



Robot High Speed Turbine Inspection and Rebuild Procedure

Model: A14895-XX Silver Shaft Style



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SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any electrostatic coating system, read and understand all of the technical and safety literature for your products. This manual contains information that is important for you to know and understand. This information relates to **USER SAFETY** and **PREVENTING EQUIPMENT PROBLEMS**. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

WARNING

A **WARNING!** states information to alert you to a situation that might cause serious injury if instructions are not followed.

CAUTION

A **CAUTION!** states information that tells how to prevent damage to equipment or how to avoid a situation that might cause minor injury.

NOTE

A **NOTE** is information relevant to the procedure in progress.

While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment. Differences in local codes and plant requirements, material delivery requirements, etc., make such variations inevitable. Compare this manual with your system installation drawings and associated equipment manuals to reconcile such differences.

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. If you do not have the manuals and safety literature for your equipment, contact your local Carlisle Fluid Technologies representative or Carlisle Fluid Technologies technical support.


WARNING



- The user **MUST** read and be familiar with the Safety Section in this manual and the safety literature therein identified.
- This equipment is intended to be used by trained personnel **ONLY**.
- This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the **WARNINGS** and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to **ALL** local building and fire codes and ordinances as well as **NFPA-33 AND EN 16985 SAFETY STANDARDS, LATEST EDITION**, or applicable country safety standards, prior to installing, operating, and/or servicing this equipment.

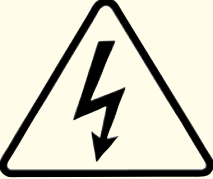
WARNING



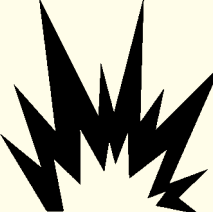
- The hazards shown on the following pages may occur during the normal use of this equipment.

Repairs may only be performed by personnel authorized by Carlisle Fluid Technologies.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
<p>Spray Area</p> 	<p>Fire Hazard</p> <p>Improper or inadequate operation and maintenance procedures will cause a fire hazard.</p> <p>Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation. Frequent Power Supply or Controller shutdown indicates a problem in the system requiring correction.</p>	<p>Fire extinguishing equipment must be present in the spray area and tested periodically.</p> <p>Spray areas must be kept clean to prevent the accumulation of combustible residues.</p> <p>Smoking must never be allowed in the spray area.</p> <p>The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance.</p> <p>Spray booth ventilation must be kept at the rates required by NFPA-33, EN 16985, country, and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents.</p> <p>Electrostatic arcing must be prevented. Safe sparking distance must be maintained between the parts being coated and the applicator. A distance of 1 inch for every 10KV of output voltage is required at all times.</p> <p>Test only in areas free of combustible material. Testing may require high voltage to be on, but only as instructed.</p> <p>Non-factory replacement parts or unauthorized equipment modifications may cause fire or injury. If used, the key switch bypass is intended for use only during setup operations. Production should never be done with safety interlocks disabled.</p> <p>The paint process and equipment should be set up and operated in accordance with NFPA-33, NEC, OSHA, local, country, and European Health and Safety Norms.</p>

<p>AREA Tells where hazards may occur.</p>	<p>HAZARD Tells what the hazard is.</p>	<p>SAFEGUARDS Tells how to avoid the hazard.</p>
<p>Spray Area</p> 	<p>Explosion Hazard</p> <p>Improper or inadequate operation and maintenance procedures will cause a fire hazard.</p> <p>Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation.</p> <p>Frequent Power Supply or Controller shutdown indicates a problem in the system requiring correction.</p>	<p>Electrostatic arcing must be prevented. Safe sparking distance must be maintained between the parts being coated and the applicator. A distance of 1 inch for every 10KV of output voltage is required at all times.</p> <p>Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33.</p> <p>Test only in areas free of flammable or combustible materials.</p> <p>The current overload sensitivity (if equipped) MUST be set as described in the corresponding section of the equipment manual. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if the current overload sensitivity is not properly set. Frequent power supply shutdown indicates a problem in the system which requires correction.</p> <p>Always turn the control panel power off prior to flushing, cleaning, or working on spray system equipment.</p> <p>Before turning high voltage on, make sure no objects are within the safe sparking distance.</p> <p>Ensure that the control panel is interlocked with the ventilation system and conveyor in accordance with NFPA-33, EN 16985.</p> <p>Have fire extinguishing equipment readily available and tested periodically.</p>
<p>General Use and Maintenance</p> 	<p>Improper operation or maintenance may create a hazard.</p> <p>Personnel must be properly trained in the use of this equipment.</p>	<p>Personnel must be given training in accordance with the requirements of NFPA-33.</p> <p>Instructions and safety precautions must be read and understood prior to using this equipment.</p> <p>Comply with appropriate local, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, EN Norms and your insurance company requirements.</p>

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
<p>Spray Area / High Voltage Equipment</p> 	<p>Electrical Discharge</p> <p>There is a high voltage device that can induce an electrical charge on ungrounded objects which is capable of igniting coating materials.</p> <p>Inadequate grounding will cause a spark hazard. A spark can ignite many coating materials and cause a fire or explosion.</p>	<p>Parts being sprayed and operators in the spray area must be properly grounded.</p> <p>Parts being sprayed must be supported on conveyors or hangers that are properly grounded. The resistance between the part and earth ground must not exceed 1 megohm. (Refer to NFPA-33, EN 16985.)</p> <p>Operators must be grounded. Rubber soled insulating shoes should not be worn. Grounding straps on wrists or legs may be used to assure adequate ground contact.</p> <p>Operators must not be wearing or carrying any ungrounded metal objects.</p> <p>When using an electrostatic handgun, operators must assure contact with the handle of the applicator via conductive gloves or gloves with the palm section cut out.</p> <p>NOTE: REFER TO NFPA-33, EN 16985 OR SPECIFIC COUNTRY SAFETY CODES REGARDING PROPER OPERATOR GROUNDING.</p> <p>All electrically conductive objects in the spray area, with the exception of those objects required by the process to be at high voltage, must be grounded. Grounded conductive flooring must be provided in the spray area.</p> <p>Always turn off the power supply prior to flushing, cleaning, or working on spray system equipment.</p> <p>Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33.</p> <p>Avoid installing an applicator into a fluid system where the solvent supply is ungrounded.</p> <p>Do not touch the applicator electrode while it is energized.</p>

