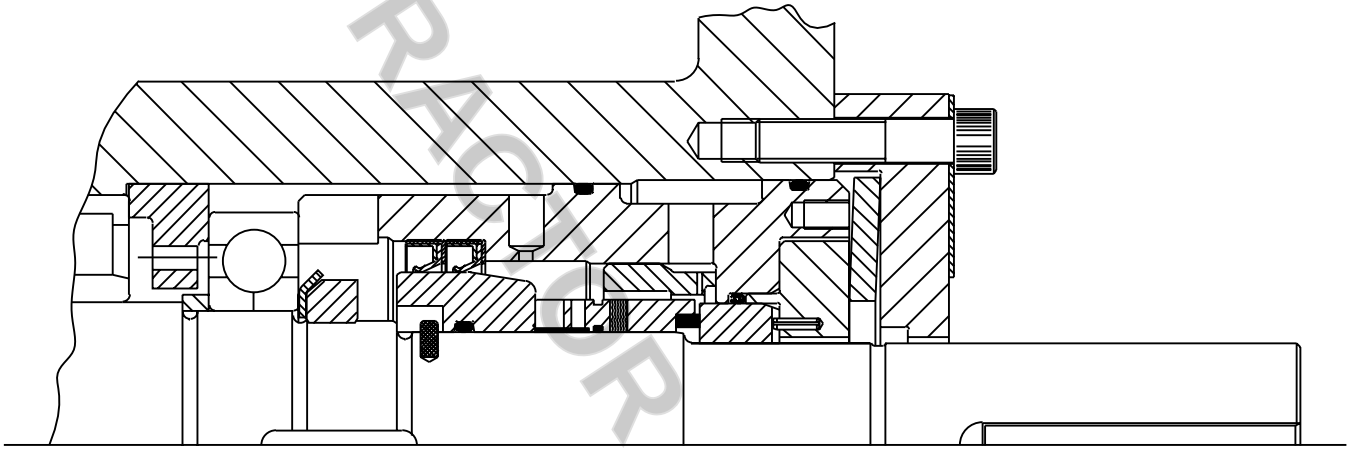
YORK®	REVISION 3 SHAFT SEAL INSTALLATION YS LIQUID CHILLERS	
SERVICE INSTRUCTION	Supersedes: Nothing	Form 160.47-M1.3 (1199)

CROSS SECTIONAL DRAWING OF REVISION 3 SHAFT SEAL
CONTRACTOR VERSION

Table 1 on page 5 has a list of production compressor serial numbers that were assembled with Revision 3 shaft seals.



LD05119

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Figure **Page**

LIST OF TABLES

Table **Page**

SECTION 1 – INTRODUCTION

1.0 - INTRODUCTION

The following instructions are to be used when installing a Revision 3 metallic-bellows, silicon carbide shaft seal.

These instructions are intended for trained service technicians with the skills and tools necessary for a safe successful installation.

Technicians must be familiar with, and comply with local requirements concerning refrigerant handling and safety practices. Governing agencies in various countries require technicians who handle refrigerants to be certified by recognized industry trade associations.

This procedure applies to S0 through S7 compressors manufactured with compressor serial numbers **prior** to those listed in Table 1.

The Metallic Bellows Style Shaft Seal which you are about to install utilizes silicon carbide sealing surfaces for both the rotating and stationary seal members. Silicon carbide is a very hard material, but is very brittle. Exercise extreme caution when handling the silicon carbide components.

Do not touch either of the polished sealing surface faces.

Should either of the silicon carbide components become damaged during handling or installation, do not proceed with the installation; order a replacement.

The installation instruction requires the technician to liberally oil the shaft seal components and O-rings during the installation process. By this we mean completely immersing the components in clean compressor oil and spraying clean compressor oil on the shaft and other components. Use only compressor oil of the same type with which the compressor is supplied. Do not use lubricants other than clean compressor oil during the shaft seal installation. You can not use too much oil during the shaft seal installation.

Oil the O-rings just prior to installation. If the O-rings are left in oil they will begin to swell and this will make the installation more difficult.

The shaft seal installation is complicated by the limited access available and the alignment of the anti-rotation pin. Read and understand these instructions before attempting to install the Revision 3 shaft seal. If questions arise during the installation procedure or these instructions are not completely understood, stop and call for assistance.

1.1 - INVENTORY PARTS

Inventory and inspect all parts for damage before the existing shaft seal is removed. Refer to the cross-sectional drawing on page 7 and parts list on page 17.

1.2 - SPECIAL TOOLS REQUIRED

Special Shaft Seal Installation Tools are required for the installation of Revision 3.0 Contractor/ Production and shaft seals. Do not attempt to install the shaft seal without the proper tools. Refer to the table on page 17 for the correct Shaft Seal Installation Tool kit part number.

1.3 - SHAFT SEAL DIFFERENCES

Beginning in 1999, a second version of Revision 3.0 shaft seal was introduced in production compressors. Refer to Table 1. This same version is also referred to as the "Contractor/Production Version".

The differences are in the machined seal housing spacer and the cover plate. The YORK Retrofit Version and the Contractor/Production Version share exactly the same shaft seals, C-rings and O-rings. The difference is in the machined components and the cover plate.

00250VIP

FIG. 1 – C-RING, O-RING AND SHAFT SEAL

Both the YORK Version and the Contractor/Production Version use the same maintenance kits.

Both versions of Revision 3.0 shaft seals are backward compatible with all YCCH compressors (S0-S5). S7 chillers beginning with compressor S/N YCCH283L0044AC are compatible with the Revision 3.0 shaft seal.

The installation procedures are different for the YORK Version and the Contractor/Production Versions. This is the correct installation instruction for installing the Contractor/Production version of Revision 3.0 shaft seal.

It is important to understand that the shaft seal cover plates must be used with the correct seal housing spacer. The shaft seal cover plates are not interchangeable with the seal housing spacers.

Refer to Form 160.47-M1.1 (699) to install the YORK Version of Revision 3.0 shaft seals. YORK Revision 3.0 shaft seals are listed by part number in Tables 4 & 5.

Revision 3.0 Contractor/Production Version shaft seal kits are listed in Tables 4 & 5. Note 233 mm compressors (S4 and S5) require a piping modification. Refer to Section 4.

Before opening the compressor to service the shaft seal, the refrigerant must be recovered from the compressor. Refrigerant must be recovered in accordance with local requirements.

The compressor must be equalized to atmospheric pressure and isolated from the rest of the system.

Do not remove the shaft seal cover plate until the internal system pressure has been verified to be equal to atmospheric pressure.

Two different design variations of the revision 3.0 shaft seal have been developed: YORK Field Retrofit version and a Frick Production version. The Frick Production version utilizes a new seal housing cover plate and a “C-ring” gland washer. Both designs use the same maintenance kits (See page 17).

Revision 3 shaft seals are backward compatible with all S0 - S5 compressors. S7 chillers, beginning with compressor P/N YCCH283L0044AC, are backward compatible with the Revision 3 retrofit kit.

Revision 3.0 shaft seal changes from Revision 2 are listed by compressor size as follows:

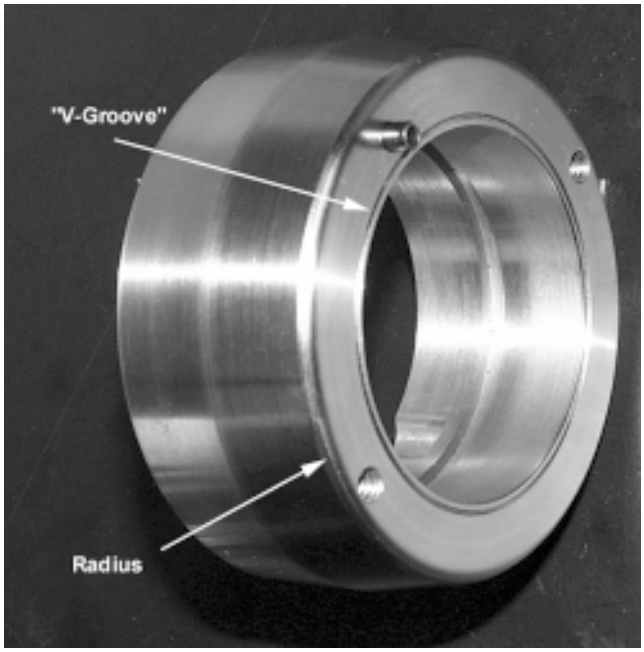
1.4 - COMPRESSOR SIZES S0 THROUGH S5

An aluminum multiport injector ring distributes oil from four injectors, directly at the shaft seal faces. The multiport injector ring is pressed fit into the seal housing spacer.

