TRANE®

# Diagnostic Troubleshooting Repair

# RTHC and RTHD

## *CHHC Compressor Service and Troubleshooting*

May 2007

RLC-SVD04B-EN

# Warnings and Cautions

**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.

## Important - Read This First!

**This manual is intended for experienced service personnel familiar with the proper use of electrical diagnostic instruments and all personal safety procedures when working on live electrical circuits.**

**This Manual is not intended for individuals who have not been properly trained in handling live electrical circuits.**

## Important Environmental Concerns!

**Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants—including industry replacements for CFCs such as and HCFCs and HFCs.**

## Responsible Refrigerant Practices!

**Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.**

## ⚠ WARNING
## Contains Refrigerant!

**System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.**

**Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.**

# CHHC Compressor Service and Troubleshooting

The purpose of this bulletin is to provide troubleshooting and repair procedures for CHHC compressors.

## Compressor Operation

The CHHC compressors consists of three distinct sections: the motor, the rotors and the bearing housing. A two-pole, hermetic, squirrel-cage induction motor directly drives the compressor rotors. The motor is cooled by suction vapor drawn from the evaporator and entering the end of the motor housing. Each Series R chiller uses a semi-hermetic, direct-drive helical rotary type compressor. Excluding the bearings, each compressor has only 3 moving parts: 2 rotors - “male” and “female” - provide compression, and a slide valve that controls capacity. The male rotor is attached to, and driven by the motor, and the female rotor is, in turn, driven by the male rotor. Separately housed bearing sets are provided at each end of both rotors on RTHC/RTHD units. The slide valve is located below (and moves along) the rotors.

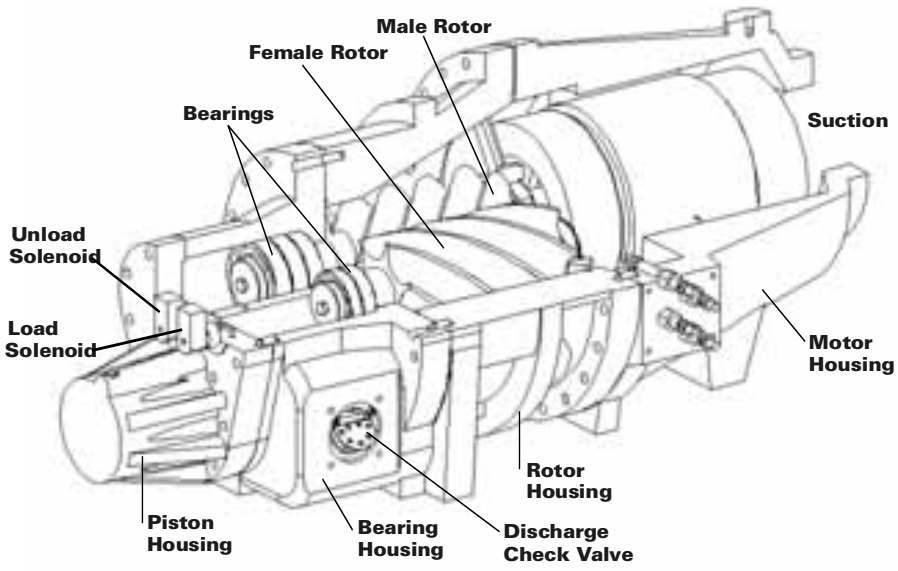


**Figure 1. CHHC Compressor**

The helical rotary compressor is a positive displacement device. Refrigerant from the evaporator is drawn into the suction opening at the end of the motor section. The gas is drawn across the motor, cooling it, and then into the rotor section. It is then

compressed and released directly into the discharge plenum.There is no physical contact between the rotors and compressor housing. Oil is injected into the bottom of the compressor rotor section, coating both rotors and the compressor housing interior. Although this oil does provide rotor lubrication, its primary purpose is to seal the clearance spaces between the rotors and compressor housing. A positive seal between these internal parts enhances compressor efficiency by limiting leakage between the high pressure and low pressure cavities.

Capacity control is accomplished by means of a slide valve assembly located in the rotor/bearing housing sections of the compressor. Positioned along the bottom of the rotors, the slide valve is driven by a piston/cylinder along an axis that parallels those of the rotors.Compressor load condition is dictated by the coverage of the rotors by the slide valve. When the slide valve fully covers the rotors, the compressor is fully loaded. Unloading occurs as the slide valve moves away from the suction end of the rotors. Slide valve unloading lowers refrigeration capacity by reducing the compression surface of the rotors. Movement of the slide valve piston determines slide valve piston which, in turn, regulates compressor capacity. Compressed vapor flowing in to and out of the cylinder governs piston movement, and is controlled by the load and unload solenoid valves.The solenoid valves (both normally closed) receive “load” and “unload” signals from the UCP2/CH530, based on system cooling requirements. To load the compressor, the UCP2/CH530 opens the load solenoid valve. The pressurized vapor flow then enters the cylinder and, with the help of the lower suction pressure acting on the face of the unloader valve, moves the slide valve over the rotors toward the suction end of the compressor.The compressor is unloaded when the unload solenoid valve is open. Vapor “trapped” within the cylinder is drawn out into the lower-pressure suction area of the compressor. As the pressurized vapor leaves the cylinder, the slide valve slowly moves away from the rotors toward the discharge end of the rotors.When both solenoid valves are closed, the present level of compressor loading is maintained.