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
<p>Electrical Equipment</p> 	<p>Electrical Discharge</p> <p>High voltage equipment is utilized in the process. Arcing in the vicinity of flammable or combustible materials may occur. Personnel are exposed to high voltage during operation and maintenance.</p> <p>Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation.</p> <p>Frequent power supply shut-down indicates a problem in the system which requires correction.</p> <p>An electrical arc can ignite coating materials and cause a fire or explosion.</p>	<p>Unless specifically approved for use in hazardous locations, the power supply, control cabinet, and all other electrical equipment must be located outside Class I or II, Division 1 and 2 hazardous areas in accordance with NFPA-33 and EN 16985.</p> <p>Turn the power supply OFF before working on the equipment.</p> <p>Test only in areas free of flammable or combustible material.</p> <p>Testing may require high voltage to be on, but only as instructed.</p> <p>Production should never be done with the safety circuits disabled.</p> <p>Before turning the high voltage on, make sure no objects are within the sparking distance.</p>
<p>Toxic Substances</p> 	<p>Chemical Hazard</p> <p>Certain materials may be harmful if inhaled, or if there is contact with the skin.</p>	<p>Follow the requirements of the Safety Data Sheet supplied by coating material manufacturer.</p> <p>Adequate exhaust must be provided to keep the air free of accumulations of toxic materials. Reference EN 12215 or applicable code.</p> <p>Use a mask or respirator whenever there is a chance of inhaling sprayed materials. The mask must be compatible with the material being sprayed and its concentration. Equipment must be as prescribed by an industrial hygienist or safety expert, and be NIOSH approved.</p>
<p>Spray Area</p> 	<p>Explosion Hazard — Incompatible Materials</p> <p>Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1, - Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment explosion.</p>	<p>Spray applicators require that aluminum inlet fittings be replaced with stainless steel.</p> <p>Aluminum is widely used in other spray application equipment - such as material pumps, regulators, triggering valves, etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing, or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your coating supplier. Any other type of solvent may be used with aluminum equipment.</p>

EQUIPMENT AND MATERIALS REQUIRED

1. 2/0 or finer abrasive paper or cloth 1-inch-wide x 8-8 1/2-inch-long strips (25mm wide x 200mm long) (included with kit A14896-00 and A12951-02) Circular Donut 2/0 or finer abrasive disks .950 I.D. x 1.54 O.D. (24.1mm I.D. x 39.1mm O.D.) (included with kit A14896-00 and A12951-02)
2. Lint Free Tissue (included with kit A14896-00 and A12951-02)
3. Aerosol electrical contact cleaner with Nozzle Attachment
4. .004-inch (0.102mm) Diameter Piano Wire (included with kit A14896-00 and A12951-02)
5. T-10 Star bit Wrench
6. Set of 90 degree "V" Blocks (Preferred Size 70mm x 90mm x 125mm) or A13268-00 Alignment Ring
7. Magnifier with Light – visual inspection
8. Master Bell Cup (12900-XX cup only) or equal
10. Safety Glasses
11. Latex Gloves
12. Isopropyl Alcohol
13. 3mm Hex Wrench
14. Light Duty Thread Retaining Compound (7969-05)
15. Torque wrench driver (30 lbs.-in. (3.4 Nm) capacity
16. Isopropyl Alcohol 99% Pure

NOTE

- Flooded turbine motors - prove to be difficult to repair if not addressed immediately after being flooded. It's difficult to impossible to flush the contaminated "hardened" fluid from the bearing air ports. If the unit cannot be cleaned up quickly, then the bearings and or housing must be replaced. Do not soak bearings in Ethylene-Glycol as it will destroy the bearing substrate and pressed in jets. The radial bearing may be soaked in a solvent compatible with the paint intrusion. A use of an Ultrasonic cleaner may aid in the loosening of material. Do not let turbine components sit in ultrasonics longer than 20 minutes. Some solutions will etch the turbine motor components.
- During repair of multiple turbine motors DO NOT MIX COMPONENT PARTS all rotor shafts are matched with their spacer ring to provide correct spacing for operation of the spindle.
- The spacers and the shafts are a matched set. The number on the shaft must correspond to the number on the spacer plate. See Figure 1-25.
- During tear down remove all O-rings and save in a safe place until new O-ring kit is installed.
- Final rinsing of component parts should be made by Isopropyl Alcohol.

OPERATION

IMPORTANT NUMBERS



TEAR DOWN PROCEDURES & VISUAL INSPECTION OF PARTS

Step 1

Remove the rear cover screws with a T10 Star wrench from rear of the turbine motor and set aside.

CRITICAL AREAS THAT MUST BE DAMAGE FREE

SEE FIGURE 1-2 FOR NON-REPAIRABLE CONDITION

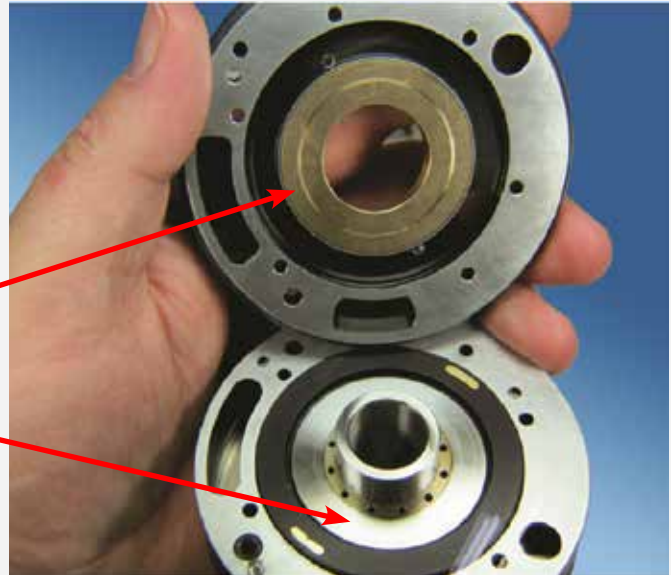


Figure 1-1: Rear Thrust Bearing and Shaft Thrust Area

Step 2

Carefully lift off the rear thrust plate and visually inspect the bronze bearing. If the bronze bearing is extremely discolored 360 degrees around the diameter this is an indication that the turbine cannot be rebuilt without replacement of rear thrust bearing (See Figure 1-2). If light damage such as less than 90 degrees damage proceed to clean up surface. See figure 1-1 for proper condition of the assembly. Set aside the rear cover until later rework process is covered.

AIR JET GALLERY GROOVE COMPLETELY WORN OFF. REPLACE SPINDLE MOTOR.



DAMAGED BEYOND REPAIR

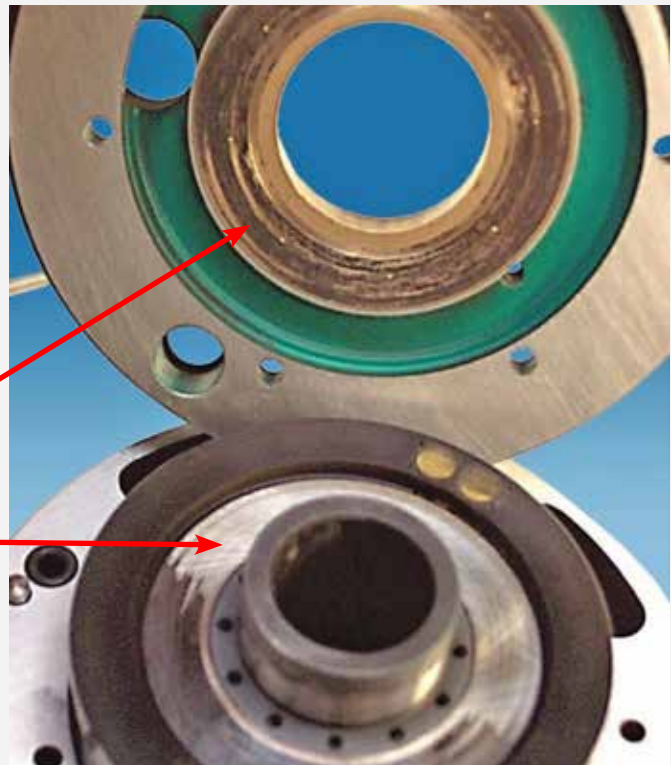


Figure 1-2: Illustration Non-Repairable Rear Plate

Step 3

Next, remove shaft rotor assembly from the turbine housing. Examine the shaft's outside diameter for contact marks. (See Figure 1-3 New Shaft Condition) Typically contact marks can be found at the bottom of the shaft and at the top. The contact marks consist of a bronze material from the air bearings transferring onto the outside diameter of the shaft.

