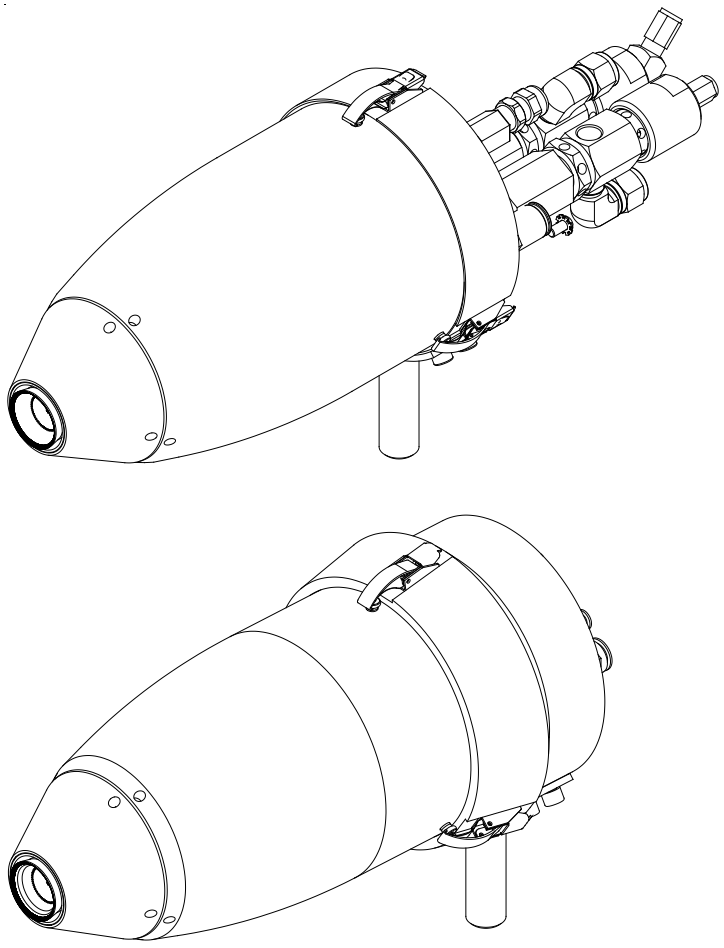
Ransburg

SERVICE MANUAL
LN-9264-08.2
(Replaces LN-9264-08.1)
March - 2013

AEROBELL™



MODEL: A12381

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.

Service Manual Price: $50.00 (U.S.)

NOTE: This manual replaces **LN-9264-08.1.**

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CONTENTS (Cont.)

SAFETY

SAFETY PRECAUTIONS

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

⚠ WARNING

➤ The user **MUST** read and be familiar with the Safety Section in this manual and the Ransburg safety literature therein identified.

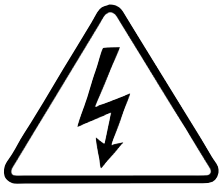
➤ This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the **WARNINGS** and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to ALL local building and fire codes and ordinances as well as **NFPA-33 SAFETY STANDARD, LATEST EDITION**, 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. Please read the hazard chart beginning on page 2.

AREA Tells where hazards may occur.	**HAZARD** Tells what the hazard is.	**SAFEGUARDS** Tells how to avoid the hazard.
Spray Area 	**Fire Hazard** Improper or inadequate operation and maintenance procedures will cause a fire hazard. 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.	Fire extinguishing equipment must be present in the spray area and tested periodically. Spray areas must be kept clean to prevent the accumulation of combustible residues. Smoking must never be allowed in the spray area. The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance. When using solvents for cleaning: • Those used for equipment flushing should have flash points equal to or higher than those of the coating material. • Those used for general cleaning must have flash points above 100°F (37.8°C). Spray booth ventilation must be kept at the rates required by NFPA-33, OSHA, country, and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents. 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. Test only in areas free of combustible material. Testing may require high voltage to be on, but only as instructed. 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. Never use equipment intended for use in waterborne installations to spray solvent based materials. 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.

AREA Tells where hazards may occur.	**HAZARD** Tells what the hazard is.	**SAFEGUARDS** Tells how to avoid the hazard.
Spray Area 	**Explosion Hazard** Improper or inadequate operation and maintenance procedures will cause a fire hazard. 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.	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. 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. Test only in areas free of flammable or combustible materials. 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. Always turn the control panel power off prior to flushing, cleaning, or working on spray system equipment. Before turning high voltage on, make sure no objects are within the safe sparking distance. Ensure that the control panel is interlocked with the ventilation system and conveyor in accordance with NFPA-33, EN 50176. Have fire extinguishing equipment readily available and tested periodically.
General Use and Maintenance 	Improper operation or maintenance may create a hazard. Personnel must be properly trained in the use of this equipment.	Personnel must be given training in accordance with the requirements of NFPA-33, EN 60079-0. Instructions and safety precautions must be read and understood prior to using this equipment. 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.

AREA Tells where hazards may occur.	**HAZARD** Tells what the hazard is.	**SAFEGUARDS** Tells how to avoid the hazard.
Spray Area / High Voltage Equipment 	**Electrical Discharge** There is a high voltage device that can induce an electrical charge on ungrounded objects which is capable of igniting coating materials. Inadequate grounding will cause a spark hazard. A spark can ignite many coating materials and cause a fire or explosion.	Parts being sprayed and operators in the spray area must be properly grounded. 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 meg ohm. (Refer to NFPA-33.) 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. Operators must not be wearing or carrying any ungrounded metal objects. 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. NOTE: REFER TO NFPA-33 OR SPECIFIC COUNTRY SAFETY CODES REGARDING PROPER OPERATOR GROUNDING. 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. Always turn off the power supply prior to flushing, cleaning, or working on spray system equipment. 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.

AREA Tells where hazards may occur.	**HAZARD** Tells what the hazard is.	**SAFEGUARDS** Tells how to avoid the hazard.
Electrical Equipment 	**Electrical Discharge** 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. Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation. Frequent power supply shutdown indicates a problem in the system which requires correction. An electrical arc can ignite coating materials and cause a fire or explosion.	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 50176. Turn the power supply OFF before working on the equipment. Test only in areas free of flammable or combustible material. Testing may require high voltage to be on, but only as instructed. Production should never be done with the safety circuits disabled. Before turning the high voltage on, make sure no objects are within the sparking distance.
Toxic Substances 	Certain material may be harmful if inhaled, or if there is contact with the skin.	Follow the requirements of the Material Safety Data Sheet supplied by coating material manufacturer. Adequate exhaust must be provided to keep the air free of accumulations of toxic materials. 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.
Spray Area 	**Explosion Hazard – Incompatible Materials** 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.	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.

INTRODUCTION

FEATURES

Features which make the **Aerobell**™ advantageous for use in rotary atomizer electrostatic applications include:

- Fast color change due to center feed fluid delivery and integral air brake
- Snap away latches for fast replacement of the rotary atomizer assembly
- Sleek configuration to facilitate cleaning of the exterior
- Turbine air exhausts behind bell edge, keeping paint and solvent contamination out of atomizer interior and back of bell clean
- Braking air capability
- Field repairable turbine assembly after the warranty period
- Magnetic pickup capability for speed readout
- 30, 57, and 70mm shaping air configuration for optimum pattern control
- 30, 57, and 70mm bell cups available. Bell cups are made of long lasting Titanium.
- Proven long life air bearing spindle

GENERAL DESCRIPTION

The Ransburg Aerobell is a high speed bell type atomizer for electrostatic application of conventional and high solids coating materials. It is available in several combinations. Contact your Ransburg representative for assistance in atomizer bell selection.

The Aerobell turbine assembly incorporates precision air type bearings for extended turbine life.

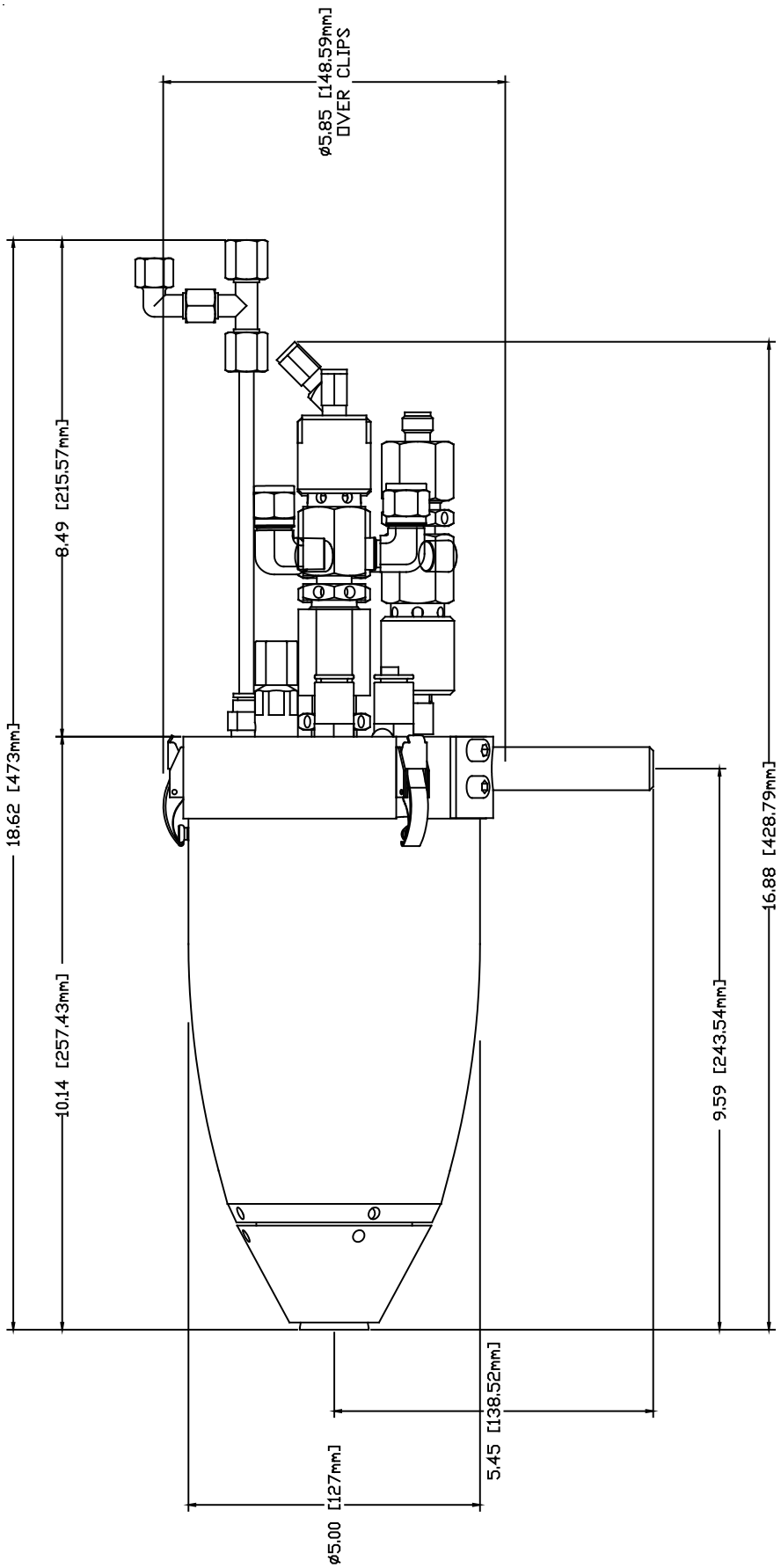
SPECIFICATIONS

Mechanical

Turbine Speed:	10,000-60,000 rpm max.
Turbine Type:	Impulse - Front Exhaust
Weight:	(See outline drawings)
Length & Diameter:	(See outline drawings)
Turbine Air Consumption:	(See "Turbine Speed Charts" in this section.)
Bearing Air:	80 psi nominal (551 kPa) 60 psi min., 100 psi max. (413-689 kPa) 2-3 SCFM (57-85 SLPM)
Target Distance:	6-12 inches (152-305mm) Recommended
Brake Air:	100 psi (689 kPa)
Fluid Pressure:	150 psi max.
Fluid Flow Rate:	500 cc's/max. (paint or solvent)
Rotator Atomizer Change Time: (Quick Change Time)	Approx. 20 sec.
Bell Change Time:	Approx. 40 sec.
Bell Cleaning Time:	Approx. 2-3 sec.
Speed Readout Pickup:	Magnetic (2 pulses/rev.)
Power Supply:	MicroPak-RansPak 1000 Cascade Voltage Master II 100kV
Special Control:	Serial Atomizer PulseTrack 2

* Paint Resistance: 1 MΩ to ∞ (Solventborne Direct Charge Applications)

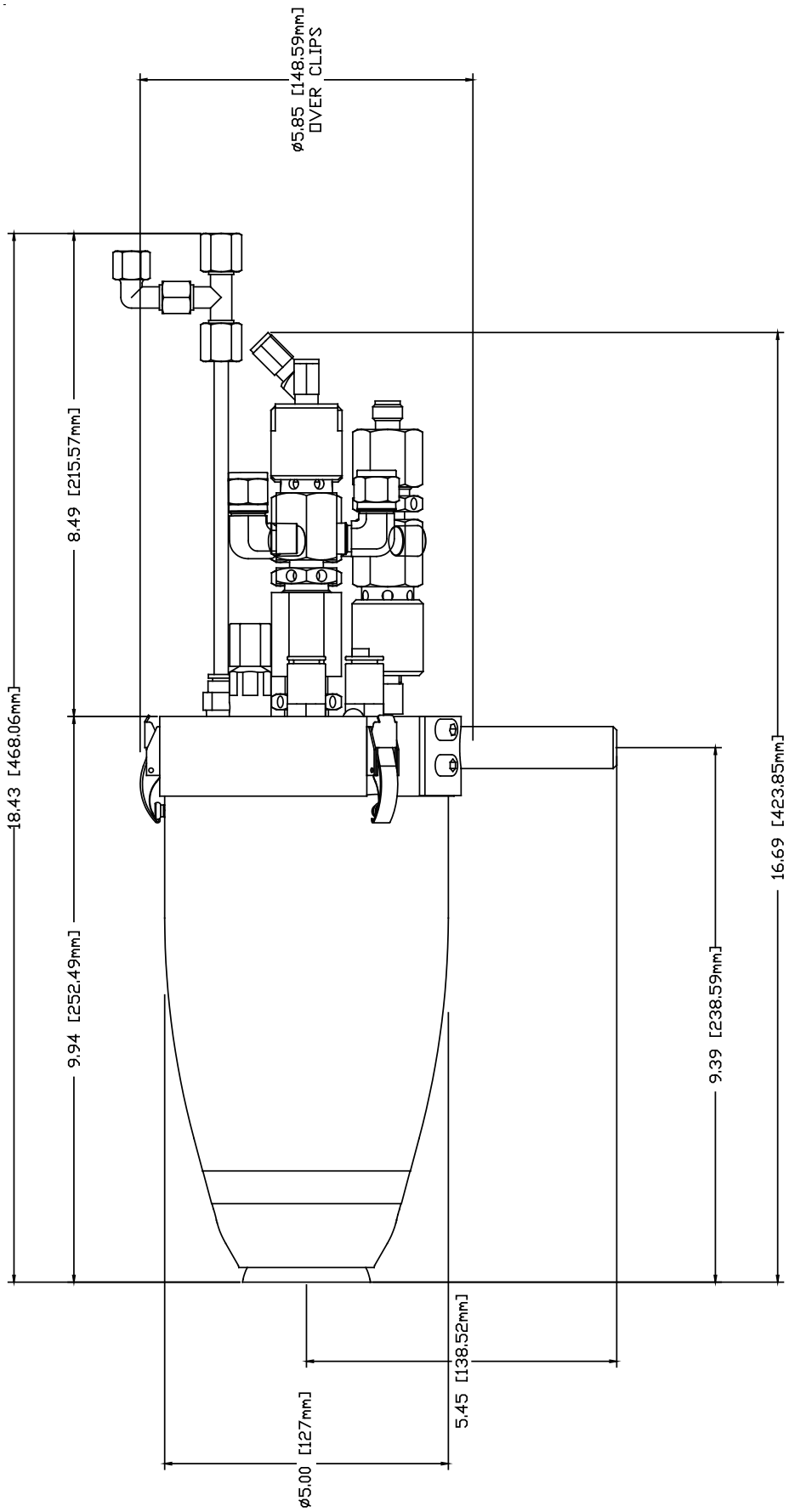
* Ransburg Meter (See "Accessories" in the "Parts Idenetification" section for part numbers.)