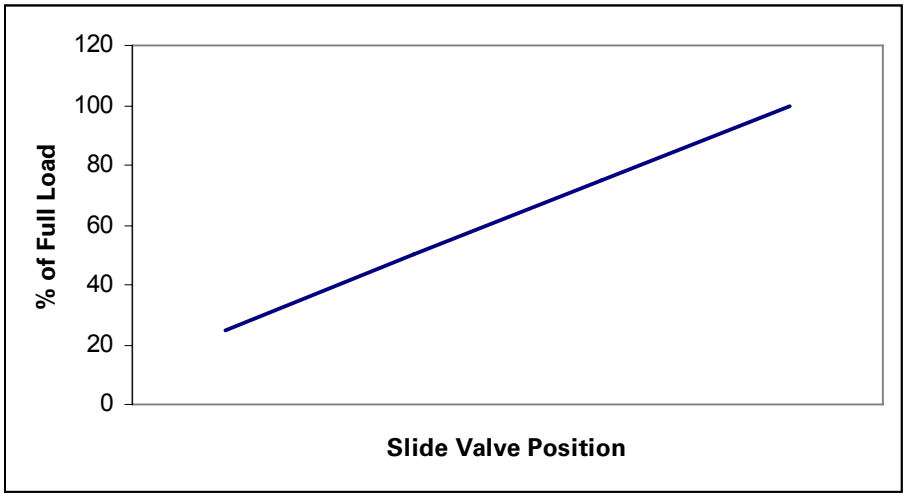


**Figure 2. Compressor Capacity**

On compressor shutdown, the unload solenoid valve is energized. Springs assist in moving the slide valve to the fully-unloaded position, so the compressor always starts at minimum loaded.

## Trouble Shooting Procedures

Listed below are some tips on how to diagnose a suspected loading problem. Possible causes of the problems are also listed in Table 1.

**Table 1. Troubleshooting**

| Problem | Possible Cause |
|---|---|
| Compressor will not load | Solenoid coil is receiving improper electrical signal |
| | The inherent differential pressure is incorrect |
| | Load solenoid fails to open |
| | Orifice under load solenoid valve is plugged - B Frame only |
| | Filter on the high side gas line to solenoid is clogged |
| Compressor will not unload | Solenoid coil is receiving improper electrical signal |
| | Unload solenoid fails to open |
| | Load solenoid fails to close |
| | Internal leak - Piston rings |

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**Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.**

- If either a load or unload solenoid valve is suspected of not closing, a piece of shim stock can be placed between the valve and the gasket, sealing off the ports of the valve. This will simulate a closed valve and confirm the diagnosis of a solenoid valve that fails to close.

- To confirm an internal leak, place a piece of shim stock under both the load/unload solenoid valves.If the schrader valve pressures still rises, there is an internal leak.

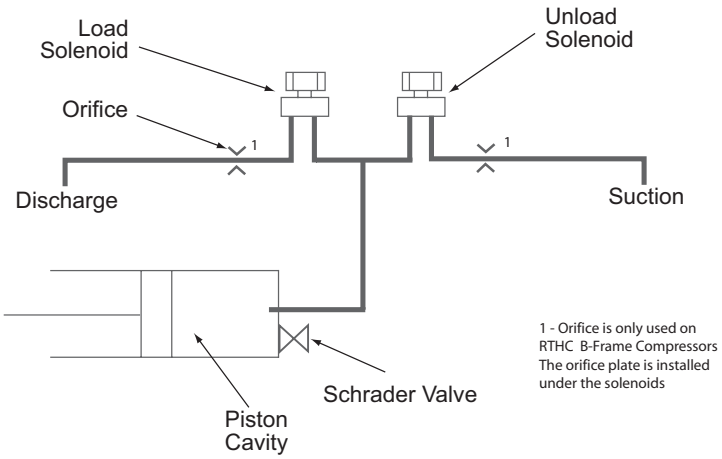


**Figure 3. Load/Unload Schematic**

## Checkout procedure for the Slide Valve and Load-Unload Solenoids

Make sure unit is off and there is no power in the control panel before beginning this procedure.

### ⚠ WARNING
### Hazardous Voltage!

**Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.**

1. **RTHD** - Connect to unit with TechView. Take manual control of the slide valve.

   Change slide valve control from auto to manual. Increase the slide valve duty cycle to load and decrease to unload.

   **RTHC** - Go into the Service Setting Menu and take manual control of the slide valve.

   Change slide valve control mode to load, or unload.

2. Connect a manifold gauge set to the schrader valve located at the end of the piston housing. This schrader allows access to the pressure behind the male piston. Refer to Figure 4.

