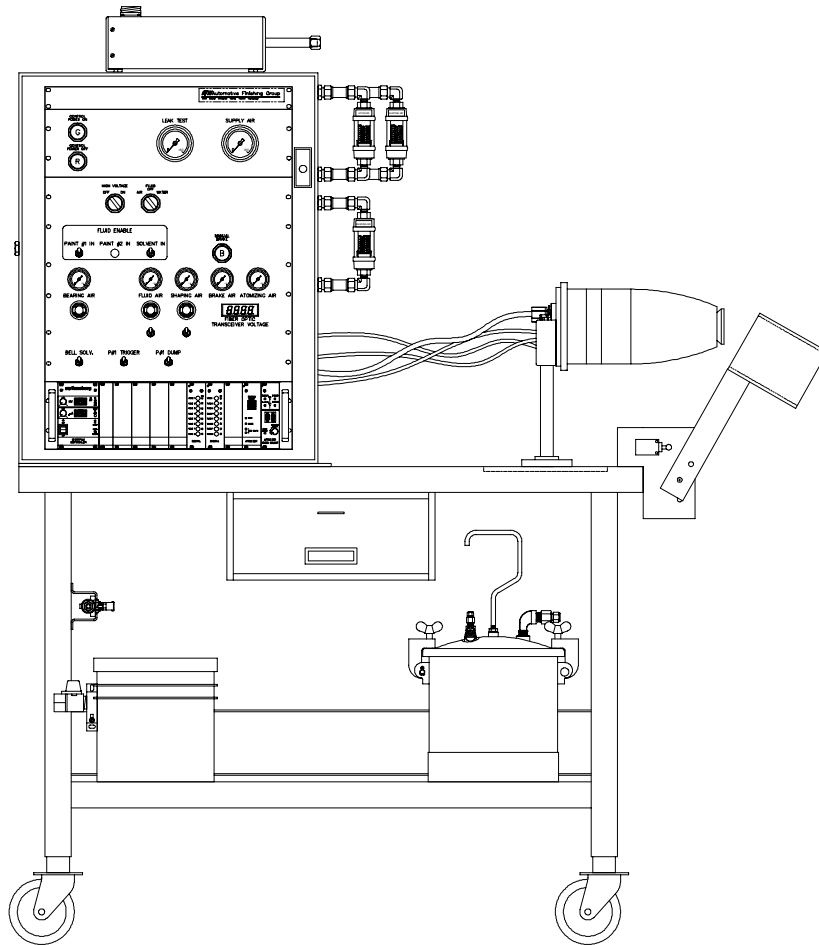

AEROBELL II DIRECT & INDIRECT TEST STATION



IMPORTANT: Before using this equipment, carefully read **SAFETY PRECAUTIONS**, starting on page 1, and all instructions in this manual. Keep this Service Manual for future reference.

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SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any ITW Ransburg electrostatic coating system, read and understand all of the technical and safety literature for your ITW Ransburg 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.

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

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

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 appropriate ITW Ransburg 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 Ransburg system, contact your local ITW Ransburg representative or ITW Ransburg.



WARNING

- ▶ The user **MUST** read and be familiar with the Safety Section in this manual and the ITW Ransburg safety literature therein identified.
- ▶ 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 SAFETY STANDARD, 1995 EDITION**, prior to installing, operating, and/or servicing this equipment.



WARNING

- ▶ The hazards shown on the following page may occur during the normal use of this equipment. Please read the hazard chart beginning on page 3.

NOTE

- ▶ The HV is interlocked electrically with the fluid trigger switches. When a fluid switch is triggered on, the HV will automatically be turned off.



WARNING

- ▶ Wear the proper safety protection such as eye and ear protection.
- ▶ NEVER wear loose clothing while working around the applicator.
- ▶ NEVER run the applicator with anyone near the bell. Serious injury COULD OCCUR if the bell is contacted while it is rotating.
- ▶ NEVER stop the rotation of the bell by hand. Use the manual air brake supplied on the test stand panel.
- ▶ Insure ALL items in the test area are grounded. Insure there are NO open containers of flammable materials in the test area.

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>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>When using solvents for cleaning: Those used for equipment flushing should have flash points equal to or higher than those of the coating material.</p> <p>Those used for general cleaning must have flash points above 100°F (37.8°C).</p> <p>Spray booth ventilation must be kept at the rates required by NFPA 33, 2000 Edition, OSHA and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents.</p> <p>Test only in areas free of combustible material.</p> <p>If used, the key switch by-pass is intended for use only during set-up operations. Production should never be done with safety interlocks disabled.</p>

INTRODUCTION

GENERAL INFORMATION

The ITW Ransburg Aerobell II Test Station was developed to assist in determining the applicator level of performance in an off-line condition. Insuring the applicator functions properly after any maintenance has been performed to it reduces the costs associated with verifying performance during production. This test station device helps to insure the applicator performs correctly when it is put into service.

The test station will verify performance of single fluid applicators, bearing air, shaping air, brake air, and atomizing air. It also checks for kV and μ A electrical performance of the applicator.

The test was developed with the user and the safety of the user in mind. The user must become familiar with the overall function and operation of the unit.

NOTE

► For all test station toggle switches, with the switch lever in the "UP" position, the valve it describes is "ON" or "actuated."