30MM BELL CUP WITH CCV VALVE CONFIGURATION

WEIGHT: 3 VALVE CONFIGURATION- 13.40 LBS/6.08 Kg

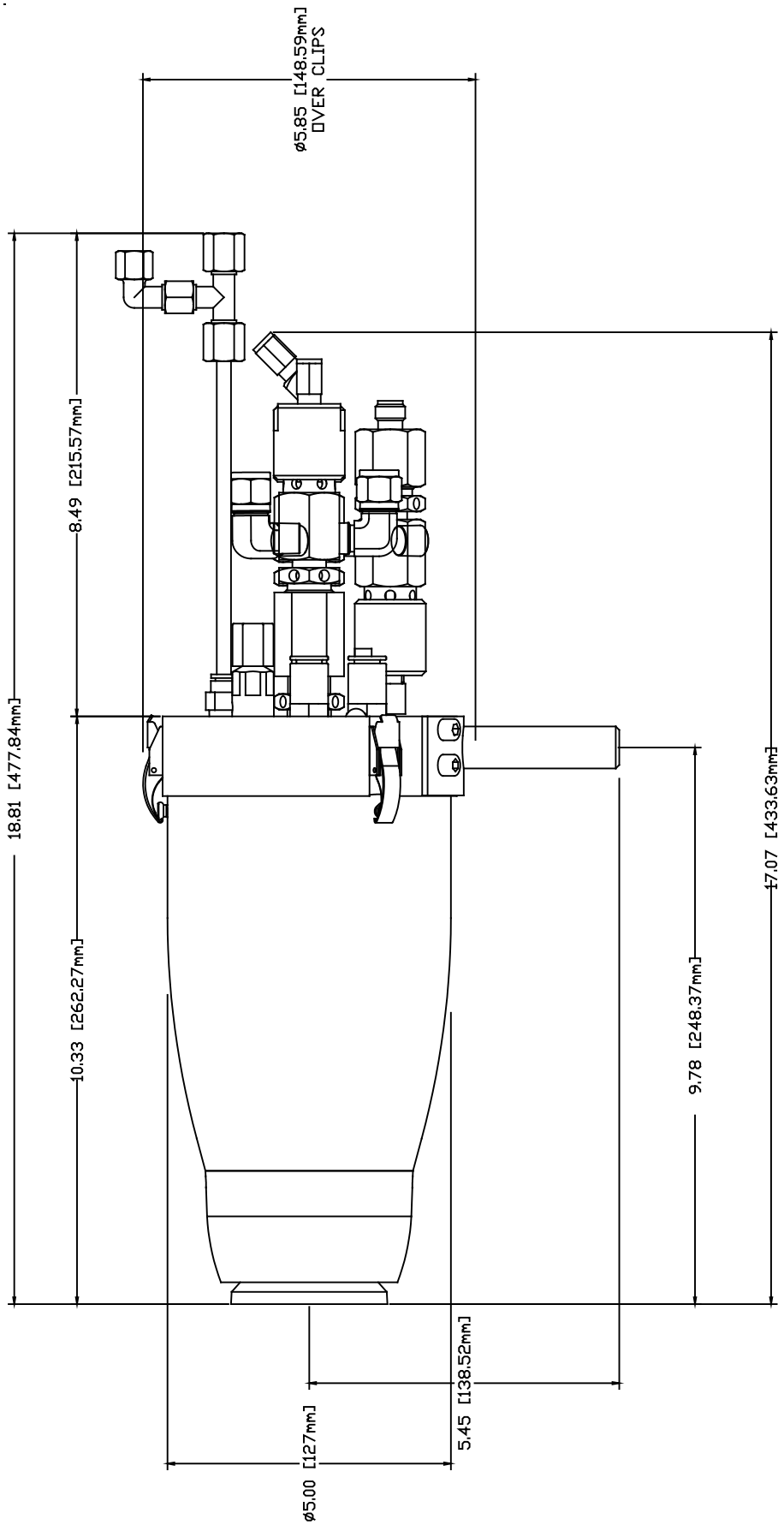
1 VALVE CONFIGURATION- 11.30 LBS/5.13 Kg



57MM BELL CUP WITH CCV VALVE CONFIGURATION

WEIGHT: 3 VALVE CONFIGURATION- 13.50 LBS/6.12 Kg

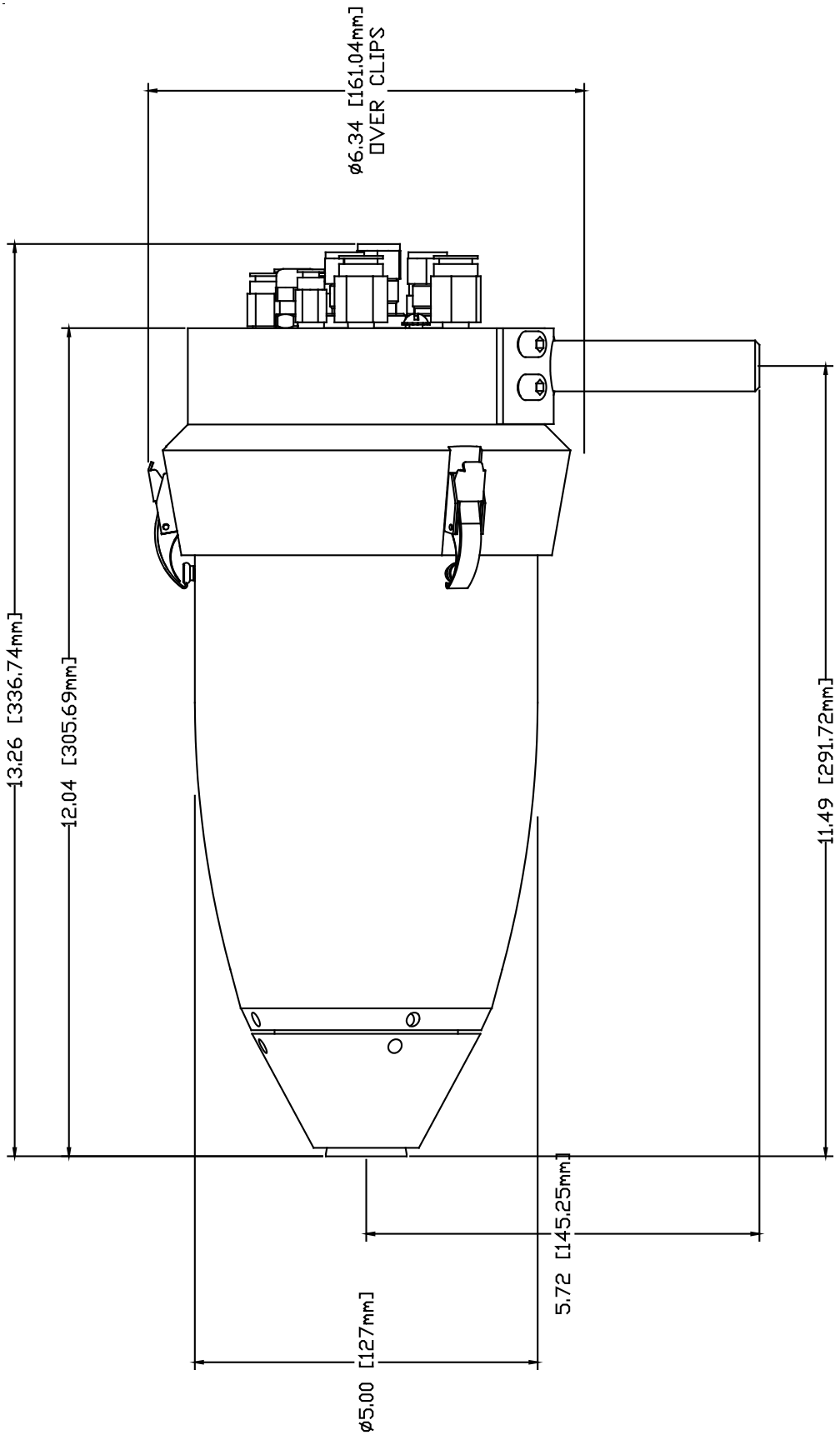
1 VALVE CONFIGURATION- 11.35 LBS/5.15 Kg



70MM BELL CUP WITH CCV VALVE CONFIGURATION

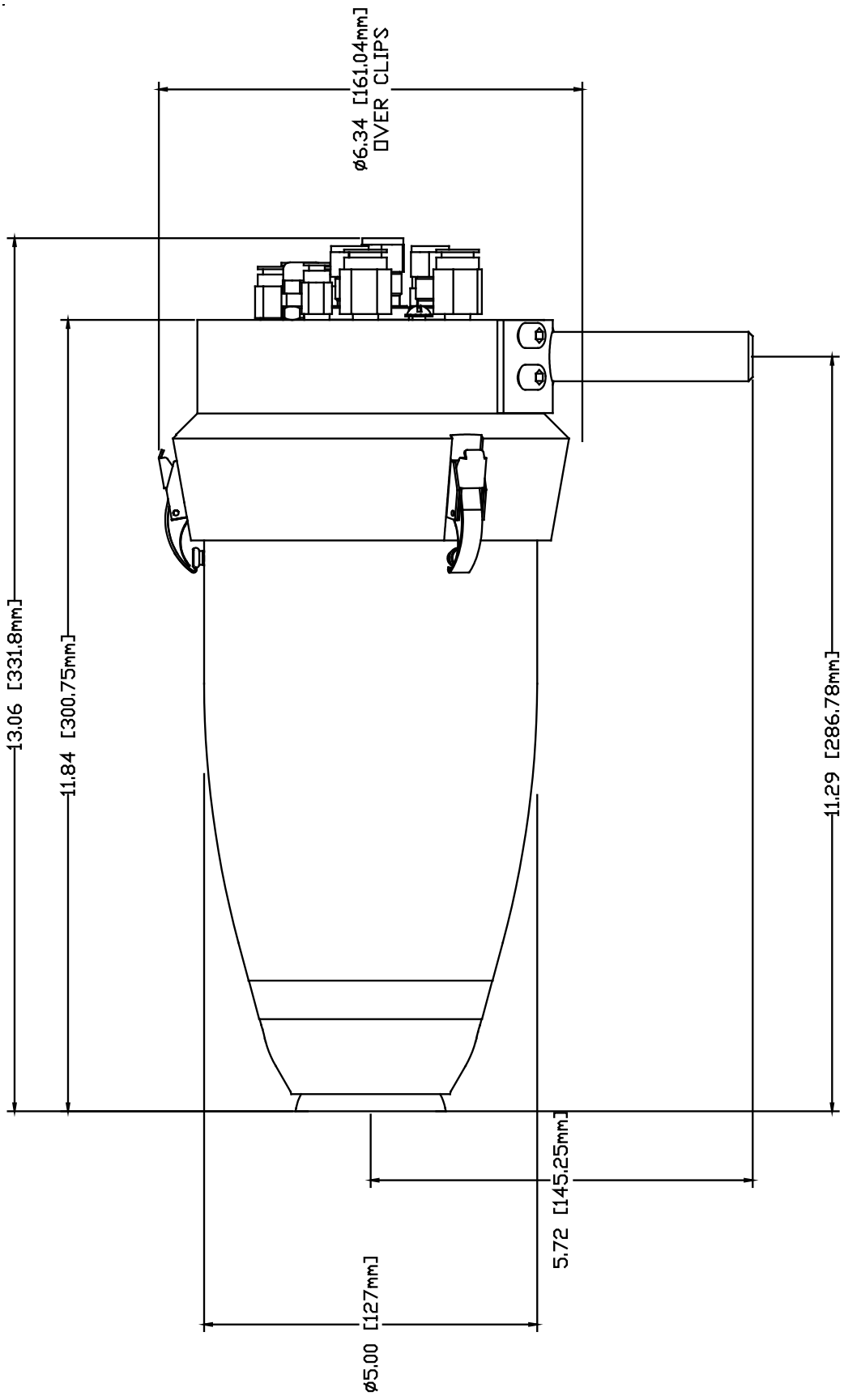
WEIGHT: 3 VALVE CONFIGURATION- 15.90 LBS/7.21 Kg