1.5 - COMPRESSOR SIZES S2, S3, S4, S5

A second lip seal has been added on top of the first lip seal.

A dimensionally different seal distance ring is incorporated into the revision 3.0 shaft seal retrofit kit. A “V-groove” is machined into the face of the seal distance ring. The “V-groove” is a means of identification for the service technician to verify the dimension of the seal distance ring. A radius has also been machined at the edge of the taper. The radius reduces the possibility of damage to the lip seals during installation. See photograph (Fig. 2) of the seal distance ring.



00106VIP

FIG. 2 – SEAL DISTANCE RING, 193 mm

As a result of the change in dimension of the seal distance ring, the seal operating length is increased by 0.060 inch (1.524 mm). See Table 2 on page 8.

CAUTION

233 mm compressors will require a piping change when a field retrofit is made to the revision 3.0 shaft seal.

Please refer to the 233 mm piping section on page 13 which describes the piping changes.

1.6 - COMPRESSOR SIZE S7 (283 MM)

The oil injectors are integrally machined into the seal housing spacer.

Double lip seals are used.

A new seal distance ring is supplied with the field retrofit kit.

TABLE 1 – YCCH PRODUCTION COMPRESSORS BUILT WITH REVISION 3 SHAFT SEALS

CHILLER SIZE	COMPRESSOR SIZE	COMPRESSOR SERIAL NUMBER
S0	163 S	YCCH163S0876YA
S1	163 L	YCCH163L1114YB
S2	193 S	YCCH193S1787YC
S3	193 L	YCCH193L1792YD
S4	233 S	YCCH233S0813YE
S5	233 L	YCCH233L0468YF
S7	283 LY	YCCH283L0187AC

SECTION 2 – SHAFT SEAL REMOVAL

2.0 SHAFT SEAL REMOVAL

Removing the old rotating bellows portion of the shaft seal can be difficult. Oil and refrigerant cause the O-ring that seals the rotating seal to the shaft to swell. This creates extra resistance when removing the bellows portion of the shaft seal.

The following recommendations have been successful to remove the seal:

WARNING

Insert a clean ship towel into the oil supply hole in the bottom of the seal cavity to prevent a set screw from falling into the oil supply line.

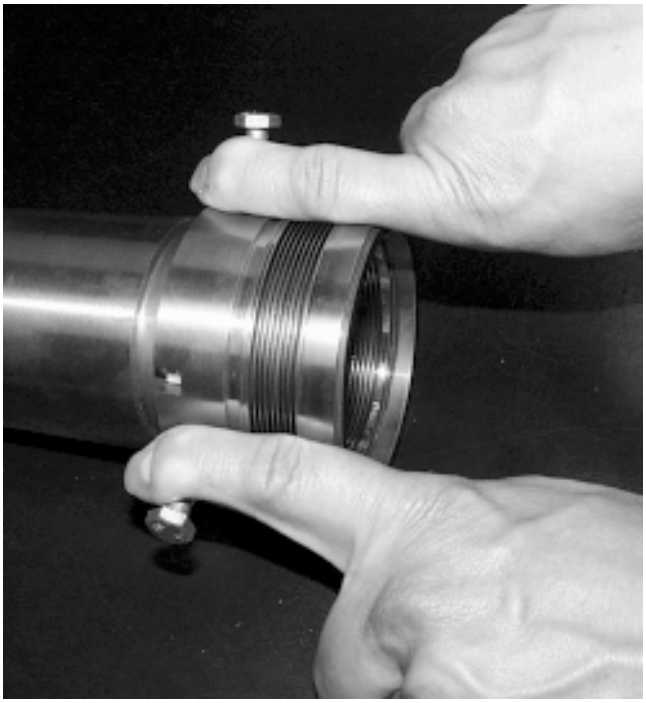
Using the ratchet wrench remove two of the set screws from the rotating shaft seal body.

Hold a bolt (1/4-20 UNC by 3/4 inch long) between your index and middle fingers. Position the bolt over one of the threaded holes in the rotating shaft seal body. Thread the bolt into the rotating shaft seal body three turns. Install a second bolt in the other hole.

00107VIP

FIG. 3 – INSTALLING BOLT FOR SEAL REMOVAL

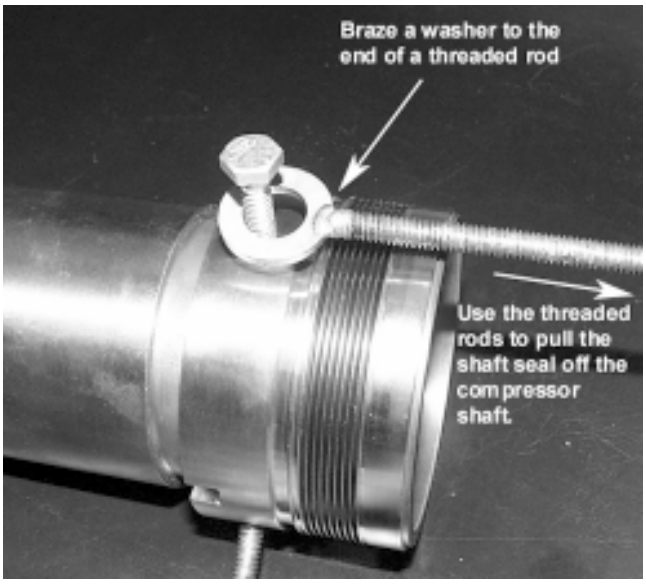
Grab each of the bolts with your index fingers and pull the rotating shaft seal off of the shaft. See Figs. 3 and 4.



00108VIP

FIG. 4 – REMOVING SEAL BY HAND PULLING

If the resistance is still too great to remove the rotating shaft seal by hand, fabricate pulling rods as follows. Silver braze a washer on to the end of threaded rod. Note the inside diameter of the washer must be large enough to pass over the bolt head. (See Fig. 5)



00109VIP

FIG. 5 – REMOVING SEAL BY PULLING WITH RODS

2.1 - SEAL DISTANCE RING REMOVAL 233 mm

The seal distance ring that was supplied with revision 2 shaft seal retrofit kits used a two piece locking seal distance ring. The locking ring must be loose before removing the seal distance ring.

Loosen and remove the four bolts that hold the locking ring in place. Tighten the two set screws shown in photograph (Fig. 6) until the locking ring is loose.

00129VIP

FIG. 6 – SEAL DISTANCE RING 233 mm REV. 2

Use two 1/4-20 UNC threaded rods to remove the seal distance ring and locking collar.

Use an inspection mirror to inspect the compressor shaft. Use 600 grit sand cloth to clean the shaft.