If contact area observed 360 degrees around the shaft diameter and it can be felt with your fingernail as a raised area, then the shaft has sustained too much damage to be cleaned up. Return entire turbine motor to Ransburg for an exchange rebuild unit. (See Figure 1-3A Non-repairable Shaft)

TYPICAL CONTACT AREA



Figure 1-3: New Shaft Appearance

NEW SHAFT CONDITION - PROVIDES OPTIMAL TURBINE MOTOR PERFORMANCE



Figure 1-3A: 360° Contact (non-repairable)



SHAFT DAMAGED BEYOND REPAIR DO NOT REPAIR

Excessive damage on front and rear thrust faces. Inspect thrust faces to determine if unit can be repaired.



Figure 1-3B

Step 4

INSPECT SHAFT “INSIDE DIAMETER”

Visually inspect the inside diameter of shaft for paint in the threads and the undercut area. It will need to be cleaned up accordingly. **See Figure 1-4 - If circular wear marks are identified on the shafts taper it will need to be inspected to verify if taper is still good as shown in Figure 1-4A.**

DIRTY ID SHAFT TAPER



Figure 1-4

TAPER VERIFICATION

Apply Die Makers ink to taper of shaft and allow to dry (1-2 minutes). Install Master Bell Cup and tighten securely. Remove the bell cup and visually examine shaft taper. Metal to metal contact must be made on at least 80% of the diameter. If contact is less than that, shaft and spacer assembly must be replaced.



WITNESS MARK VISIBLE – TAPER ACCEPTABLE WITH 80% CONTACT ON THE DIAMETER



Figure 1-4A

Step 5

Pull off spacer plate from turbine assembly and set aside until later.

Bearing Air O-Ring, retain do not lose.

“DO NOT REMOVE” FRONT THRUST BEARING - IT IS PRESET BY THE SUPPLIER. IT IS NOT FIELD REPLACEABLE

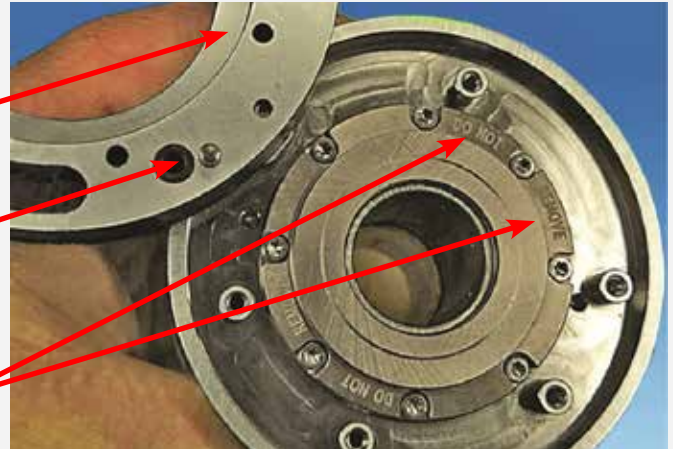


Figure: 1-5

Step 6

Inspect Front Thrust Bearing Mounted in the Bearing Housing:

Inspect the rear bronze bearing in the turbine housing, if the bearing face is “Discolored severely” the entire bearing housing must be replaced. The circular ring that connects air bearing jets must be intact to assure turbine motor will function at factory load specifications.

CIRCULAR RING MUST BE PRESENT TO REPAIR!!!

IMPORTANT NOTE:

The circular ring connecting the bearing air holes on the front thrust bearing surface if the ring is broken or completely worn down, the bronze bearing is no longer any good and the assembly needs to be replaced.

VISUAL EXAMPLE OF: NON-REPAIRABLE FRONT THRUST BEARING.

AIR BEARING JETS AND CIRCULAR JET RING DAMAGED BEYOND REPAIR.

VISUAL APPEARANCE OF NEW FRONT THRUST BEARING

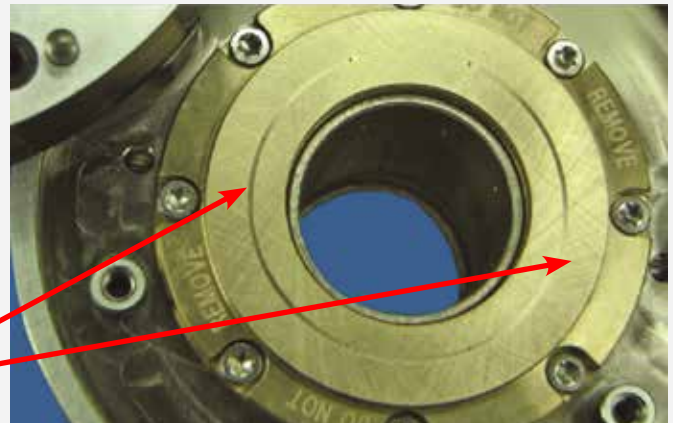


Figure 1-6: Front thrust bearing in turbine housing.

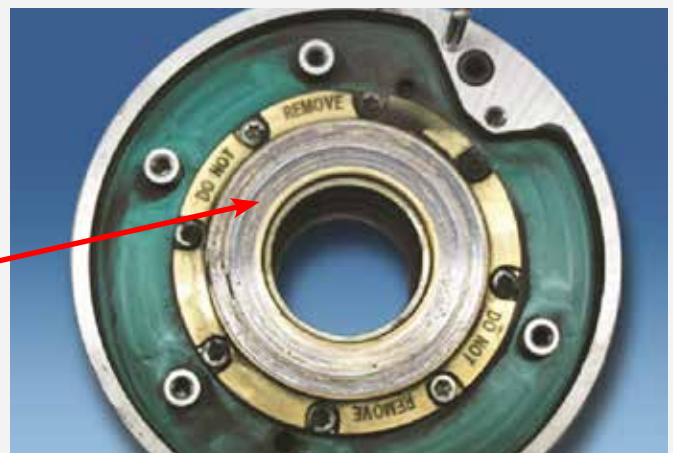


Figure 1-6A

Step 7

Removal of Dual Bearings from Bearing Housing (Set Screw Extraction)

Set Screw Removal:

Remove the two setscrews using 3mm hex wrench as shown in Figure 1-7.



Figure 1-7

Step 8

Take note of the setscrew assembly:

There should be (2) O-Rings and small spring that are removed from the two bearings. They will need to be reassembled in the same manner.