1 VALVE CONFIGURATION- 13.90 LBS/6.30 Kg



30MM BELL CUP WITH MCV VALVE CONFIGURATION

WEIGHT: 13.25 LBS/6.01 Kg



57MM BELL CUP WITH MCV VALVE CONFIGURATION

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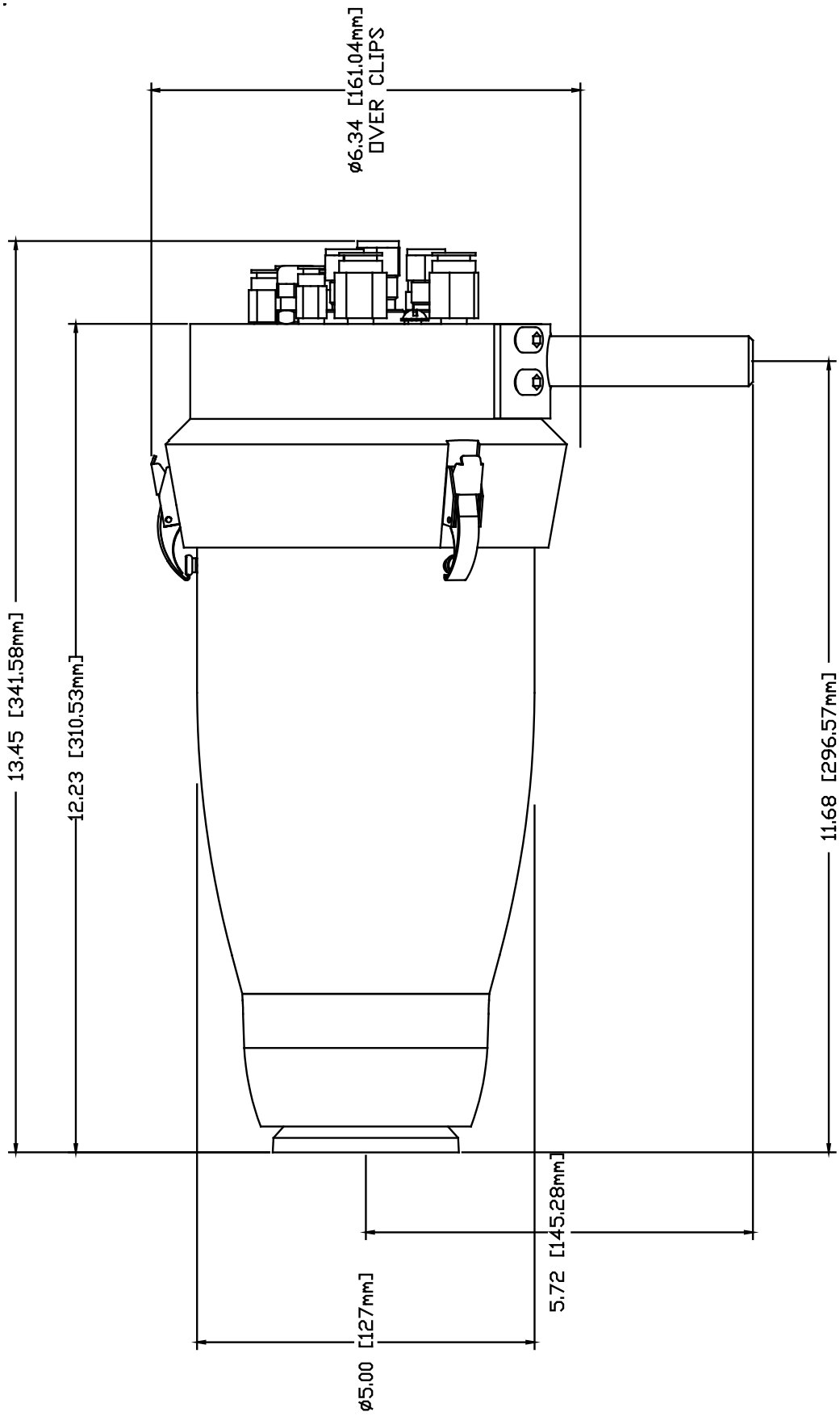
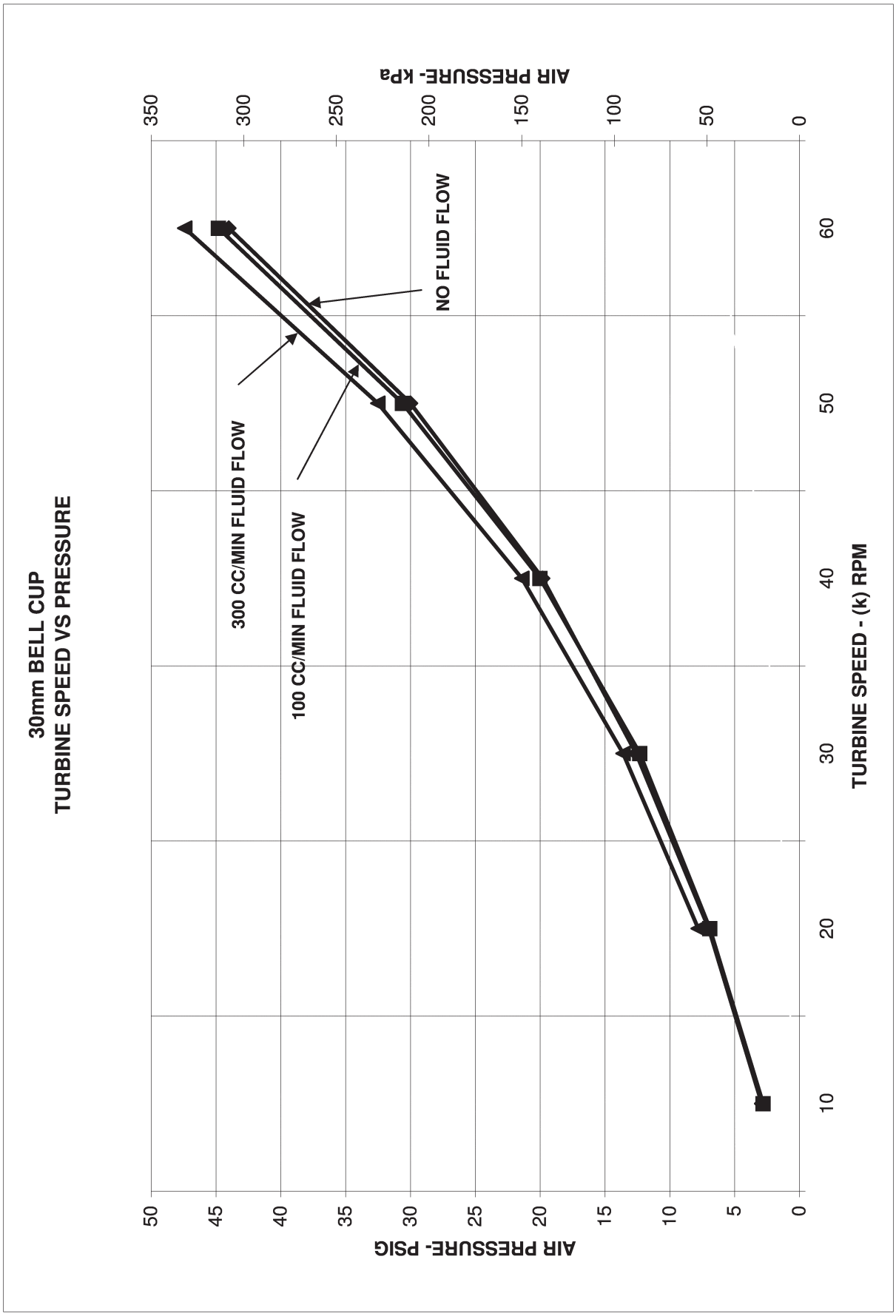
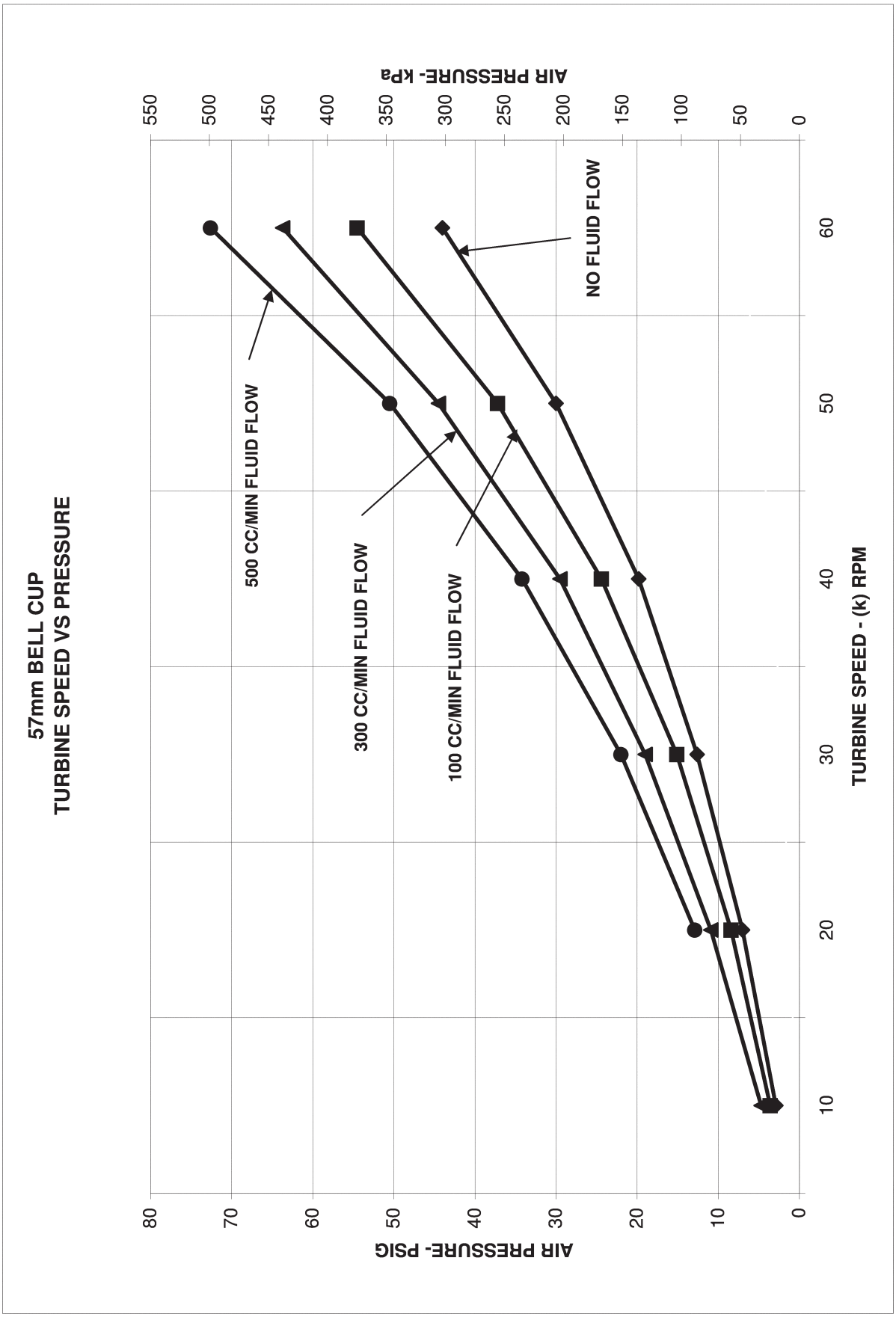


70MM BELL CUP WITH MCV VALVE CONFIGURATION

WEIGHT: 15.85 LBS/7.19 Kg


30mm BELL CUP
TURBINE SPEED VS PRESSURE
AIR PRESSURE- PSIG
0
5
10
15
20
25
30
35
40
45
50
AIR PRESSURE- kPa
0
50
100
150
200
250
300
350
TURBINE SPEED - (k) RPM
10
20
30
40
50
60
NO FLUID FLOW
300 CC/MIN FLUID FLOW
100 CC/MIN FLUID FLOW


57mm BELL CUP
TURBINE SPEED VS PRESSURE
AIR PRESSURE- PSIG
AIR PRESSURE- kPa
TURBINE SPEED - (k) RPM
500 CC/MIN FLUID FLOW
300 CC/MIN FLUID FLOW
100 CC/MIN FLUID FLOW
NO FLUID FLOW
0
10
20
30
40
50
60
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400
450
500
550
10
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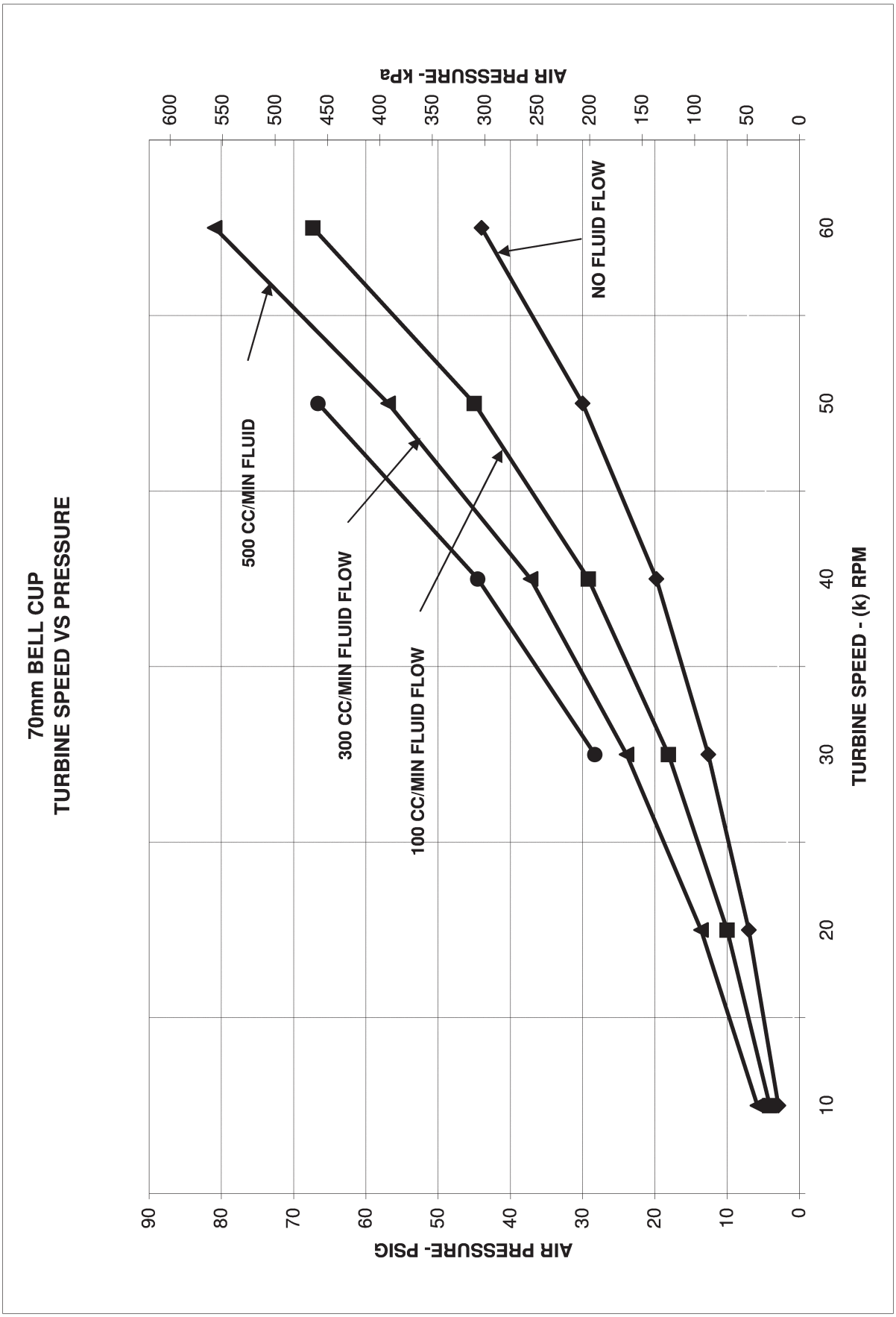
30
40
50
60


