Confidential
Service Bulletin

Insulated Bearing and Brush Kit

For units with LF2.0 drives

Order Number: CTV-SVC15B-EN DATE: June 9, 2005

This confidential service bulletin provides special warranty policy and/or service expense compensation information for use by Trane warranty representatives.

NOTICE: Warnings and Cautions appear at appropriate sections throughout this literature. Read these carefully.

⚠ WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

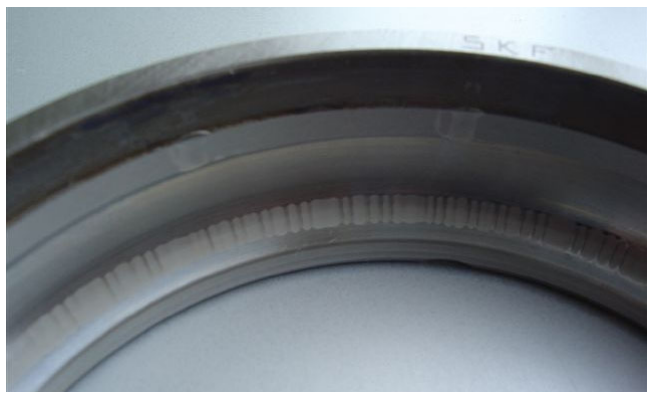
CAUTION: Indicates a situation that may result in equipment or property-damage only accidents.

Introduction

The purpose of this bulletin is to advise Trane Service Companies of a FIX-ON-FAIL retrofit action for 3-stage CVHE/G chillers that meet ALL of the following criteria:

- The units are equipped with standard steel thrust bearings, BRG01209 (small) or BRG01210 (large).
- The units are factory equipped with the LiquiFlo 2.0 Adaptive Frequency Drive (drive model # AFDE....).
- The unit presently has a thrust bearing that has failed due to spark discharge.

Figure 1. Photo of typical spark discharge damage in a bearing race



Note: Service Bulletin CTV-SVC06C-EN has expired and is no longer applicable to these units.

Problem

A situation may occur in some LF 2.0 equipped units where the chiller motor experiences a shaft voltage. The shaft voltage created may seek a path to ground through the thrust bearings, resulting in damage to the thrust bearing.

Units Affected

Rockwell LF 2.0 Adaptive Frequency Drive equipped centrifugal chillers manufactured after November 1st, 2001 that have experienced premature failure of steel bearing BRG01209 or BRG01210. Not all LF 2.0 equipped chillers are affected.

Discussion

If a LF 2.0 AFD equipped chiller with steel bearing BRG01209 or BRG01210 is determined to have suffered a premature or repeat thrust bearing failure due to spark discharge, then Trane has available to install an insulated bearing assembly, a new design grounding brush, and a bearing inspection cover that allows the fitting of the new design brush.

Corrective Actions

FIX-ON-FAIL only.

For an LF 2.0 equipped chiller with a standard steel thrust bearing BRG01209 or BRG01210 that has failed due to spark discharge, with or without a brush kit: Order and install the insulated bearing assembly, new design brush, and (if needed) a new bearing inspection cover. See the parts ordering information below for details.

Parts Ordering Information

For affected units order an insulated bearing kit selected from Table 1

Table 1.

Original Bearing	Insulated Bearing
BRG01209	BRG01507
BRG01210	BRG01508

Note: Initially, only limited bearing quantities are available.

For affected units that do not have a brush kit already installed, or that have an older design brush kit installed, order one new design brush selected from Table 2. To determine the motor frame size refer to the data plate that is attached to the chiller's motor housing, or breakdown the chiller model number using the parts identification systems.

Table 2.

Compressor Family (NTON)	Motor Frame Size	Brush Part #
CVHE320 & CVHE500 (NTON 190, 210, 230, 240, 250, 270, 280, 300, 320, 330, 360, 370, 400, 420, 450, 500)	360, 400	BRU00428
	440E	BRU00429
CVHG565 (NTON 480, 565)	400	BRU00428
CVHF485 & CVHF910 & CVHF128 (NTON 350, 410, 485, 570, 650, 770, 910, 1060, 1280)	All	BRU00428

For affected units shipped prior to 9/24/2004, or that have the older design brush kit installed, order one replacement New Design Bearing Inspection Cover per Table 3.

Table 3.