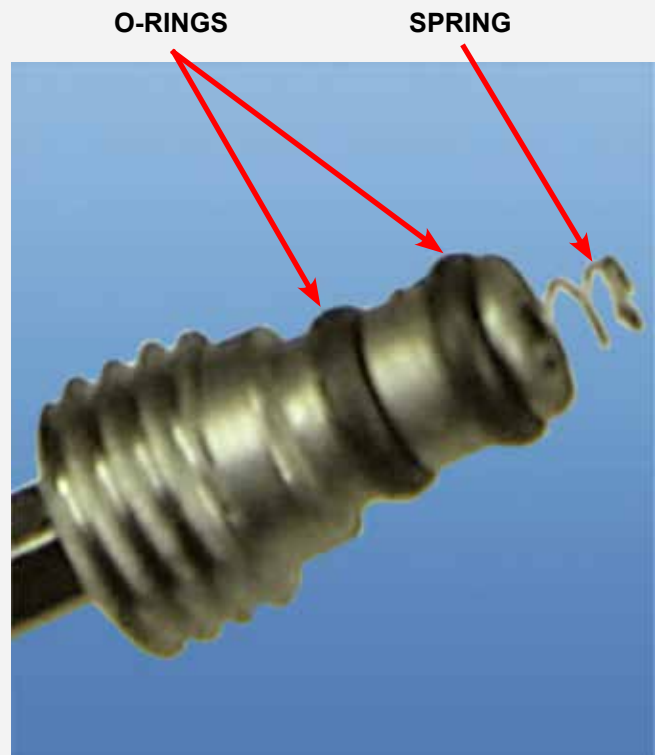


Figure 1-8

Step 9

Removal of Dual Bearings from Bearing Housing (Bearing Removal)

Dual Bearing Removal:

Use only non-metallic tool to extract bearing from housing. Bearings will remove with the slight pull of the forefinger as shown in Figure 1-9. Observe closely the position of the bearings assembled into housing.



Figure 1-9

Step 10

Use tool A13269-00 to push out radial bearings from the rear of the body assembly.

Push bearings all the way through body assembly as shown.

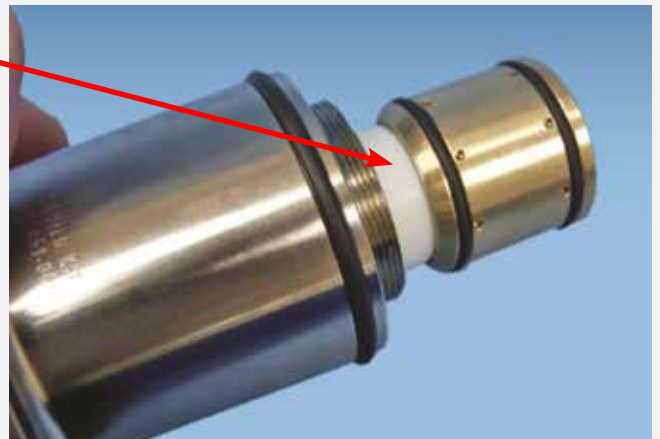
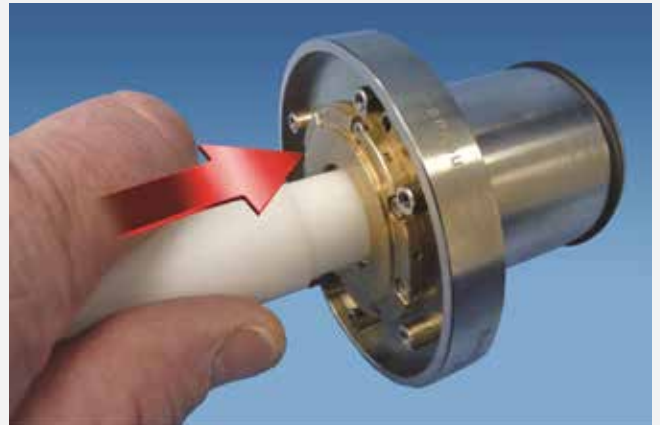


Figure 1-10

Step 10 (Cont.)**Dual Bearing Inspection & Repair Process**

Extract O-rings from bearing as shown in Figure 1-10A.

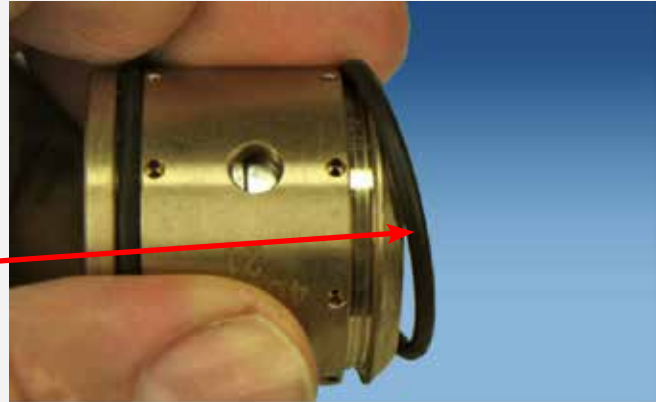


Figure 1-10A

Step 11

The radial bearings may be soaked in a solvent compatible with the paint debris intrusion. Use of an Ultrasonic cleaner may aid in loosening of the foreign material.

Air Bearing Jet Inspection:

Using a .004 inch (0.102mm) dia. wire inspect all bearing air jet holes in both bearings making sure they are clean and free of debris. Blocked holes reduce the load capacities of the turbine motor allowing it to fail prematurely. If holes are blocked and cannot be cleared with wire, replace with new bearings.

Do Not Change Bearing Jet Hole Size - Performance and motor life will be affected.

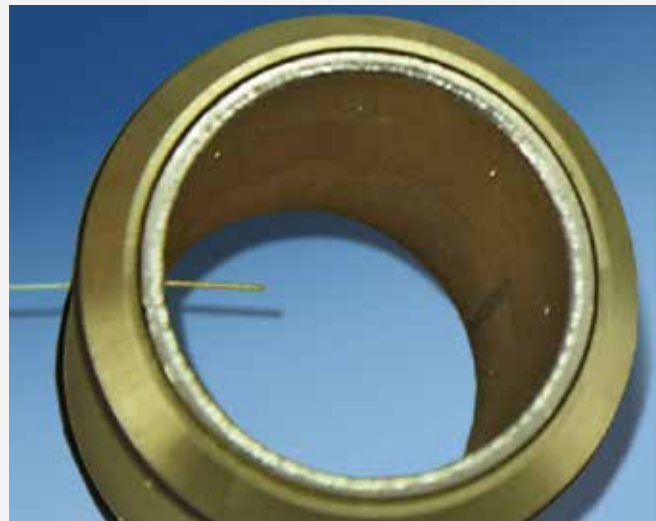


Figure 1-11

Step 12**Polish ID of Bearing:**

Dependent upon shaft contact to the ID of the bearing it may be necessary to polish the inside diameter of the bearing as shown in Figure 1-12.

Polish bearing in circular (rotation) motion not in linear direction use only abrasive paper/cloth 2/0.



Figure 1-12

Step 13

Clean Air Bearing Jets After Polishing Operation:

Using an approved compressed solvent with extension tube and face shield. Spray solvent through each air bearing jet to make sure they are clean and free of debris. Plugged holes will result in premature turbine motor failure.