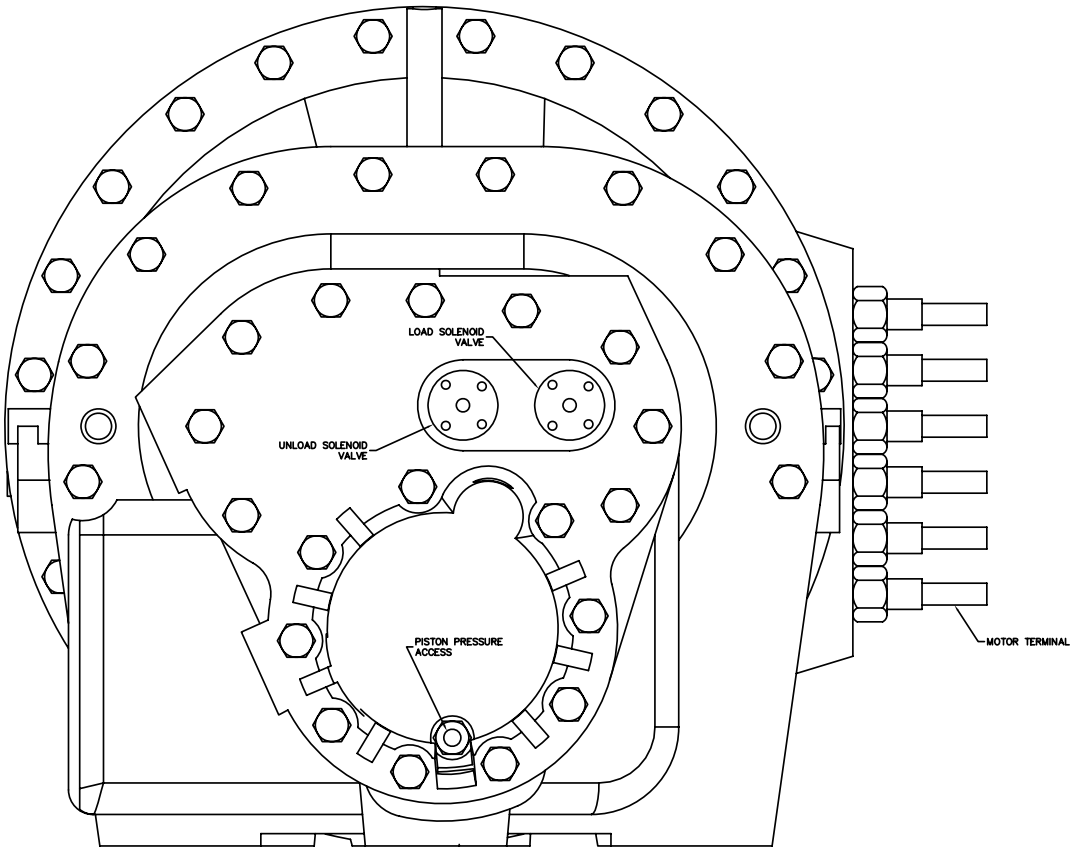


**Figure 4. CHHC Compressor**

3. Place the chiller in "Auto" mode and provide all necessary interlocks and a load to start the chiller
4. Allow the compressor to start and monitor the compressor currents with a clamp-on type ammeter.

## Load

### ⚠ WARNING
### Live Electrical Components!

**During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.**

1. Once the compressor has started, allow the Unload solenoid to remain energized for approximately 45 seconds, then manually load the compressor (using UCP2 or TechView). Record the male piston pressure and compressor currents.

2. Monitor the male pressure behind the piston and the amp draw of the unit. Both should gradually increase with each pulse of the load solenoid.

***Note:*** *All limits are still active. If the chiller enters into a condenser, current, or evaporator limit. Continuously monitor the operating mode.*

## Unload

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1. Manually Unload the compressor using the front panel or TechView.
2. The pressure behind the male piston and the RLA of the unit should gradually decrease with each pulse sent to the unload solenoid.

***Note:*** *The pressure behind the piston should be approximately suction pressure when the compressor is fully unloaded. The RLA will be dependent on the application.*

With the results from the above checkout procedure use Table 2 to determine the possible causes of the loading problem.

**Table 2. Possible Causes to Loading Problem**

| Possible Operation | Recorded Measurement | Load | Unload | Hold |
|---|---|---|---|---|
| Operating properly | Piston Pressure | increase | decrease | remain constant |
| | Amp Draw | increase | decrease | remain constant |
| Stuck piston | Piston Pressure | increase | decrease | remain constant |
| | Amp Draw | remain constant | remain constant | remain constant |
| Leaking load solenoid, internal leak or leaking piston | Piston Pressure | increase | may drop initially but will increase as soon as the unload is de-energized | increase |
| | Amp Draw | increase | may drop initially but will increase as soon as the unload is de energized | increase |
| Leaking unload solenoid | Piston Pressure | remain constant or decrease | decrease | decrease |
| | Amp Draw | remain constant or decrease | decrease | decrease |