Compressor Family (NTON)	Motor Frame Size	New Design Bearing Inspection Cover Part #
CVHE320 & CVHE500 (NTON 190, 210, 230, 240, 250, 270, 280, 300, 320, 330, 360, 370, 400, 420, 450, 500)	360, 400	COV03609 10.51" (26.69cm) diameter
	440E	COV03610 13.43" (34.11cm) diameter
CVHG565 (NTON 480, 565)	400	COV03609 10.51" (26.69cm) diameter
CVHF485 & CVHF910 & CVHF128 (NTON 350, 410, 485, 570, 650, 770, 910, 1060, 1280)	All	COV03610, 13.43" (34.11cm) diameter

ROTOR BOLT

For affected units shipped prior to 9/24/2004 and that do not already have a rotor bolt installed, order and install one KIT12220. KIT12220 consists of the flat-headed rotor bolt, belleville washer, drill bits, and tap that are needed to provide the shaft with a flat running surface for the grounding brush.

AFD equipped chillers shipped after 9/24/2004 should already be equipped with a drilled and tapped motor shaft and with a grounding bolt. Do not order KIT12220 if the affected chiller shipped after 9/24/2004.

The rotor shaft grounding system consists of the flat headed bolt that must be installed into the motor shaft, and a brush assembly that mounts through the new style bearing inspection cover.

Refer to the instructions below for the installation of the rotor shaft grounding bolt, or refer to the instructions for the bolt installation that were provided in PART-SVN79A-EN.

Note: The installer may find that some units already have a 7/16-20 hole tapped into the shaft, and/or that a flat headed bolt may already be installed into the motor shaft. If this is found it is not necessary to follow the full instructions for drilling and tapping the shaft or installing the bolt.

Instructions

- Remove the thrust bearing inspection cover, if the thrust bearings are to be changed at this time follow the applicable instructions for thrust bearing removal as detailed in service bulletin CVHE-SB-33C.

Note: Drilling and tapping of the motor shaft for the grounding system can be done with the thrust bearings and bearing bracket installed, but great care must be taken to prevent contamination of the thrust bearings. It is highly recommended, but not required, that the drilling and tapping be accomplished with the thrust bearings removed.

CAUTION
Thrust Bearing Damage!

Extreme care must be taken when drilling and tapping the motor shaft with the thrust bearings and bearing bracket installed. Failure to follow this recommendation may lead to contamination and damage of the thrust bearings.

- Follow all warnings and cautions as stated in bulletin CVHE-SB-33C.
- Use paper or plastic sheeting and tape to seal the bearing and motor cavity. Use the tape to seal the shaft to the sheeting, and the sheeting to the motor housing. This is done to keep the motor and housing CLEAN!
- Use the 1/4” drill bit provided in KIT12220 and carefully drill the center of the motor shaft, using the existing shaft center dimple and hole as a guide. Keep the drill bit well lubricated and drill to a depth of 2.0" to 2.2" from the end of the shaft. Drill straight into the shaft.
- Use the 25/64” drill bit provided in KIT12220 and carefully enlarge the 1/4” hole drilled in the step above. Keep the drill bit well lubricated and drill to a depth of 2.0" to 2.2" from the end of the shaft. Drill straight into the shaft.
- Flush any remaining chips or debris from the drilled hole.
- Use the 7/16-20 LH tap provided in KIT12220 and carefully tap the 25/64” hole that was drilled in the end of the motor shaft. Note the tap is LEFT- HAND. Keep the tap well lubricated and clean. Tap the hole in small steps, reversing the tap often to keep it clean. Tap to a minimum of 1.75" depth from the end of the shaft.
- Flush any remaining chips or debris from the drilled and tapped hole.
- Properly place the belleville washer onto the rotor grounding bolt provided in KIT12220. Note that the washer MUST be placed such that the concave side of the washer will be towards the motor shaft. The washer, when properly collapsed, will provide spring tension to the bolt. See Figure 1. You may install a small amount of Loctite 271 to the threads of the bolt.
- Install the rotor grounding bolt and washer onto the end of the motor shaft using a 1-1/8” socket. Note that the bolt has left-hand threads. Hold the shaft and tighten the bolt to 55-65 lb.-ft. The belleville washer should be evenly centered during tightening and fully compressed after tightening is complete.
- Carefully collect any debris and remove the sheeting and tape from the shaft and housing. Visually inspect the motor and remove any debris found.
- If not already done, re-install the inner bearing cap and install the new insulated thrust bearings onto the shaft. Follow the standard SKF mounting instructions for heating

and pressing the bearings as provided in service bulletin CVHE-SB-33C. Install the bearing tab washer and locknut. Tighten and secure the locknut using the instructions in service bulletin CVHE-SB-33C.