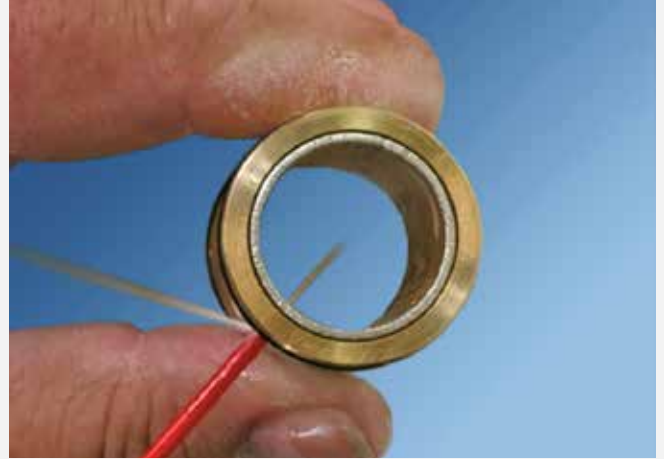


Figure 1-13

Step 14

Rotor Shaft Polishing Process (Light Contact Marks Only)

Wrap the 2/0 sandpaper/cloth around shaft.

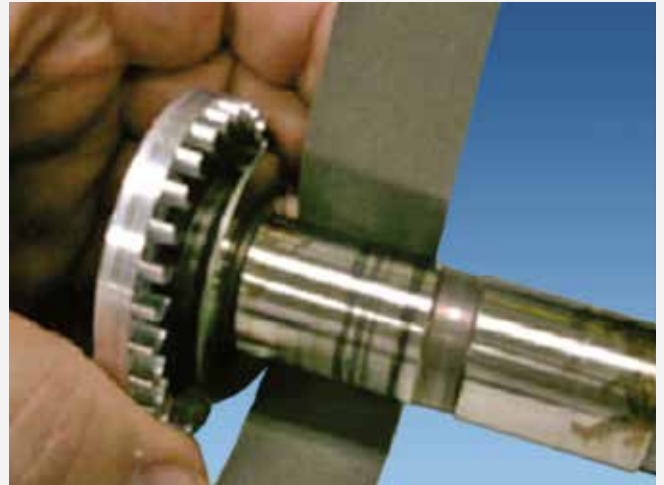


Figure 1-14

Polish Shaft:

Use a fine abrasive paper/cloth 2/0 paper to clean the outside diameter of the shaft as shown in Figure 1-14A. Using the 2/0 abrasive paper/cloth, polish the shaft removing the deposition marks. Polish by rotating the shaft by hand - Do not polish the shaft in a linear motion creating flat spots on the shaft.



Figure 1-14A

Step 14 (Cont.)**NOTE**

➤ After polishing is complete, the minimum shaft diameter allowed is .8828 (Inches) / 22.42mm. Measure the entire shaft length with micrometers. If the diameter is under the measurement stated .8828 Inches / 22.42mm discard shaft return bearing housing assembly and rear cover for core credit towards an exchange rebuild unit.



Figure 1-14B

Step 15**Sanding the Bearing Thrust Faces****Sanding Thrust Faces:**

Using 2/0 abrasive paper/cloth, polish both sides front and rear thrust faces.



Figure 1-15

Step 16**Polish Thrust-face using Bearing face as Shown in Figure 1-16**

Rotate shaft back and forth looking to see if discoloration has been removed. It may require additional 2/0 abrasive paper/cloth disc to achieve required finish. Reverse the abrasive paper/cloth and polish rear thrust bearing also. When polish-



Figure 1-16

Step 16 (Cont.)

ing the rear thrust bearing final inspection with the .004 inch (0.102mm) wire will be required to assure jets are open and clean.



Figure 1-16

Optional Tool A13270-00

Thrust plate sanding tool can be purchased and used to polish the thrust plate on both sides of the shaft using the 2/0 abrasive sanding paper/ cloth disc as shown in Figure 1-16A.



Figure 1-16A: Optional

Step 16 (Cont.)

Clean Shaft:

After polishing shaft thrust faces clean entire shaft with aerosol electronic contact cleaner, wear goggles, wipe down shaft with a lint free cloth.



Figure 1-16B

Step 17

Inspect Bearing Air Jets in both thrust faces as shown in Figure 1-17

Inspect Bearing Air Jets:

Insert a .004-inch (0.102mm) wire into each bearing air jet (8 total) making sure, jet is open and clear of debris.

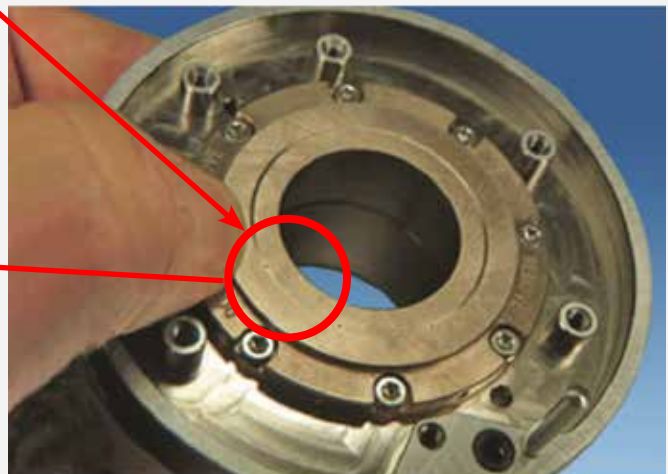
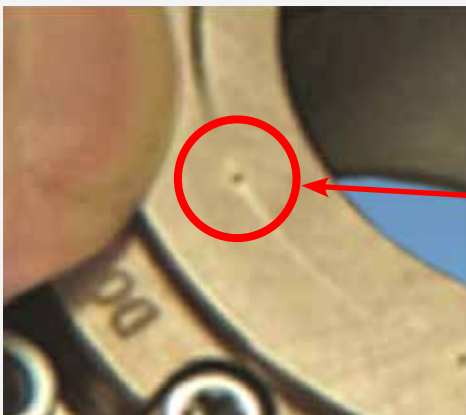
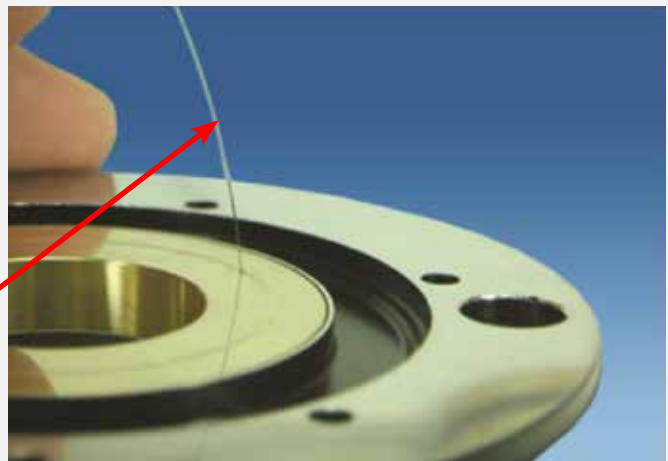


Figure 1-17

Step 18

**USE SAFETY GLASSES
DURING THIS PROCEDURE**

Flush Bearing Air Jets with an aerosol electronic contact cleaner as shown in Figure 1-18

Solvent Flush Ports:

Apply aerosol feed tube to bearing air port as shown. The hole on the opposite side need to be blocked. Use a small cloth or a piece of rubber. See Figure 1-18A on where Solvent should exit (bearing air ports).