70mm BELL CUP
TURBINE SPEED VS PRESSURE
AIR PRESSURE- PSIG
0
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30
40
50
60
70
80
90
AIR PRESSURE- kPa
0
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100
150
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250
300
350
400
450
500
550
600
TURBINE SPEED - (k) RPM
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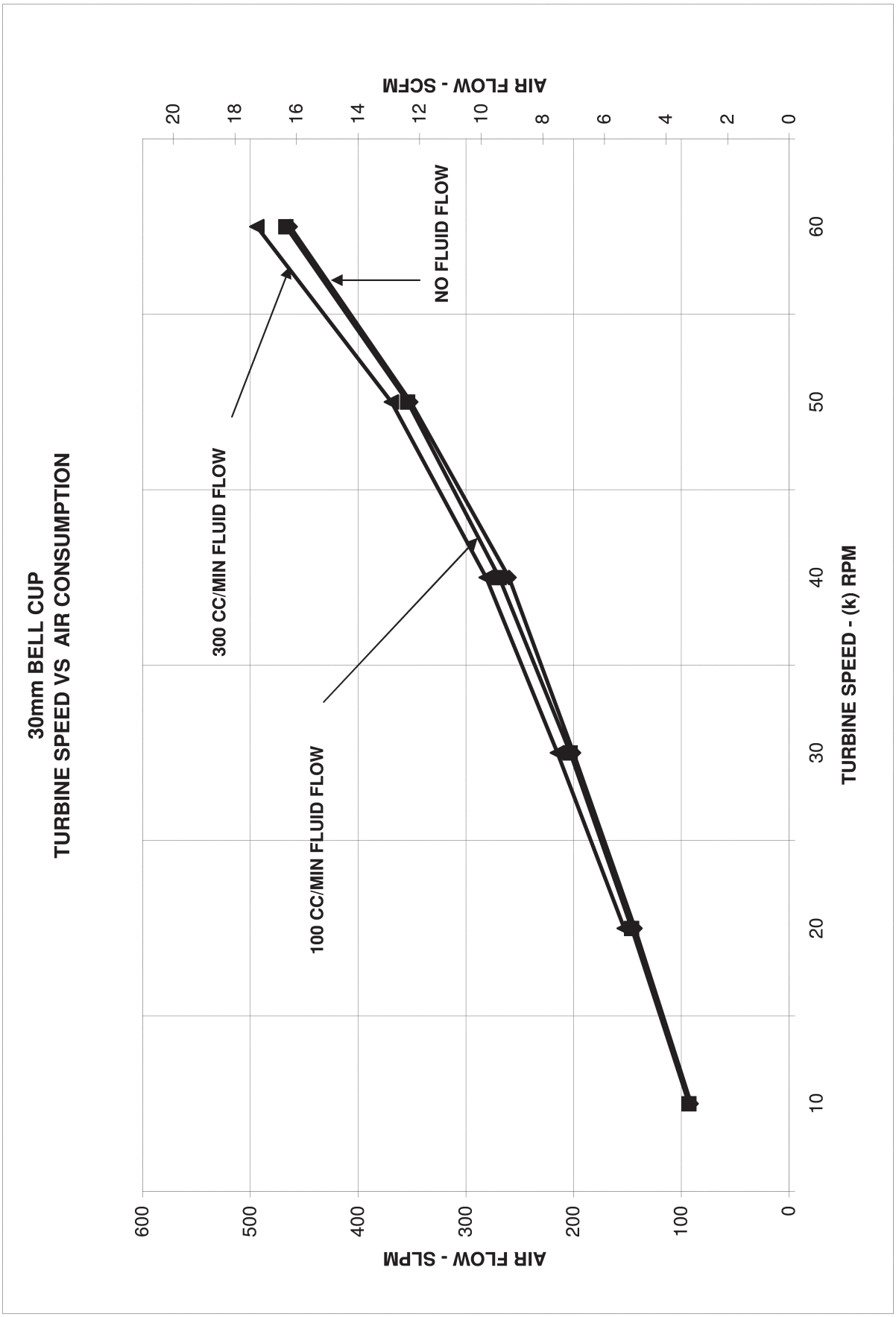
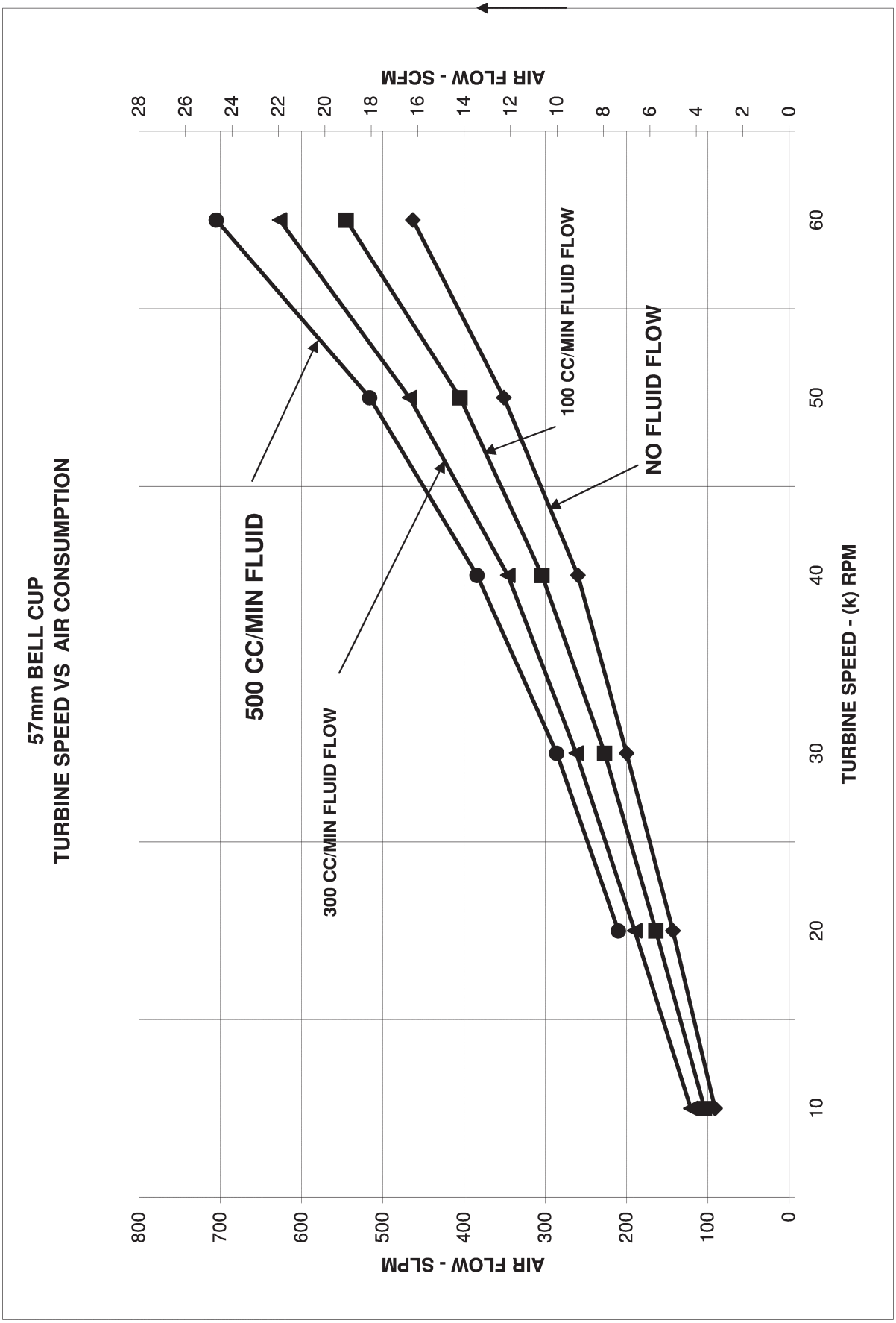
30
40
50
60
NO FLUID FLOW
500 CC/MIN FLUID
300 CC/MIN FLUID FLOW
100 CC/MIN FLUID FLOW


30mm BELL CUP
TURBINE SPEED VS AIR CONSUMPTION
AIR FLOW - SLPM
AIR FLOW - SCFM
TURBINE SPEED - (k) RPM
NO FLUID FLOW
300 CC/MIN FLUID FLOW
100 CC/MIN FLUID FLOW
0
100
200
300
400
500
600
0
2
4
6
8
10
12
14
16
18
20
10
20
30
40
50
60


57mm BELL CUP
TURBINE SPEED VS AIR CONSUMPTION
AIR FLOW - SLPM
AIR FLOW - SCFM
TURBINE SPEED - (k) RPM
500 CC/MIN FLUID
300 CC/MIN FLUID FLOW
100 CC/MIN FLUID FLOW
NO FLUID FLOW
0
100
200
300
400
500
600
700
800
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30
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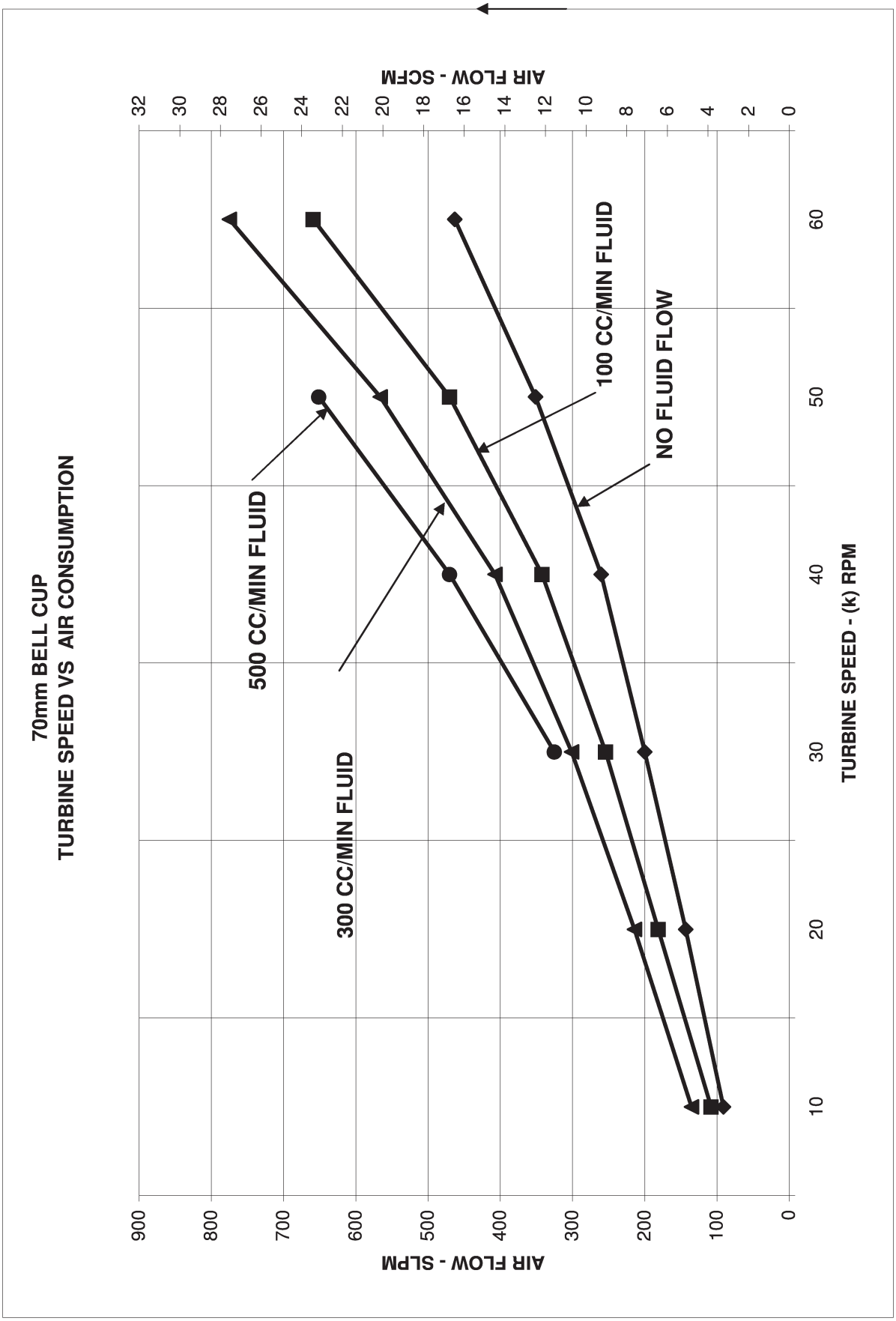
50
60


70mm BELL CUP
TURBINE SPEED VS AIR CONSUMPTION
AIR FLOW - SLPM
AIR FLOW - SCFM
TURBINE SPEED - (k) RPM
500 CC/MIN FLUID
300 CC/MIN FLUID
100 CC/MIN FLUID
NO FLUID FLOW
0
100
200
300
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600
700
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900
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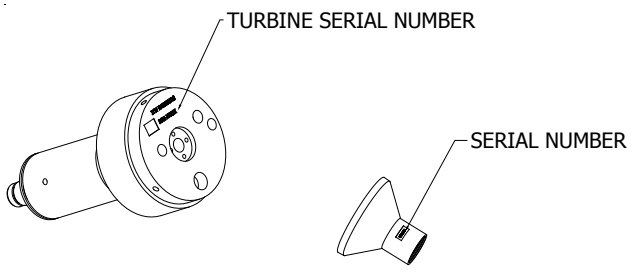
60

IMPORTANT NUMBERS

Record these numbers in a log book for future reference.

The last digits of the Atomizer serial number are also the Turbine serial numbers.



NOTES

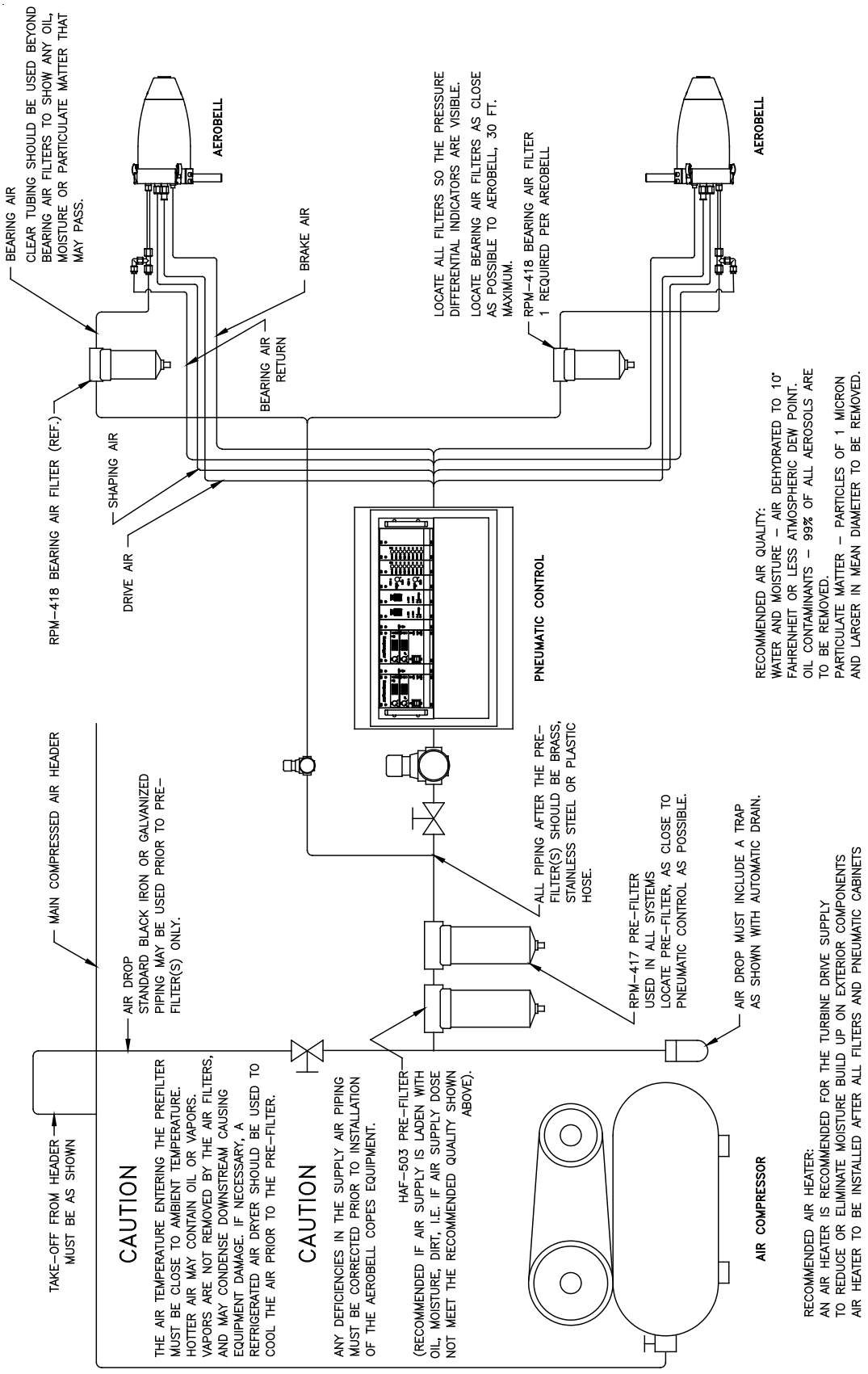


Figure 1: Aerobell Models Recommended Air Filtration

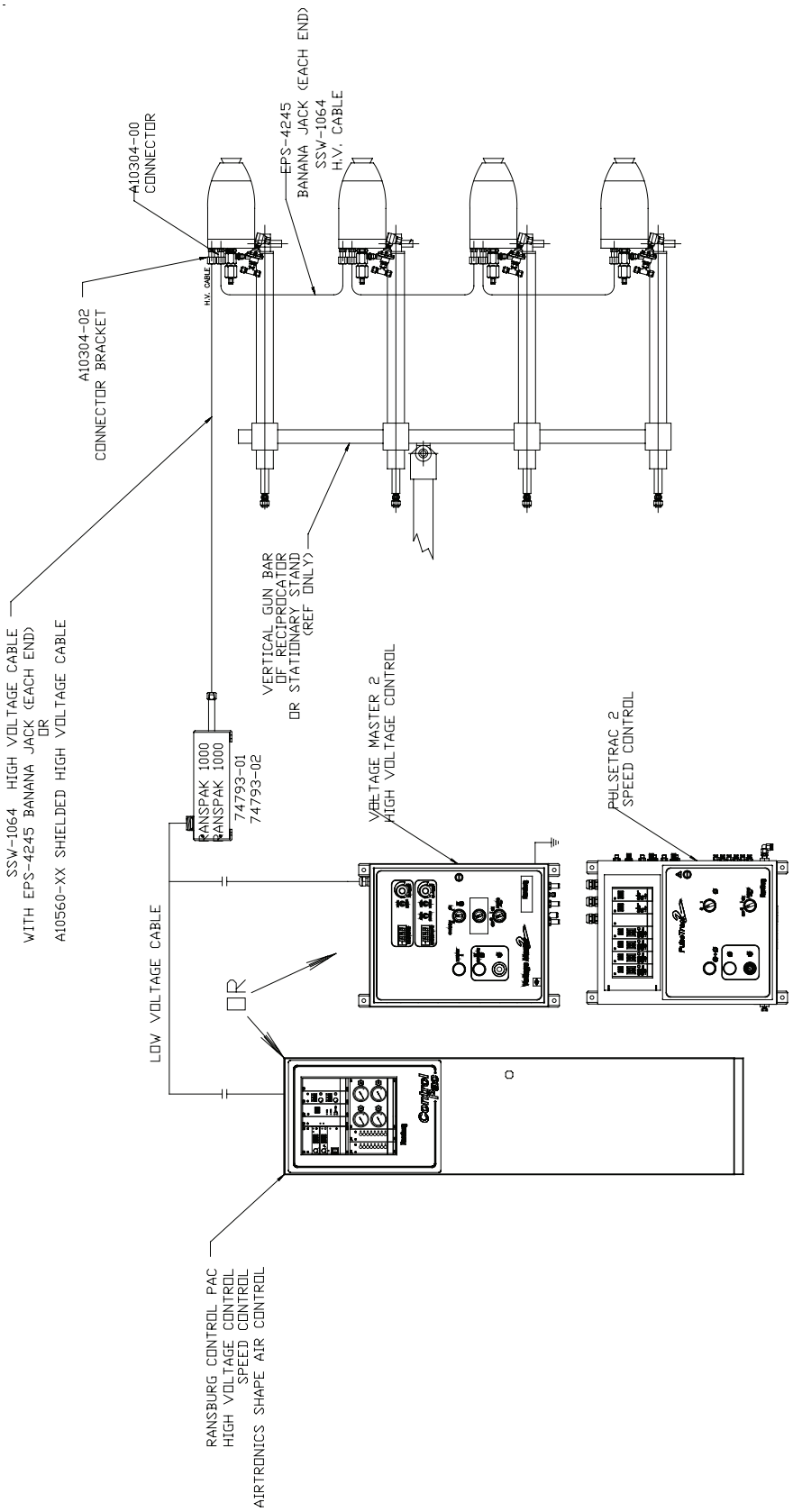


Figure 2: Typical Multiple Applicator Configuration - MicroPak and RansPak 1000 Cascade

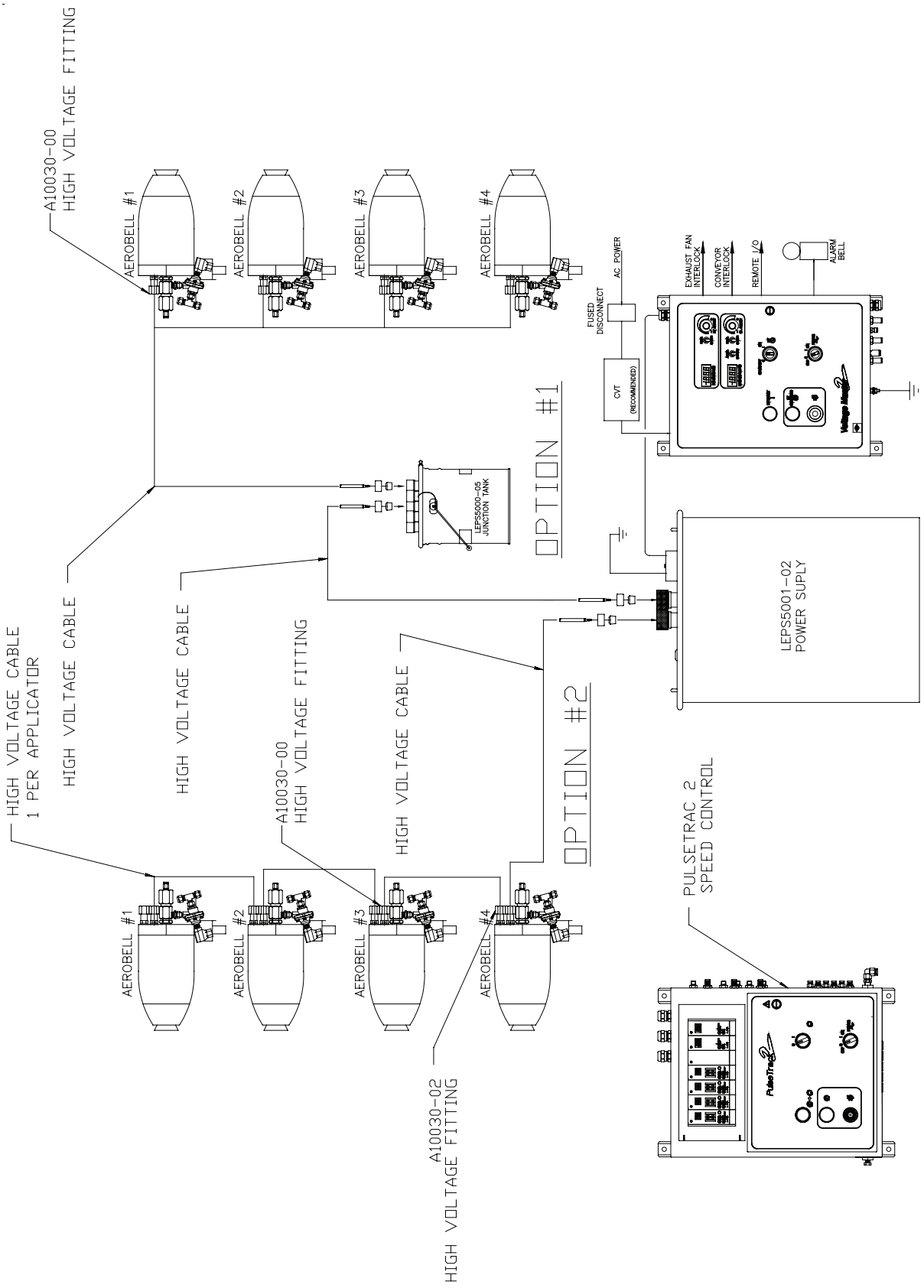


Figure 3: Typical Multiple Applicator Configuration - Voltage Master 2 and PulseTrack 2 Speed Control

INSTALLATION

⚠ WARNING

➤ Risk of arcing/fire hazard. The Aerobell must be located a safe distance from the object to be sprayed, as well as all other grounded objects. The safe distance is at least 1-inch per 10kV of electrostatic voltage. Example: If the Aerobell is used with 100kV applied voltage, it must be at least 10-inches from the object to prevent arcing.

The Aerobell shipping container includes the basic atomizer assembly with bell and manifold. Also required with the system are 2 (or more) RPM-419 wrenches (ordered separately). The RPM-419 wrenches are used to remove the shaping air cap and air ring, and the bell cup (wrenches not required during installation as the cap, ring, and bell are mounted in place). The optional CCV Color Change Valve assemblies are ordered and shipped separately.

Mount the Aerobell securely to a stationary or reciprocating fixture with the 3/4-inch diameter stud provided.

AIR FILTER INSTALLATION

The following guidelines must be observed when installing air filters for the Aerobell system (see "Air Filtration Requirements Chart" for additional information).

1. Use only recommended pre-filters and bearing air filters as shown in "Recommended Air Filtration Requirements" in this section. Additional system air filtration (i.e., refrigerated air dryer) may also be used if desired.

2. Use one bearing air filter per Aerobell.

3. Mount the bearing air filter as close as possible to the Aerobell (do not mount further than 30 feet away).

4. Where possible, the pre-filter(s) and bearing air filter(s) should be mounted where they can be easily seen, so the user will see when maintenance is required.

5. Standard black iron or galvanized piping may be used prior to the HAF-515 or RPM-417 pre-filters only. All piping after the pre-filter should be brass, stainless steel, aluminum, or hose (poly, nylon, nyliner, etc.).

6. **Do not** use tape, pipe dope, or other thread sealant downstream of the bearing air filter. Loose flakes of tape or other sealant can break loose and plug the very fine air holes in the turbine bearings.

7. Use clear see-through air tubing between the bearing air filter and bearing air fitting to clearly indicate to the user if oil or moisture contamination is getting past the filter.

8. If air heaters are used in the system (to minimize the effect of excessively humid conditions), and the heated air will exceed 120°F, the heaters must be located after all filters to prevent damage to the filter media.

AIR FILTRATION REQUIREMENTS

Ransburg Filter Model No.	Description / Specifications	Replacement Element Part No.
HAF-515	Pre-filter, removes coarse amounts of oil, moisture and dirt. Used upstream of RPM-417 pre-filter (used in systems with poor air quality).	HAF-5 Element, One
RPM-417	Pre-filter, coalescing type, 136 SCFM, 98.5% efficiency particulate removal .3 to .6 micron, max. aerosol passed 1.0 micron, max. solid passed .4 micron (dependent upon SCFM requirement per applicator, one RPM-417 can be used with up to three Aerobell assemblies).	RPM-32 Elements, Carton of 4
RPM-418	Bearing air filter, coalescing type, 19 SCFM, 99.995% efficiency particulate removal .3 to .6 micron, max. aerosol passed .6 micron, max. solid passed .2 micron (one per Aerobell).	RPM-33 Elements, Carton of 8

⚠ CAUTION

► Air must be properly filtered to ensure extended turbine life and to prevent contamination of the paint finish. Air which is not adequately filtered will foul the turbine air bearings and cause turbine failure. The correct type of filters must be used in an Aerobell system. The filter elements must be replaced on a regular schedule to assure clean air.

► **It is the user's responsibility to ensure clean air at all times. Turbine failure resulting from contaminated air will not be covered under warranty.** If other filters are incorporated in the system, the filters to be used must have filtering capacities equal or better than those shown in "Air Filtration Requirements Chart".

► The user must ensure the bearing air supply is not inadvertently turned off while the Aerobell air motor is turning. This will cause air bearing failure.

NOTE

► Each applicator must have its own filter for bearing air. Recommended: RPM-418 or equivalent.

AIR HEATER REQUIREMENTS

Turbine drive air expands as it moves through the turbine wheel cavity and as it exits the turbine from the exhaust port. This expansion will cause cooling of the exhaust air and the surfaces it contacts. This same expansion cooling can occur across the shaping air exit ports. This cooling effect can cause surface temperatures to fall below the dew point of the booth, which will result in condensation on the interior and exterior of the atomizer, machine, and its components. It is even possible that the temperature of the supply air may be below the booth dew point, even without additional expansion cooling.

Condensation is especially probable in waterborne applications when booth temperature and relative humidity levels are typically maintained very high. This condensation will allow sufficient conductivity of the surfaces such that they act as an erratic ground source potential. This can cause damage to the equipment.

It is therefore, a requirement that turbine exhaust air temperature be maintained above the booth dew point to prevent condensation from forming on atomizer surfaces. Doing so will eliminate moisture as a potential defect in painted surfaces as well as extending equipment life. Thus, it is recommended that air heaters be installed into the atomizer air supply lines, i.e. shaping air. The air heaters must be of sufficient capacity capable of raising the incoming air temperature at least 40°F (4.4°C) at a flow rate of 60 SCFM per applicator.

The actual air heater process setting depends on applicator fluid flow rate load, booth conditions, turbine airflow settings, and incoming air temperature. The heater should be set as low as possible, sufficient to maintain the applicator surface temperatures above the dew point in the booth.

Example: With the incoming air temperature at 72°F (22.2°C), an Aerobell with 70mm bell cup rotating unloaded at 60 krpm has a turbine outlet temperature drop of approximately 28°F (-2.2°C) (@ 40 krpm unloaded, ΔT ~ 14°F (-.10°C).

Referring to the ASHRAE Psychrometric chart, the saturation temperature range (dew point) of a spray booth maintained at 70-75°F / 65-70% RH is 62-68°F (21.1-23.9°C / 65-70° RH is 16.7-20°C). Thus it is almost certain that the surface temperatures of the applicator will fall below the dew point of the booth, and an air heater will be needed in this case.

To prevent condensation, an air heater assembly should be assembled after the air filters. (Reference the current "Air Heater Assembly" service manual for further information.)

NOTE

► Failure to use an air heater may cause damage to equipment or ruin the finished component being processed.

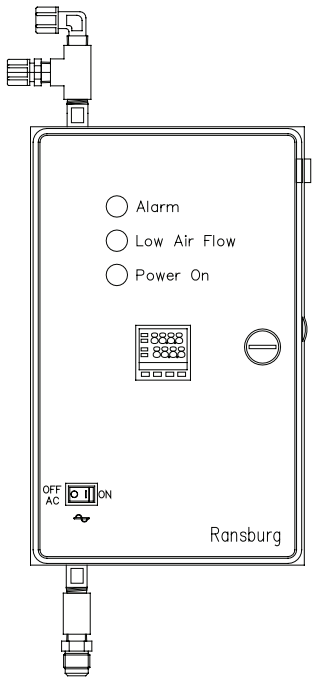


Figure 4: A11065-05 Air Heater

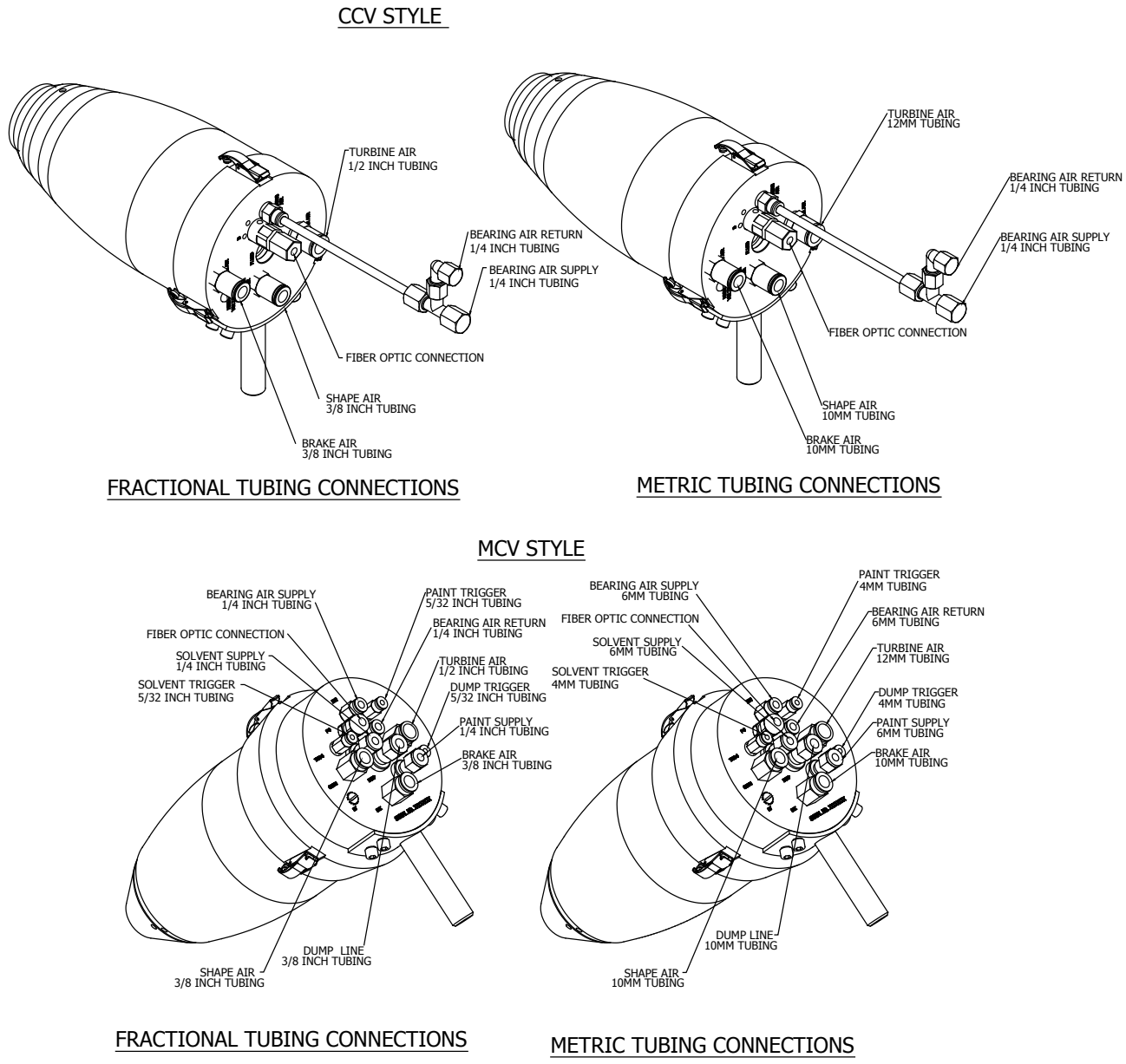


Figure 5: Tubing Connections

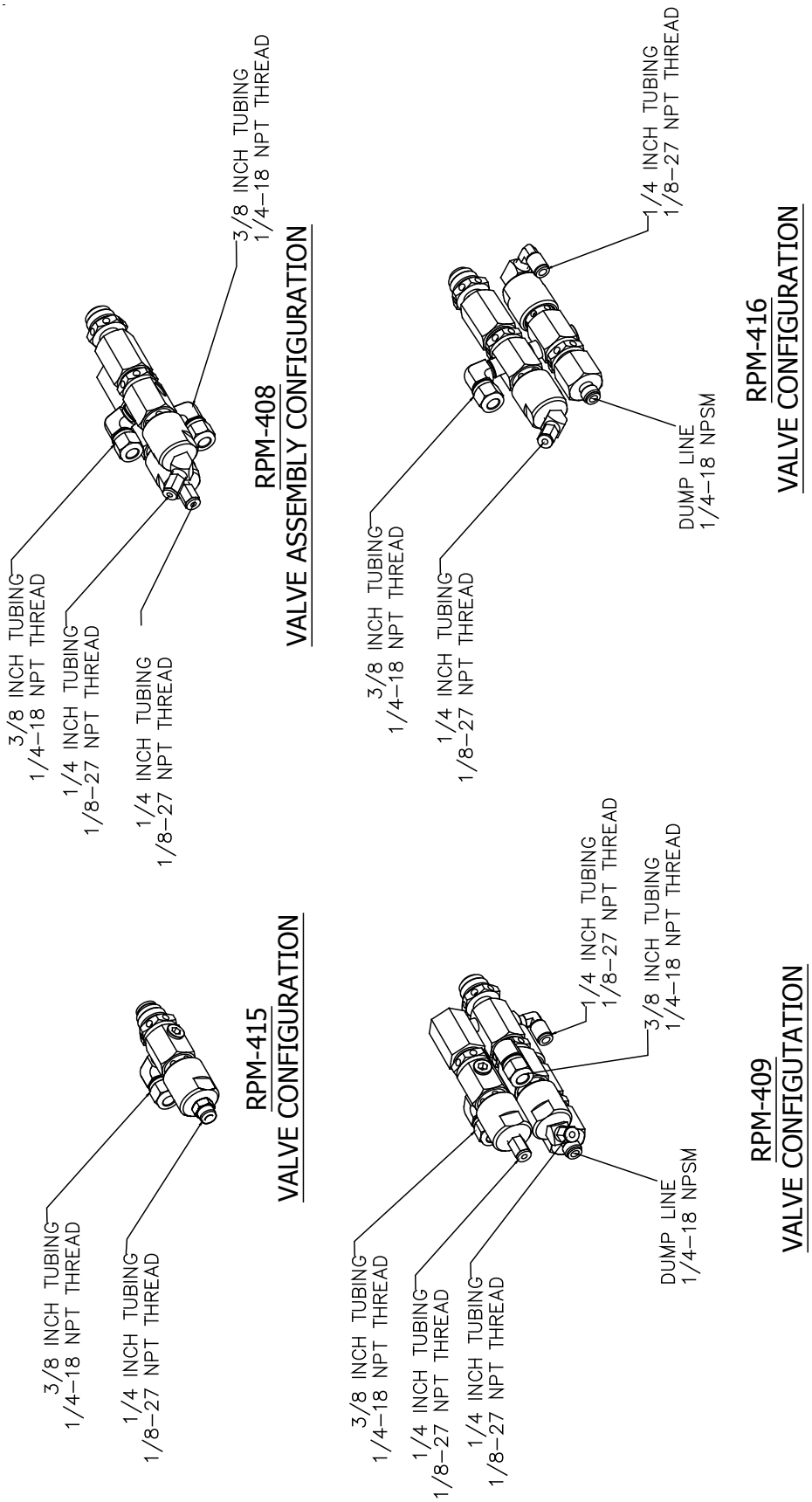
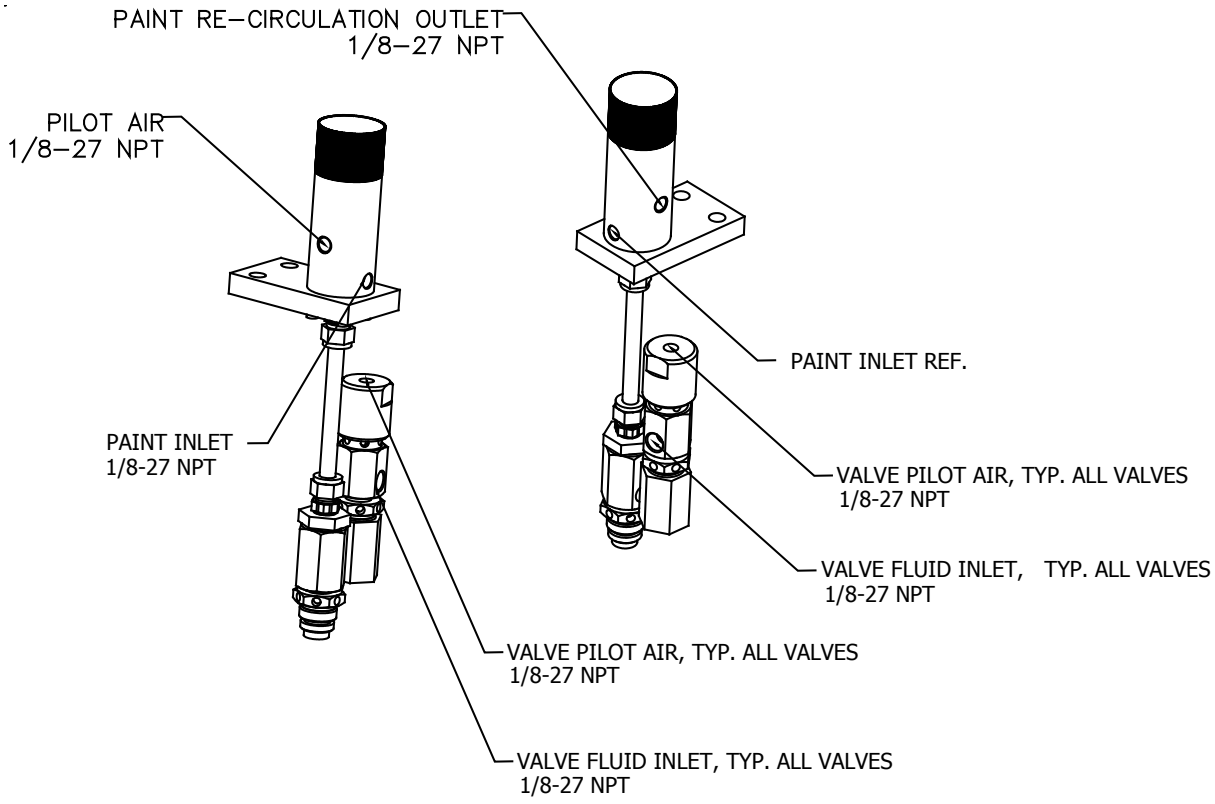
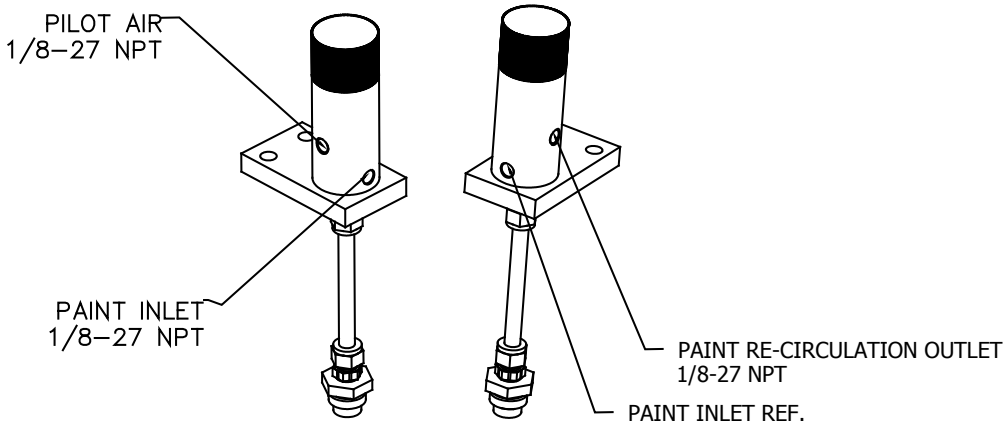


Figure 6: Valve Configurations



A12383-01/-02 3-WAY
VALVE WITH CCV
SOLVENT VALVE



A12382-01/-02 3-WAY
VALVE

Figure 7: 3-Way Valves

AIR CONNECTIONS

⚠ WARNING

► Arcing/fire hazard exists if ungrounded metal connections (air or fluid) are used in the spray area. Use plastic non-conductive connections, or ensure metal connections are at ground potential.

(See Figures 5, 6, and 7 for tubing connections and sizes.)

⚠ CAUTION

► Do not use tape or pipe dope on any air fittings beyond the final air filter for BEARING AIR. The tape or dope may break free and cause plugging of the turbine air bearings, and result in turbine failure.