SPECIFICATIONS

Electrical / Physical

Power Requirements: 110/120 v AC

Air Requirements: 1" NPT (F) Inlet
3/4" ID Air Line to Stand
100 psi (6.4 bar) Min.
0.3 to 0.6 Micron
Filtration

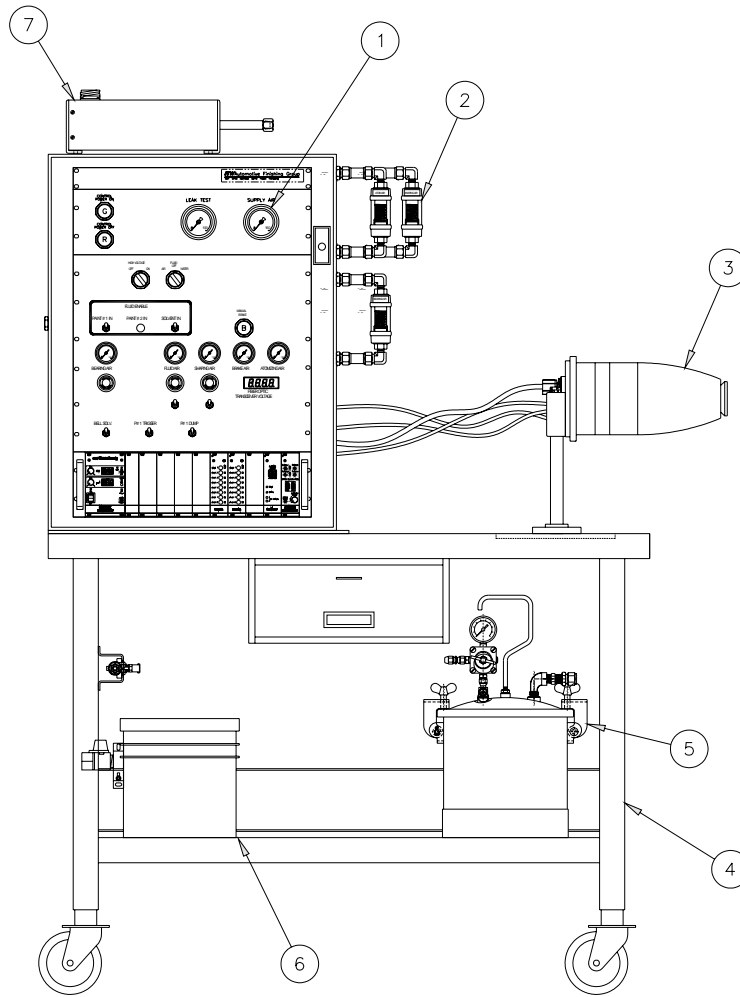
Dimensions:

Height: 67" (1702 cm)
Width: 30" (762 cm)
Length: 48" (1219 cm)

Fluids: Use water only for testing

Maximum Fluid Pressure: 80 psi (5.2 bar)

FEATURES



ITEM #	DESCRIPTION
1	Main Control Panel
2	Air Flow Meters
3	Test Applicator
4	Table
5	Pressure Pot
6	Dump Bucket
7	High Voltage Cascade

