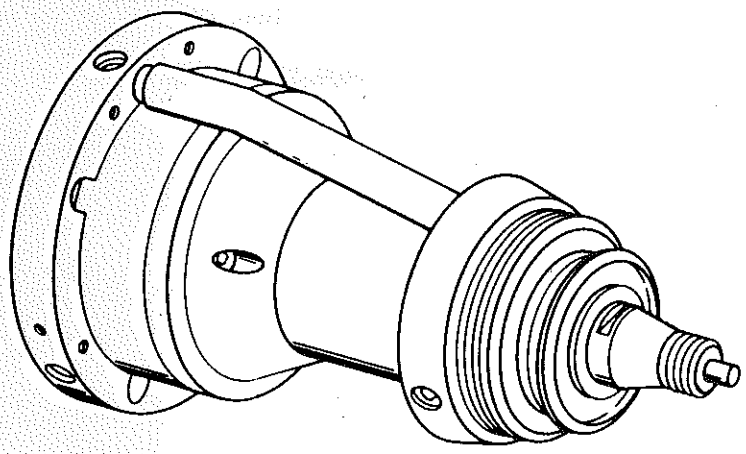
Ransburg

Service Reference
SR-70-52-1

AEROBELL™ Air Bearing Turbine Assembly
SERVICE INFORMATION



U.S.A. AND FOREIGN PATENTS PENDING

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SAFETY PRECAUTIONS

This manual contains information that *all* users should know and understand before using the equipment. This information relates to USER SAFETY and PREVENTING EQUIPMENT PROBLEMS. To help you recognize this information, we use the following terms to draw your attention to certain equipment labels and portions of this Service Instruction Manual. Please pay special attention to any label or information that is highlighted by one of these terms:

WARNING

IMPORTANT INFORMATION TO ALERT YOU TO A SITUATION THAT MIGHT CAUSE SERIOUS INJURY IF INSTRUCTIONS ARE NOT FOLLOWED.

CAUTION

Important information that tells how to prevent damage to equipment, or how to avoid a situation that might cause minor injury.

Note

Information that you should pay special attention to.

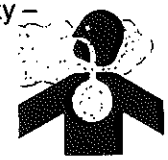
MAJOR HAZARDS

WARNING

THE FOLLOWING HAZARDS MAY OCCUR DURING THE NORMAL USE OF THIS EQUIPMENT. PLEASE READ THE FOLLOWING CHART.

AREA Indicates where a hazard can occur.	**HAZARD** Indicates what can happen if precautions are not observed.	**SAFEGUARDS** Indicates how to avoid the hazard and what special equipment and precautions will be used.
Spray Area – High Voltage Equipment 	This is a high voltage ungrounded device that can produce electrical arcs capable of igniting coating materials.	Parts being sprayed must be supported on conveyors or hangers and be grounded. The resistance between the part and ground must not exceed 1 megohm. A safe distance must be maintained between the parts being coated and the atomizer bell. A distance of at least 1 inch for each 10 KV of power supply output voltage is required at all times. Parts must be supported so that they will not swing and reduce the clearance specified above. 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. Unless specifically approved for use in hazardous locations, the power supply and other electrical equipment must not be used in Class I, Division 1 or 2 locations.
Spray Area – Fire Hazard 	Improper or inadequate operations and maintenance procedures will cause a fire hazard.	Spray areas must be kept clean to prevent the accumulation of combustible residues. The high voltage supplied to the atomizer must be turned off prior to cleaning or maintenance. When using solvents for cleaning: • Those used for equipment flushing or purging must have flash points equal to or higher than those of the coating material.

MAJOR HAZARDS (continued)

AREA	HAZARD	SAFEGUARD
Spray Area – Fire Hazard (cont)		• Those used for equipment wipe-down or general cleaning must be nonflammable (flash point higher than 100°F/37.8°C) and also nonpolar. Examples are: Amyl Acetate — High Flash Naptha Methyl Amyl Acetate — Mineral Spirits Spray booth ventilation must be kept at the rates required by OSHA or local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents.
Personnel Safety – Electrical Hazards 	The high voltage equipment used in this application creates a hazard for personnel. The high voltage can cause injury, and a spark from the equipment to a person is capable of igniting coating material.	High voltage equipment must be isolated from personnel. Booths, fencing, railings or other means must be placed around the equipment and maintained to assure safe isolation of the process. The high voltage equipment must be deenergized prior to allowing personnel to enter the spray area.
Explosion Hazard – Incompatible Material 	Halogenated hydrocarbon solvents – for example: methylene chloride and 1,1,1,-Trichloroethane are not chemically compatible with aluminum used in many AEROBELL system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment explosion.	The AEROBELL itself can be used with these solvents. However, aluminum is widely used in other spray application equipment – such as material pumps, regulators, triggering valves, etc. Do not use these solvents for spraying, equipment flushing or purging if aluminum equipment is used. 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 material supplier. Any other type solvent may be used with this equipment.
Personnel Safety – Toxic Substances 	Certain coating materials are harmful if inhaled, or if brought into contact with the skin.	Read the labels or material safety data sheet for your coating material. If required, personal protection equipment must be suitable for both the type and amount of toxic material to which the worker may be exposed.
Personnel Safety – Mechanical Hazards 	The atomizer rotates at speeds up to 60,000 RPM. At these speeds, the edge of the bell can easily cut into skin. Loose articles can also be caught by the rotating bell.	Personnel must stay clear of the bell whenever it is rotating. Before touching the bell, the turbine air must be shut off. If the bell has been rotating, allow at least three minutes for it to come to a complete stop before touching it. If the air brake feature is utilized, the bell can be stopped in a shorter period.
General Use and Maintenance	Personnel must be properly trained in the use of this equipment. Improper operation or maintenance can cause hazardous conditions.	Personnel must be given training in accordance with the requirements of NFPA-33, Chapter 15 (1985). Read all instructions prior to use. Reference NFPA-33 (1985), OSHA 1910.107 and your particular local codes and insurance requirements.

INTRODUCTION

This Service Reference manual will instruct the user how to disassemble, clean, complete *minor* repairs, and reassemble the AEROBELL air bearing turbine. Care MUST be taken to follow *all* directions to insure a successful repair. BEFORE attempting any repairs on the turbine, read the "IMPORTANT WARRANTY NOTE" which follows regarding repair policy on turbines under DeVilbiss' Warranty:

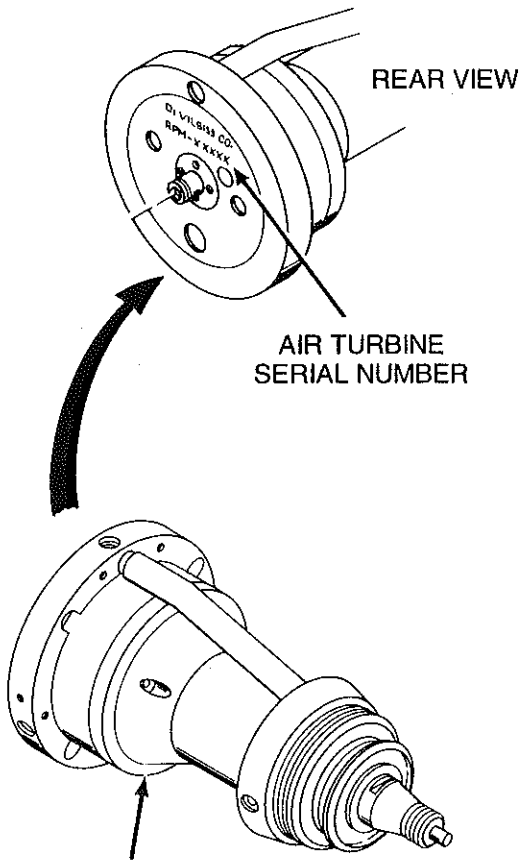
IMPORTANT WARRANTY NOTE

Do NOT disassemble or attempt to repair an AEROBELL air bearing turbine that is covered under DeVilbiss' warranty. Turbines which fail to operate properly within the warranty period MUST be returned to DeVilbiss for warranty inspection and repair. Warranty will be VOIDED on any unit disassembled or repaired by the user. The AEROBELL air bearing turbine is factory sealed, and any attempted disassembly will be readily known by DeVilbiss, voiding warranty. The repair instructions provided in this manual are intended for those users who wish to repair their turbines AFTER the warranty period. Repair service on non-warranty turbines is also available through DeVilbiss for those users who do not choose to complete their own repairs.

To Return a Turbine to DeVilbiss for Warranty Inspection/Repair:

1. Disassemble the AEROBELL rotary atomizer as shown in procedures 1 through 5 on page 6. Return the RPM-406 air bearing turbine *only* to DeVilbiss.
2. Contact your DeVilbiss distributor (if your AEROBELL system was purchased through a distributor), or DeVilbiss (phone 1-800-338-4448) with the following information:
   a. Your purchase order number (a conditional P.O. will be required by DeVilbiss to cover any repairs not covered under warranty, such as turbine failure caused by abuse, accident, contaminated bearing air supply, attempted customer repair, etc.).
   b. The turbine serial number (s/n located on rear of turbine, see illustration on this page.)
   c. The AEROBELL system installation date.
   d. Total hours of usage for the turbine.
3. The information contained in 2 must be shown on the packing slip accompanying the turbine being returned.
4. Return the turbine to your Ransburg distributor, or to Ransburg at:

   Ransburg
   1910 N. Wayne St.
   Angola, Ind. 46703



RPM-406 AIR BEARING TURBINE ASSEMBLY

FOR ADDITIONAL INFORMATION ON YOUR AEROBELL – for operating, maintenance, installation, etc. – SEE SI-70-52-1 (latest edition).

AEROBELL DISASSEMBLY

NOTE

Prior to removing the AEROBELL atomizer assembly, flush the paint feed line and bell with solvent. If flushing is not possible and paint is in the atomizer feed tube, place a rag over the bell end of the atomizer and be prepared to catch paint from the bell. Do not allow any paint to drip from the manifold into the air ports on the back of the turbine.