# Repair Procedures

## Piston Repair

### ⚠ WARNING
### Hazardous Voltage!

**Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.**

### ⚠ WARNING
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1. Drain oil from the compressor by pulling the drain plug (18 mm socket) on the bottom of the bearing housing.
2. RTHCs have orifice plates and the RTHDs do not.
   **The piston housing will ship with the orifice plate installed under the solenoids. For RTHD units, this plate will need to be removed. If the plate is not removed the loading and unloading of the compressor will be very sluggish.**
3. Reinstall drain plug, once oil is completely drained. Note the quantity of oil for recharging.
4. Remove the schrader core on the piston housing, this will remove all pressure and allow residual oil to drain. See Figure 5

   **There may by residual pressure in the piston housing. Use caution when removing schrader core**

**Figure 5. Removing the Schrader Core**

5. Loosen all the bolts on the piston housing bolts (24 mm socket). See Figure 6. Leave 3 bolts around the piston, loose but installed, to prevent housing from coming completely off until it has been broken loose from the bearing housing.

**Figure 6. Removing Piston Housing Bolts**

**Figure 7. Install Guide Rods**

6. It may be necessary to strike on the housing with a dead blow hammer or a pry bar to loosen the piston housing.
7. Install M16 guide rods or all thread. See Figure 7
8. Install metal plate that is to be obtained locally. The plate should be roughly the size denoted below.

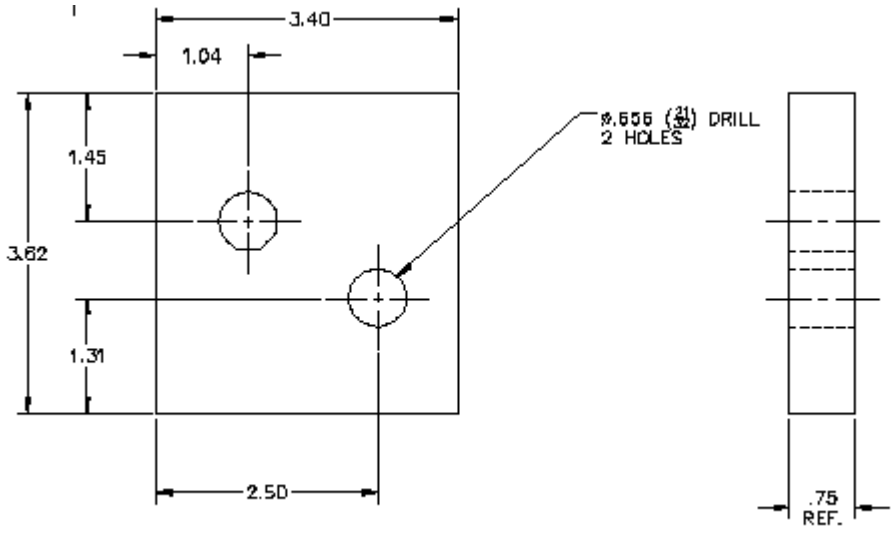
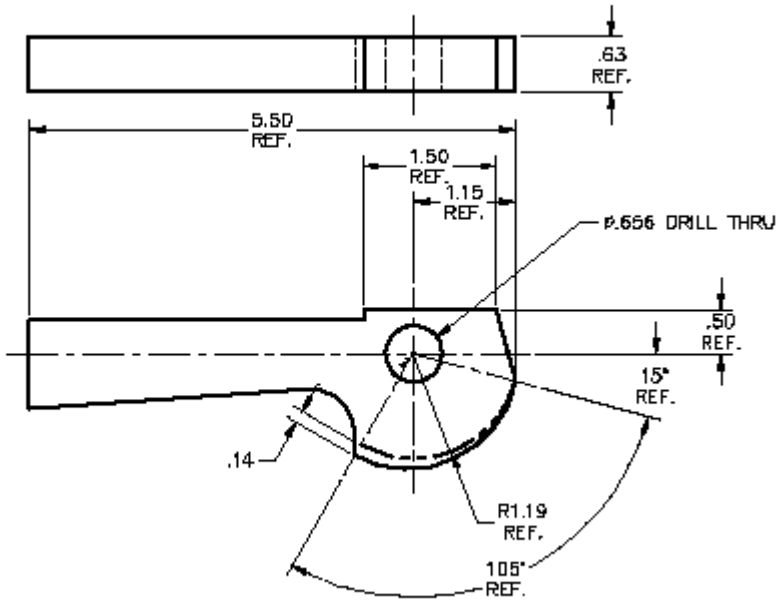



**Figure 8. Metal plate dimensions**

1. Install a cam handle (obtained locally) to the piston housing using the other M16 bolt. Leave this bolt semi lose to allow for rotating the handle.

**Figure 9. Dimensions for Cam-handle**




2. It may be necessary to strike on the housing with a dead blow hammer or a pry bar to loosen the piston housing.

**Figure 10. Install Metal Plate and Cam - handle**


3. Once the handle has been rotated, the cam plate will need to be removed and rotated to gain more torque with the handle. Notice in Figure 11, p. 14, the cam plate is no longer flush with the bearing housing.