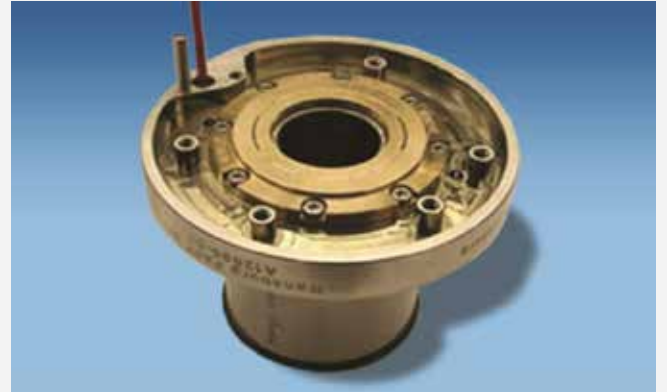


Figure 1-18A

**USE SAFETY GLASSES
DURING THIS PROCEDURE**

Flush Bearing Air Jets:

Apply an aerosol electronic contact cleaner to bearing air-port and observe to see if solvent passes through all bearing air ports. See solvent stream shown in Figure 1-18B. Holes must be free of debris to assure optimal performance.

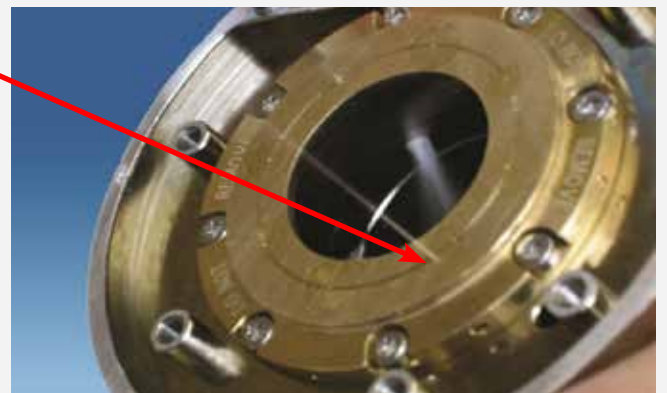
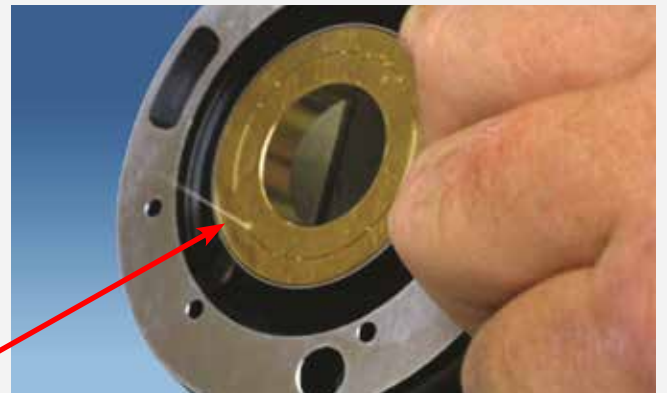


Figure 1-18B

Step 19**NOTE**

➤ Prior to assembly, go back through and make sure that all component parts are clean. If not, wash them with 99% pure Isopropyl Alcohol and wipe with a lint free cloth. All parts must be very clean. Use safety glasses and latex gloves during cleaning operation. Do not apply solvents to O-Rings, swelling will occur, replace as needed with new kit.

Assemble Bearings back into Bearing Housing

Install new O-rings onto Bearings
(Note: Radial Bearings are the Same Size and can be interchanged)

Install O-Rings:

Locate O-rings from replacement kit and install onto bearing as shown in Figure 1-19. Please note new bearings may need to be installed if required. New bearings are included with the rebuild kits. (A12951-01)

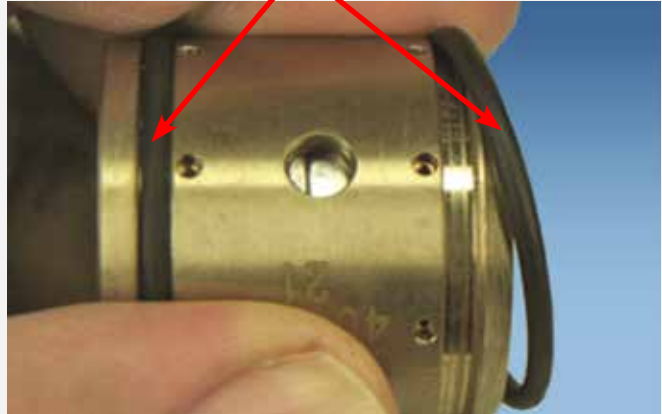


Figure 1-19

Step 20**Lay out bearings for installation****Position Assembled Bearings:**

Lay out bearings for install as shown. Note the "taper end" goes inward towards the housing. Remember the set screw holes must align with bearing housing.

Tapered end
in first



Figure 1-20

Step 21

Lightly lubricate bearing housing

Use Ransburg lubricant A11545 sparingly enough (super thin film) to allow bearings to slide into position. Too much lubricant could lead to air bearing failure.



Figure 1-21A



Figure 1-21B

Step 22

Slide Bearings into Position within the Housing

Slide Bearings into Housing:

Notice position of the taper on bearings, they will be facing inwards during assembly.

Set Screw Hole Alignment:

Make sure to align both blind set screw holes to bearing housing during the insertion process.

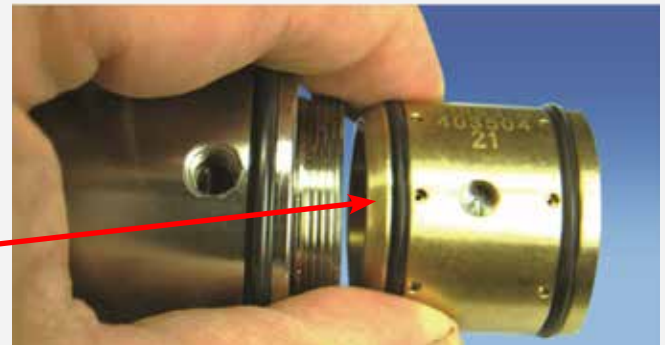


Figure 1-22A



Figure 1-22B

Step 23

Install Set Screws into Bearings

Install New O-rings and spring:

Install new O-rings and spring onto set screws as shown in Figure 1-23A.

Apply a drop of light duty thread retaining compound to first thread (7969-05)

Install Assembled Set Screws into bearing housing:

Visually inspect to make sure blind holes in bearings are in alignment with housing. Once in alignment, install both set screws and torque into place 15-20lb.-in (1.3-1.6 Nm) torque.

Reminder: It's critical to have proper alignment of set screws otherwise, they will not fully seat allowing bearings to move yielding premature bearing failure.



Figure 1-23A



Figure 1-23B

Step 24

Assemble Turbine Motor Complete

Insert Bearing Air O-Ring:

Locate O-ring from kit and install into bearing housing as shown in Figure 1-24.



Figure 1-24

Step 25

Locate Spacer and Shaft

Important Assembly Note:

Inspect spacer and shaft to make sure, that they have corresponding serial numbers. They are a matched set. If numbers do not match locate ones that do match. Failure to do so will result in turbine motor failure.

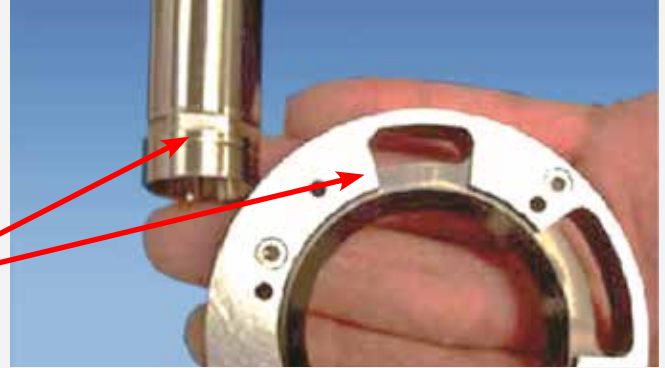


Figure 1-25

Step 26

Assemble Spacer Ring onto Bearing Housing

Assemble Spacer & Second O-Ring:

Align pin on body with hole near bearing air. Align spacer before installing shaft.

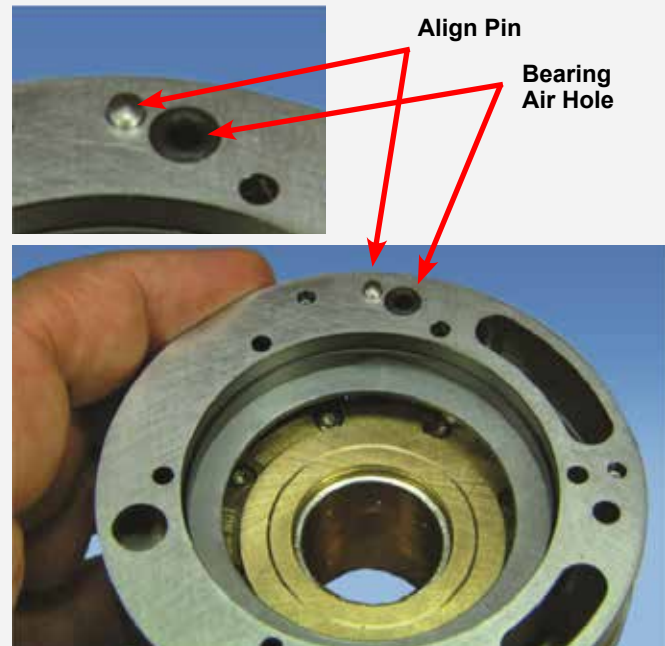


Figure 1-26

Step 27

Assemble Shaft into Bearing Housing

Assemble Shaft:

Assemble shaft into bearing housing as shown in Figure 1-27. Use care during installation.



Figure 1-27

Step 28

Assemble Rear Cover onto Bearing Housing

Assemble Rear Cover:

Observe alignment pin during assembly. Make sure bearing air O-ring is in place. Assemble rear cover.

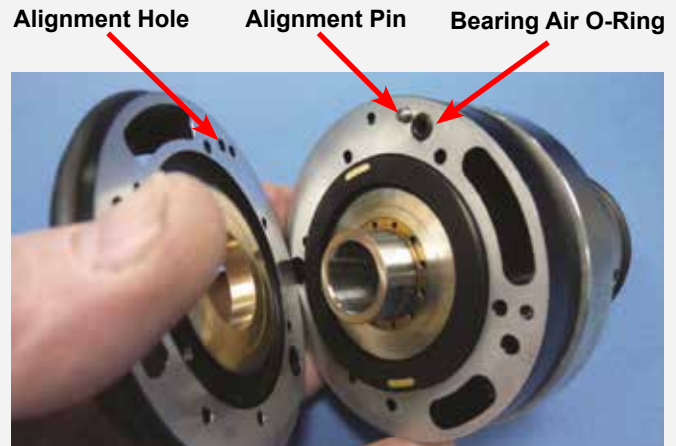


Figure 1-28

Step 29

Assemble Rear Cover onto Bearing Housing

Assemble Star Screws:

Replace star screws into rear cover of turbine motor. Do not tighten leave loose and proceed to next step.



Figure 1-29

Step 30

Align housing, Spacer and Rear Cover in V-Block

Align Turbine Motor in V-Blocks:

Carefully align turbine motor into V-block as shown in Figure 1-30. Once aligned, check staff for free rotation by hand then proceed to tighten Star screws to 12-15lbs.-in.(1.4-1.7 N-m) torque using an alternating pattern. The shaft should be free moving during the screw tightening process as well as after. If not spinning free, loosen screws and reposition unit in V-block then repeat process.



Figure 1-29



Remove exterior body O-Ring during assembly

OPTIONAL ALIGNMENT TOOL METHOD

Step 29A

Assemble Rear Cover onto Bearing Housing

Assemble Star Head Screws:

Replace star screws into rear cover of turbine motor. Do not tighten leave loose and proceed to next step.



Figure 1-29A

Step 30A

Align housing, Spacer and Rear Cover in Alignment Ring

Align Turbine Motor in Alignment Ring:

Carefully align turbine motor as shown in Figure 1-30A. Once aligned, check shaft for free rotation by hand then proceed to tighten #10 Star screws to 12-15 lbs.-in. (1.4-1.7 N-m) torque using an alternating pattern. The shaft should be free moving during the screw tightening process as well as after. If not spinning free, loosen screws and reposition unit in the alignment ring, then repeat process.

Remove large diameter rear O-Ring during assembly.