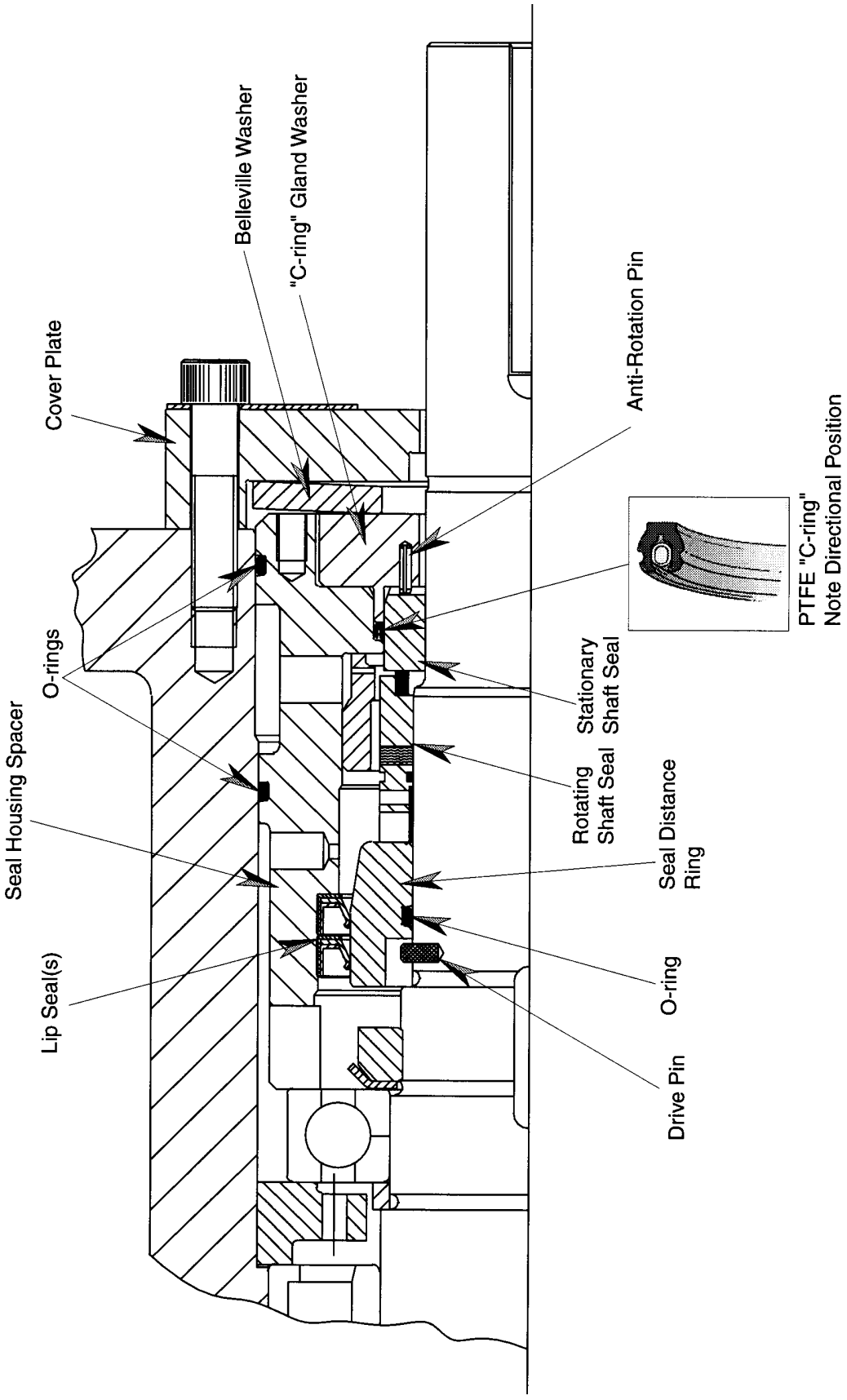


FIG. 7 – REVISION 3.0 SHAFT SEAL CROSS SECTION, CONTRACTOR/PRODUCTION VERSION

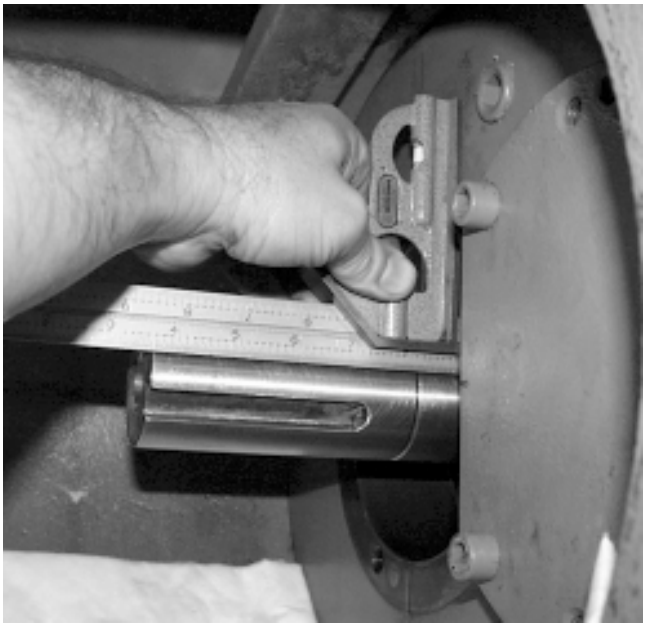
SECTION 3 – SHAFT SEAL INSTALLATION

3.0 - INSTALLATION - YORK RETROFIT KIT

Refer to Fig. 7, Cross-Sectional Drawing, as often as necessary during installation.

Seal Distance Ring

Install the seal distance ring onto the shaft without the O-ring installed.



00110VIP

FIG. 8 – MEASURING SEAL OPERATING LENGTH

Measure the seal operating length using a square as shown in the photograph (Fig. 8). Hold the end of the scale against the face to the seal distance ring. Slide the head down the scale until it contacts the machined face of the compressor housing. Tighten the thumb screw to lock the head on the scale to hold the measurement. Use a vernier caliper to measure the distance from the end of the scale to face of the head.

TABLE 2 – REVISION 3 SEAL OPERATING LENGTHS

COMPRESSOR (CHILLER) SIZE	SEAL OPERATING LENGTH inches (mm)
163 mm (S0 and S1)	2.671 (67.843)
193 mm (S2 and S3)	3.310 (84.074)
233 mm (S4 and S5)	2.810 (71.374)
283 mm (S7)	3.362 (85.395)

Compare the measurement made using the square with the measurements in Table 2.

Remove the seal distance ring. Lubricate the compressor shaft with compressor oil. Lubricate the seal distance O-ring with compressor oil. Install the O-ring in the seal distance ring.

CAUTION

Use the threaded rods to assist installing the seal distance ring.

The seal distance ring must be installed so the drive pin is engaged in drive pin notch. The seal distance ring must be installed all the way on the shaft until it is seated against the shoulder on the compressor shaft. Recheck the seal operating length measurement and compare the measurement with the measurements in Table 2.

Rotating Shaft Seal

Note the position of the drive pin on the face of the seal distance ring. The drive pin must engage one of the two notches in the rotating shaft seal body (two notches are used to maintain dynamic balance).

Lubricate the rotating shaft seal prior to installation. Use the plastic bag that the rotating shaft seal comes packaged in; fill the plastic bag with clean compressor oil. Immerse the rotating shaft seal in the oil.

Slide the rotating shaft seal onto the shaft. Do not touch the face of the silicon carbide seal face with you hands. Hold the rotating shaft seal by the seal body as you press onto the shaft.

CAUTION

Make certain that the drive pin is engaged into one of the notches in the seal body. Make certain that the back of the rotating shaft seal is seated against the seal distance ring.

Use an inspection mirror to verify that the rotating shaft seal is seated against the seal distance ring.

Use the ratchet wrench to tighten the set screws in the rotating shaft seal body. Initially, tighten the set screws so that they are snug. Then tighten the set screws to 45 in-lb of torque. This is equal to applying a force of 15 lbs. (6.8 kg.) to the end of the ratchet wrench.

3.1 - INSTALLATION – FRICK PRODUCTION AND CONTRACTOR VERSION

Seal Housing Spacer Preparation

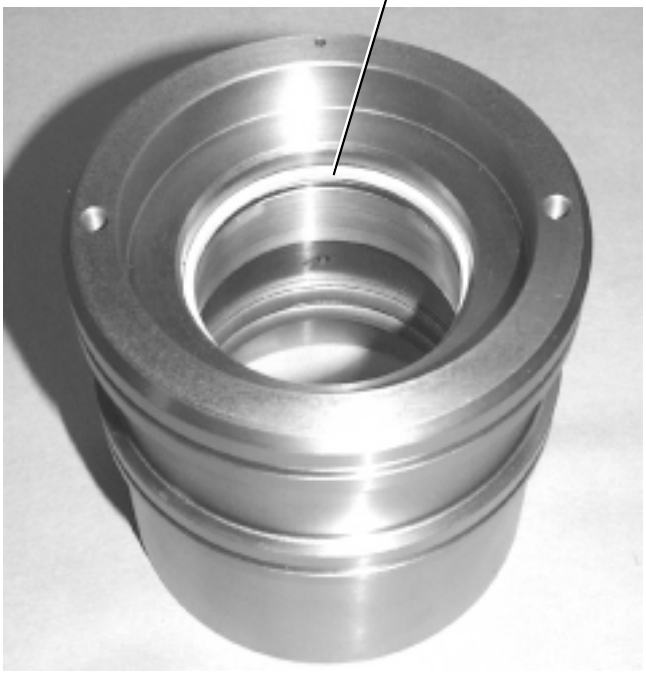
(Refer to Figs. 9, 10, 11, 12 and 13)

C-Ring Installation

Carefully inspect the shoulder where the C-ring will be positioned. Make certain that this is free of dirt, lint, scratches or other damage.

Immerse the PTFE C-ring in clean compressor oil.

Insert the PTFE C-ring into the seal housing spacer as shown in Fig. 9.



00251VIP

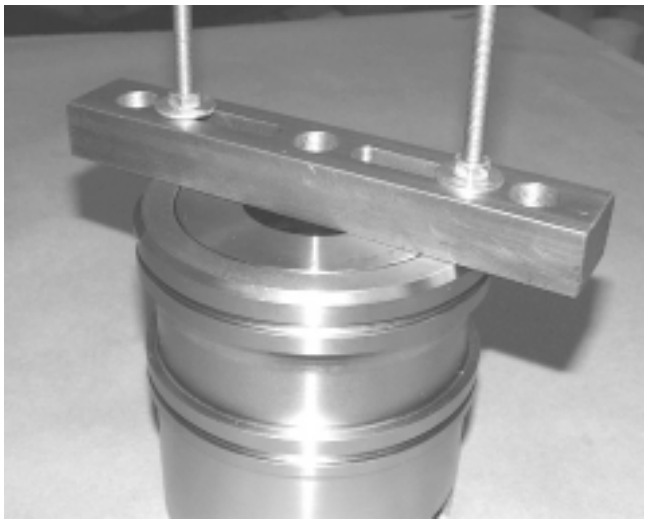
FIG. 9 – PTFE "C-RING" INSERTED IN SEAL HOUSING SPACER

The PTFE "C-ring is directionally sensitive and must be positioned so the open side of the "C" is facing into the compressor. Refer to Cross Sectional Drawing, Figure 7, on page 7.

Insert the C-ring gland washer from the tool kit **without the anti-rotation pin** into the seal housing spacer.

Stationary Shaft Seal Seat Installation

Install the puller bar onto to the seal housing spacer to secure the C-ring gland washer in place.



00252VIP

FIG. 10 – INSTALLING THE PULLER BAR

Locate the stationary shaft seal seat and immerse the seat in clean compressor oil.

Position the stationary shaft seal seat onto the installation tool with the polished seal face downward.

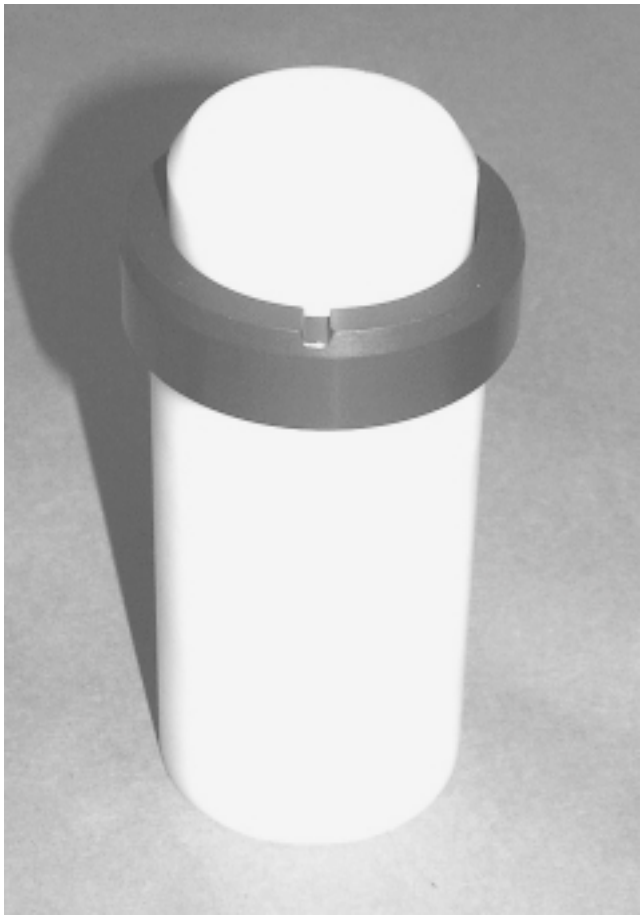
Make certain the installation tool is free of dirt or debris.

Place the installation tool with the stationary shaft seal seat on a work surface that will not deflect when the seal housing spacer is placed over the tool and shaft seal seat (See Fig. 11).

The position of the anti-rotation pin notch is not important; it can be positioned at any location in the seal housing spacer.

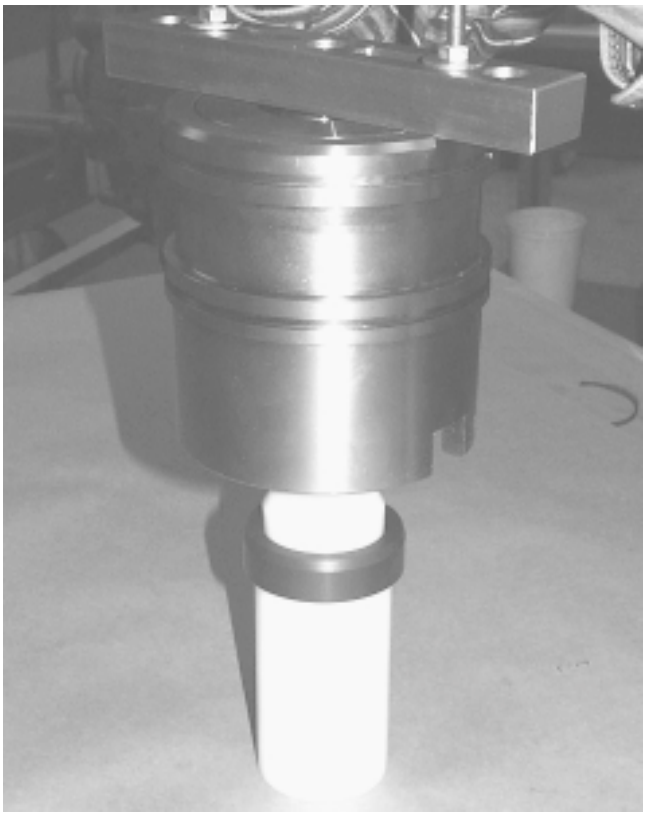
Carefully place the seal housing spacer, C-ring gland washer (without pin) and puller bar assembly over the stationary shaft seal. Keep the seal housing spacer aligned squarely and evenly (See Fig. 12). Use the base of your fist to tap the seal housing spacer onto the stationary shaft seal seat. Tap the seal housing spacer onto the installation tool until the bottom of the seal housing contacts the work surface or the top of the installation tool contacts the bottom of the puller bar (See Fig. 13).

Remove the puller bar.



00255VIP

FIG. 11 – INSTALLATION TOOL



00256VIP

FIG. 12 – PLACING THE PULLER BAR ASSEMBLY

00257VIP

FIG. 13 – PUTTING SEAL HOUSING SPACER ONTO INSTALLATION TOOL

Remove the C-ring gland washer without the anti-rotation pin and return it to the tool kit.

O-Ring Installation

Carefully inspect the O-ring grooves and make certain that they are free of dirt, lint or other debris.

Immerse both O-rings in clean compressor oil.

Install both O-rings into the O-ring grooves on the outside of the seal housing spacer.

Check the O-rings to make sure they were not cut or damaged during installation.

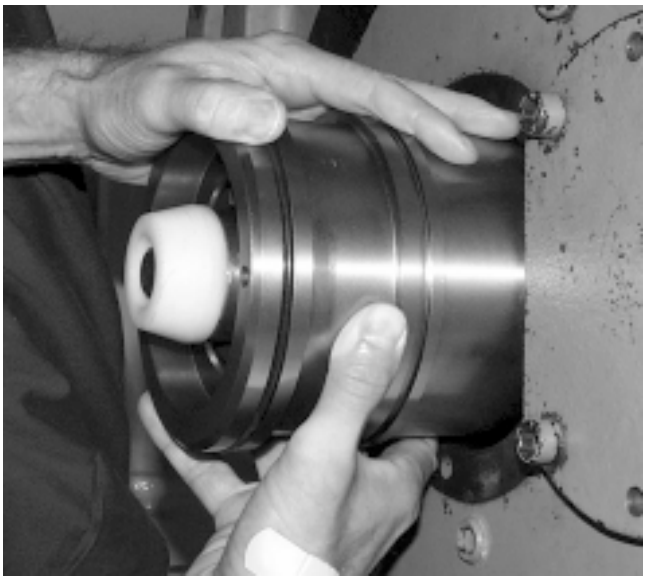
The seal housing spacer is now ready for installation into the compressor. Before installing the seal housing spacer into the compressor, spray clean compressor oil onto both shaft seal faces (rotating and stationary).

Install the plastic safety installation cone on to the end of the compressor shaft. See Fig. 14.

Turn the compressor shaft so the keyway is pointing downward.

Seal Housing Spacer Installation

Carefully insert the seal housing spacer into the compressor housing. Keep the seal housing spacer positioned straight as it is slid into the compressor housing. Do not angle the seal housing spacer as it is being installed.

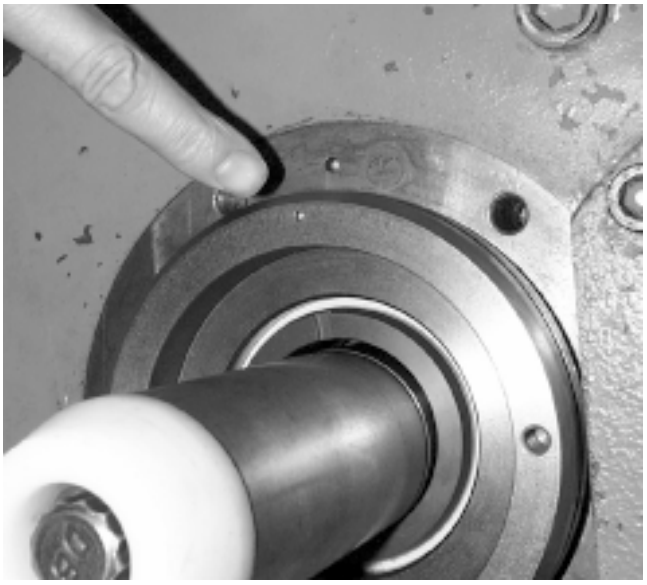


00253VIP

FIG. 14 – SEAL HOUSING SPACER INSTALLATION

Position the index mark that is drilled into the front of the seal housing spacer at the 12:00 o'clock position.

Push the seal housing spacer into the compressor housing until resistance is felt. This is normal; the resistance that is being felt is the lip seal coming into contact with the seal distance ring.

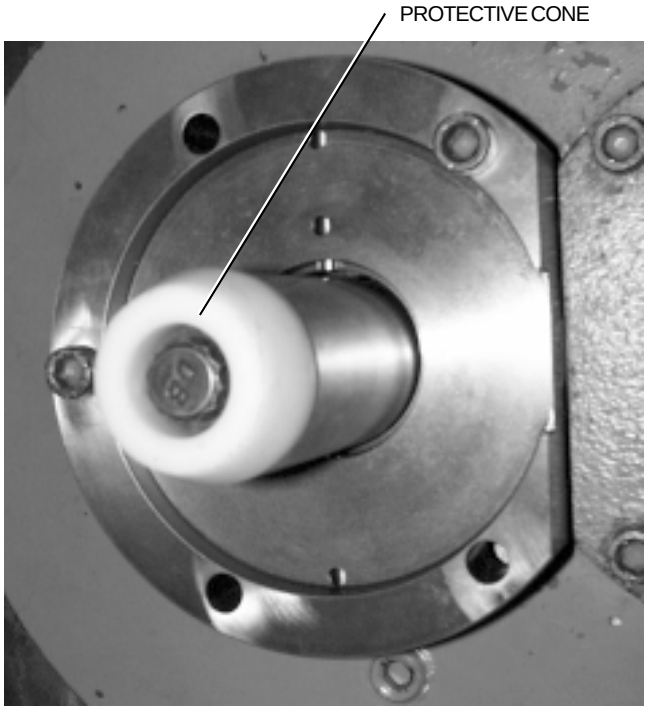


00254VIP

FIG. 15 – SEAL HOUSING SPACER POSITIONING

Use the shaft seal cover plate to drive the seal housing spacer into position. Reverse the cover plate so the outside of the cover plate is facing inward toward the compressor. Use two bolts opposite each other to drive the seal housing spacer into position. Tighten the bolts to 56 ft-lb. of torque.

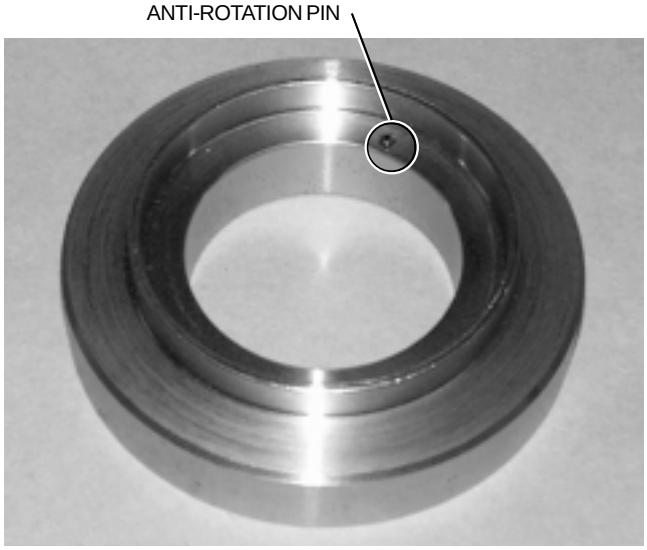
Remove the bolts and the cover plate.



00259VIP

FIG. 16 – BOLTS AND COVER PLATE

Install the C-ring gland washer **with the anti-rotation pin**. Rotate the C-ring gland washer until the anti-rotation pin is engaged into the anti-rotation pin notch in the stationary shaft seal seat. The C-ring will be able to be rotated slightly back and forth about 1/8 inch.