CAUTION

Be sure to carefully hold the shroud while unlatching the three latch buttons that secure the AEROBELL into the manifold. The AEROBELL weighs approximately 7 lbs. and may be dropped and damaged if not properly supported.

1. Unlatch three draw latches while carefully supporting the shroud (Fig. 1).

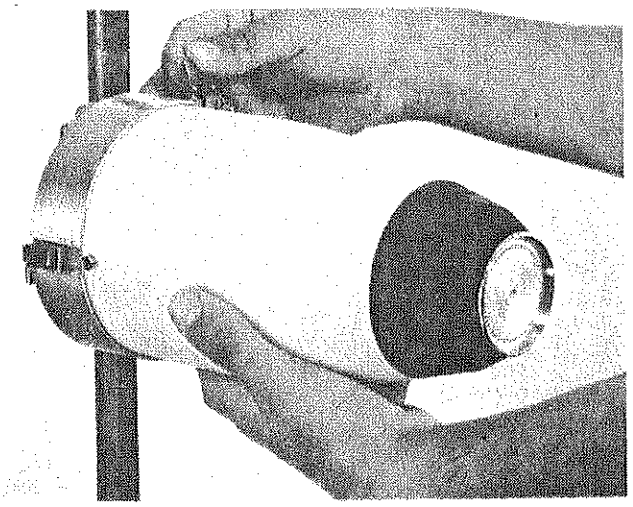


FIG. 1

2. Pull AEROBELL rotary atomizer away from the manifold. Prevent any paint that may drip from the manifold from getting in the air ports on the back of the turbine.
3. Remove RPM-4 shaping air cap from shroud using RPM-419 wrench. Turn CCW (Fig. 2). Note the RPM-5 shaping air ring will come off with the RPM-4.

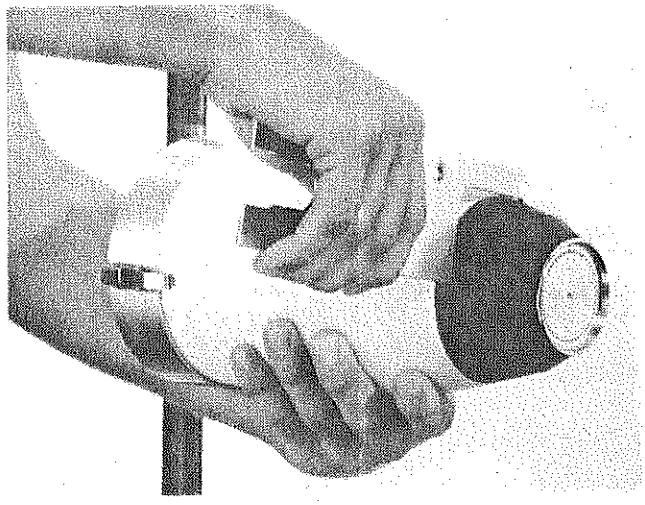


FIG. 2

4. To remove atomizer bell, place RPM-419 wrench over flats of shaft to lock shaft. Unscrew atomizer bell by hand turning CCW (Fig. 3). If the atomizer bell is tight and can't be removed by hand, use a second RPM-419 wrench to place over the wrench flats of the atomizer bell.

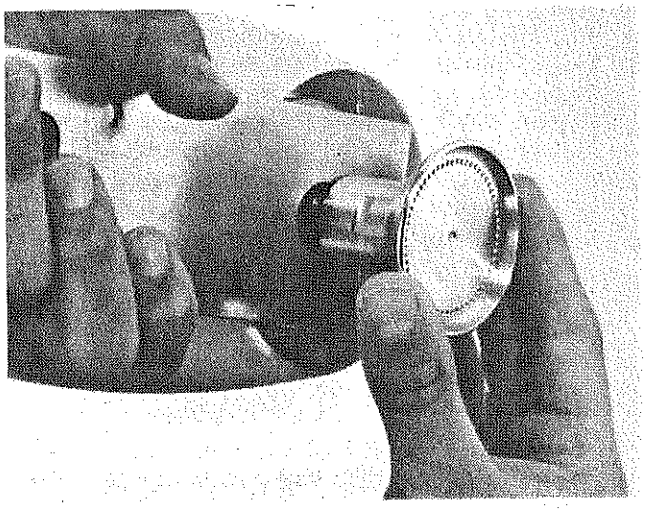


FIG. 3

5. Remove RPM-3 shroud by removing three latch button assemblies with a 1/16" allen screwdriver (Fig. 4). Shroud can then be pulled forward. Note: if allen slots on latch buttons are either filled with paint or rounded off and can't be removed, use pliers to remove assembly and replace latch button assembly (KK-4460).

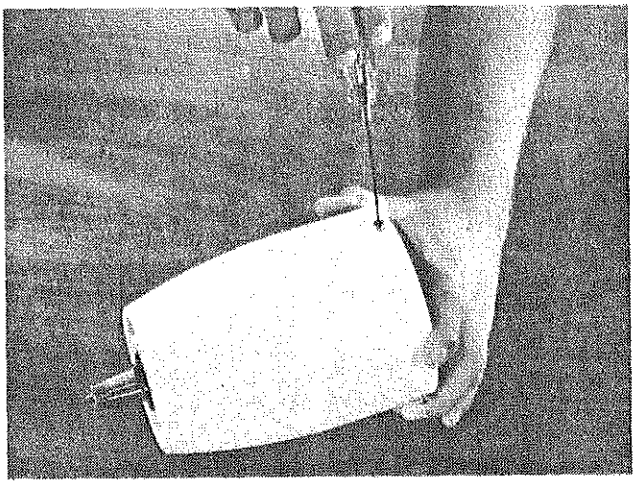


FIG. 4

TOOLS, SUPPLIES, KITS REQUIRED

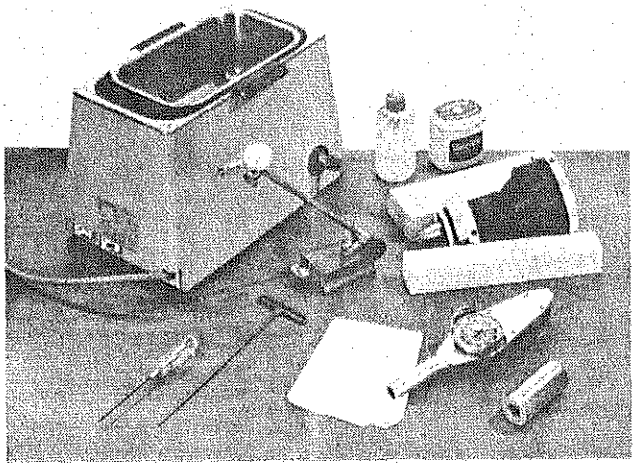


FIG. 5

The following are required to disassemble, clean, repair, reassemble, and test the AEROBELL turbine:

KK-4461 turbine repair kit
*Abrasive paper, emery A621, Grade 2/0 (made by Norton)
*.006" dia. wire
1/16" allen screwdriver
2½ MM hex allen wrench
Torque wrench (with adapters for 1/16" and 2½ MM allen wrenches)
(Two) RPM-419 wrenches
1 1/16" deep well socket
Flashlight
(Two) hardwood or aluminum support blocks
.0001 dial indicator (to measure .001" axial movement of shaft)
Micrometer
Inspection table (smooth surface plate)

(continued)

Ultrasonic cleaner (and appropriate cleaning solvent – see page 10).
Cleaning solvent to hand wipe parts
*Lint free tissues
Clean filtered air source to blow off parts
Vaseline petroleum jelly
Plus any other turbine components – see parts list on page 21.

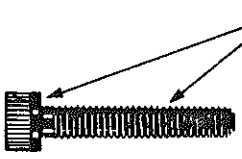
*These items are included in KK-4461 turbine repair kit.

IMPORTANT GUIDELINES TO FOLLOW

CAUTION

The following guidelines MUST be observed during repair to avoid equipment damage, and to better insure a successful repair.

1. When handling bearings and other turbine parts, be very careful not to drop, scuff, scratch, or otherwise damage any parts.
2. When handling turbine, do not spin the shaft (when bearing air is off) as this causes abrasion to the bearing surfaces.
3. During reassembly CLEANLINESS IS VERY IMPORTANT! Lint-free tissues, moistened with solvent, should be used to wipe all parts just prior to reassembly. After wiping with solvent, wipe dry with a lint-free tissue, and then blow off with clean compressed air. Make sure your hands are clean.
4. When repairing a turbine, always use a new set of O-rings, slinger, and shaping air cap retainer (all available in Kit KK-4461).
5. All O-rings must be *lightly* lubricated with vaseline prior to reassembly.



LUBRICATE UNDER HEAD OF SCREW AND ON THREADS TO PREVENT BINDING OR GALLING.

6. See illustration above. All screws must be *lightly* lubricated with vaseline. This is to prevent binding or galling of the threads and will facilitate screw removal in the future if the turbine is again disassembled.
7. During reassembly, follow the torque specifications shown, and tighten the screws alternating in a crisscross method to assure equal torquing pressure is applied.

TURBINE DISASSEMBLY PROCEDURES

1. Remove the air tubing located between the two rings. To facilitate removal, cut the tubing over both barbed fittings (Fig. 6).