Figure 1: Basic Station Features

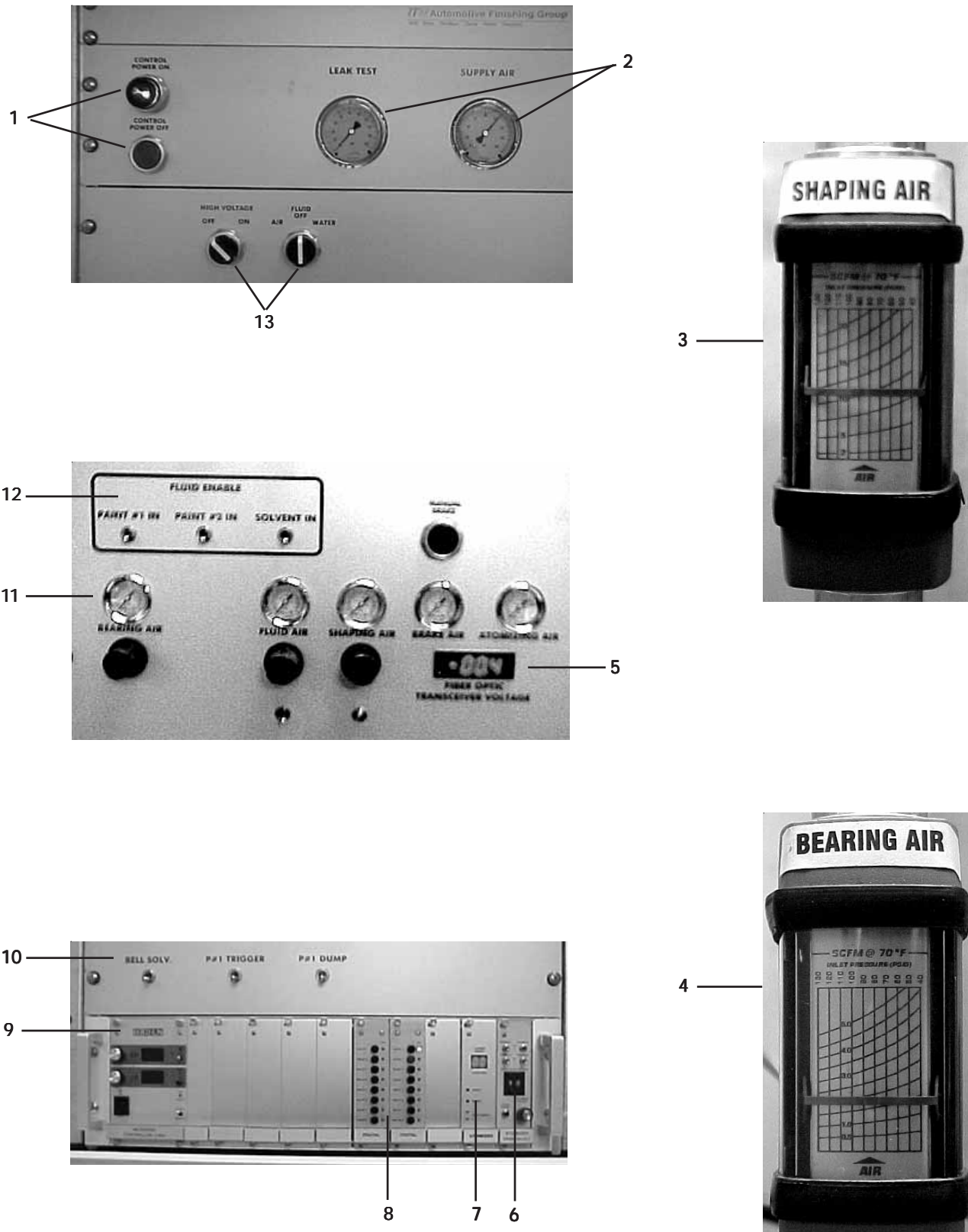


Figure 2: Basic Station Features

BASIC STATION PARTS IDENTIFICATION

ITEM #	DESCRIPTION
1	Power Control - On/Off Button
2	Main Gauges - Leak Down, Supply Air
3	Air Flow Meter - Turbine Air, Shape Air
4	Air Flow Meter - Bearing Air
5	Fiber Optic Voltage Readout
6	Atomizer Speed Select Card
7	Atomizer Card
8	Digital Output Cards
9	MicroPak Power Supply
10	Solvent, Paint, and Dump Trigger Switches
11	Regulated Function Gauges - Bearing Air, Fluid Air, Shaping Air, Brake Air, Turbine Air
12	Fluid Enable Switches
13	Control Switches - High Voltage On/Off Water/Air

INSTALLATION

SETUP PROCEDURE

Note: Refer to Aerobell II Service Manual for Aerobell II placemat for all parts and part number identifications.

1. Insure that ground connections, cart ground, and applicator ground are made to a true earth ground.

! WARNING

- ▶ If true earth ground is not made, injury to personnel or serious damage may occur to the equipment.
- ▶ Insure ALL items in the test area are grounded. Insure there are NO open containers of flammable materials in the test area.

2. Provide air filtration to the manifold that has the capability of passing 136 SCFM with particulate removal of .3 to .6 micron particle size. (Bearing air filtration is provided with the stand.)

3. Provide a minimum 3/4-inch I.D. air line to the filter at the manifold inlet. A minimum of 100 psig pressure is required at the manifold inlet.

4. Install water supply line and air pressure line to the pressure pot.

! WARNING

- ▶ NEVER use solvent as a test fluid for this device!
- ▶ Using any material OTHER than distilled water or de-ionized water may cause fire during the test. Use only distilled water or de-ionized to test the applicator.

5. Fill the pressure pot liner with approximately one (1) gallon of either de-ionized or distilled water.

6. Plug the unit into a suitable 110/120V outlet.

NOTE

▶ When opening dump valve for any test, hold tubing securely by hand or clamp to prevent whipping.

TOOLS REQUIRED

- Soap and Water solution
- Digital Volt Meter
- High Voltage Wire 2 ft. long with banana plug at both ends
- DI Water
- Test Shap Air Ring T77603-01
- Test Bell Cup 77981-00
- Cup Insert 77982-00
- Bell Wrenches (2) RPM-409
- Amojell Grease SSL-1001
- Red Electrode Caps 7331-01
- High Voltage Probe and Test Meter 76634-00
- Shaping Air Tool 79005-00
- Megohm Test Meter
- Stop Watch

INITIAL TEST SETTINGS

1. High voltage is off unless instructed to turn on. Main power off.
2. Fluid enable off.
3. Flow rate select set to none.
4. All toggle switches in the off position.
5. Set speed select to 00.

NOTE

- ▶ Using the tap water **MAY CAUSE** problems with chemical incompatibilities with the production spray material. Only use distilled or de-ionized water
- ▶ Use an ear protection device when performing this test.
- ▶ Always inspect pressure pot prior to testing, keep pot full of clean distilled or de-ionized water.