4. If the handle is too tight to rotate, slide a “cheater” bar over the handle to help pry apart the housings.

**Figure 11. Rotate the Cam Plate**

5. Once the housing is separated, remove the cam handle and cam plate. Install M16 Eyebolt in the top of the housing. Insure the eyebolt is properly installed.
   *Piston housing weight = 130 lbs.*

**Figure 12. Install Eye Bolt**

**⚠ WARNING**
**Eyebolts!**

**Maximum load rating for eyebolts are based on a straight vertical lift in a gradually increasing manner. Angular lifts will significantly lower maximum loads and should be avoided whenever possible. If an angular lift is required, a properly seated Shoulder Pattern eyebolt must be used. Loads should always be applied to eyebolts in the plane of the eye, not at some angle to this plane. Angular lifts must never be more than a 45 degree pull. Failure to properly lift Piston Housing could result in death or serious injury or equipment or property- only damage.**

6. Support the piston housing with overhead **crane/hoist**.
7. It may be necessary to pry the piston housing slightly away from the bearing housing as it may adhere to the gasket.
8. Slide the piston housing toward the discharge end of the compressor until it is clear of the piston. See Figure 13.
9. Place the housing on the floor.

**Figure 13. Removing the Piston housing**

10. Remove guide rods.
11. Remove piston nut (30 mm socket), remove piston and springs.

***Note:*** *Piston is under spring tension, use necessary precautions while removing the piston.*

## ⚠ WARNING
## Hazardous Service Procedures!

**The maintenance and troubleshooting procedures recommended in this section of the manual could result in exposure to electrical, mechanical or other potential safety hazards. Always refer to the safety warnings provided throughout this manual concerning these procedures. When possible, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks. Failure to follow all of the recommended safety warnings provided, could result in death or serious injury.**

12. Clean old gasket from bearing housing.

    **Keep debris out of the compressor.**

13. Clean new piston.
14. Apply 1 drop of loctite 271 to slide valve shaft threads.
15. Install existing springs, new piston, and nut. Torque nut to 150 ft-lbs. Ensure piston is installed completely against the shaft shoulder. The springs must be centered and verify that they not bound. See Figure 14.

**Figure 14. Installing the Piston**

16. Install guide rods

## CAUTION
## POE Oil!

**The POE oil used in the system is very hygroscopic. To insure the oil does not absorb too much water, store in a clean and dry metal container that is sealed.**

**Regardless of where the refrigerant is stored, the oil needs to be removed from the system and stored in a sealed metal container.**

17. Install new piston housing gasket with the bead side out. Put a light coating of POE oil on the gasket.
18. Put a light coating of POE oil on the piston housing and piston seals to assist in the assembly.
19. Remove the piston housing schrader core to assist in assembly.
20. Reinstall piston housing and torque bolts in a cross pattern to 175 ft-lbs.

    **Push piston housing on until it is seated on the dowel pins.**
21. Once the piston housing is assembled and the bolts are properly torqued, exercise the piston using dry nitrogen.
22. Install the schrader core and solenoid coils.
23. Pressure test the unit and check for leaks.
24. Evacuate to <500 microns and perform a rise test.

    **Make sure that the piston cavity has been evacuated.**
25. Open isolation valves
26. Recharge as necessary and place chiller back in service.

**Table 3. Parts for Piston Replacement**

| Description | Part Number | Qty |
|---|---|---|
| B frame kit<br>Design Sequence A-K | KIT06838 | 1 |
| B frame kit<br>Design Sequence K and later | KIT09515 | 1 |
| C frame kit | KIT06362 | 1 |
| D/E frame kit | KIT06051 | 1 |
| Cam-handle | obtain locally | 1 |
| Metal Plate | obtain locally | 1 |

## Motor Terminals

### Motor Terminal Condensation

The condition of condensation on motor terminal insulators is normal for screw chillers and each unit has been designed to take this into account.

Because of their exposure to suction refrigerant temperatures, condensation may appear on the motor terminals whenever the suction temperature falls below the dew point temperature. In applications where the relative humidity is elevated, droplets of water will form on the insulators, and may even begin to "rain" from them. If the corrosion from the condensation is a concern to the customer, a “varnish” such as Glyptal™ or a suitable insulation may be used on the terminals. Future maintenance considerations should be taken in to account when selecting a compound as it may be difficult to clean off, and may cause a poor connection if the leads are removed and later re-secured.

### Motor Terminal Leaks

During disassembly of a chiller, the compressor terminals are prone to damage, and it is recommended that they be protected while being moved. The Trane part number for this block is BLK01009. If the terminals are damaged or leaking they can replaced. Review Figure 15 for action needed to fix the leaking terminal.