Bearing Air

Use tubing (clear, see-through, nylon, natural) to connect a properly filtered air source to the bearing air fitting on the manifold. It is recommended to use tubing (clear, see- through) for bearing air so that any contamination that gets past the final bearing air filter will be apparent. Also refer to the previous "Caution".

Under the “Operation” section which follows, there is a "Caution" regarding bearing damage if the turbine is run while bearing air is off. Since the turbine must not be operated without first turning on bearing air, it is required to provide some means of assuring the presence of bearing air before turning the turbine “On.” One method is by interlocking the turbine drive air to the bearing air (i.e., with an air piloted valve).

⚠ CAUTION

► Provisions should also be made to assure bearing air remains on during the coast down period when turbine air is turned off. See “Specifications” in the "Introduction" section of this manual.

Brake Air

NOTE

► Brake air is used to slow the turbine when changing speed. It is recommended that the brake air and turbine drive air be interlocked.

Turbine Air

Turbine drive air must be interlocked with paint flow. Damage to spindle will occur if paint is triggered without the bell cup spinning. It is recommended that the bell cup is spinning at least 10,000 rpm before any fluid is turned on.

FLUID CONNECTIONS

(See Figures 5, 6, and 7 for connections.) See the following "Note".

NOTE

► If the coating material used is heated, check the maximum rated temperature for the fluid tubing to be used. Polyethylene tubing (H-2338 and H-2339) is rated for a maximum of 80°F (27°C). Nylon tubing (H-2340 and H-2341) is rated for 200°F (95°C) maximum.

HIGH VOLTAGE

(See Figures 2 and 3 "Typical Multiple Application Configurations" in the "Introduction" section.)

INTERLOCKS

The following system interlocks are recommended to prevent equipment damage:

1. Bearing air should remain on at all times and should be shut off only by turning off the main air to the pneumatic control cabinet.

⚠ CAUTION

► When the turbine air is turned off, the turbine will continue to operate or "coast down" for about two minutes. Provisions should be made to assure that the operator waits at least three minutes, after shutting off the turbine air and before shutting off the main air supply.

► The bell cup must be removed when making flow checks. If the paint is turned on when the bell is mounted and the turbine shaft is not rotating, paint will enter the shaft and possibly damage the air bearing. Material flow checks (flow rate verification) must be made with the bell cup off and the turbine not rotating. Normally pneumatic interlocks will not allow the paint to trigger on when the turbine air is off. These interlocks may need to be bypassed with proper safety procedures as required.

⚠ CAUTION

► Bell cup must be rotating at least 10,000 rpm when fluid is triggered. Turning on fluid without the bell cup spinning may flood the turbine and cause damage to components.

⚠ WARNING

► Under normal operation, the high voltage and/or coating material must never be turned on unless the bell cup is mounted on the motor shaft and the turbine is rotating.

► Pneumatic input to the turbine air inlet must be controlled to prevent the turbine from exceeding the maximum rated speed of 60,000 rpm. (See "Specifications" in the "Introduction" section.)

► High voltage must never be turned on while cleaning solvent is being sprayed either through the applicator supply or the cup wash line. High voltage and both solvent triggers must be interlocked.

2. It should not be possible for the coating material to be sprayed unless the turbine is spinning.

3. Two (2) interconnected bearing air ports are provided, one for supply air and the other to be used as a return signal for measuring bearing air pressure at the atomizer. If bearing air falls below 60 psi (413 kPa) at the atomizer, the turbine air should be automatically interlocked to shut off. This interlock is provided by the Serial Atomizer Module (see current "Serial Atomizer" manual).

4. High voltage must be interlocked with the solvent valve pilot signal to prevent solvent flow while high voltage is energized.

⚠ WARNING

► Never spray solvent with high voltage on.

5. Turbine air and brake air must be interlocked to prevent both from being used simultaneously. This interlock is provided by the Serial Atomizer Module (see current "Serial Atomizer"manual).

6. Any other interlocks required by local code, national code, or international code.

7. High voltage must be interlocked with the booth entry door.

HIGH VOLTAGE CABLE ASSEMBLIES

General Instructions

1. When routing cable, ensure that no chaffing, binding, or pulling on the cable will occur. Maintain at least a 4-inch bend radius. When possible, sleeve cable with the appropriate sized tubing for external cable protection. Torsion stress should be minimized.

2. Considerations should be taken when routing cables next to other cabling and fluid tubing. Be cognizant of the placement of such cable near control wires and fluid lines. Follow NEC wiring standards where applicable. Separation of AC, control wiring, and fluid tubing is advisable.

3. To ensure that all cable connections are clean and free of foreign materials, wipe with Naphta. This also applies to the cascade, splitter, and applicator connectors.

4. Apply dielectric grease (LSCH0009-08) on all cable end connectors (cascade, splitter, and applicator) to displace any encapsulated air.

5. Each time a cable is replaced, the nut assembly (78441-00) must also be replaced.

6. Ensure that no conductive sponges are used in any connector!

7. A10560-XX cables are not to be modified in the field. To do so will void any and all warranties that may exist.

HIGH VOLTAGE CABLE CONFIGURATIONS

There are two (2) high voltage cable assemblies available:

A10560-XX is a shielded cable and is the most flexible. It is available in several lengths per the "Accessories" chart in the "Parts Identification" section.

79006-XX is a metallic core conductor cable with a polyethylene jacket and an exterior sleeve. It comes pre-assembled with banana jacks at each end.

A third option is to build your own cable to a specific length not to exceed 100-ft. (30.5 meters) in length. A non-shielded metallic conductor cable (SSW-1064) is used. the end user must intall the EPS-4245 banana jacks. It is hightly recommended that an insulating jacket (79007-00) be installed over the assembly to protect it from damage.

HIGH VOLTAGE INSTALLATION CONFIGURATIONS

Cascade RP1000 Installation (74793-XX) with MicroPak Control

1. Loosen connector nut assembly from the cascade.

Apply dielectric grease (LSCH0009-08) on the cascade end of the high voltage cable and in the cascade tube.

Insert the cable through the back of the compression nut followed by the plastic gripper and sleeve
(78441-00).

Insert the high voltage cable through the cascade high voltage tube, all the way through the nut assembly to the banana plug socket in the cascade tube assembly.

Slide the fitting and start threading on to the high voltage cascade tube threads. (Each piece of the fitting may have to be slid into place starting with the sleeve followed by the plastic gripper and then the nut.)

Turn the nut hand tight.

Wrench tighten the nut 1/2 turn.

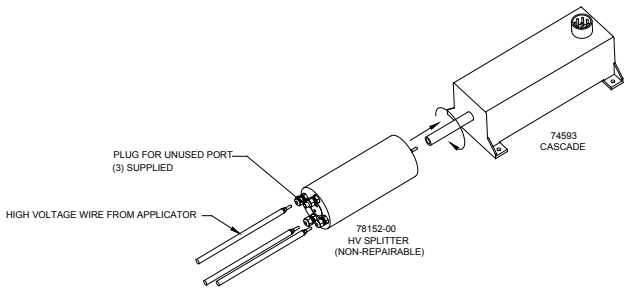
Pull on cable to ensure a secure fitting. If the cable is loose and can be pulled free, then reinsert cable into cascade and follow these steps again with an additional 1/2 turn on the nut.

2. Attach the ring lug of the green ground wire (shield cables A10560-XX only) securely to a known good earth ground source.

High Voltage Splitter Installation (78152-00) (See Figure 8)

The splitter can be used for up to four atomizers.

1. Remove nut from end of cascade extension tube (78441-00). Apply a small amount of dielectric grease to tip of the banana jack of the high voltage splitter assembly. Slide the banana jack into the cascade tube until it bottoms. Tighten onto threads by turning clockwise until snug.



2. Loosen one of the connector nuts from the high voltage splitter assembly.

Apply dielectric grease (LSCH0009-08) on the cascade end of the high voltage cable and in the splitter assembly.

Insert the high voltag e cable through the back of the nut all the way through the nut assembly to the banana plug socket in the splitter body.

Turn the nut hand tight.

Wrench tighten the nut 1/2 turn.

Pull on cable to ensure a secure fitting. If the cable is loose and can be pulled free, then reinsert cable into high voltage splitter and follow these steps again with an additional 1/2 turn on the nut.

3. Attach the ring-lug of green ground wire (shielded cables A10560-XX only) securely to a known good earth ground source.

Voltage Master 2 (78789) Cable Installation

The Voltage Master 2 contains a control panel and a power supply (LEPS5001). To install the high voltage cable, loosen the nut on the top of the LEPS5001-02 power supply tank and insert the high voltage cable through the nut and rubber gromment and push into tank until the banana jack is fully seated. Tighten the nut firmly by hand to grip the cable.

To connect multiple applicators, you can connect a high voltage cable from LEPS5001-02 tank to the input of a LEPS5000-05 junction tank. Up to five (5) applicators can be supplied from the junction tank. High voltage cable connection on this tank is the same as the Voltage Master 2 tank.

Another method for connecting multiple applicators from the Voltage Master 2 is to "daisy chain" by using high voltage fittings A10030-00 and A10030-02 (see "Figure 3 - Typical Multiple Applicator Configuration Voltage Master 2 and PulseTrack 2 Speed Control" in the "Introduction" section).

High Voltage Cable Assembly Instructions

(Instructions for assembling components when using High Voltage Cable SSW-1064)

1. Measure and cut cable to desired length. Make sure ends are cut square.

2. Thread banana plug assembly (EPS-4245) into the cable (SSW-1064) by hand for two turns. **Make sure to start on center of cable.**

3. Take a 5/16" deep well nut driver and slip it over the banana plug and cable. The nut driver will act as a guide while tightening the banana plug in place. Tighten banana plug until the hex seats on the face of the cable. Check periodically to ensure screw of banana plug is being driven into center of cable.

Do this procedure for both ends of cable.:

4. After assembling, use an ohm meter to check for continuity from one end of the cable to the other. **The reading should be 10 ohms or less.** (Refer to Figures 9a and 9b for pre-assembled and assembled pictures.)

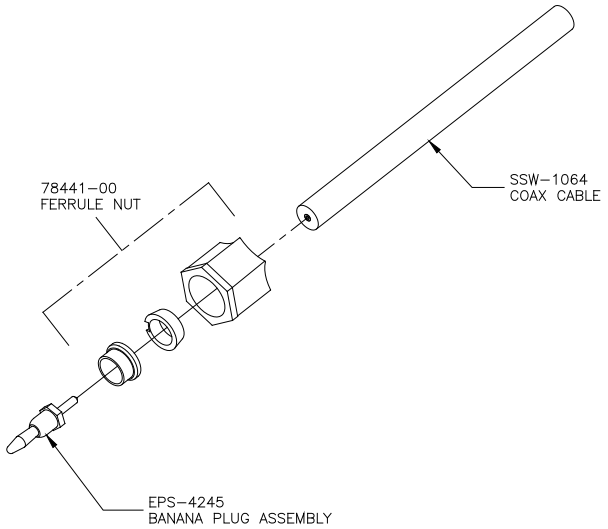


Figure 9a: High Voltage Cable Assembly

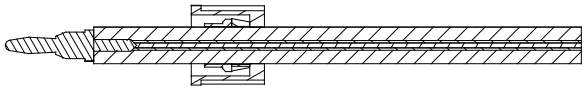


Figure 9b: Assembly Cross Section

Aerobell High Voltage Connect at Atomizer End (All High Voltage Cables)

Insert high voltage cable with banana plug assembly thru ferrule nut (78441-00) and into high voltage connection (A10030-02 or A10030-00) until it bottoms into hole and seats firmly. Tighten compression nut by hand, then tighten 1/2 more turn with a wrench. Pull on cable to ensure a secure fitting. If cable is loose and can be pulled free, then reinsert cable and re-tighten as discussed previously.

OPERATION

⚠ WARNING

► Operators must be fully trained in safe operation of electrostatic equipment. Operators must read all instructions and safety precautions prior to using this equipment (reference NFPA-33).

As with any spray finishing system, operation of the Aerobell involves properly setting the operating parameters to obtain the best finish quality for the coating material being sprayed, while maintaining correct operation and reliability of the equipment used. Adjustments to operating parameters, which cover spraying, cleaning, and on/off control, include:

- Coating Materials
- Fluid Flow Rate Control
- Fluid Valve / Trigger Control
- Turbine Speed
- Shaping Air (Pattern Control)
- Brake Air
- Electrostatic Voltage
- Target Distance

TURBINE SPEED

The speed of the turbine is determined by the air inlet pressure. See "Turbine Air Pressure, RPM, SCFM" in the "Installation" section for more information. The desired speed will depend upon the type of coating material and various application requirements.

⚠ CAUTION

► Excessive speed will cause air turbine damage. Do not exceed the maximum rated speed of 60,000 rpm.

Turbine speed may be controlled by either the use of A11515-XXXX PulseTrack 2 or A11925-00 Serial Atomizer Module in an Euro rack configuration or as part of A11000-XX Control Pak system.

BEARING AIR

⚠ CAUTION

► Air bearing air **must** be on whenever the turbine is operated. If not, severe bearing damage will occur. It is recommended to leave bearing air on at all times. During maintenance or disassembly, turbine air must be off for at least 3 minutes before shutting off bearing air or main line air.

Bearing damage (and subsequent turbine failure) caused by running the turbine without bearing air will not be covered under Ransburg warranty.

When turning the turbine on, bearing air must be present. Likewise, bearing air must remain on when the turbine air is turned off until the turbine stops spinning. Never turn off bearing air to cause the turbine to stop spinning. Brake air can be used to slow the turbine (see "Brake Air" in this section). Wait for the turbine to stop spinning before turning bearing air off.

⚠ CAUTION

► Operating the turbine with bearing air pressure below 60 psi (measured at turbine inlet) may cause bearing damage.

The nominal bearing air pressure is 80 psi, 60 psi minimum, 100 psi maximum. Under no circumstances should the turbine be operated with less than 60 psi bearing air pressure.

BRAKE AIR

Brake air is used to slow the turbine speed. It is advantageous for short color change cycle times, and may be used for stopping the turbine. Use of the brake involves (1) turning off turbine drive air, and then (2) turning the brake air on for a short duration. For example, the air brake will reduce the turbine speed as shown in "Braking Time" chart.

Braking Time (at 90 psi Brake Air Pressure)	
To Brake From (RPM)	**Seconds (Approx.)**
60,000 to 40,000	3.7
60,000 to 20,000	7.5
60,000 to 0	12.9
40,000 to 20,000	4.0
40,000 to 0	9.0

Brake air should be interlocked so that it is imposible for air to be applied to the braking system while the turbine air is on.

⚠ WARNING

► Electrical discharge of a high electrical capacitance fluid/paint system can cause fire or explosion with some materials. If arcing occurs when a specific coating material is used, turn the system off and verify that the fluid is non-flammable. In these conditions, the system is capable of releasing sufficient electrical and thermal energy to cause ignition of specific hazardous materials in the air.