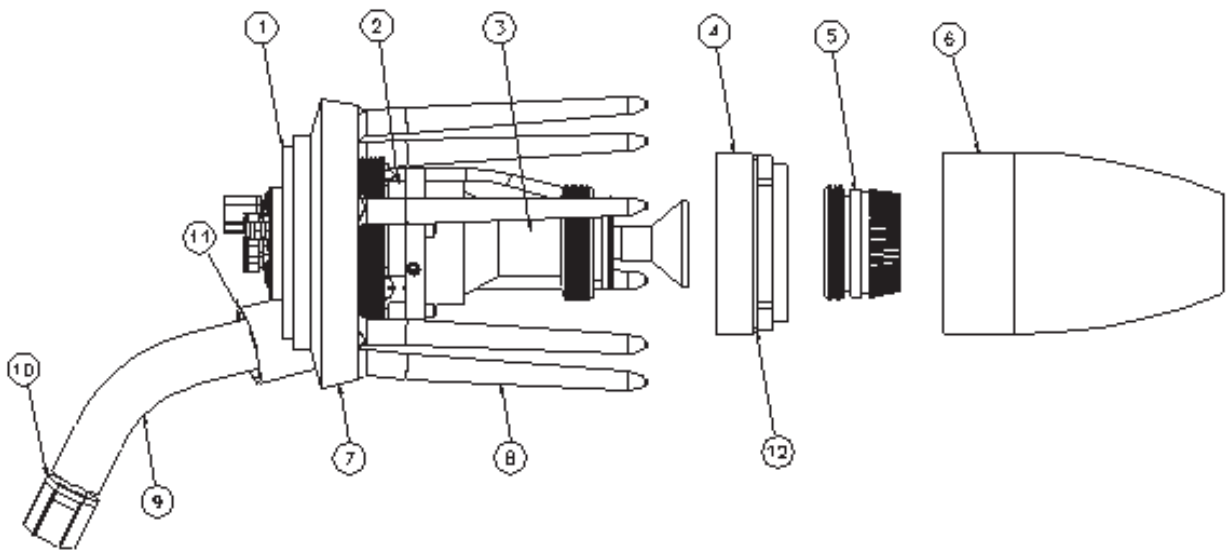


Figure 3: Aerobell II Exploded Assembly

AEROBELL II ASSEMBLY PARTS IDENTIFICATION		
ITEM #	PART #	DESCRIPTION
1	78267	Manifold Assembly
2	77602	Valve Module
3	77599	Turbine Assembly
4	77627-00	Ring, Module Retaining
5	77610 / 78595	Shaping Air Ring
6	77611-01	Shaping Air Cap W/Shroud
7	77615-00	Base, High Voltage Ring
8	77601-00	Electrode Assembly
9	78230-00	Tube, High Voltage
10	78441-00	Nut, Ferrule
11	78229-00	Locknut, High Voltage Tube
12	LSOR0005-09	O-Ring (2-252), Teflon Encapsulated

TEST INSTRUCTIONS

Inspect Valve

1. Inspect the valve module (77602) to make sure all of the o-rings are in place prior to insertion into the test manifold assembly (78267).

NOTE

- ▶ Only use Amojell grease to affix the o-rings onto the manifold.



Figure 4: Valve Module Inspection of O-Rings

2. Set main air in at 100 psi.

3. After inspecting the valve module (77602), assemble it into the manifold (78267). The valve module (77602) has a locating pin for alignment into the manifold (78267). Align the pin to the groove and carefully press the manifold into place.

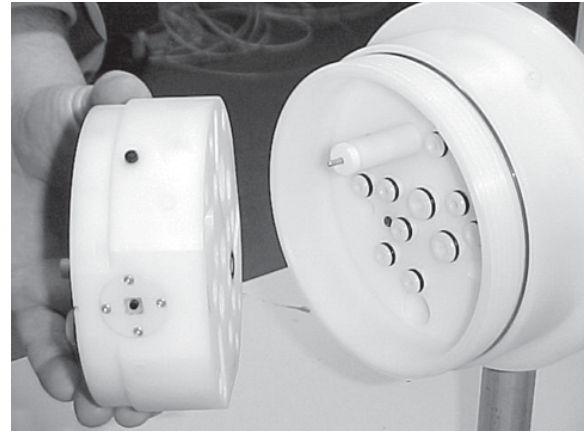


Figure 5: Valve Module Assembly

4. Use two cap screws (8532-64C) (5/16-18 X 2") to retain the valve module (77602) in place. After tightening cap screws, turn on the trigger valves paint, solvent, and dump. Listen and feel for air leakage from the valve cartridges. If air escapes from relief hole, tiny hole in the face of the valve module (77602), replace valve and cartridge, and retest. Turn the trigger valves off once this test step has been completed.

Install Turbine Onto the Manifold (77602).

Place the RPM turbine assembly onto the manifold assembly; secure the turbine with the socket head cap screws. Tighten until stops, then 1/8 turn more.



Figure 6: Turbine Assembly Onto the Manifold Assembly

1. **Voltage Resistance Reading** - Insert a short section high voltage cable, which has a banana plug on both ends, into GND/high voltage tube assembly (77608) at the rear of the manifold assembly (78267). Push the cable in until it bottoms out.

Locate a digital volt meter and connect the black lead onto the opposite end of the short length high voltage cable's banana plug.

Turn on the digital volt meter to lowest resistance setting.

Take the red lead of the digital volt meter and touch it upon the turbine shaping air manifold and fluid feed tube.

Observe the resistance readings from the digital volt meter (it must be a maximum of 10 ohms.)

2. **Test for Missing Shaping Air Fitting** - Assemble the test shaping air ring (T77603-01) onto the turbine assembly, hand tighten until it is seated on the shaping air manifold.

3. Proceed to turn on the shaping air control to 30 psi and observe for air leakage from the shaping air fitting where the turbine is mounted onto the valve module (77602). Carefully apply soap and water solution onto the valve module and shaping air tube connections to identify if air leakage is present.

4. If no leakage is found, then turn off shaping air control and remove the test ring. If leakage is found, proceed to turn off the shaping air control and dis-assemble the turbine from the module. Visually inspect to see if the shaping air fitting and o-ring are missing.

Test Pilot Valves

1. First turn on the "Fluid" switch to "Air" and the "Fluid Enable" to Paint #1 IN to "On." Verify the air pressure on the CCV valve on the back of the unit is between 20-40 psi (See Figure 7).

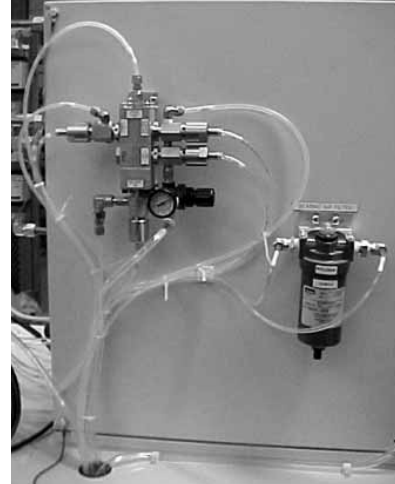
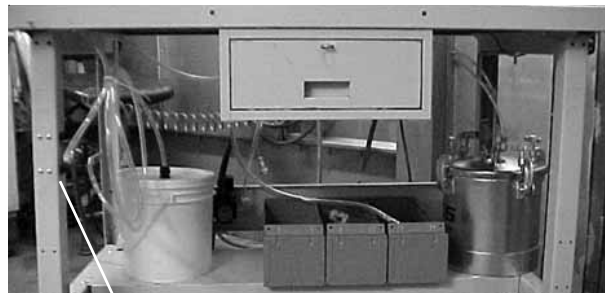