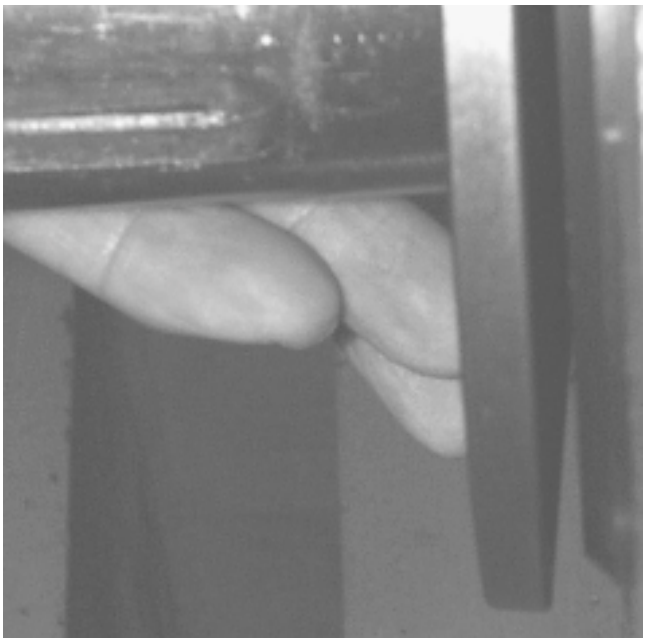
00260VIP

FIG. 17 – C-RING & ANTI-ROTATION PIN POSITION

CAUTION

Make certain that the anti-rotation pin can be felt to engage the anti-rotation notch in the back of the stationary shaft seal.

Assemble the cover plate with the belleville washer between the shaft seal cover plate and the seal housing spacer. The belleville washer should be installed so the curved side of the washer contacts the C-ring gland washer first.



00261VIP

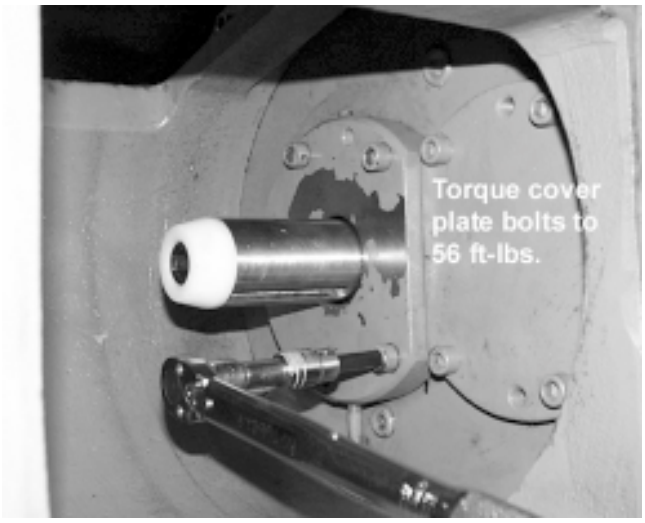
FIG. 18 – INSTALLING THE BELLEVILLE WASHER

Install and evenly tighten the cover plate bolts. Tighten the bolts is several steps in a criss-cross (star) pattern.

Tighten the cover plate bolts to 56 ft-lb. of torque.

CAUTION

Tighten the cover plate bolts evenly and alternately. It is very important to tighten the bolts evenly. The cover plate bolts are compressing the belleville washer and positioning the stationary shaft seal in contact with the rotating seal. As the bolts are tightened, the bellows are compressed to its operating height.



00122VIP

FIG. 19 – BOLT TORQUE

Rotate the compressor shaft 24 - 30 revolutions by hand. The shaft may seem tight as it is being rotated; this is due to the resistance from the lip seal(s).

Pressure test and leak check the shaft seal before assembling the drive coupling.

Until the shaft seal is operated at system operating temperatures and pressures there may be a small amount of refrigerant leakage detected with electronic and halide torches. Leak check with a soap bubble solution. If leaks can be detected with the soap bubble solution the shaft seal must be disassembled and examined for a broken seal or dirt. Correct the source of leakage and repeat until satisfactory results are obtained.

Attach the Yellow Revision 3 shaft seal label to the outside of the shaft seal housing cover. Record the date, hours of operation and number of starts on the label. **This information is very important.**

Oil leakage should be minimal from the revision 3.0 shaft seal. Remember, some oil is normal. Oil lubricates and cools the shaft seal faces. As long as the rate of oil leakage is less than 750 ml per month, the shaft seal is performing properly.

SECTION 4
PIPING MODIFICATIONS

4.0 OIL PIPING MODIFICATION KIT - 233 mm (S4 AND S5) ONLY

Use this oil piping modification kit only when installing a Revision 3 shaft seal kit on design level "A", "B" and "C" chillers. Do not use this kit with Design Level "D" chillers.

Order YORK part number 629-22753-001 for design level "A", "B" and "C". This includes the YORK shaft seal retrofit kit part number 329-22752-001 and piping kit 329-22789-000.

Refer to the photographs (Figs. 20 and 21) for the location of the oil piping modification components.

TABLE 3 – BILL OF MATERIALS - 233 mm SHAFT SEAL PIPING KIT

233 mm COMPRESSOR SHAFT SEAL PIPING KIT 329-22789-000			
KEY	**DESCRIPTION**	**QUANTITY**	**PART NUMBER**
1	MANIFOLD	1	029-22788-000
2	CONNECTOR, UNION 3/4-16UNF-2A STRAIGHT THREAD	1	023-18973-000
3	PRESSURE TRANSDUCER, 0-300 PSIG	1	025-28678-006
4	VALVE, TRANSDUCER ISOLATION	1	022-09577-000
5	ROTALOCK ® STRAIGHT ADAPTER	1	023-17628-000
6	VALVE ASSEMBLY, SPECIAL ANGLE VALVE - ROTALOCK® BY 3/4-16UNF-2A STRAIGHT THREAD	1	029-22790-000
7	FILTER DRIER	1	026-32839-000
8	PLUG, 3/4" HEX. HEAD 3/4-16UNF-2A STRAIGHT THREAD	1	023-18280-000
9	EPROM, S.01F.17 (or later version)	1	031-01102-002
10	TEFLON® SEAL WASHERS	2	028-12709-000
11	O-RINGS, NEOPRENE	4	028-12961-004
12	CABLE, SPECIAL FOR TRANSDUCER	1	025-34183-000
13*	ADAPTER, 3/8" MALE NPT x FEMALE 3/4-16UNF-2A	1*	023-19058-000*
14	STEEL TUBING, 1/2" O.D. x 0.045" THICK WALL	10 FEET	Purchase Locally

* Use item #13 on compressors with national pipe threads. This adapter is not required on chillers with S.A.E. O-ring straight threads.

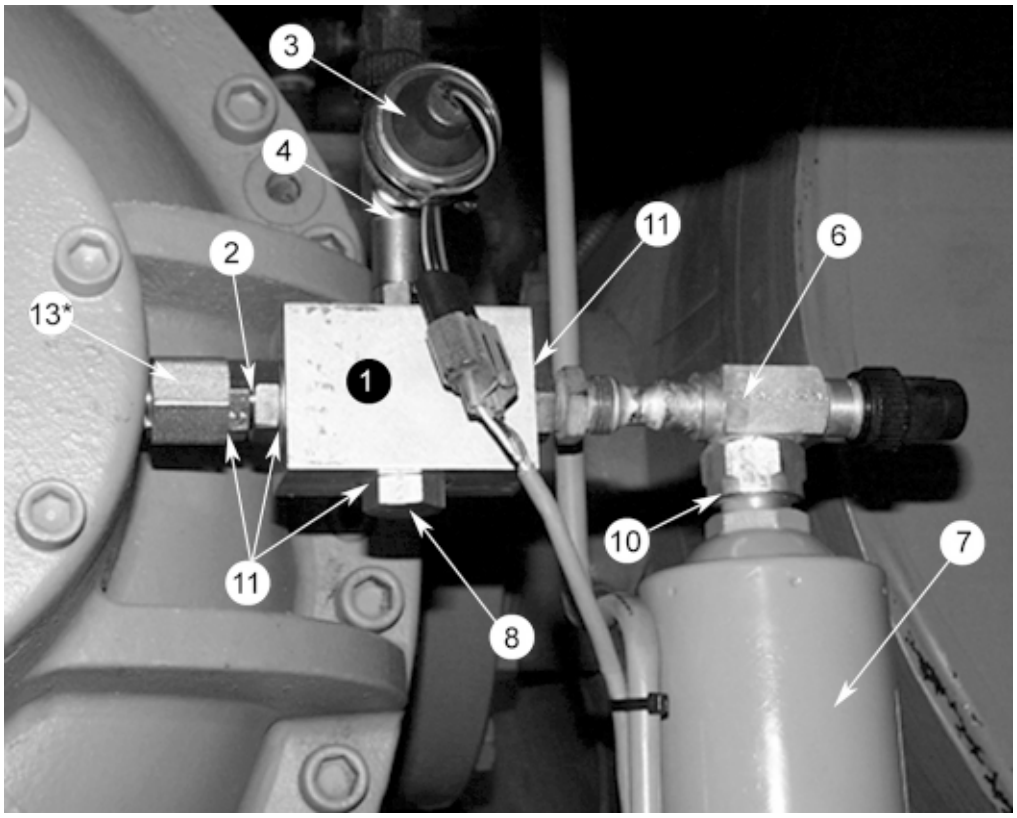


FIG. 20 – PIPING DETAIL SB-2 00123VIP

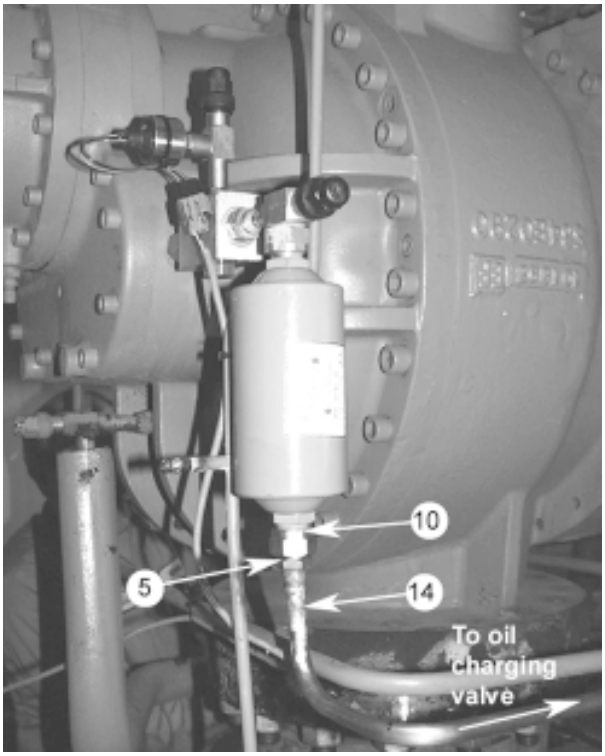
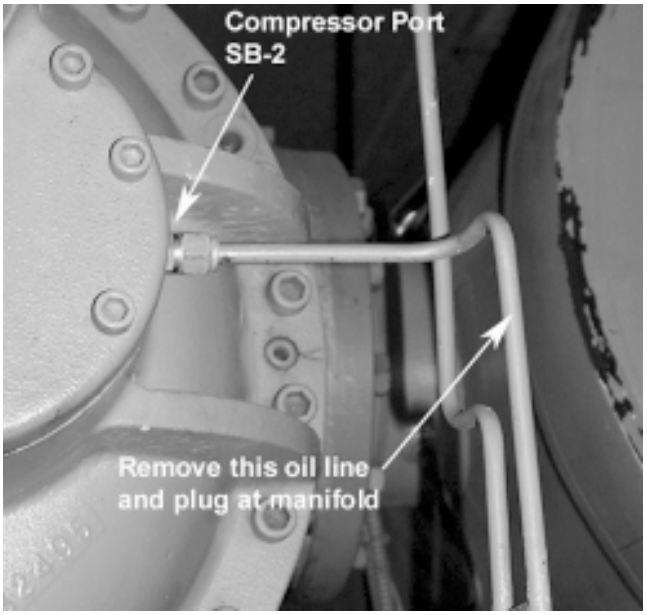


FIG. 21 – PIPING ASSEMBLY, 233 mm 00124VIP

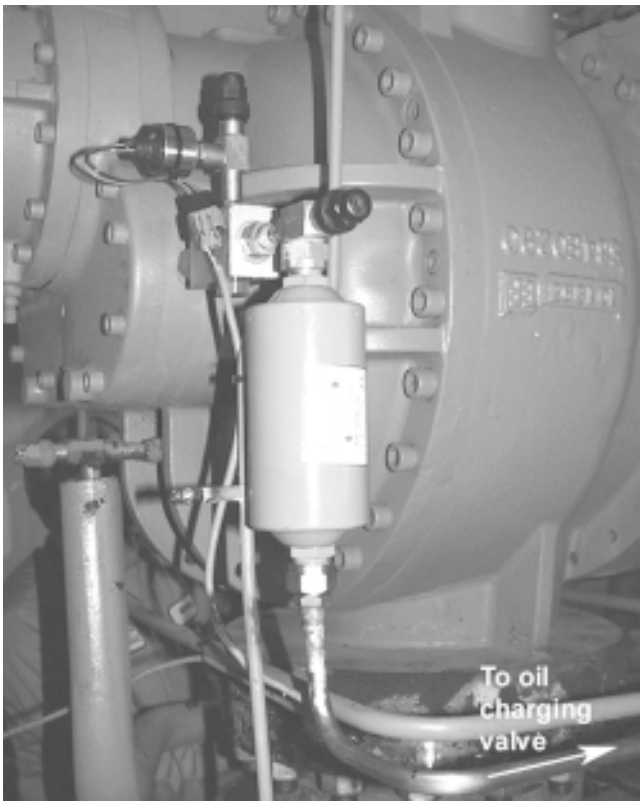


00125VIP

FIG. 22 – ORIGINAL 233 mm PIPING

Remove the existing oil supply line at compressor port SB-2. Cut the oil line at the oil manifold and plug or braze closed. See Fig. 22.

Install the new piping as shown in photographs (Fig. 20 and Fig. 21) on page 14.



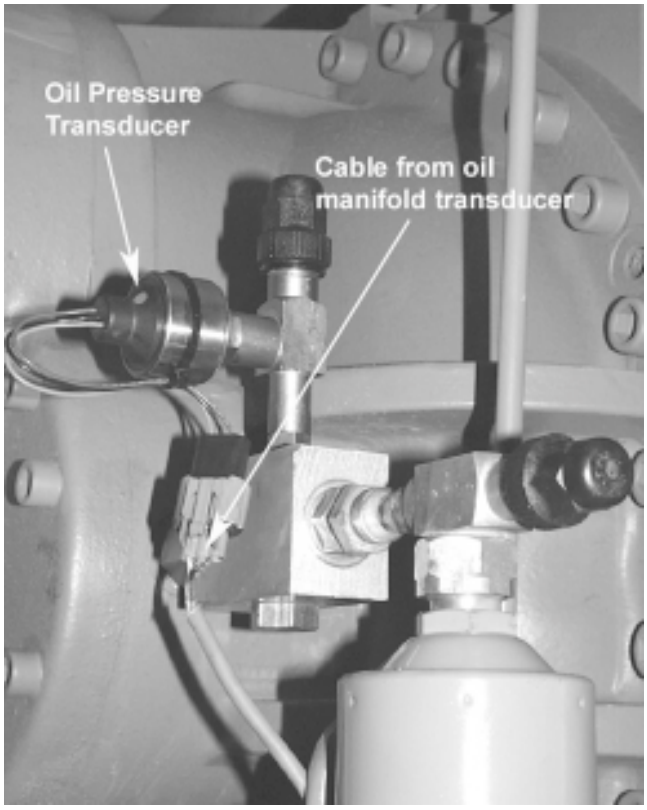
00126VIP

FIG. 23 – COMPLETE PIPING MODIFICATION, 233 mm

A male pipe thread adapter is provided for compressors with pipe threads at compressor port SB-2. If the compressor has SAE straight threads, do not use the adapter (Key #13* page 13).