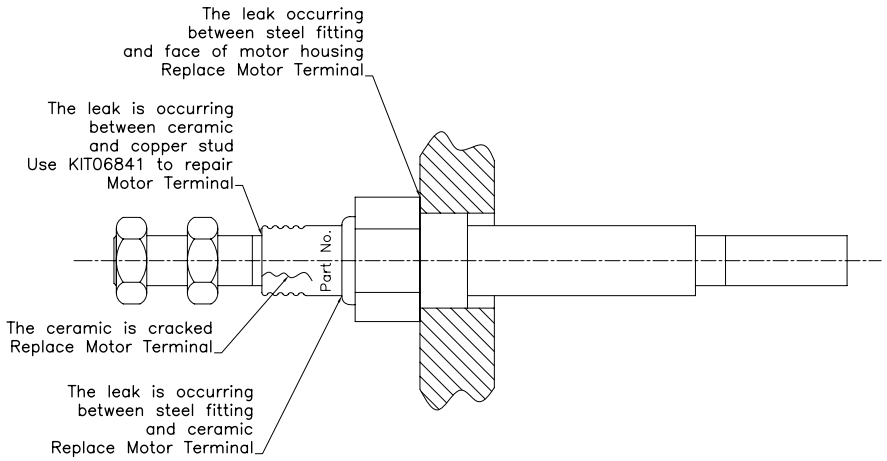



**Figure 15. Motor Terminal Leaks**

### Assembly Instructions for O-ring and Seal Cap on CHHC Compressors

This kit is only applicable to terminals that are leaking between the copper stud and the ceramic, it will not work on terminals with cracked ceramics.

**⚠ WARNING**
**Hazardous Voltage!**

**Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.**

1. Loosen the brass nuts (using a back up wrench) on the terminals and remove the power wires and brass nuts.
2. Wrap the terminal threads with tape. (This will prevent damage to the o-ring when sliding over the terminal threads.)
3. Stretch the o-ring over the terminal stud and slide it down until it stops against the ceramic.
4. Remove the tape and slide the seal cap on and torque to 120 in/lbs (13.6 Nm).
5. Check the terminals for leaks.
6. Re-install the other brass nut and power wires. (**Use a back up wrench** and tighten terminal nuts to 40 ft/lbs. (54.2 Nm)). Refer to Figure 16.

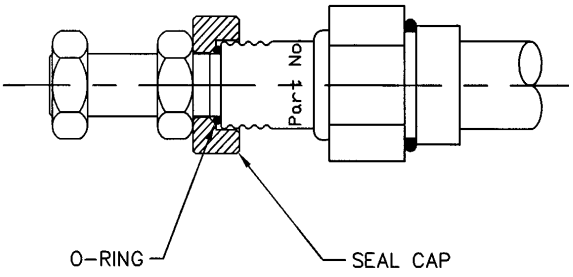



**Figure 16. O-ring and Seal Cap**

### Motor Terminal Replacement/Compressor Separation Procedure

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1. Refrigerant and Oil Removal

   Prior to disassembly, the refrigerant needs to either be isolated in the condenser or removed from the system. The oil needs to be removed from the system also.

Refrigerant Isolation

   a. If the unit has isolation valves, use the following steps to store the charge in the condenser.
   b. Close the butterfly valve(s) on the top of the condenser.
   c. Close the large angle valve at the bottom of the condenser.
   d. Close the two (2) service valves at the back of the condenser that have 1/4” lines tied to the oil sump and the gas pump.
   e. Connect one end of a refrigerant hose to the bottom of the evaporator on the evaporator charging valve and the other end to a liquid transfer pump. From the liquid transfer pump, connect another hose to the 5/8" charging valve on bottom of the condenser.
   f. After the liquid is in the condenser, remove the vapor using the same connection points and a recovery system.

Refrigerant Removal

   a. If no isolation valves are installed, remove the entire charge from the system.
   b. Open all valves.
   c. Connect a liquid transfer pump to the 5/8" charging valve on the evaporator.
   d. Use the same point to remove the vapor.

2. Oil Charge Removal

**CAUTION**
**POE Oil!**

**The POE oil used in the system is very hygroscopic. To insure the oil does not absorb too much water, store in a clean and dry metal container that is sealed.**

**Regardless of where the refrigerant is stored, the oil needs to be removed from the system and stored in a sealed metal container.**

a. Energize the master oil solenoid valve to allow oil to drain from the oil lines into the oil sump.

b. Drain the oil from the oil charging valve located at the bottom of the oil sump.

3. Starter/Control Panel Removal

   **Starter panel weight - 550 lbs (249 Kg)**

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**Hazardous Voltage!**

**Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.**

The refrigerant and oil does not need to be removed for this process. If the starter/control panel needs to be removed as well as removal of the refrigerant, the two processes can occur simultaneously.

While the refrigerant and oil is being removed, preparation for removing the starter panel can begin.

a. Label and record all wiring and conduit so that it can be reconnected correctly.

b. Disconnect LLID buss at the power supply module (1A2).

c. If separating the condenser and evaporator, remove discharge sensor and tie it to the condenser buss.

d. Cut the buss between the condenser and evaporator.

e. Important: Cut the buss at a 45o angle

f. Remove coils from the load and unload solenoids, gas pump fill and drain solenoid and the master oil solenoid.

g. Remove the oil heater.

h. Coil the flexible conduit and wire tie them to the back of the panel.

i. Oil optical sensor on the lube system - disconnect the cable inside the panel and coil the cable up at the lube circuit near the sensor. Label each of the four leads as they are removed from the terminals.

j. Remove the high pressure switch and coil the flexible conduit up wire tie to the back of the control panel.