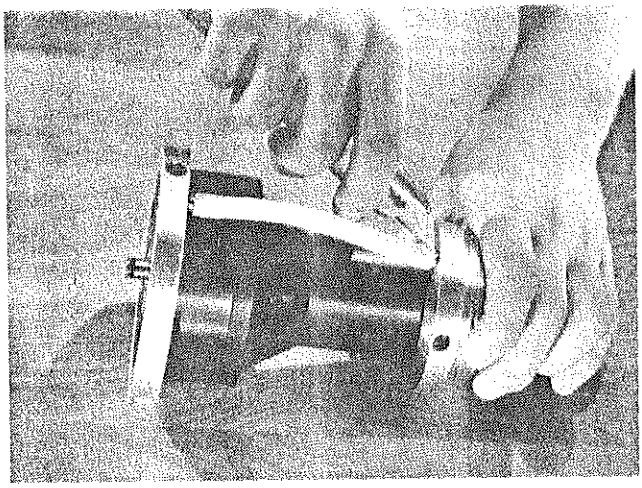


FIG. 6

2. Remove four M3X12 MM cap screws using 2½ MM hex allen wrench (Fig. 7).

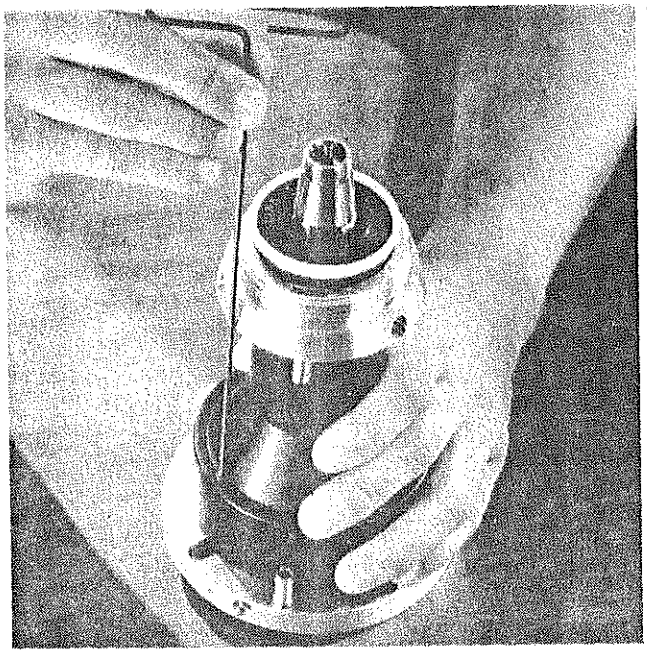


FIG. 7

CAUTION

Be careful not to strike the fluid tube which could cause a misalignment problem.

3. Pull rear cover carefully away from turbine (Fig. 8).

4. Remove four M3X16 MM cap screws with 2½ MM hex allen wrench. Prevent shaft from spinning by locking with RPM-419 wrench (Fig. 9). See "Note".

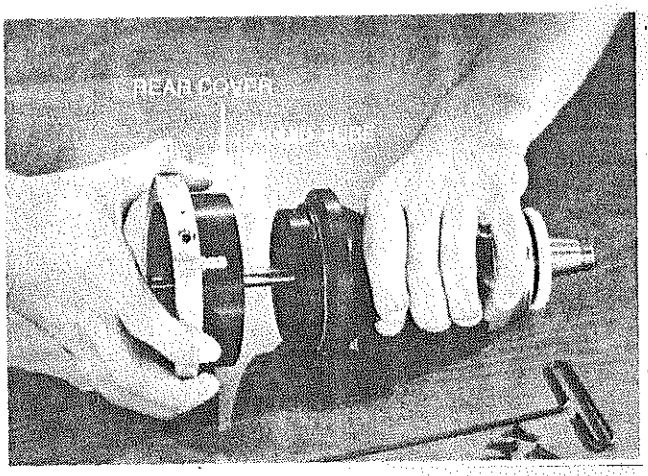


FIG. 8

5. Remove turbine rotor from shaft (Fig. 9). Note: If rotor will not fall off shaft easily, proceed to step 6.

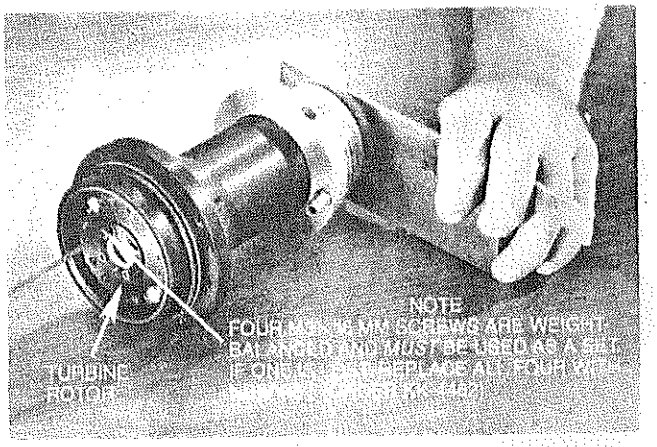


FIG. 9

6. Remove four M3X20 MM cap screws with 2½ MM allen hex wrench (Fig. 10).

7. Remove feed plate (Fig. 10). Note: If rotor could not be removed from shaft in step 5, it will be easily removed after the feed plate is taken off.

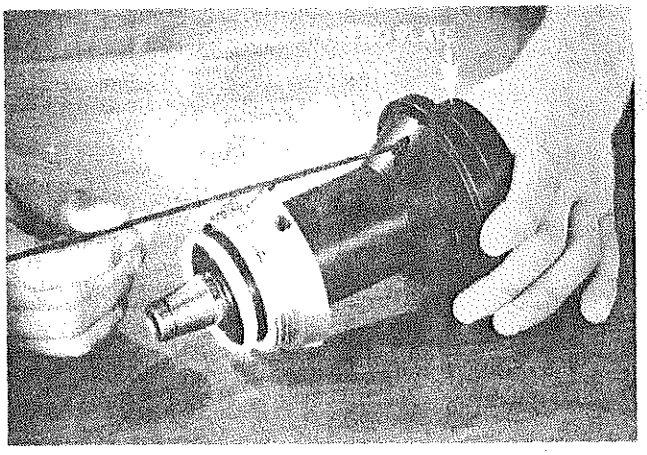


FIG. 10

8. Place turbine (rear down) on 1½" aluminum or hardwood blocks. Protect bottom of shaft from impact. Press shaft downward by hand and remove shaft, rear bearing, thrust bearing, shaft spacer and bearing spacer. If hand force is not sufficient, use a small arbor press (do *not* strike shaft). Note once the shaft is removed, the front bearing is held inside the turbine only with O-rings and may fall out. Use caution when handling the shaft and bearings. When the shaft is removed, the slinger will be free (Fig. 11).

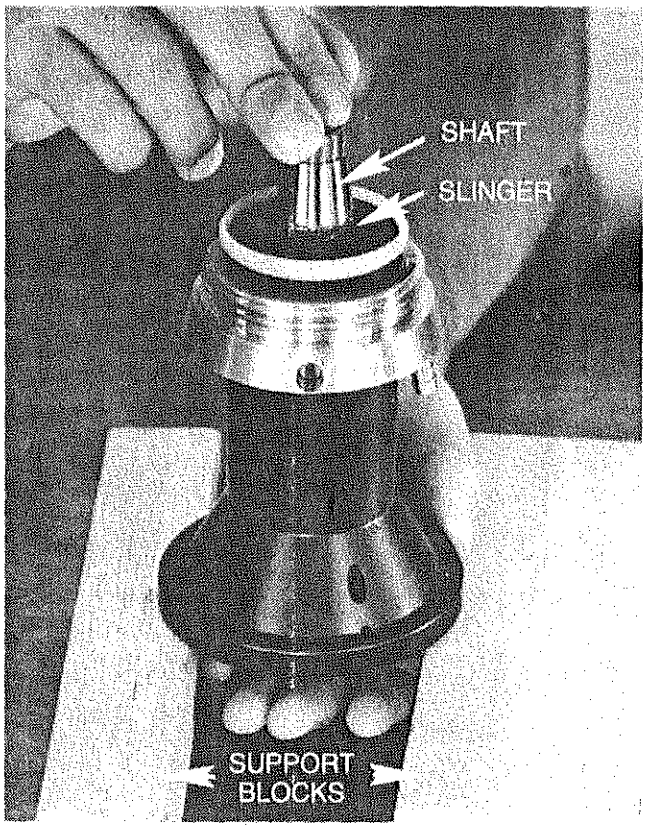


FIG. 11

9. Remove four M3X6 MM cap screws with 2½ MM allen hex wrench (Fig. 12).

10. Remove front cover and shaping air cap retainer (Fig. 12).

11. Remove front bearing and two O-rings by pushing the bearing from the front end with your thumbs as shown (Fig. 13).

12. Remove rear bearing, rear thrust bearing, and shaft spacer from shaft by removing the eight 8BAX5/8 cap screws with 1/16" allen screwdriver (Fig. 14).

FIG. 12

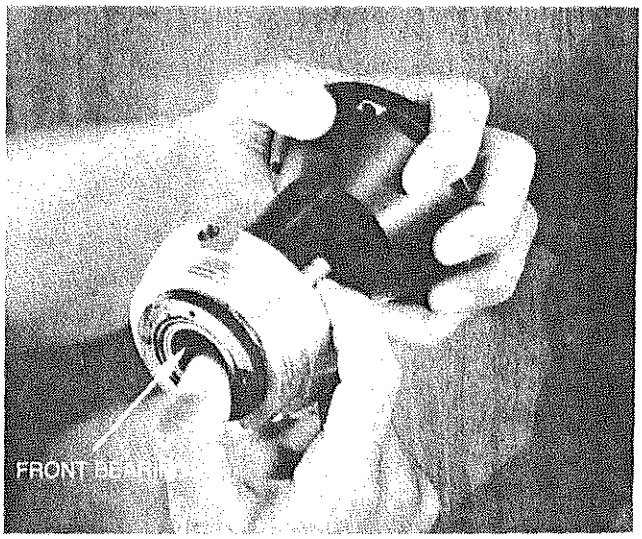


FIG. 13

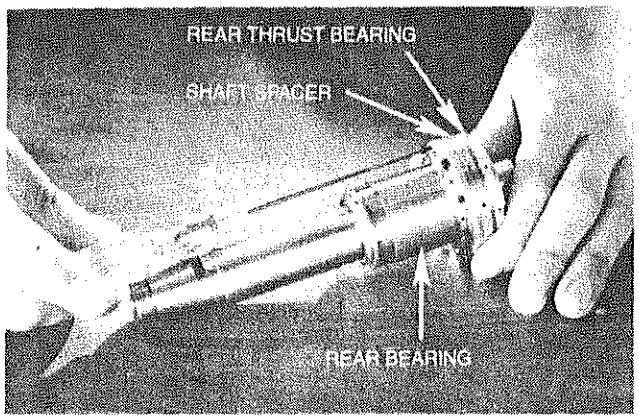


FIG. 14

NOTE

The shaft, shaft spacer and turbine rotor *MUST* be kept as a matched set, and are identified with an "I.D." number (see Fig. 15). Do *NOT* switch any of these parts from one turbine to another. If one of these parts are damaged or lost, replace the entire assembly (see parts list).