A13268-00 Alignment Ring

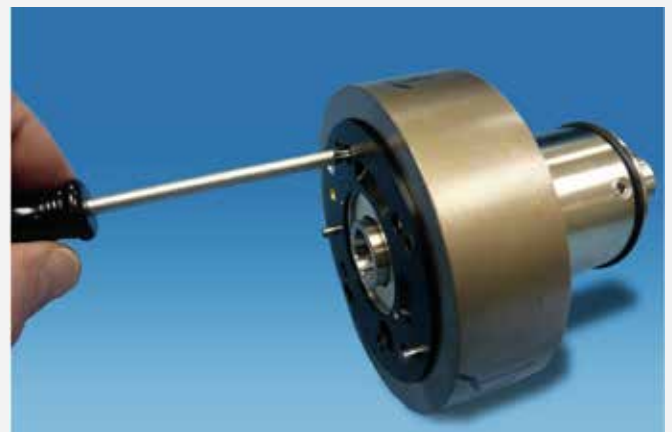


Figure 1-30A

Step 31

Install New O-Rings onto Turbine Motor

Install New O-Rings onto turbine motor as shown in Figures 1-31A and 31B

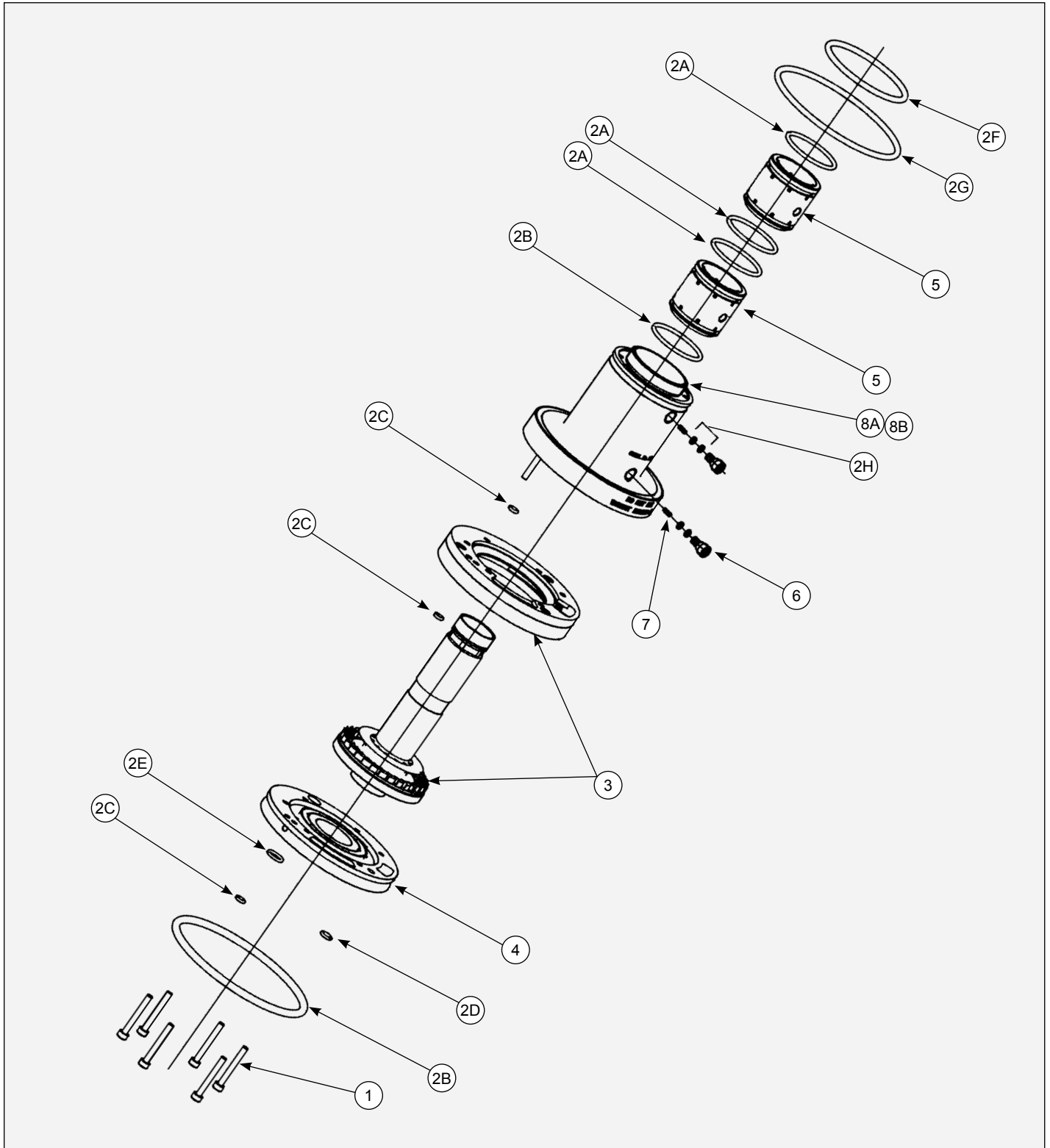


Figure 1-31A



Figure 1-31B

PARTS IDENTIFICATION



Spindle Replacement

SPINDLE REPLACEMENT PARTS

Item No.	Part No.	Qty	Description
1	A12907-00	1	SCREW KIT (6 SCREWS)
2	A12908-00	1	O-RING KIT (16 O-RINGS) (SEE KIT BREAKDOWN FOR EACH O-RING)
3	A14901-00	1	SHAFT AND SPACER ASSEMBLY KIT
4	A14902-00	1	REAR COVER ASSEMBLY WITH THRUST BEARING
5	A14898-00	2	RADIAL BEARING
6	A14899-00	2	RADIAL LOCATION PIN (2 PER ASS'Y REQ'D.)
7	A12961-00	2	SPRING (2 PER ASS'Y REQ'D.)
8A	A14897-00	1	BODY WITH THRUST BEARING (WITH SHAPE AIR HOLES)
8B	A14904-00	1	BODY WITH THRUST BEARING (NO SHAPE AIR HOLES)

A12908 O-RING KIT

Item No.	Part No.	Where Used
2A	A13259-00	RADIAL BEARING O-RINGS (4 REQUIRED PER ASSEMBLY)
2B	A13260-00	REAR COVER OUTSIDE DIAMETER O-RINGS
2C	A13261-00	BEARING AIR O-RINGS (3 REQUIRED PER ASSEMBLY)
2D	A13262-00	BRAKE AIR, REAR COVER FACE, O-RINGS
2E	A13263-00	TURBINE AIR, REAR COVER FACE, O-RINGS
2F	A13264-00	SPINDLE BODY, FRONT, OUTSIDE DIAMETER, O-RINGS
2G	A13265-00	SPINDLE BODY, FRONT FACE, LARGE DIAMETER, O-RINGS
2H	A13266-00	RADIAL LOCATION PIN FOR BEARING LOCATOR, O-RINGS (4 REQ'D. PER ASS'Y.)

SERVICE KIT A12951-02 (CLEANING AND BEARING)

Item No.	Part No.	Qty	Description
1	RPM-63	2	SANDPAPER STRIP
2	SSC-6001	1	LINT FREE TISSUE
3	RPM-62-1	2	SANDPAPER DISC
4	A13343-00	2	WIRE, 6 1/4"
5	A12907-00	1	KIT, SCREW
6	A14898-00	2	BEARING
7	A12961-00	2	SPRING
8	A12908-00	1	O-RING KIT
9	SI-21-06	1	SERVICE INSTRUCTION (A14895-XX)

SERVICE KIT A14896-00 (CLEANING)

Item No.	Part No.	Qty	Description
1	RPM-63	2	SANDPAPER STRIP
2	SSC-6001	1	LINT FREE TISSUE
3	RPM-62-1	2	SANDPAPER DISC
4	A13343-00	2	WIRE, 6 1/4"
5	A12961-00	2	SPRING
6	A12908-00	1	O-RING KIT
7	A12907-00	1	KIT,SCREW
8	SI-21-06	1	SERVICE INSTRUCTION (A14895-XX)

TOOL OPTIONS**ALIGNMENT TOOL (A13268-00)****THRUST BEARING SANDING TOOL (A13270-00)****BEARING TOOL (A13269-00)**

WARRANTY POLICY

This product is covered by Carlisle Fluid Technologies' materials and workmanship limited warranty. The use of any parts or accessories, from a source other than Carlisle Fluid Technologies, will void all warranties. Failure to reasonably follow any maintenance guidance provided, may invalidate any warranty.

For specific warranty information please contact Carlisle Fluid Technologies.

For technical assistance or to locate an authorized distributor, contact one of our international sales and customer support locations.

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China	Tel: +8621-3373 0108 Fax: +8621-3373 0308	
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