Important: Verify that the HPC depresses the schraeder valve when it is reinstalled.

k. Label and remove the motor terminal leads.

***Note:*** *The plastic terminal cover used in the factory is available from service parts. The part number for the cover is BLK01009.*

### ⚠ WARNING
### Heavy Objects!

**Do not use cables (chains or slings) except as shown. Each of the cables (chains or slings) used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift. Other lifting arrangements may cause equipment or property-only damage. Failure to properly lift unit could result in death or serious injury. See details below.**

### CAUTION
### Motor Terminals!

**When loosening retaining nuts on the motor terminals use backup wrench to avoid applying excessive torque to the motor terminals. Failure to use backup wrench may cause terminals to develop a leak path between the copper conductor and porcelain.**

**DO NOT hit the motor terminals when removing the starter/control panel. If the motor terminals are cracked or develop a leak, the entire compressor must be removed and opened to repair the terminals.**

l. Install two 1/2" eyebolts on the top of the starter/control panel. Secure the eyebolts to an overhead support to avoid dropping the panel on the motor terminals.

m. Remove two of the bolts that secure the starter panel to the motor housing and insert two M10 all thread guide pins. These are located near T1 and T6 compressor motor terminals.

n. Remove the remaining bolts.

o. Lift the panel only about 1/8” to unload the weight of the panel from the five isolators located under the panel. Be careful not to lift the panel too much causing the panel cutout to hit the motor terminals.

p. Pull the starter/control panel horizontally along the guide pins, until the panel clears the motor terminal plugs.

q. Lower and secure the starter/control panel.

r. Follow the steps in reverse to reassemble the starter/control panel.

4. Compressor Removal

   First follow the “Refrigerant and Oil Removal” procedures and the "Starter/Control Panel Removal" then proceed with the steps outlined below.

   **Compressor weights**
   **B Frame - 2830 lbs (1284 Kg)**
   **C Frame - 4940 lbs (2241 Kg)**

**D Frame - 5600 lbs (2540 Kg)**
**E Frame - 5750 lbs (2608 Kg)**

a. Disconnect the oil return line at the compressor by loosening the nut and set the line assembly aside.

b. Disconnect the joint for the oil injection line under the compressor by loosening the nut, and set the line aside.

c. Remove the twelve suction flange bolts at the evaporator.

***Note:*** *The suction line assembly will remain bolted to the compressor and be removed with the compressor.*

d. Remove the shipping bolts from under the compressor. There are four (except on B compressors, which use three) located above the discharge end support.

e. Remove the three isolator bolts under the discharge end of the compressor, and the two isolator bolts under the motor housing.

f. Unbolt and remove both discharge pipes running between the compressor and the oil separators.

g. Install three M16 shoulder pattern eye bolts on the top side of the compressor. Make sure that they are properly seated and aligned.

h. Lift the compressor/suction line assembly from the evaporator shell.

## CAUTION
## Machined Surfaces!

**Take care in providing some protection for the machined surface on the suction line flange. Provide blocks under the compressor rotor and motor housings, sufficient to keep the compressor from resting on the suction flange.**

5. Place the compressor on a flat sheet metal surface. Put oil on sheet metal to aid in disassembly. The compressor has machined surfaces on the casting and this will aid in disassembly.

   Select two of the motor housing-rotor housing bolt holes (opposite sides of the compressor). Tap each selected hole (rotor-housing) with M24x3 tool. Tap the hole the full depth of the flange on the rotor housing. Make sure you do not run this tap into the motor-housing hole. This will give you two jacking holes. Install a rod slightly smaller than the I.D. of the original threaded bolt hole (either M16 or M20). See Figure 17. The length of this rod should extend from the bottom of the hole to the middle of the flange hole in the rotor housing. Install a M24x3 bolt. See Figure 17.

6. Separate the compressor with the Jacking Bolt(s). The bolts need to be turned simultaneously or the castings may bind. When separating and reassembling the compressor, pieces of All-thread may be used as guides.

   Once the rotor housing-motor housing is separated ensure that NOTHING gets into the exposed rotors and housing! Cover separated components before movement!

   DO NOT remove the motor rotor as Locktight is used during manufacturing, which can result in motor rotor damage!

7. Once the compressor is separated, disconnect the motor leads and remove the damaged terminal.
8. Clean the gasket off of the motor housing.
9. Install new terminal(s) and torque to 100 ft-lbs.
10. Install wire leads in the same location as before and torque to 40ft-lbs.
11. Install new motor housing gasket.
12. Once the motor housing-rotor housing is ready to be reassembled, remove the Jacking Bolt(s), Rod, and re-install the motor-rotor housing flange bolts for re-assembly. Your compressor will have either M16 or M20 mounting bolts, depending on the compressor size.
13. Carefully slide the compressor halves back together.
14. Torque the motor housing bolts
    M16 bolts - 175 ft/lbs
    M20 bolts - 225 ft/lbs.
15. Re-assembly requires the opposite procedure.

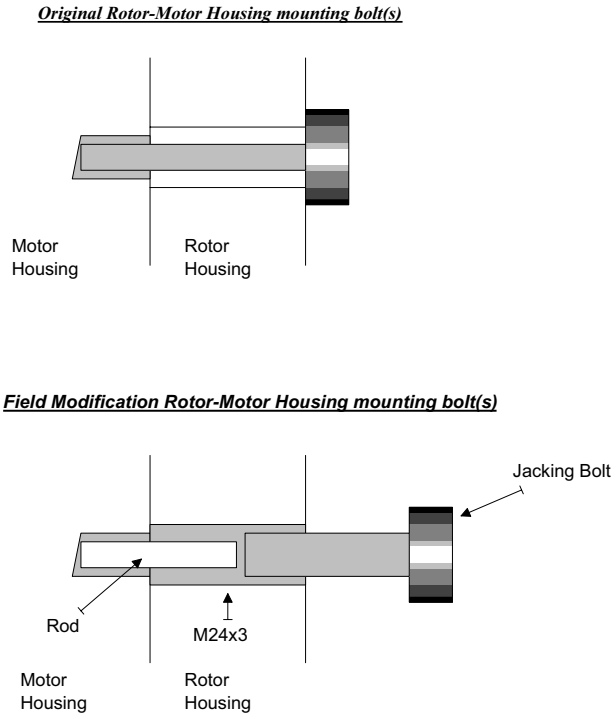


**Figure 17. Rotor-Motor Housing mounting bolt(s)**

**Table 4. Parts for Motor Terminal Repair or Replacement**

| Description | Part Number | Qty |
|---|---|---|
| Terminal Seal Kit | TER00609 | 1 |

**Table 4. Parts for Motor Terminal Repair or Replacement**

| Description | Part Number | Qty |
|---|---|---|
| Terminal | TER00609 | 1 per leaking terminal |
| Rotor-Motor Housing Gasket B-frame | GKT03710 | 1 |
| Rotor-Motor Housing Gasket C-frame | GKT03464 | 1 |
| Rotor-Motor Housing Gasket D/E-frame | GKT03464 | 1 |

## Rotor to bearing housing o-ring replacement

### ⚠ WARNING
### Hazardous Voltage!

**Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.**

### ⚠ WARNING
### Contains Refrigerant!

**System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.**

**Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.**

Please use caution doing this repair. If the bearing housing is separated more than 3 inches the rotor can slide out of the bearings causing the rollers of the suction bearings hitting the bearing races. This will make if very difficult to slide the bearing housing back into place. If the bearings are damaged the compressor will have to be replaced.

Contact Pueblo Technical Support before attempting this repair.

1. Remove the discharge lines.
2. Remove all the bolts between the rotor housing and bearing housing except for two bolts to use as guides, loosen them approximately 1".
3. Remove the suction pipe.
4. Loosen the motor rotor bolt approximately 1".
5. Inspect the o-ring in place. Replace the o-rings only if there is visible damage.
6. Slide the bearing housing back and remove the old o-ring if necessary.

   **Separate the bearing housing only a few inches (~3 inches). This makes it a little difficult to get the o-ring in place but it should allow for easier reassembly.**
7. Clean the matting surfaces.
8. Stretch a new o-ring over the bearing housing (be careful not to damage it) and seat it in the o-ring groove.
9. Put a small bead of Loctite 515 around the bearing housing between the o-ring groove and bolt holes.

**Note: Do not use excessive Loctite**

10. Slide the bearing housing back into place and re-install the bolts.
11. Torque the bolts
    M16 bolts - 175 ft/lbs
    M20 bolts - 225 ft/lbs.
12. Apply Loctite 271 to the motor rotor bolt and tighten with an impact gun.
13. Using new o-rings re-install suction and discharge pipes.
14. Leak test.

**Table 5. Rotor to Bearing housing o-ring replacement**

| Description | Part Number | Qty |
|---|---|---|
| Rotor-Bearing Housing o-ring B-frame Design Sequence A-K | RNG01532 | 1 |
| Rotor-Bearing Housing o-ring C/D/E-frame Design Sequence A-K | RNG01655 | 1 |
| Rotor-Bearing Housing o-ring B/C/D/E-frame Design Sequence K and later | RNG01532 | 1 |
| Discharge line o-ring all frames | RNG01414 | 1 |
| Suction line o-ring B-frame | RNG01417 | 1 |
| Suction line o-ring C/D/E-frame | RNG01512 | 1 |

## Questions

Contact the Product Technical Service department in Pueblo, Colorado with questions regarding this Service Bulletin. They can be reached at techservicepueblo@trane.com.

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|---|---|
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