.
Vibration Troubleshooting

If unacceptable levels of vibration occur upon installation, disassemble and reinstall being sure to tighten fasteners as described, verify that the flange plate sits flush with the bushing or with the optional Locking Ring assembly, and that the Locking Ring assembly is not bottomed out against the mating shaft. Verify that shaft concentricity does not exceed 0.003 inch TIR. Also verify that the torque arm is not bound in any way but is free to float against its stops.

Maintenance

The Draftguard clutch and bearing assembly is sealed and lubricated for life.

The clutch assembly should be replaced every five years to ensure uninterrupted service life.
1. Remove the two shoulder screws to free the torque arm.
2. Remove outer snap ring from flange plate stub shaft.
3. Slide clutch assembly off the stub shaft.
4. Visually inspect the key for any damage and replace if needed.
5. Clean the stub shaft thoroughly and coat with anti-seize compound.
6. Insert key into stub shaft.
7. Slide new clutch assembly on stub shaft, check for proper direction of rotation.
8. Install outer snap ring.
9. Re-install torque arm bolts using thread locker.

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 contact Gates or our distributor.

Limited Lifetime Warranty

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LOCTITE® is a registered trademark of Henkel Corporation
Gates Corporation
Denver, CO

Draftguard™ Kit

Weight | MAX Torque | MAX Speed
--- | --- | ---
24.6 lbs | 284 lb-ft | 500 rpm

Created
June 24, 2009

Product Number
7814-0004

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES