S70-102 SM (JAN 2007)
SERVICE MANUAL
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Dist: 3, 3a, 3b, 3c

SERVICE INSTRUCTIONS
SHAFT SEAL REPLACEMENT KIT

XJS and XJF 95/120
ROTARY SCREW COMPRESSORS

It is recommended that prior to replacing the shaft seal, a thrust clearance measurement be conducted on the male rotor to determine the axial (in and out) movement. An increase from the design specification in the axial movement of the rotor can result in excessive oil leakage from the shaft seal. The specifications for the axial measurements with the seal housing cover removed are shown below.

⚠ CAUTION

DO NOT APPLY FORCE TO THE ROTOR SHAFT OR JACK SHAFT IN THE RADIAL (UP AND DOWN) DIRECTION AS THIS WILL RESULT IN DAMAGE TO THE BEARINGS.

TDS / RDB / RWF UNITS

Unit Model	Comp Rotor Size	Measurements in Inch	Measurements in mm
RWBII 60 - 76	163mm	.0065 - .009	0.1651 – 0.243
RWBII /RDB/ RWF 100 – 134	193mm	.0065 - .009	0.1651 – 0.243
RWBII /RDB/ RWF 177, 222, 270	233mm	.0075 - .0105	0.1905 – 0.2667
RWBII / RDB/ RWF 316, 399, 546	283mm	.008 – 012	0.2032 – 0.2794
*All TDSH & SGCH 355 designs	355mm	.010 - .012	0.254 – 0.3048
*All TDSB & SGCB 355 designs	355mm	.007 - .012	0.1778 – 0.3048

* Identify by COMPRESSOR serial number.

RWBII, RDB, RWF UNITS

THRUST CLEARANCE PROCEDURE:

The DISCHARGE END CLEARANCE measurement records the overall rotor to discharge housing clearance. Pressure must be removed from the unit prior to conducting the reading. This reading is conducted with the seal housing cover and spring washer removed.

⚠ CAUTION

WEAR PROPER SAFTY EQUIPMENT AND TAKE NECESSARY SAFETY PRECAUTIONS REQUIRED FOR THIS PROCEDURE.

1. Evacuate unit (refer to S70-200/210 or S70-300/301 IOM)
2. Lockout and tag motor.
3. Remove coupling guard and center hub of the coupling.
4. Position the compressor coupling-half in order to fit a prying device between the coupling-half and compressor, see Figure 2. A board 2″ x 4″ x 24″ works well for this procedure. The rotor needs to extend past the coupling to ensure good contact with the indicator plunger. Tighten the coupling securely to the shaft.
5. Position the motor coupling half in order to fit the prying device between the two coupling halves. Tighten the coupling securely to the shaft.
6. Use a dial indicator graduated to measure between .001″ to .0005″. The indicator can be attached to a magnetic base as shown in Figure 1. The indicator can also be attached to a clamping device mounted on the motor coupling half.

⚠ CAUTION

IF A CLAMP STYLE MOUNT IS USED, FORCE CANNOT BE APPLIED TO THE MOTOR COUPLING END AS THIS WILL DEFLECT THE COUPLING AND RESULT IN AN INACCURATE READING.

7. The plunger of the indicator must be against the end of the rotor shaft. Position the plunger mid-throw to ensure the plunger has adequate travel. It will be necessary to have someone read the indicator (with an inspection mirror) while the clearance is being measured.
8. Insert the prying device between the compressor and compressor coupling. Move the coupling towards the motor and adjust the indicator to zero. When releasing the pressure from the coupling, the indicator may move off zero, DO NOT RESET INDICATOR.
9. Insert the prying device between the couplings and push the compressor coupling towards the compressor. Record movement. Care should be taken not to turn the rotor. If a clamping mount is used, the motor coupling half cannot be used to pry against the compressor coupling. Insert the end of the pry bar against something solid in order to push against the compressor coupling. Once the rotor is pushed towards the compressor record indicator reading. This reading will be the discharge end clearance.