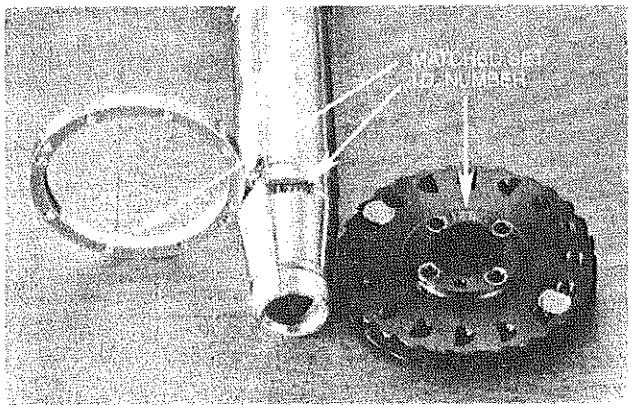


FIG. 15

CLEANING PROCEDURES

An ultrasonic cleaner is necessary to effectively clean turbine parts. One of the following types of solvents are recommended for use in the ultrasonic cleaner:

1,1,1 Trichloroethane
Petroleum Ether
Petroleum Naptha
Methyl Alcohol
Isopropyl Alcohol
Acetone
Other types may also be effective

Follow these procedures carefully to clean all parts:

1. Remove and discard all old O-rings.
2. Clean the three bearings first *by hand* with a lint-free tissue and solvent to remove as much contamination (oil, paint, dirt) as possible.

CAUTION

Do NOT clean the *rear* or *rear thrust bearings* in the ultrasonic cleaner – bearing damage may occur. These bearings have thrust surfaces with a sintered bronze plate bonded in position. The bonding adhesive can be affected by solvents and raise the thrust surfaces, making the bearings non-usable (scrap).

3. Clean the *front* bearing in the ultrasonic cleaner for *one minute* only. Wipe off with a lint-free tissue and blow dry with compressed air.
4. Clean the rear and rear thrust bearings by hand with a lint-free tissue dampened with solvent. Wipe dry with a lint-free tissue and blow dry with compressed air.
5. Inspect the three bearings for any visible signs of damage to the bearing surfaces. If damage is apparent, refer to the section on "Bearing Damage – Repair."
6. Check all three bearings to make sure the fine air holes have been cleared of all obstructions. This can be accomplished by using a flashlight. Hold flashlight up to bearing and look for light to pass through each hole. See Fig. 16. Another method is by blowing air through each hole. Be sure to check each hole in all three bearings. Each bearing has the following number of air holes:

	Qty. Air Holes
Front Bearing	16
Rear Bearing	24
Rear Thrust Bearing	8

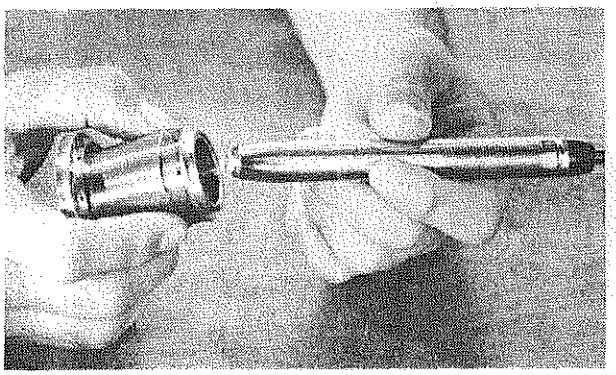


FIG. 16

7. If any holes are obstructed, they can be cleaned with a .006" wire. See Fig. 17 and 18. Note: .006" wire included in KK-4461 kit.

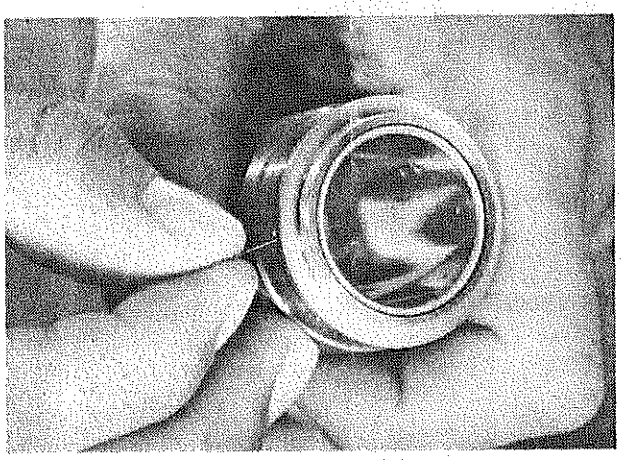


FIG. 17

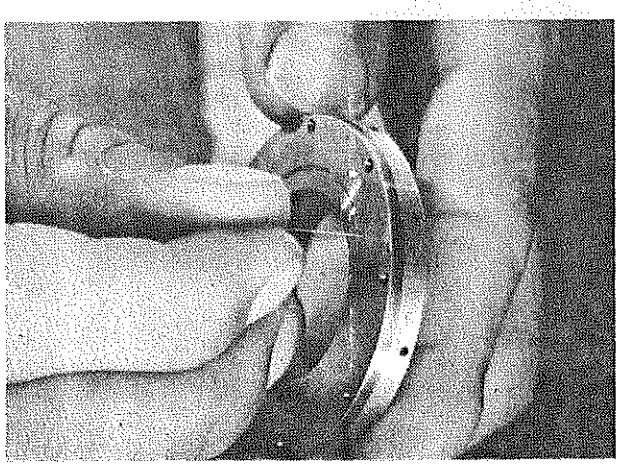


FIG. 18

8. All other turbine parts (except for the rear cover/fluid tube assembly) should be cleaned of as much contamination as possible with a lint free tissue and solvent, and then cleaned in the ultrasonic cleaner for one minute.

9. After ultrasonic cleaning, wipe with a lint free tissue and blow dry with clean air.

CAUTION

If oil contamination is found in the turbine (as evidenced by oil floating to the surface in the ultrasonic cleaner), the air filtration system MUST be checked. Replace the filter elements and check the air line from the bearing air filter to the bearing air connection on the manifold. If the air line shows contamination, steps must be taken to flush the air line to prevent further contamination.

10. The rear cover/fluid tube should be carefully cleaned by hand with a lint free tissue and solvent. Ultrasonic cleaning is not recommended as there is a gasket between the fluid tube and rear cover which can be damaged. (Gasket not supplied on newer units.) Disassembly of the fluid tube from the rear cover is not recommended as alignment of the feed tube is critical, and it could be affected.

11. Inspect the shaft for any visible signs of damage. If damage is evident, refer to the section on "Shaft Repair."

BEARING DAMAGE – REPAIR

Repair of damaged bearings in the field is *not* recommended. Because of the critical tolerances and geometry involved, trying to repair damaged bearings without the proper equipment and training may lead to further bearing damage. If a bearing is damaged, return it to DeVilbiss for repair and install a new bearing(s). Improperly field repaired bearings will likely cause the air turbine to either 1) not function properly, or 2) fail within a short period of time after the repair. Field repair of bearings should be limited to cleaning of oil, dirt or paint contamination only.

Fig. 19 below shows typical bearing damage that is non-field repairable. The following statement is a guide to follow when trying to determine if a bearing is damaged and non-usable:

"If the bearing surface has any detectable grooves or scoring, discernible either by feel or by sight, the bearing should be replaced with a new part, and the damaged bearing returned to DeVilbiss for *possible* repair."

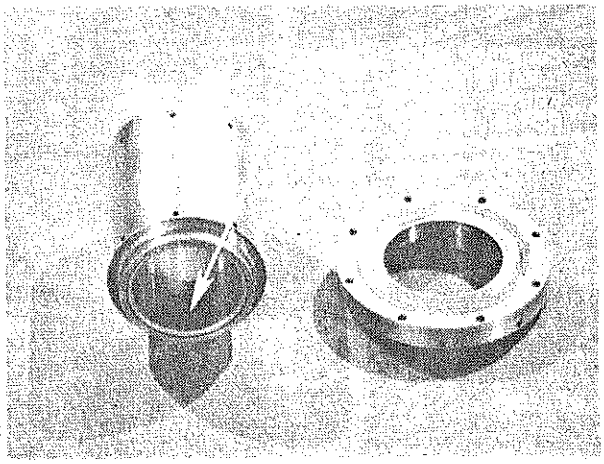


FIG. 19

SHAFT REPAIR

While any major bearing repair should not be attempted in the field, minor shaft repair can be accomplished using the abrasive paper supplied in KK-4461 repair kit, and a micrometer. Because the shaft material is significantly harder than the bearing surfaces, more severe damage normally occurs to the bearings rather than the shaft. Repair to the shaft normally consists of smoothing out any raised material or removing any bearing material or contamination on the shaft.

To smooth out, use the abrasive paper supplied in KK-4461 only, *not* any more abrasive material. Repair only the affected areas – do *not* use abrasive paper on any undamaged areas. Repair *only* until the shaft surface first becomes polished in appearance, and then stop.

Using the micrometer, check the diameters of the damaged area as compared to an undamaged area. The diameters after repair *must* be within .00015" of the undamaged area. If the variance is greater, the shaft/spacer/turbine rotor must be replaced. Follow these procedures to repair:

1. Use one of the 1" wide strips of abrasive paper supplied in KK-4461.
2. Wrap abrasive paper over damaged area completely around shaft and then rotate the shaft. See Fig. 20. Continue only until the residue is removed. Check the repaired area with the micrometer to insure the repaired area is within .00015" of the undamaged area.