Figure 7: CCV Valve

2. Turn on the "Paint Trigger" switch. Air should be escaping from the feed tube of turbine assembly.

3. Turn off the "Paint Trigger", now turn on the "Dump Trigger", and then turn the ball valve on at the end of the dump trigger. Air should be escaping from the dump line. (See Figure 8)



Ball Valve

Figure 8: Ball Valve On the Dump Trigger

4. Turn off the "Paint #1 Dump" and "Paint #1 IN", now turn on the "Solvent IN" and "Bell Solvent". Air should be escaping from the feed tube of the turbine assembly.

5. Turn off "Bell Solvent", "Solvent IN", and the "Fluid" switch.

Static Decay / Water Pressure Test

1. Put the test bell cup (77981) with cup insert (77982) onto the turbine assembly, hand tighten only.
2. Turn the "Fluid" switch to "Water" position.
3. Turn the "Fluid Air" regulator to the pressure pot to 80 psi. Make sure you have distilled water in the pot.
4. Make sure the dump line is secured in the bucket and the dump valve is in the "Open" position.
5. Turn on the "Paint #1 IN" and "Solvent IN" in the Fluid Enable section.
6. Activate the "Dump Trigger" until the air is completely purged from the manifold. You will see water running from the valve. Turn the dump valve off stopping the water flow. Turn "Fluid" switch to "Off." Leak gauge should stay at pressure.
7. Observe the turbine assembly for any possible water leakage, wait 3 minutes. No seepage is allowed.
8. If a leak is found, turn the "Water" switch to the "Air" side and activate dump valve until all water is evacuated. Turn "Fluid" switch to "Off", repair leak, and repeat test.
9. If no leak is found, turn on the "Fluid" switch to "Air", slowly open the dump valve to purge out the water.
10. When no traces of water are present, close the dump valve on the end of the hose and turn the "Fluid" switch to "Off".

Air Test

1. Turn the "Fluid" switch to "On", then to "Off" to pressurize the system.
2. Observe the leak test pressure gauge. The pressure must not drop more than 2 psi in 10 seconds.

3. Open the "Dump Valve" to de-pressurize the system and turn off all of the trigger valves.
4. Remove test cup. With a rag over the end of the fluid tube, turn on "Bell Solvent" and the "Fluid" switch to "On" to purge all material from lines. Turn off "Bell Solvent."
5. Open manual relief valve on pressure pot first, then turn off "Fluid Air" switch.
6. Turn all switches off. Turn off "Fluid Enable, Paint #1 IN, Solvent IN, and Dump".

Test Shaping Air

1. Measure the height of the insert. Check the dimension of insert. Both faces should be flush \pm .007 inches. (See Figure 9)
2. Assemble production bell cup onto the turbine assembly using RPM-409 wrenches to tighten bell cup onto the shaft.

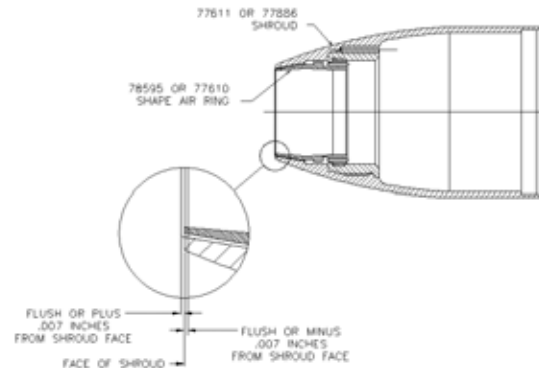


Figure 9: Shaping Air and Shroud Tolerance

3. Apply Amojell grease SSL-1001 onto the o-ring on the manifold (77617). Carefully assemble the Teflon shroud onto the turbine assembly. Twist shroud on by hand only.
4. Inspect the current production order and determine what shaping air ring is being used. If testing the "Low Flow" shaping air ring (78595-00), reference Chart #1.

5. The following steps outline how to test the low flow shaping ring (78595-00).
6. Turn on the "Shaping Air" switch and adjust the shaping air to the following PSI settings listed on the following charts.
7. The SCFM gauge should compare to the range stated on the chart.
8. After the shaping air test is completed, turn off the shaping air dial.

CHART #1 78595-00 LOW FLOW SHAPING AIR CONSUMPTION	
PSI RANGE	SCFM RANGE
20	4-6
30	6-8
40	10-13
50	15-17
60	20-23

Test Bearing Air

1. Adjust the "Bearing Air Regulator" to 80 psi.



2. Look at the bearing air flow meter. It should be reading greater than 1.7 SCFM.

Turbine Start Time

Raise the safety lever and lock with pin. Adjust the atomizer speed select card to 50k RPM; with stop watch in hand, press start button on the atomizer card and the start button on the stopwatch. The turbine must reach 50k RPM in 22 seconds or less.