RXB & RXF UNITS

The procedure to measure the axial thrust clearance on the RXB and RXF units is similar to the procedure for the RWBII/RDB & RWF units. The one difference is that on the RXB and RXF units the thrust clearance is measured on the Jack Shaft (shaft coupled to motor) not on the rotor.

1. The seal housing must remain mounted to the compressor to conduct measurement.
2. Follow steps 1 through 9 in RWBII/RDB/RWF procedure.
3. The clearance specification on all RXB and RXF units is .001″ to .005″ (0.0254mm – 0.127mm)

⚠ CAUTION

4. Do not apply force on the jack shaft in the radial (up and down) direction as this will result in damage to the bearings.

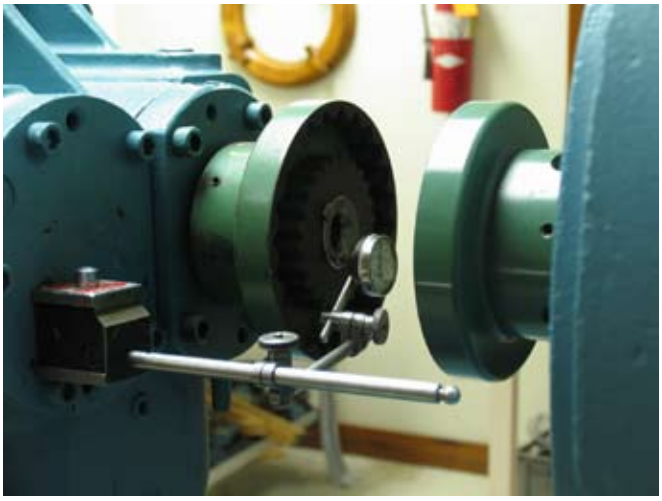


Figure 1.
Indicator is attached to a magnetic base. Plunger of indicator is positioned on rotor face.

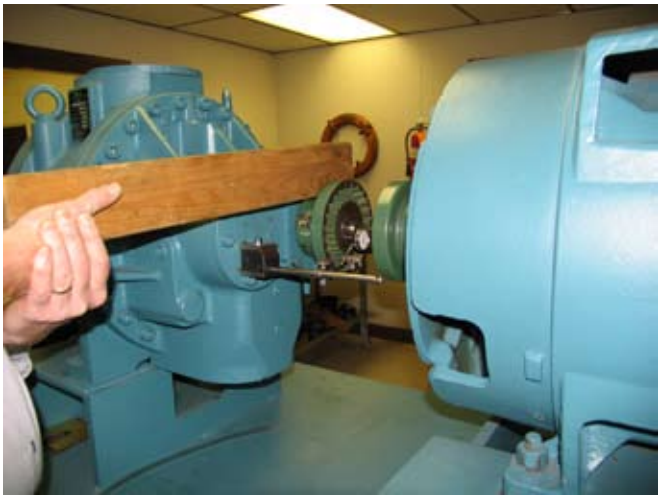


Figure 2.
Board is positioned between the compressor and coupling to force the rotor towards the motor.

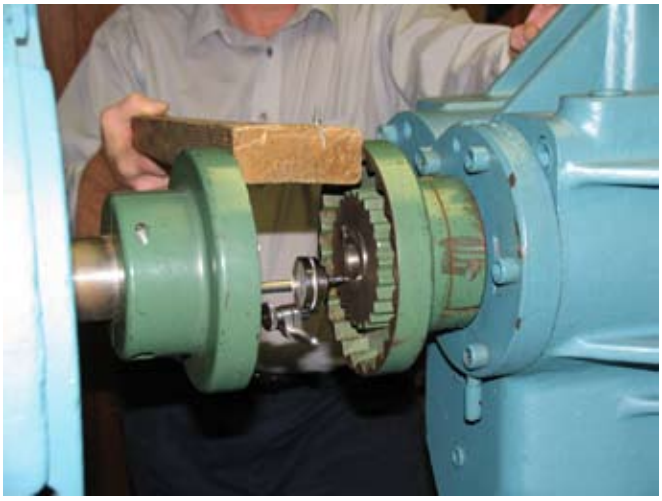


Figure 3.
Board is positioned between both couplings to force the rotor towards the compressor.