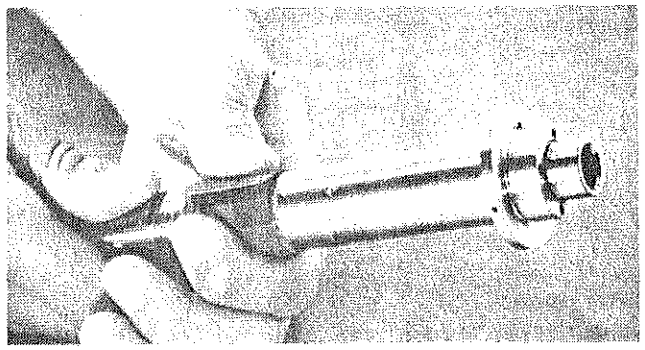


FIG. 20

3. To repair the thrust runner surface of the shaft, use one of the square pieces of abrasive paper with a 1" hole cut in the center.

4. Place abrasive paper over shaft with abrasive side facing thrust runner surface of the shaft. Then place the thrust bearing over the top of the abrasive paper (non-abrasive side facing bearing). See Fig. 21. Rotate shaft, holding thrust bearing stationary, until the thrust runner of the shaft is polished. The same procedure can be used on the opposite side of the thrust runner.

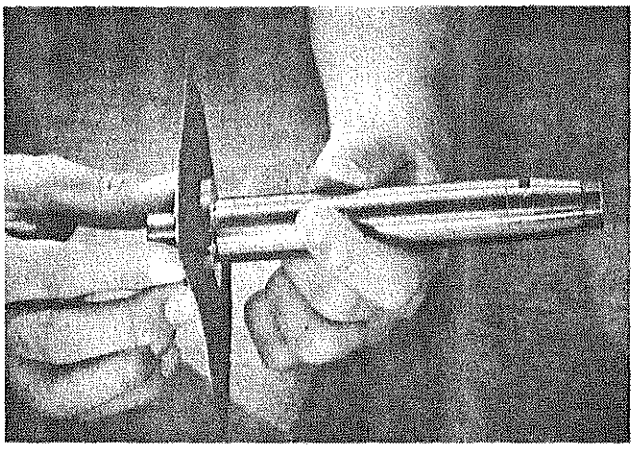
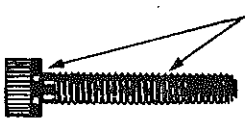


FIG. 21

TURBINE REASSEMBLY PROCEDURES

NOTES

- Wash hands prior to reassembly.
- Make sure the parts are cleaned as previously described. If there is any doubt as to whether a part is clean, clean again with solvent and a lint free tissue. Wipe dry with a lint free tissue, then blow off with clean air.
- Use new O-rings, slinger, and shaping air cap retainer during re-assembly (all included in kit KK-4461).
- Lightly lubricate all O-rings with vaseline during reassembly. Use caution not to use too much vaseline, and not to get vaseline in any unwanted areas (such as in the air holes in the bearings).



LUBRICATE UNDER HEAD OF SCREW AND ON THREADS TO PREVENT BINDING OR GALLING.

- Lightly lubricate all screws as shown in the above illustration to prevent binding or galling.
- Follow the torque specifications shown.

1. Place shaft through rear bearing; and, shaft spacer and rear thrust bearing over shaft end. Place assembly on support blocks as shown on Fig. 22. Note the alignment marks must be aligned as shown.

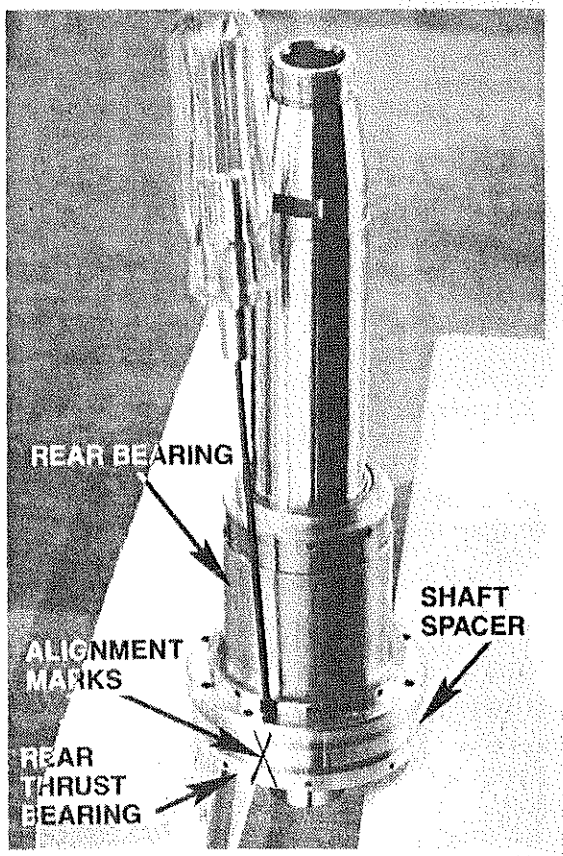


FIG. 22

2. Install eight lubricated 8BAX5/8" cap screws. Tighten to 4-5 in. lbs. (snug only – do not overtighten).

3. After the shaft, rear bearing, bearing spacer, and thrust bearing are assembled, the user should check the shaft for proper axial movement within the thrust bearing surfaces. The shaft should move approximately .001" (.0009 min., .0013 max.). This can be checked by using a dial indicator, as follows:

a. Place assembly on precision blocks, using a smooth surface plate (inspection table). See Fig. 23. Place dial indicator (dial indicator should measure in .0001" increments) so it touches top of shaft and then measure axial movement for .0009" to .0013". If the movement is over .0013", it may indicate damaged thrust bearing surfaces. If under .0009", it may indicate the surfaces have not been cleaned properly. In either case, the assembly should be taken apart and checked further for damage and cleanliness.

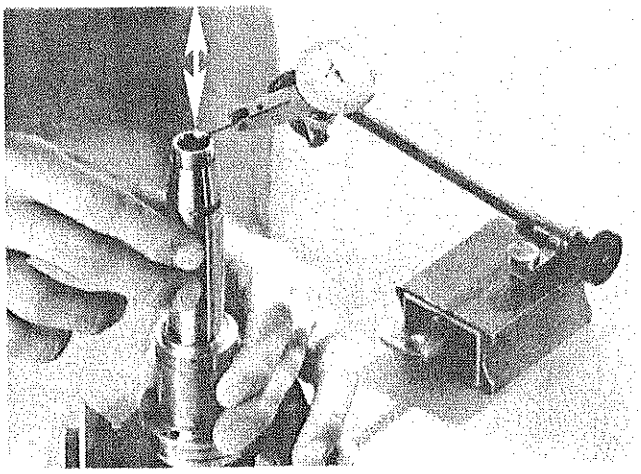


FIG. 23

b. If the user does not have the facilities to measure axial movement with a dial indicator, another option is to hold the assembly in hand and to feel for approximately .001" movement. See Fig. 24. This method is of course not as accurate and the reliability of the unit will not be as assured upon complete turbine reassembly.

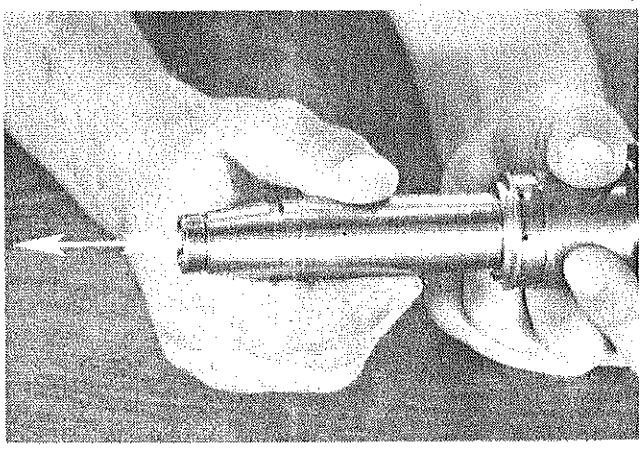


FIG. 24

4. Place new shaping air cap retainer over rear of front cover. Make sure the retainer fits properly in the shoulder (Fig. 25).

5. Attach shaping air cap retainer and front cover to turbine body using four lubricated M3X6 MM cap screws (Fig. 25). Tighten to 15-16 in. lbs. torque.

6. Lubricate bearing lands, and install two lubricated O-rings over ends of front bearing. (Fig. 26).

7. Note the directional arrow on the front bearing. Make sure the arrow faces towards the front of the turbine (Fig. 26).

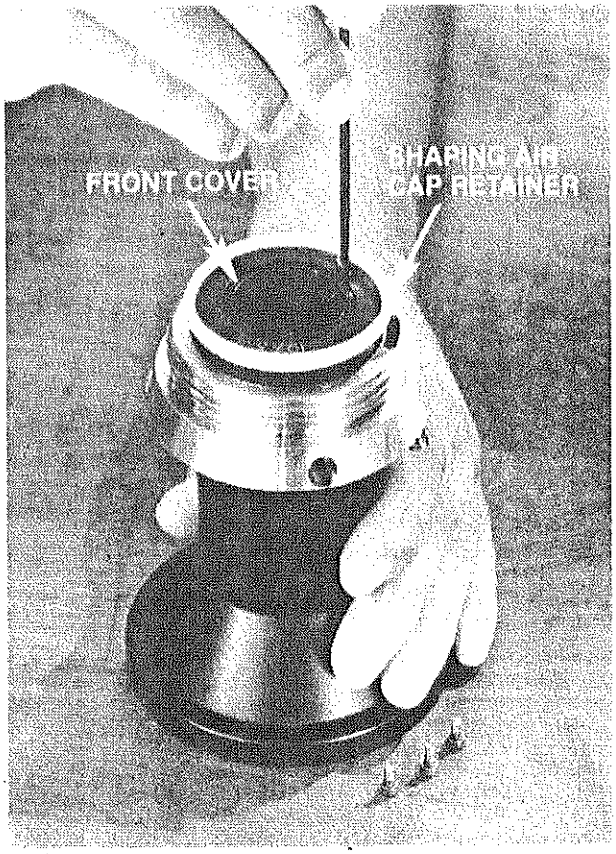


FIG. 25

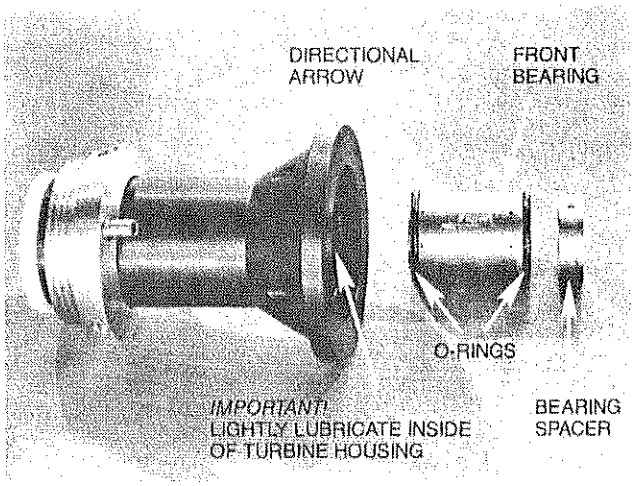


FIG. 26

8. *Note – lightly* lubricate inside of turbine body to facilitate insertion of bearings.