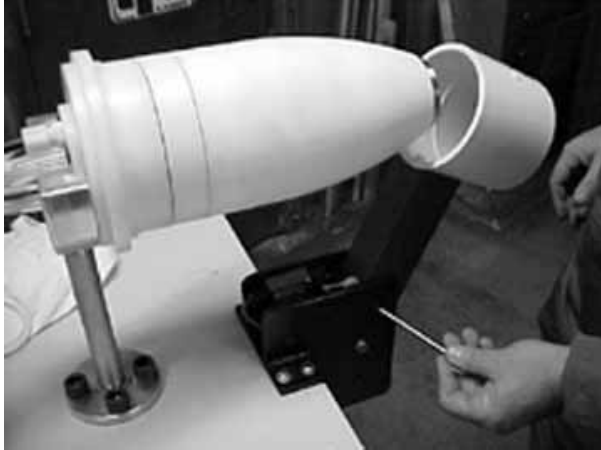


Figure 10: Turbine Safety Lever and Lock Pin

Turbine Drive Air

With turbine running at 50k RPM, drive air consumption should not exceed 16.0 SCFM.

Brake Test

Note: Use ear protection for this test.

Note: Do not allow turbine to run in reverse.

The turbine should be running at 50k RPM, with stopwatch in hand, press the brake button and the start button on the stopwatch. Once the digital readout on the speed card reads 5k RPM, then press the stop on the stopwatch. The brake stop time should not exceed 18 seconds.

Fiber Optic Voltage

Re-adjust atomizer speed card to 55k RPM, press the start button on the card, and observe the speed. It should be reading 55k RPM. Now, look at the fiber optic red digital display, the reading must be .75mV to 2.0mV. If readings are low, replace transmitter and re-test. **Note: To be done with 100 ft. cable.**

System Shut Down

1. Turn off all trigger valves, shaping, and the "Paint Air" enable switch.
2. Turn the bearing air regulator down to 0 psi.

77615-00 HIGH VOLTAGE ASSEMBLY TEST - INDIRECT

Carefully assemble the electrode assemblies (77601) into the high voltage ring as shown in Figure 11. Once the electrodes are assembled, then install red caps (7331-01) onto the electrode assemblies as shown in Figure 11.



Figure 11: High Voltage Ring

Now position the high voltage ring assembly onto the manifold assembly (78267) as shown in Figure 12. During the installation of ring onto the manifold, you will need to twist the ring into its locking position. The ring must be locked into position before testing is permitted. Affix high voltage cable into the curved high voltage tube located on the back side of the high voltage ring. Make sure that the banana plug is fully inserted (firmly) into the receptacle inside the high voltage ring.

Locate a megohm test meter and affix the ground clamp onto the high voltage cable. Touch the probe side of the meter to the electrode needle. Make sure to remove the red cap. Each electrode assembly should yield readings on the digital display of 152 to 168 meg.

After completing the Low Voltage Test, reassemble the red caps back onto the electrodes.



Figure 12: Aerobell With High Voltage Ring Assembly



Figure 13: Probe & Test Meter

NOTES

MAINTENANCE

If any maintenance is required, consult factory for spare part availability.

WARRANTY POLICIES

LIMITED WARRANTY

ITW Ransburg will replace or repair without charge any part and/or equipment that fails within the specified time (see below) because of faulty workmanship or material, provided that the equipment has been used and maintained in accordance with ITW Ransburg's written safety and operating instructions, and has been used under normal operating conditions. Normal wear items are excluded.

THE USE OF OTHER THAN ITW RANSBURG APPROVED PARTS VOIDS ALL WARRANTIES.

SPARE PARTS: One hundred and eighty (180) days from date of purchase, except for rebuilt parts (any part number ending in "R") for which the warranty period is ninety (90) days.

EQUIPMENT: When purchased as a complete unit, (example: guns, power supplies, control units, etc.), is one (1) year from date of purchase.
WRAPPING THE APPLICATOR IN PLASTIC, SHRINK-WRAP, ETC., WILL VOID THIS WARRANTY.

FLUID HANDLING: One (1) year from date of purchase (example: Totalizer, CCV Valves, etc.).

AIR BEARING ROTATORS: Fifteen thousand (15,000) hours or three (3) years, whichever occurs first. Warranty period begins on the date of purchase.

ITW RANSBURG'S ONLY OBLIGATION UNDER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATERIALS. THERE ARE NO IMPLIED WARRANTIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ITW RANSBURG ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CONSEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR INCOME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PURCHASER OR OTHERS.

EXCLUSIONS:

If, in ITW Ransburg's opinion the warranty item in question, or other items damaged by this part was improperly installed, operated or maintained, ITW Ransburg will assume no responsibility for repair or replacement of the item or items. The purchaser, therefore will assume all responsibility for any cost of repair or replacement and service related costs if applicable.

APPENDIX

PAINT AND SOLVENT SPECIFICATIONS

	REA™ / EFM™ EVOLVER	REM™ / M90™	NO. 2 HAND GUN	TURBODISK™	AEROBELL® II*** AEROBELL® AEROBELL® 33 RMA™-101
RECOMMENDED VISCOSITY USING A ZAHN NO. 2	18 TO 30 SEC	18 TO 30 SEC	20 TO 60 SEC	20 TO 60 SEC	20 TO 60 SEC
PAINT ELECTRICAL RESISTANCE**	.1 MΩ TO ∞	.1 MΩ TO ∞	.1 TO 1 MΩ	.1 MΩ TO ∞	.1 MΩ TO ∞
RECOMMENDED DELIVERY (UP TO)	1000 cc/min	1500 cc/min	180 cc/min	1000 cc/min	500 cc/min