- Continue to use CVHE-SB-33C to position the inner seal, re-install the motor bearing bracket, and re-install the bearing retaining ring and bolts. Use CTV-SB-66F for guidance on the use of Loctite.
- If required, prepare the new inspection cover for installation onto the chiller. Transfer the bearing temperature sensor well (or plug, if the chiller is not equipped with bearing temp sensors) from the original bearing inspection cover to the new bearing inspection cover.
- Properly install the new bearing inspection cover onto the chiller.
- To install the new brush into the inspection cover, first remove the plug (if present) from the center fitting of the cover, then clean the threads. The threads and o-ring of the new style brush should be lubricated with Trane compressor oil OIL00022. The brush can then be inserted into the cover and tightened to a final maximum torque of 150 lb.-ft.
- Reassemble the bearing oil supply and return lines. Also reference service bulletins CTV-SVB11C-EN (oil orifice size), CVHE-SB-33C (thrust bearing installation procedures), and CTV-SB-66F (o-ring and flange sealants).
  Pressurize and leak test the chiller.

Figure 2. Rotor grounding bolt and washer, must be installed in the end of motor shaft to provide a smooth surface for the grounding brush to ride upon.

Figure 3. New Design Grounding Brush

Figure 4. Original Bearing Inspection Cover without brush fitting or brush.

Figure 5. New design Bearing Inspection Cover with brush fitting, but without the brush installed. This cover is standard on LF 2.0 equipped chillers since 9/24/2004.

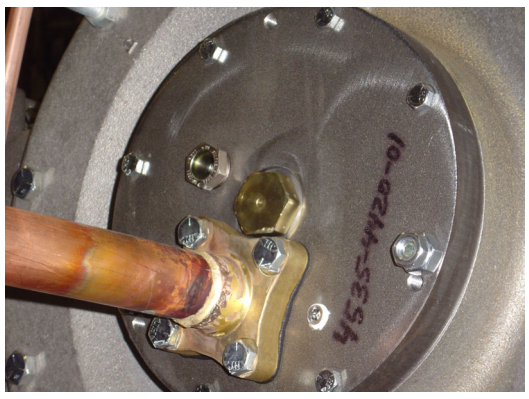


Figure 6. New design Bearing Inspection Cover with new design Grounding Brush installed.

Material Disposition

- Any failed or damaged thrust bearings must be returned to Trane along with a completed Bearing Failure Questionnaire.
- Any older style grounding brush removed must be returned to Trane.
- Older style bearing inspection covers should NOT be returned to Trane, they can be scrapped in the field.

Return Parts To:

Trane
2313 South 20th
La Crosse, WI 54601
Attn: Product Support CTV Technical Service
Re: CTV-SVC15A-EN

When the failed bearings are returned to La Crosse they must be accompanied by the following completed questionnaire:

Unit Serial # _____

Unit Sales Order # _____

AFD Type (LF 1.0, LF 1.5, or LF 2.0) _____

Motor size (CPKW) _____

Chiller Start Date _____

Date of Bearing Failure _____

Chiller Operating Hours _____

Has this chiller had previous bearing failures _____

Bearing Operating Hours* _____

Date Ground Brush Installed _____

Local Trane office personnel to contact if more information is needed

Name: _____

Phone: _____

*If this is the original bearing set, the bearing operating hours will be equal to the chiller operating hours. If the failed bearings are not the original set, then please record only the operating hours of the most recent failed set.

Notification

Upon completion of the repair send an e-mail to *techservice@trane.com* containing the job name and unit serial number, to notify La Crosse Tech Service that the unit has been repaired per this service bulletin.

Labor Authorization

- Up to 2 hours will be allowed to install the new design brush kit.
- Standard hours will be allowed to install the thrust bearing.
- Standard hours will be allowed for refrigerant removal and reinstallation.
- 3 hours travel per job

Expiration Date

This service bulletin expires December 31st, 2005.

Questions

For general questions contact the CTV Technical Service department in La Crosse at 608-787-3943 or e-mail at *TechService@trane.com*.

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www.trane.com

For more information contact your local district office or e-mail us at comfort@trane.com

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