9. Install front bearing with O-rings and bearing spacer into turbine (Fig. 27). Press in from the rear. Press until you feel the front bearing bottom out against the back of the front cover. Note bearing spacer can be inserted in either direction.

FIG. 27

10. Install lubricated O-ring into groove inside turbine housing. Lubricate bearing lands, and install lubricated O-rings over front edge of rear bearing and over rear of rear thrust bearing (Fig. 28).

11. *Carefully* slide shaft/rear bearing/rear thrust bearing assembly into turbine housing (Fig. 28).

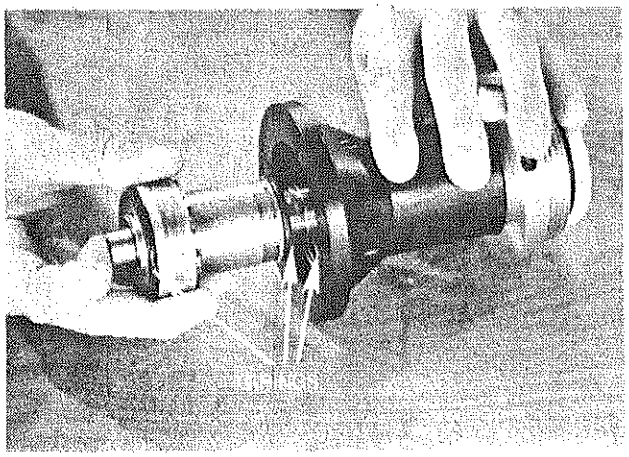


FIG. 28

12. Install three lubricated O-rings onto feed plate (Fig. 29).

13. Mount feed plate into rear of turbine housing. Make sure the alignment marks are aligned as shown (Fig. 29).

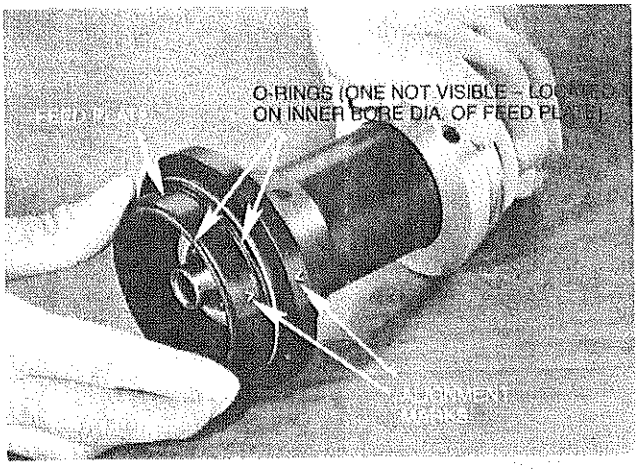


FIG. 29

14. Turn unit facing up and install four lubricated M3X20MM cap screws (Fig. 30). Tighten to 15-16 in. lbs.

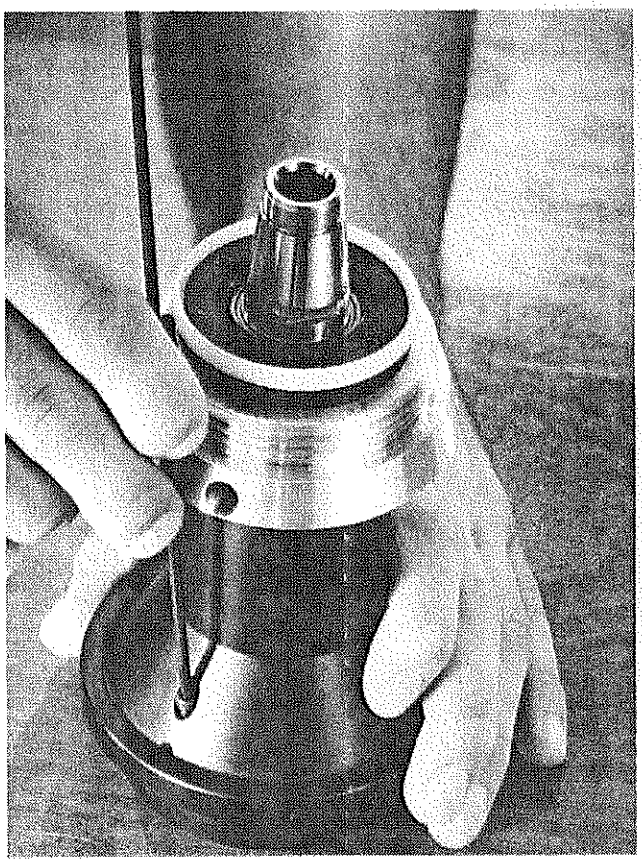


FIG. 30

15. Turn unit over with front facing down and push on the rear of the shaft slightly by hand to make sure the O-rings have correctly seated (Fig. 31).

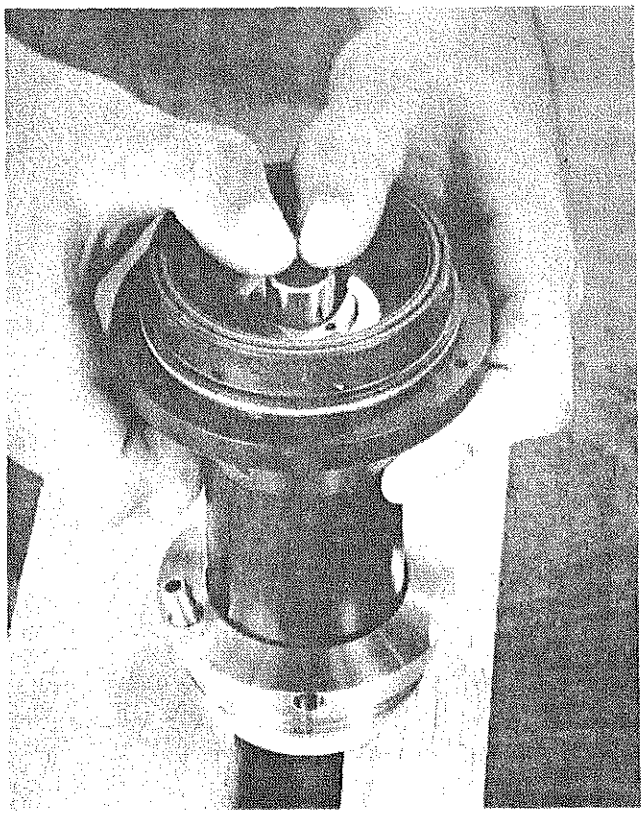


FIG. 31

16. Place turbine rotor over shaft. Note there is an alignment notch (dimple) in the turbine rotor that must be aligned with the notch in the shaft (Fig. 32).

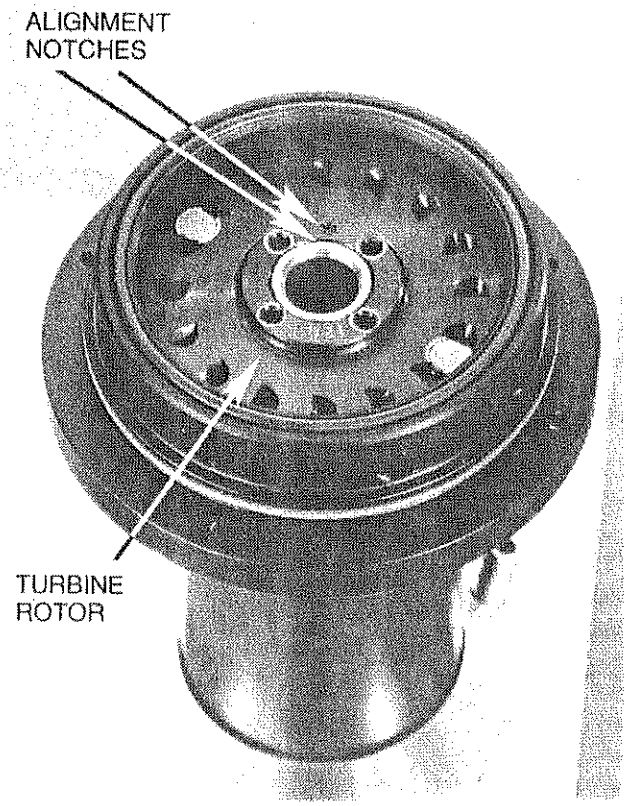


FIG. 32

17. Install four lubricated M3X16 MM balanced cap screws. Note these screws are weight-balanced and must be used as a set. If one is lost, replace all four with KK-4462 kit (Fig. 33). Tighten to 15-16 in. lbs. torque. Use RPM-419 wrench to lock shaft while tightening.

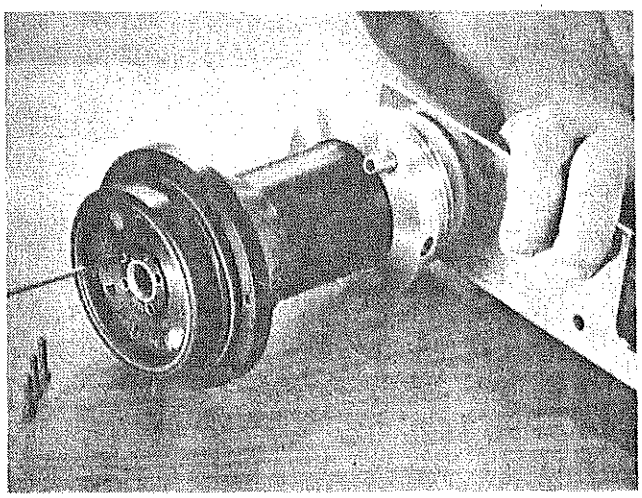


FIG. 33

18. Lightly lubricate inside surface of rear cover. Install lubricated O-ring into counterbore on edge of rear cover (Fig. 34).