GUIDE TO USABLE SOLVENT SELECTION

Chemical Name	Common Name	Category	Flash Point†† (TCC)	*CAS Number	Evap. Rate†	Elec. Res.**
DICHLOROMETHANE	Methylene Chloride	Chlorinated Solvents		75-09-2	14.5	HIGH
VM & P NAPHTHA	Naptha	Aliphatic Hydrocarbons	65°F	8030-30-6	10	HIGH
ACETONE		Ketones	-18°F	67-64-1	5.6	LOW
METHYL ACETATE		Esters	90°F	79-20-9	5.3	LOW
BENZENE		Aromatic Hydrocarbons	12°F	71-43-2	5.1	HIGH
ETHYL ACETATE		Esters	24°F	141-78-6	3.9	MEDIUM
2-BUTANONE	MEK	Ketones	16°F	78-93-3	3.8	MEDIUM
ISO-PROPYL ACETATE		Esters	35°F	108-21-4	3.4	LOW
ISOPROPYL ALCOHOL	IPA	Alcohols	53°F	67-63-0	2.5	LOW
2-PENTANONE	MPK	Ketones	104°F	107-87-9	2.5	MEDIUM
METHANOL	Methyl Alcohol	Alcohols	50°F	67-56-1	2.1	LOW
PROPYL ACETATE	n-Propyl Acetate	Esters	55°F	109-60-4	2.1	LOW
TOLUOL	Toluene	Aromatic Hydrocarbons	48°F	108-88-3	1.9	HIGH
METHYL ISOBUTYL KETONE	MIBK	Ketones	60°F	108-10-1	1.6	MEDIUM
ISOBUTYL ACETATE		Esters	69°F	110-19-0	1.5	LOW
ETHANOL	Ethyl Alcohol	Alcohols		64-17-5	1.4	LOW
BUTYL ACETATE		Esters	78°F	123-86-4	1.0	LOW
ETHYLBENZENE		Aromatic Hydrocarbons	64°F	100-41-4	.89	HIGH
1-PROPANOL	n-Propyl Alcohol	Alcohols	74°F	71-23-8	.86	LOW
2-BUTANOL	sec.-Butyl Alcohol	Alcohols	72°F	78-92-2	.81	LOW
XYLOL	Xylene	Aromatic Hydrocarbons	79°F	1330-02-07	.80	HIGH
AMYL ACETATE		Esters	106°F	628-63-7	.67	MEDIUM
2-METHYLPROPANOL	iso-Butyl Alcohol	Alcohols	82°F	78-83-1	.62	LOW
METHYL AMYL ACETATE		Esters	96°F	108-84-9	.50	LOW
5-METHYL-2-HEXANONE	MIAK	Ketones	96°F	110-12-3	.50	MEDIUM
1-BUTANOL	n-Butyl Alcohol	Alcohols	95°F	71-36-3	.43	LOW
2-ETHOXYETHANOL		Glycol Ethers	164°F	110-80-5	.38	LOW
2-HEPTANONE	MAK	Ketones	102°F	110-43-0	.40	MEDIUM
CYCLOHEXANONE		Ketones	111°F	108-94-1	.29	MEDIUM
AROMATIC-100	SC#100	Aromatic Hydrocarbons	111°F		.20	HIGH
DIISOBUTYL KETONE	DIBK	Ketones	120°F	108-83-8	.19	MEDIUM
1-PENTANOL	Amyl Alcohol	Alcohols		71-41-0	.15	LOW
DIACETONE ALCOHOL		Ketones	133°F	123-42-2	.12	LOW
2-BUTOXYETHANOL	Butyl Cellosolve	Glycol Ethers	154°F	111-76-2	.07	LOW
CYCLOHEXANOL		Alcohols	111°F	108-93-0	.05	LOW
AROMATIC-150	SC#150	Aromatic Hydrocarbons	149°F		.004	HIGH
AROMATIC-200		Aromatic Hydrocarbons	203°F		.003	HIGH

* CAS Number: Chemical Abstract Service Number.

** Electrical Resistance using the ITW Ransburg Meter.

*** Solvent Base Configuration Only.

† Information Obtained From: <http://solvdb.ncms.org>

†† The lowest temperature at which a volatile fluid will ignite.

Evaporation Rate is Based Upon Butyl Acetate Having a Rate

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NOTE: Chart provides resistance and control information that we feel is necessary when using ITW Ransburg equipment.

VISCOSITY CONVERSION CHART																		
Poise	Centipoise	DuPont Parlin 7	DuPont Parlin 10	Fisher 1	Fisher 2	Ford Cup 3	Ford Cup 4	Gardner - Holdt Bubble	Gardner - Lithographic	Krebs Unit KU	Saybolt Universal SSU	Zahn 1	Zahn 2	Zahn 3	Zahn 4	Zahn 5	Sears Craftsman Cup	Din Cup 4
.1	10	27	11	20			5	A-4			60	30	16					10
.15	15	30	12	25			8	A-3			80	34	17					11
.2	20	32	13	30	15	12	10				100	37	18					12
.25	25	37	14	35	17	15	12	A-2			130	41	19					13
.3	30	43	15	39	18	19	14	A-1			160	44	20					14
.4	40	50	16	50	21	25	18	A			210	52	22				19	15
.5	50	57	17		24	29	22			30	260	60	24				20	16
.6	60	64	18		29	33	25	B		33	320	68	27				21	18
.7	70		20		33	36	28			35	370		30				23	21
.8	80		22		39	41	31	C		37	430		34				24	23
.9	90		23		44	45	32			38	480		37	10			26	25
1.0	100		25		50	50	34	D		40	530		41	12	10		27	27
1.2	120		30		62	58	41	E		43	580		49	14	11		31	31
1.4	140		32			66	45	F		46	690		58	16	13		34	34
1.6	160		37				50	G		48	790		66	18	14		38	38
1.8	180		41				54		000	50	900		74	20	16		40	43
2.0	200		45				58	H		52	1000		82	23	17	10	44	46
2.2	220						62	I		54	1100			25	18	11		51
2.4	240						65	J		56	1200			27	20	12		55
2.6	260						68			58	1280			30	21	13		58
2.8	280						70	K		59	1380			32	22	14		63
3.0	300						74	L		60	1475			34	24	15		68
3.2	320							M			1530			36	25	16		72
3.4	340							N			1630			39	26	17		76
3.6	360							O		62	1730			41	28	18		82
3.8	380										1850			43	29	19		86
4.0	400							P		64	1950			46	30	20		90
4.2	420										2050			48	32	21		95
4.4	440							Q			2160			50	33	22		100
4.6	460							R		66	2270			52	34	23		104
4.8	480								00	67	2380			54	36	24		109
5.0	500							S		68	2480			57	37	25		112
5.5	550							T		69	2660			63	40	27		124
6.0	600							U		71	2900			68	44	30		135
7.0	700									74	3375				51	35		160
8.0	800								0	77	3380				58	40		172
9.0	900							V		81	4300				64	45		195
10.0	1000							W		85	4600					49		218
11.0	1100									88	5200					55		
12.0	1200									92	5620					59		