SHAFT SEAL REPLACEMENT. This procedure provides the information necessary for qualified personnel to replace the jackshaft carbon-faced seal, including required compressor disassembly.

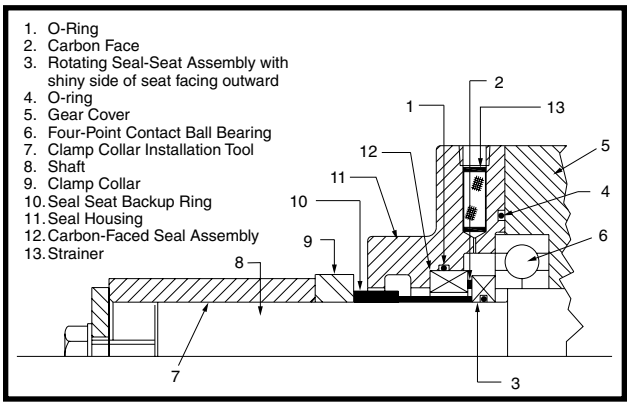
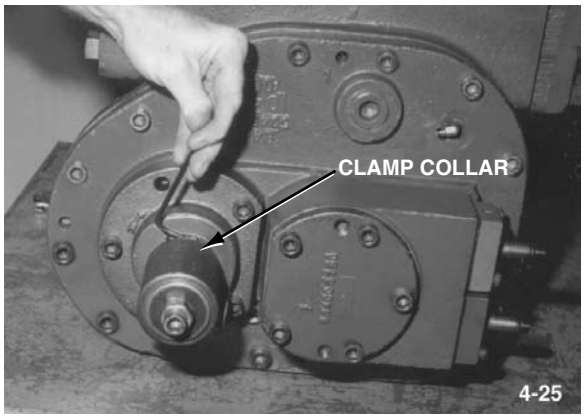


Figure 1. Seal Assembly Using Clamp Collar Installation Tool.

SHAFT SEAL – REMOVAL. Shaft seal removal shall be accomplished as follows:

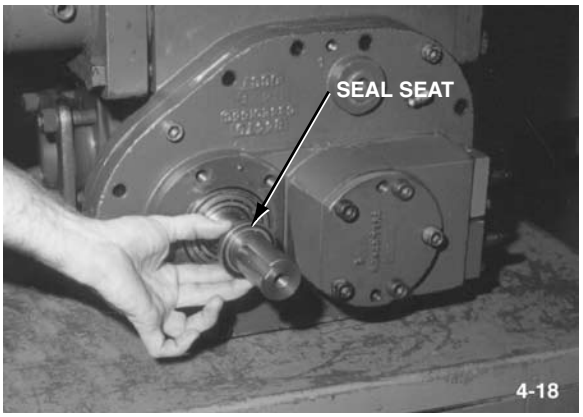
1. Evacuate compressor and oil separator (refer to S70-101 IOM).
2. Remove flexible drive coupling (refer to S70-101 IOM).
3. Loosen oil supply line nuts at elbows, which are located on seal housing and gear cover.
4. Remove seal housing oil supply tubing.
5. Loosen hex-head screw in clamp collar (9); remove clamp collar and seal-seat backup ring (10) from jackshaft (8).