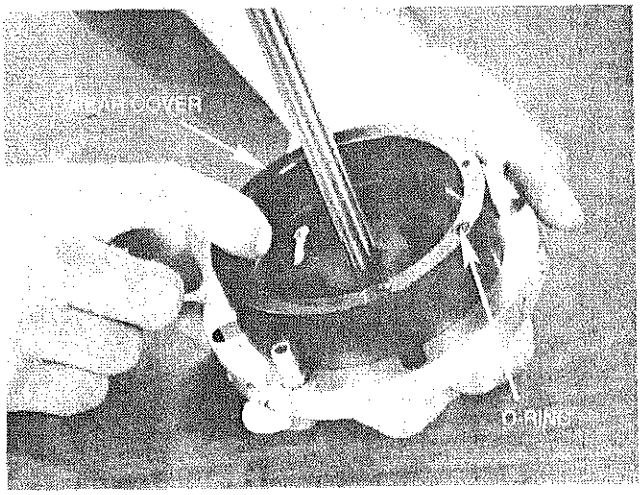


FIG. 34

19. *Carefully* insert rear cover into turbine housing. Use caution not to strike the fluid tube assembly. Note the alignment mark must line up with the mark on the turbine housing (Fig. 35).

20. Install four lubricated M3X12 MM cap screws. Tighten to 15-16 in. lbs. torque (Fig. 35).

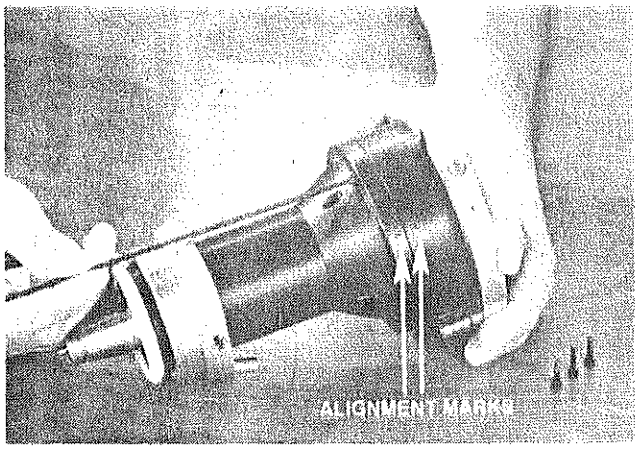


FIG. 35

21. Install new polyethylene tubing (H-2338), ¼" I.D., 4⅝" long (supplied in KK-4461 kit), over barbed fittings (Fig. 36).

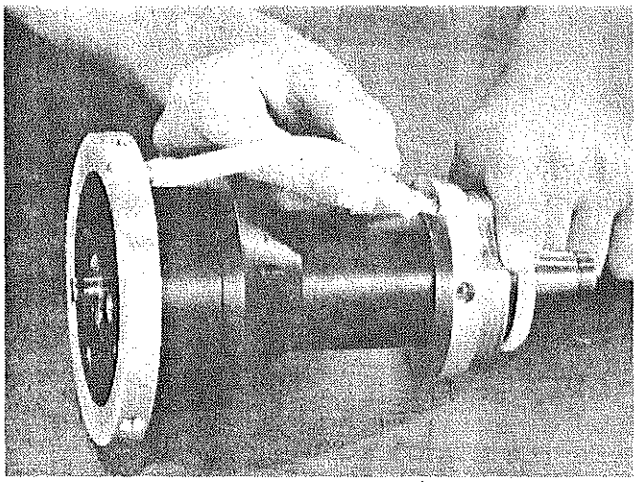


FIG. 36

22. Install new slinger over shaft (Fig. 37). Place turbine facing up on blocks. Using a 1 1/16" deep well socket, press slinger by hand over shaft until it stops. The slinger should be flush with the wrench flats. Do not over-press as it will cause the slinger to rub against the front cover.

23. Slide shroud over turbine (Fig. 38).

24. Attach shroud to turbine by installing three latch button assemblies (lubricate allen screws). Tighten with 1/16" allen screwdriver (Fig. 38).

25. Install atomizer bell assembly onto shaft by locking the shaft with RPM-419 wrench, and spinning bell on CW. *Hand tighten only* (Fig. 39).

26. Install RPM-4 shaping air cap and RPM-5 shaping air ring onto shroud (Fig. 40). When screwing the shaping air cap in place, after approx. 2½ turns, the cap will become tight. Using the RPM-419 wrench, turn the cap further. The cap will become loose again and it can then be rotated further. Tighten until the cap bottoms against the shroud.

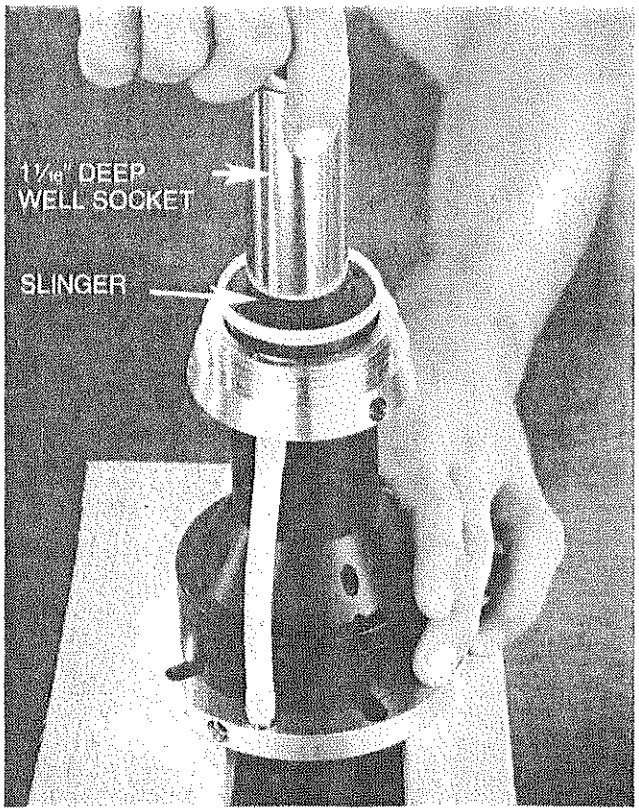


FIG. 37

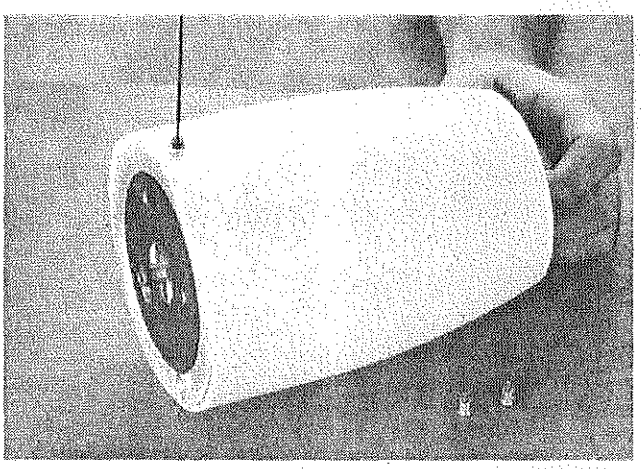


FIG. 38

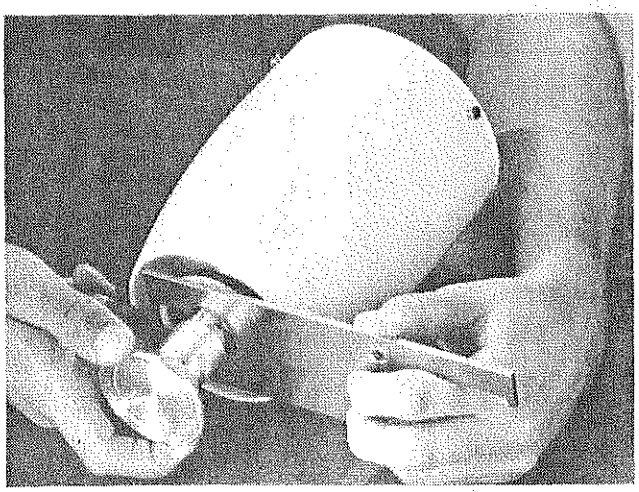


FIG. 39

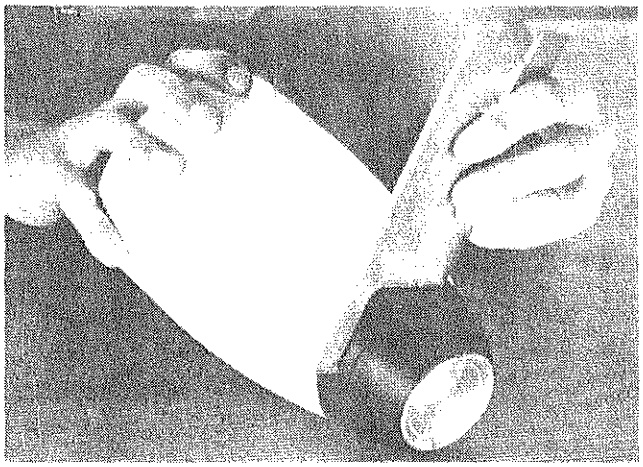


FIG. 40

27. Before reinstalling the AEROBELL atomizer into the manifold, check the condition of the four teflon coated O-rings located on the air fittings (Fig. 41). Replace any damaged or missing O-rings (all four available in kit KK-4459). Note these O-rings are teflon coated and do not require lubrication.

28. Check the condition of the Kalrez O-ring (SSG-8128) on the feed tube inlet. Replace if damaged or missing (Fig. 41). Lightly lubricate.