VISCOSITY CONVERSION CHART (Continued)																		
Poise	Centipoise	DuPont Parlin 7	DuPont Parlin 10	Fisher 1	Fisher 2	Ford Cup 3	Ford Cup 4	Gardner - Holdt Bubble	Gardner - Lithographic	Krebs Unit KU	Saybolt Universal SSU	Zahn 1	Zahn 2	Zahn 3	Zahn 4	Zahn 5	Sears Craftsman Cup	Din Cup 4
13.0	1300							X		95	6100					64		
14.0	1400								1	96	6480							
15.0	1500									98	7000							
16.0	1600									100	7500							
17.0	1700									101	8000							
18.0	1800							Y			8500							
19.0	1900										9000							
20.0	2000									103	9400							
21.0	2100										9850							
22.0	2200										10300							
23.0	2300							Z	2	105	10750							
24.0	2400									109	11200							
25.0	2500							Z-1		114	11600							
30.0	3000									121	14500							
35.0	3500							Z-2	3	129	16500							
40.0	4000									133	18500							
45.0	4500							Z-3		136	21000							
50.0	5000										23500							
55.0	5500										26000							
60.0	6000							Z-4	4		2800							
65.0	6500										30000							
70.0	7000										32500							
75.0	7500										35000							
80.0	8000										37000							
85.0	8500										39500							
90.0	9000										41000							
95.0	9500										43000							
100.0	10000							Z-5	5		46500							
110.0	11000										51000							
120.0	12000										55005							
130.0	13000										60000							
140.0	14000										65000							
150.0	15000							Z-6			67500							
160.0	16000										74000							
170.0	17000										83500							
180.0	18000										83500							
190.0	19000										88000							
200.0	20000										93000							
300.0	30000										140000							

Note: All viscosity comparisons are as accurate as possible with existing information. Comparisons are made with a material having a specific gravity of 1.0.

VOLUMETRIC CONTENT OF HOSE OR TUBE (English Units)							
I.D. (inches)	cc/ft.	Cross Section (in. ²)	Length				
			5ft. (60")	10ft. (120")	15ft. (180")	25ft. (300")	50ft. (600")
1/8	2.4	.012	.003 gal. .4 fl. oz.	.006 gal. .8 fl. oz.	.010 gal. 1.2 fl. oz.	.016 gal. 2.0 fl. oz.	.032 gal. 4.1 fl. oz.
3/16	5.4	.028	.007 gal. .9 fl. oz.	.014 gal. 1.8 fl. oz.	.022 gal. 2.8 fl. oz.	.036 gal. 4.6 fl. oz.	.072 gal. 9.2 fl. oz.
1/4	9.7	.049	.013 gal. 1.6 fl. oz.	.025 gal. 3.3 fl. oz.	.038 gal. 4.9 fl. oz.	.064 gal. 8.2 fl. oz.	.127 gal. 16.3 fl. oz.
5/16	15.1	.077	.020 gal. 2.5 fl. oz.	.040 gal. 5.1 fl. oz.	.060 gal. 7.6 fl. oz.	.100 gal. 12.7 fl. oz.	.199 gal. 25.5 fl. oz.
3/8	21.7	.110	.029 gal. 3.7 fl. oz.	.057 gal. 7.3 fl. oz.	.086 gal. 11.0 fl. oz.	.143 gal. 18.4 fl. oz.	.287 gal. 36.7 fl. oz.
1/2	38.6	.196	.051 gal. 6.5 fl. oz.	.102 gal. 13.1 fl. oz.	.153 gal. 19.6 fl. oz.	.255 gal. 32.6 fl. oz.	.510 gal. 65.3 fl. oz.

VOLUMETRIC CONTENT OF HOSE OR TUBE (Metric Units)							
I.D. (mm)	cc/m	Cross Section (mm ²)	Length				
			1.5m	3.0m	4.5m	6.0m	7.5m
3.6	10.2	10.2	15.3 cc	30.5 cc	45.8 cc	61.1 cc	76.3 cc
5.6	24.6	24.6	36.9 cc	73.9 cc	110.8 cc	147.8 cc	184.7 cc
6.8	36.3	36.3	54.5 cc	109.0 cc	163.4 cc	217.9 cc	272.4 cc
8.8	60.8	60.8	91.2 cc	182.5 cc	273.7 cc	364.9 cc	456.2 cc

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Manufacturing

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Technical/Service Assistance

Automotive Assembly and Tier I	Telephone: 800/ 626-3565	Fax: 419/ 470-2040
Industrial Systems	Telephone: 800/ 233-3366	Fax: 419/ 470-2071
Ransburg Guns	Telephone: 800/ 233-3366	Fax: 419/ 470-2071

Technical Support Representative will direct you to the appropriate telephone number for ordering Spare Parts.