Lubricate all the O-rings with compressor oil.

Install the connector union (Key #2, page 13) between the compressor (or adapter fitting) and the aluminum manifold block. Refer to Figs. 23 and 24.



00127VIP

FIG. 24 – TRANSDUCER WIRING DETAIL

Install the pressure transducer and transducer isolation valve into the aluminum manifold block. Make certain the valve is in the fully open position. Install the 3/4 hex plug with O-ring into the manifold.

Install the valve assembly into the manifold. Lubricate the O-ring with compressor oil. Tighten the lock nut when the valve assembly is in the correct position.

Install Teflon® seal washers at each end of the filter drier Rotalock fittings. Install the filter drier in the direction indicated by the arrow on the filter drier "WITHOUT CHECK VALVE".

Install a steel 1/2 inch O.D. by 0.045 inch thick wall tube from the oil charging valve located on the bottom of the oil separator to the inlet of the filter drier.

Pressure test the new piping after the shaft seal has been installed.

The new piping will result in a reduction in the seal oil pressure differential because the oil flow has been divided. The OIL PRESSURE transducer (new transducer) is monitoring the oil pressure to the balance piston at compressor port SB-2.

The pressure transducer in the oil manifold will be renamed and recognized by the microcomputer as SEAL OIL PRESSURE TRANSDUCER.

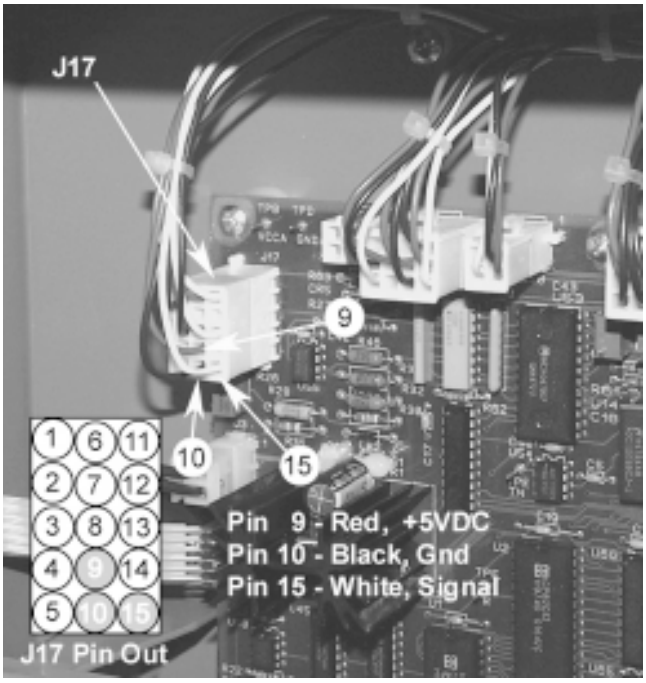
4.1 - TRANSDUCER WIRING

Disconnect control power to the microcomputer.

Unplug the transducer cable from the pressure transducer that is located on the oil manifold (this **was** the OIL PRESSURE transducer).

Move and connect this cable to the **new** pressure transducer located at compressor port SB-2. This is now the OIL PRESSURE transducer.

The pressure transducer located on the oil manifold is **renamed** and designated as the **SEAL OIL PRESSURE** transducer.



00128VIP

FIG. 25 – TRANSDUCER CONNECTION, MICROBOARD

Loosen the cable clamp on the back of the control panel, feed the end of the new transducer cable with the pins through the back of the control panel and pull enough length of wire to connect at plug J17. Tighten the cable clamp.

Locate plug J17 on the microcomputer main board (see Fig. 25).

Insert the red, black and white wires from the new transducer cable into plug J17 as shown in (see Fig. 25).

Connect the wires as follows:

J17 Pin 9 - Red: + 5VDC

J17 Pin 10 - Black: Ground

J17 Pin 15 - White: Signal

Replace the EPROM with version S.01F.17 or later version. Install the new EPROM socket on the microcomputer board.

Plug the end of the new transducer cable into the SEAL OIL PRESSURE transducer located on the oil pressure manifold.

Reconnect the electrical power to the microcomputer.

Enable the new SEAL OIL PRESSURE transducer as follows:

- Gain access to the programming function using the 1380 prompt.
- Press the PROGRAM key
- Press the OIL PRESSURE FILTER key
- Press ADVANCE DAY/ SCROLL key once.
- The display will indicate SEAL OIL PRESSURE ENABLED 1 DISABLED 2.
- Enter 1 for SEAL OIL PRESSURE ENABLED.
- Check to make sure that the SEAL OIL PRESSURE is enabled and reading correctly.
- Press the OIL PRESSURE FILTER key until SEAL OIL PRESS DIFF is displayed. This is the difference pressure between seal oil pressure and evaporator pressure.
- Press the DISPLAY DATA key. Scroll through the data until SEAL OIL PRESSURE is displayed.

With the chiller off the FILTER PRESSURE, OIL PRESSURE and SEAL OIL PRESSURE should all be reading the same pressure.

SECTION 5 – PART NUMBERS

TABLE 4 – CONTRACTOR SHAFT SEAL RETROFIT KIT PART NUMBERS WITH TOOL KIT

Use the part numbers listed below when retrofitting a compressor for the first time. Retrofit Part Numbers include **all** of component parts necessary to change the shaft seal including the tool kit.

DESCRIPTION	S0 & S1 (163 mm)	S2 & S3 (193 mm)	S4 & S5 (233 mm)	S7 (283 mm)
Contractor Retrofit Kit with Tool Kit	**329-22946-001**	**329-22946-002**	**329-22946-003**	**329-22946-004**
Seal Housing Spacer	029-22949-001	029-22948-001	029-22948-002	029-22949-002
C-ring Gland Washer	029-22950-001	029-22950-002	029-22950-003	029-22950-004
Shaft Seal Housing Cover Plate	029-22951-001	029-22951-002	029-22951-003	029-22951-004
Seal Distance Ring	029-22485-000	029-22761-001	029-22762-000	029-22763-000
Shaft Seal Maintenance Kit	329-22750-002	329-22752-002	329-22753-002	329-22754-002
Tool Kit	329-22947-001	329-22947-002	329-22947-003	329-22947-004
Piping Kit	Not Required	Not Required	329-22789-000	Not Required

TABLE 5 – CONTRACTOR SHAFT SEAL MAINTENANCE KIT PART NUMBERS

Use the Maintenance Kits listed below when replacing an existing Revision 3 shaft seal. Maintenance Kits include all the component parts necessary to change a shaft seal, but do not include the machined components necessary to retrofit the compressor to the Revision 3 shaft seal.

DESCRIPTION	S0 & S1 (163 mm)	S2 & S3 (193 mm)	S4 & S5 (233 mm)	S7 (283 mm)
Shaft Seal Maintenance Kit	329-22750-002	329-22752-002	329-22753-002	329-22754-002

NOTES

NOTES

Proud Sponsor
of the 2000
U.S. Olympic Team

36USC380

P.O. Box 1592, York, Pennsylvania USA 17405-1592

Form 160.47-M1.3 (1199)
Supersedes: Nothing