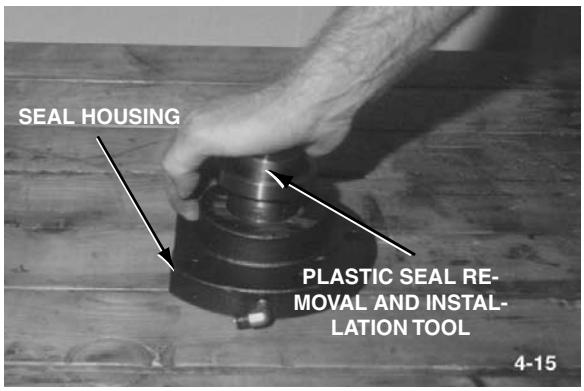
6. Remove capscrews securing seal housing (11) to gear cover (5). Remove seal housing and seal housing O-ring (4). A small amount of oil will drain from housing.

NOTE: Provisions should be made to catch residual oil that will drain when seal housing is removed.

7. Remove rotating seal-seat portion (3) of shaft seal assembly (12) from jackshaft (8).



8. Place seal housing (11) on workbench with inboard side facing down; using plastic Seal Installation and Removal Tool, push **(with hand pressure only)** carbon-faced seal assembly out of housing.



9. Remove carbon-faced seal assembly O-ring (1) from seal housing.
10. Remove oil supply line elbow from seal housing.

SHAFT SEAL – INSTALLATION. Shaft seal installation shall be accomplished as follows:

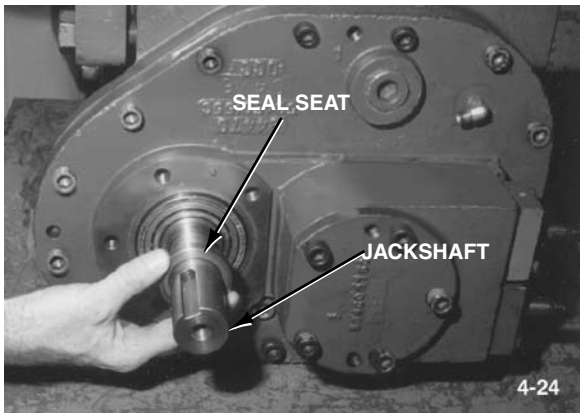
⚠ CAUTION

Avoid damaging carbon-faced seal and rotating seal seat. Mishandling will shorten seal life. Do not touch sealing surfaces. Surfaces can be blemished by perspiration. Ensure that carbon is not chipped or cracked.

1. Clean jackshaft; polish minor scratches with crocus cloth, wipe clean and coat shaft with clean refrigerant oil. Ensure that keyway edges are free of burrs.

NOTE: Do not use grease on seal parts.

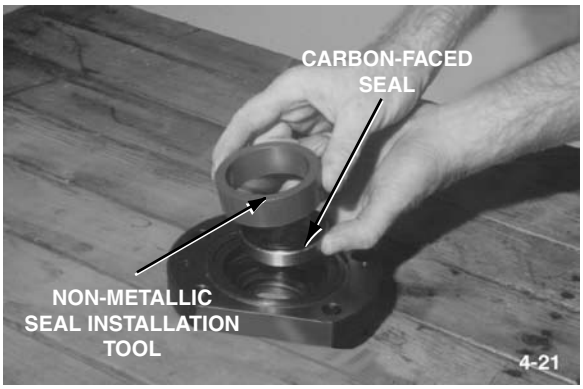
2. Before installing rotating seal-seat, coat seat surface with clean refrigerant oil.
3. With shiny side of seal seat facing out, coat seat with refrigerant oil and slide around jackshaft. **Do not damage O-ring.**



CAUTION

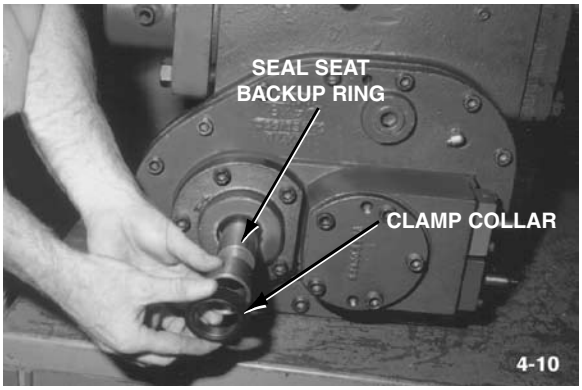
Before installing seal housing, ensure that feed hole below elbow is free of obstructions.