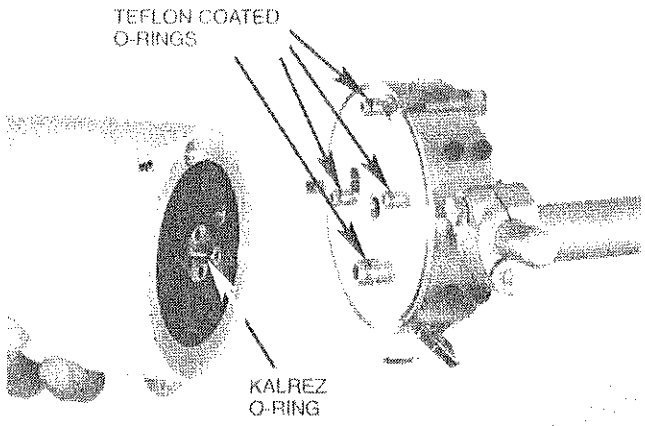


FIG. 41

29. Install AEROBELL atomizer assembly into manifold. Align properly (it is easiest to align the shaping air fitting which is furthest from the centerline).

30. Press AEROBELL straight forward as much as possible, but do *not* force it on.

31. Latch the three latch button assemblies which will draw the AEROBELL fully into place in the manifold (Fig. 42).

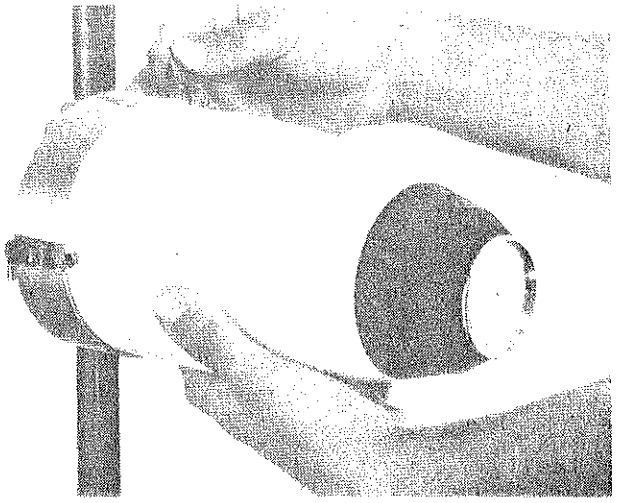
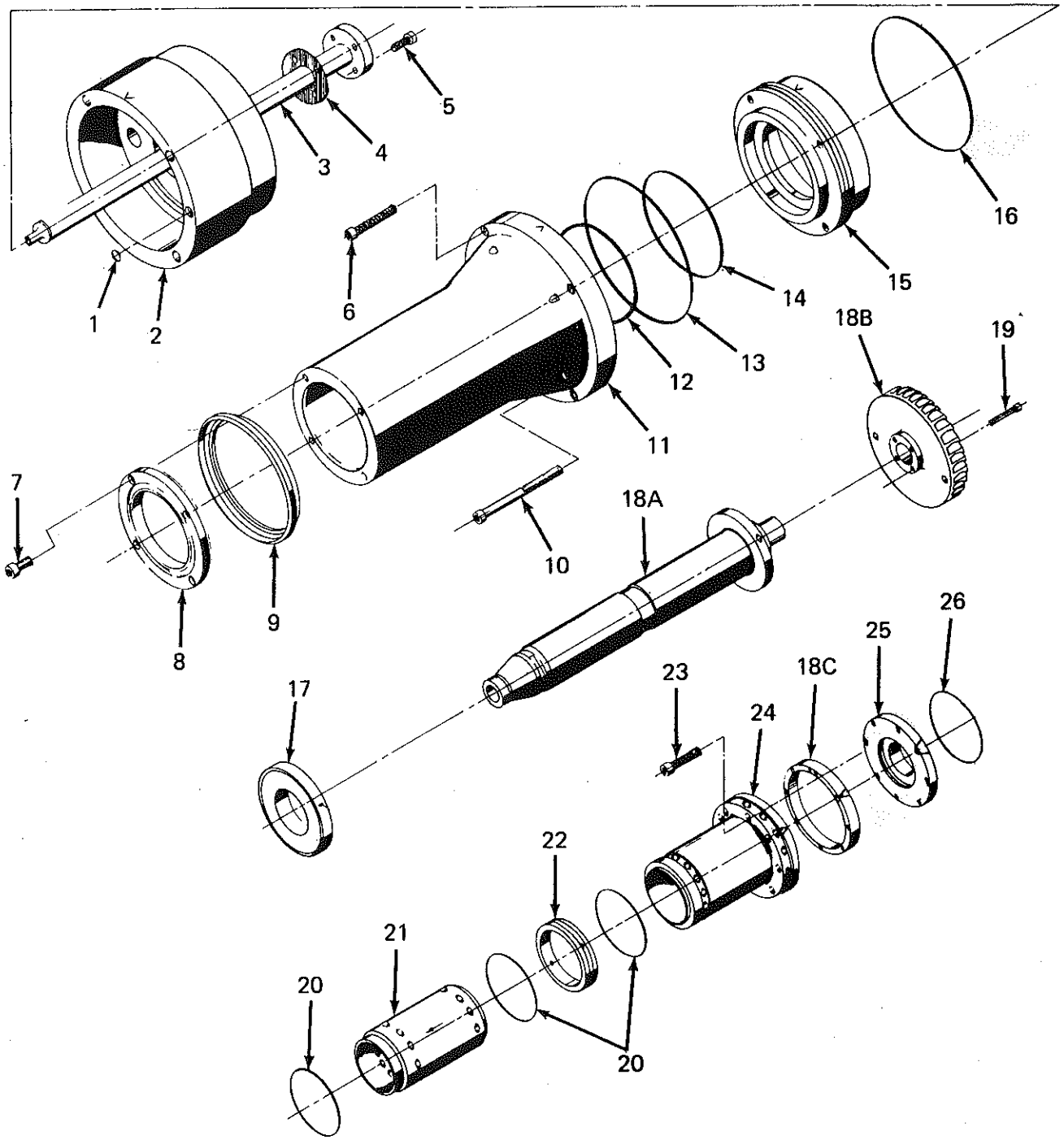


FIG. 42

TESTING THE REPAIRED ASSEMBLY

1. With high voltage, fluid, turbine air, brake air, and shaping air all *OFF, gradually* start BEARING AIR and build pressure to approx. 15 to 20 PSI.
2. Spin the atomizer bell by hand to see if the turbine shaft will "free float" (continue to spin). Optimal free float pressure is 15 to 20 PSI. If the shaft does not free float at 15 to 20 PSI, increase pressure until it does free float. If more than 30 PSI is required to free float, it may indicate one of the following problems:
   a. The bearing O-rings did not seat properly. This may be correctable by pushing on the front of the bell by hand – do *not* use excessive force. Since the bearing system is mounted on a series of O-rings, it is very important for the O-rings to be properly seated for the shaft to float freely. A common cause of the O-rings not seating is failure during assembly to properly lubricate the O-rings and the metal surfaces they are in contact with. If the turbine must be disassembled, be sure to properly lubricate the O-rings, bearing lands where the O-rings seat, and the bore of the turbine housing.
   b. Inadequate cleaning procedures.
   c. Damaged bearings and/or shaft.
   d. Damaged O-rings.
   e. Improper assembly (failure to match alignment marks – Figures 22, 26, 29, 32 and 35).
3. If pushing on the front of the bell (step a) does not correct the problem, the turbine should be disassembled again, inspected, cleaned, any damaged parts replaced, and then carefully reassembled.
4. If, after disassembling the turbine a second time, the turbine fails to free float at 30 PSI or less, or fails to operate properly, bearing or shaft damage may be present. New bearings and shaft-rotor-spacer should be tried, or else the turbine should be returned to DeVilbiss for repair.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PARTS LIST – RPM-406 AIR BEARING TURBINE ASSEMBLY

REF. NO.	DeVILBISS PART NUMBER	DESCRIPTION	QTY.
1	Footnote 1	O-Ring	1
2	RPM-29	Rear Cover	1
3	RPM-413	Fluid Tube Assembly	1
4	–	Gasket (Used on earlier turbines, not used currently. Can be discarded if present)	1
5	Footnote 2	Cap Screw, M3 × 8 MM	4
6	Footnote 3	Cap Screw, M3 × 12 MM	4
7	Footnote 3	Cap Screw, M3 × 6 MM	4
8	RPM-28	Front Cover	1
9	Footnote 1	Shaping Air Cap Retainer	1
10	Footnote 3	Cap Screw, M3 × 20 MM	4
11	RPM-27	Body	1
12	Footnote 1	O-Ring	1
13	Footnote 1	O-Ring	1
14	Footnote 1	O-Ring	1
15	RPM-30	Feed Plate	1
16	Footnote 1	O-Ring	1
17	Footnote 1	Slinger	1
18A,B,C	RPM-412	Shaft, Turbine Rotor, Shaft Spacer Assembly (*Must* be ordered and used as a matched set.)	1
19	KK-4462	Cap Screw, M3 × 16 MM (weight-balanced, *must* be used as a matched set. Order 1 kit)	1 (Kit)
20	Footnote 1	O-Ring	3
21	RPM-26	Front Bearing	1
22	RPM-51	Bearing Spacer	1
23	Footnote 3	Cap Screw, 8BA × 5/8"	8
24	RPM-25	Rear Bearing	1
25	RPM-24	Rear Thrust Bearing	1
26	Footnote 1	O-Ring	1

FOOTNOTE 1 Order *KK-4461 TURBINE REPAIR KIT* which includes: All required O-rings, shaping air cap retainer, slinger, special abrasive paper for shaft repair, .006" dia. wire for clearing bearing holes of obstructions, and lint-free tissues for cleaning.

FOOTNOTE 2 Four cap screws are included with RPM-413 fluid tube assembly.

FOOTNOTE 3 Order *KK-4463 SET SCREW KIT* which includes the set screws indicated by this footnote.

See SI-70-52-1 (latest edition) for parts explosion and parts list on the complete AEROBELL Rotary Atomizer Assembly.

SR-70-52-1

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