4. Place seal housing on workbench, with outboard side down. Coat new O-ring (1) with clean refrigerant oil; install o-ring in groove in seal housing, located in stationary carbon bore.
5. Coat carbon-faced seal with clean refrigerant oil.
6. Carefully place carbon-faced seal assembly, with carbon end up, in seal housing. Using nonmetallic Seal Installation Tool and being careful not to touch carbon, push seal assembly **(hand pressure only)** into seal housing until it is evenly seated, with no gap between seal and housing.

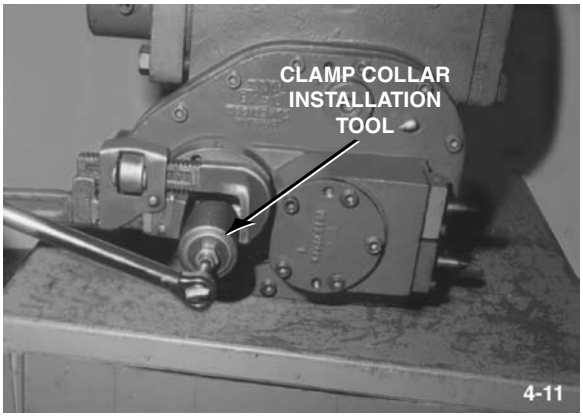


7. Install new oil strainer, p/n 534A0342H01, in gear cover oil supply line elbow port. **NOTE: If orifice plug is installed, remove and discard before installing strainer. Also, check to make sure that diameter of hole is .094. If necessary, drill out to size.**

8. Install oil line elbow in seal housing.
9. Install oil supply tubing on elbow located on gear cover.
10. Place new O-ring (4) on seal housing and install seal housing over jackshaft, using care not to damage carbon-faced seal.
11. Install end of oil supply tubing into elbow on seal housing, ensuring that roll pin in gear cover (5) engages hole in seal housing; align elbow with oil supply line, as necessary.
12. Secure seal housing to gear cover with capscrews; tighten capscrews evenly, in crisscross pattern, to a torque value of 58 foot-pounds (79 Nm).
13. Tighten nuts at elbows of oil supply line, which are located on seal housing and gear cover.
14. Install seal seat backup ring (10) and clamp collar (9) around jackshaft and against rotating seal seat.



15. Lubricate torque screw threads. Using Clamp Collar Installation Tool, tighten clamp collar and seal seat backup ring against rotating seal seat to 170 inch-pounds (19.2 Nm). Loosen the torque screw and retighten to 30 inch-pounds (3.4 Nm). **DO NOT OVERTORQUE!** Apply 170 inch-pounds (19.2 Nm) torque to the clamp collar bolt to keep it tight.
16. Remove Installation Tool.



17. Install flexible drive coupling. (Refer to S70-101 IOM.)
18. Evacuate compressor and oil separator. (Refer to S70-101 IOM.)

SHAFT SEAL KIT

NOMENCLATURE	ITEM NUMBER*	
	95mm	120mm
Shaft Seal Kit	111Q0043229	111Q0043231
Includes:		
Shaft Seal Tool	534A0310H01	534A0310H02
Clamp Collar	534B0182H02	534B0182H03
Seal Seat Backup Ring	534B0302H01	534B0301H01
O-ring	980A0012B04	980A0012B72
Shaft Seal Assembly	534B0207H01	534B0175H01
O-ring	980A0012A90	980A0012A94
Strainer, Seal Housing	534A0342H01	534A0342H01

* Quantity, 1 each.

NOTES

NOTES

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