ELECTROSTATIC VOLTAGE

Depending upon the power supply model used, the maximum output voltage of the power supply can vary. The actual voltage setting will depend upon various coating application requirements. The level of voltage applied to the Aerobell plays an important role with regard to pattern size, efficiency (wrap), penetration into cavity areas, and target distance.

SHAPING AIR

Shaping air is used to shape the spray pattern. The lower the pressure, the wider the pattern, and conversely, higher pressures result in narrower patterns. Shaping air does not help atomize the material, but does assist in the penetration of atomized particles into cavity areas. Shaping air should be kept at a minimum consistent with coating requirements. Excessive shaping air will cause some atomized particles to blow by the target not allowing full “wrap,” or paint particles to bounce back onto the atomizer.

FLUID FLOW RATE CONTROL

Externally mounted fluid regulators or gear pumps are typically used to control fluid flow.

The atomizer assembly is equipped with valves which are pneumatically operated to direct the flow of paint to either the feed tube or dump line and to supply an intermittent solvent to clean the interior of the bell cup.

Three (3) fluid tube sizes are available: 1/16", 3/32", and 1/8" (1.6mm, 2.4mm, and 3.2mm).

Fluid Flow Rate Check

In the test mode, the flow rate can be measured by removing the bell cup from the atomizer, turning the fluid flow on, and capturing the material in a graduated beaker or measuring cup for a fixed period of time (shaping air, high voltage, and turbine air must be off).

WARNING

► Danger of shock and/or personal injury can occur. Proper grounding procedures must be followed. Personnel must never work around the turbine when the turbine is spinning or when high voltage is turned on.

TARGET DISTANCE

The distance from the Aerobell atomizer to target affects the spray application. For instance, closer distances give a smaller spray pattern and greater efficiency. Increasing the distance will give a larger pattern and possibly reduce efficiency. If the distance is too great, material may “wrap back” on the Aerobell. However, coming too close may cause arcing. (See the following "Warning".)

WARNING

► Risk of arcing/fire hazard. The Aerobell must be located a safe distance from the object to be sprayed, as well as all other grounded objects. The safe distance is at least 1-inch per 10kV of electrostatic voltage. Example: If the Aerobell is used with 100kV applied voltage, it must be at least 10-inches from the object to prevent arcing.

MATERIAL CONDUCTIVITY

The Aerobell can be used with a full range of conductive coating materials. With coatings having higher conductivity, it may be necessary to isolate the material supply tank and hoses from ground. If there is any question as to the suitability of spraying a material with the Aerobell, contact your Ransburg distributor or representative. (See the following "Warning".)

WARNING

► Electrical discharge can cause fire or explosion. If arcing occurs when a specific coating material is used, turn the system off immediately and notify your coating supplier. Do not restart system until proper adjustments are made to your coating material.

TURBINE AIR

NOTE

► If the turbine drive air is heated, check the maximum rated temperature for the air supply tubing to be used. Polyethylene tubing is rated for a maximum of 80°F (27°C). Nylon tubing is rated for 200°F (95°C) maximum.

MAINTENANCE

⚠ WARNING

► lectrical shock/arcing and fire hazards can exist during maintenance. The high voltage must be turned off before entering the spray area and performing any maintenance procedures. Spray booth exhaust fan(s) should remain on while cleaning the equipment with solvents.

► Never touch the atomizer bell while it is spinning. The front edge can easily cut into human skin. Make sure the atomizer bell has stopped spinning before attempting to touch it. Wait at least three minutes after turbine drive air is off before touching the bell.

In addition to the previous "Warning", which relates to potential safety hazards, the following information under "Caution" must be observed to prevent damage to the equipment.

⚠ CAUTION

► Do **not** immerse the Aerobell turbine in solvent or other liquids. Turbine components will be damaged.

► Bearing air must be on during all cleaning procedures.

► If the Aerobell is sprayed off with a solvent applicator for cleaning, the turbine should be turned on, as well as shaping air (high voltage off). Air exhausting from the turbine and shaping air form a curtain around the back edge of the bell, and help prevent solvent from getting into the cavity behind the bell. Do not direct the solvent spray directly at the opening behind the edge of the bell, as this may allow solvent to be forced into the turbine.

O-RINGS

All o-rings in this atomizer are solvent proof except the ones in the air bearing spindle. These o-rings must not be soaked in solvent; if these are exposed or soaked in solvent, they must be replaced. These o-rings are engineered to provide a fit between the air bearing spindle and it's mating parts to reduce or eliminate harmonic resonance (vibration).

Some o-rings are encapsulated. These o-rings have a limited amount of stretch and will not return to their original diameters if over-stretched. These o-rings are subject to being distorted more easily than rubber o-rings, so it is important that they be sufficiently lubricated when mating parts are installed onto them. They also will take a square set over time and should be replaced periodically if mating parts are removed repeatedly or if a new mating part is installed onto them.

Any o-ring that is cracked, nicked, or distorted must be replaced.

A suitable lubricant is food grade petroleum jell or A11545-00 Petrolatum Jell.

Cleaning Procedures

The precise sequence of flushing the system of paint will vary according to the type of color valve arrangement used, and other automatic features built into the system. But follow these basic procedures when cleaning:

1. Verify high voltage is off.

2. With the bearing air and turbine air on, flush paint out of material lines with solvent. Flushing should be done before any break in production. If the Aerobell is mounted vertical-facing up, rotate to horizontal plane before flushing or cleaning.

3. Flushing should be done with the atomizer bell cup installed. The bell cup will normally be fully cleaned with flushing. However, if there is any remaining paint build up on any areas of the bell after flushing, the bell should be removed for hand cleaning.

4. Clean the bell cup by soaking in an appropriate solvent as long as necessary to loosen paint. Use a soft bristle brush dipped in solvent to remove paint. Make sure all signs of paint are removed (See the following "Caution"). Rinse and dry bell.

Using a non-metallic item (toothpick), clean the center holes of the splash plate. Using plenty of cleaning fluid, flush these holes towards rear of bell cup. Make sure these holes are clean.

5. Before reinstalling the bell onto the shaft, check the tapered mating surfaces of the turbine shaft and bell for any paint residue. Clean any residue. See following "Caution".

⚠ CAUTION

► Using an atomizer bell with paint build-up will cause a bell imbalance. An im-bal-anced bell may cause bearing damage and turbine failure. Also, any paint residue caught between the tapered surfaces can prevent the bell from seating properly and result in an imbalanced condition.

6. Clean the exterior of the Aerobell as follows (read following "Warning" first):

⚠ WARNING

► To reduce the risk of fire or explosion, OSHA and NFPA-33 require that solvents used for exterior cleaning be non-flammable (flash points higher than 100°F/37.8°C). Also, since electrostatic equipment is involved, these solvents should also be non-polar. Examples of non-flammable, non-polar solvents for wipe down are: amyl acetate, methyl amylacetate, high flash naptha, and mineral spirits.

a. If using a rag to hand wipe the Aerobell, turbine air should be off, but leave shaping air on. Be careful not to drip solvent into the opening behind the bell (see step #1).

b. Do not use conductive solvents such as MEK to clean the Aerobell.

7. Do not reuse an atomizer bell that shows signs of damage such as nicks, heavy scratches, dents, or excessive wear.

8. Periodic cleaning of the slots in the shaping air ring will prevent paint build-up which does affect pattern control or cause defects in parts being coated. Follow "Cleaning Shaping Air Slots and Annulus" in the "Maintenance" section and clean the slots of the shaping air ring using a soft bristle brush.

To prevent paint build-up in slots of shaping air ring while installed, clean shroud assembly with shaping air ON. Clean with a damp rag or soft bristle brush. Do not soak or saturate area to force fluid or paint into the slots (70-100 SLPM of shaping air is recommended).

Vibration Noise

If the Aerobell is vibrating or making an unusually loud noise, it usually means there is an imbalance situation. The atomizer bell may have dried paint on it, or the bell may be physically damaged, or there may be paint trapped between the bell and shaft preventing the bell from properly seating. If any of these conditions exist, they **must** be corrected. Excessive imbalance caused by one of these conditions may result in bearing damage and turbine failure. Warranty **DOES NOT** cover failure caused by imbalanced loading conditions.

To determine if the bell is dirty or damaged, remove the bell and turn the turbine on. If the noise is eliminated, the bell cup is the problem. If the noise continues, the turbine may be damaged and should be inspected. Excessive air required to achieve same speed may indicate a faulty or contaminated turbine. **DO NOT** continue to operate a noisy turbine.

PREVENTIVE MAINTENANCE

(See "Preventive Maintenance Schedule")

Daily/Weekly Maintenance

- Due to the close proximity of high voltage to ground potential, a schedule must be developed for equipment maintenance (cleanliness).
- Verify that high voltge is OFF and that shaping air, bearing air, and turbine drive air are ON.
- Open the dump valve, if equipped, flushing all paint from the supply lines and valve module.
- Open the solvent valve, if equipped, flushing all paint from the fluid tube and through the atomizer bell assembly.
- Verify that high voltage is OFF, turbine drive air is OFF, and that the bell cup has stopped spinning. The bearing air and shaping air should remain ON.
- Clean all external surfaces of the applicator using a lint-free rag dampened with solvent. External surfaces include the shroud, valve module, and rear manifold.
- After cleaning, all conductive residue must be removed using a non-conductive solvent, since electrostatic equipment is involved, these solvent should also be non-polar.
- Inspect bell cup for nicks, dents, heavy scratches, or excessive wear. Replace if necessary.

⚠ WARNING

► The high voltage must be turned OFF before entering the spray area and performing any maintenance procedures. Spray booth exhaust fan(s) should remain ON while cleaning the equipment with solvents.

Internal Fluid Path Purge Cleaning and Load

Cleaning the incoming paint line (from paint supply source such as color manifold through the fluid manifold and bell assembly:

Open the dump valve and flush the incoming paint line with solvent or an air/solvent chop. Make sure the last step of the sequence is air to purge the dump line of remaining solvent. To speed the loading of the new paint, leave the dump line open to allow the air in front of the paint push to escape. The length of time the dump valve is open depends on several factors such as viscosity, paint pressure, etc. Timing should be such that the dump is closed as the paint reaches the trigger valve in the atomizer. Paint in the dump line may cause high voltage issues.

To Clean the Fluid Tube and Bell Cup

Using microvalve style manifold, open solvent valve by applying 70-100 psi (482-689 kPa) air pressure to valve pilot line. Fluid will flow through fluid tube into bell cup. Time will be determined by solvent ability to clean sprayed material. **Do not** spray solvent with voltage on! Atomizer must be spinning at least 10,000 rpm.

Using a CCV valve configuration, apply 50-100 psi (345-689 kPa) air pressure to CCV solvent valve pilot. Fluid will flow through fluid tube and into bell cup. Time will be determined by solvents ability to clean sprayed material. **Do no**t spray solvent with voltage on! Atomizer must be spinning at lease 10,000 rpm.

External Atomizer Surface Cleaning

- Verify that the high voltage is turned off.
- All external surfaces may be cleaned using a mild solvent and lint free rags to hand wipe. Turbine drive must be off, but leave bearing air on. The shaping air should have approximately 70 SLPM air flow through each to prevent the solvent from entering these passages.
- Do not spray the unit with a solvent applicator used for cleaning. The cleaning fluid under pressure may aid conductive materials to work into hard to clean areas or may allow fluids to be forced into the turbine assembly.
- Do not reuse an atomizer bell cup that shows any sign of damage such as nicks, heavy scratches, dents, or excessive wear.
- Always final wipe all parts with a non-polar solvent and wipe dry (high flash Naphta, etc.).

Bell Cup Cleaning (Cup Wash) (Without Cleaning the Incoming Paint Line)

Turn off the high voltage and trigger valve. With the bell spinning at 30,000 rpm, turn on the external solvent valve to allow cleaning solvent to flow through the manifold passages, through the fluid tube, and into the bell cup. The spinning bell will atomize the solvent, clean out the bell passages. It is always recommended to blow the solvent line dry after the cleaning operation. Typical bell speed during the cup flush sequence is 30,000 rpm.

⚠ WARNING

➤ **NEVER** wrap the applicator in plastic to keep it clean. A surface charge may build up on the plastic surface and discharge to the nearest grounded object. Efficiency of the applicator will also be reduced and damage or failure of the applicator components may occur. **WRAPPING THE APPLICATOR IN PLASTIC WILL VOID WARRANTY.**

⚠ WARNING

➤ To reduce the risk of fire or explosion, OSHA and NFPA-33 require that solvents used for exterior cleaning, including bell cleaning and soaking, be non-flammable (flash points higher than 100°F/37.8°C). Since electrostatic equipment is involved, these solvents should also be non-polar. Examples of non-flammable, non-polar solvents for cleaning are: Amyl acetate, methyl amyl acetate, high flash naphtha, and mineral spirits.

➤ Do not use conductive solvents such as MEK to clean the external surfaces of the Aerobell with a second cleaning with a non-polar solvent.

➤ When using a rag to hand wipe the Aerobell, the turbine air should be off, but leave both the shaping air and bearing air turned on. Ensure that rotation has come to a complete stop.

AIR FILTERS / ELEMENT REPLACEMENT

⚠ CAUTION

► Introducing air which contains oil, moisture, and dirt may cause wear and damage to the bearings. It is the user's responsibility to monitor the quality of air and to replace the filter elements as often as necessary. Turbine failure caused by poor air quality **will not** be covered under warranty.

REPLACEMENT ELEMENTS

Part#	Qty. Elements Per Carton	Used On
HAF-5	1	HAF-515, Pre-Filter
RPM-32	4	RPM-417, Pre-Filter
RPM-33	8	RPM-418, Bearing Air Filter

Ransburg Aerobell systems should include a prefilter(s) and final filters for all air to the Aerobell unit. The final filter is for bearing air only. All filters contain elements that must be replaced on a regular basis to assure clean air. RPM-417 and RPM-418 filters also contain an automatic drain and pressure differential indicator.

The pressure differential indicator provides a visual indicator that pops up (becomes more visible) as the filter element becomes plugged. Replace the filter elements when the visual indicator becomes visible, don't wait until it pops up fully. As the elements become plugged, their efficiency drops. The frequency of filter element change will depend upon the quality of the plant air. It is recommended that all elements be replaced at least every 4 to 6 months.

In plants where heavy amounts of oil and moisture vapor are present in the air lines, a refrigerated air dryer may be necessary.

The Aerobell is designed to give dependable service and extended life. One of the most important factors in realizing long life is the quality of air. It is therefore essential for the user to closely monitor the quality of their air and to properly maintain the air filters by replacing the filter elements as often as necessary. (Replace elements at least every 4-6 months or more often.)

Atomizer Bell Assembly

Inspect the atomizer bell assembly for any damage, wear, or paint build-up every day.

BELL CUP CLEANINGS

Always verify that high voltage is off and that the atomizer bell is spinning before performing any type of bell flush cleaning cycle.

To reduce the risk of fire or explosion, the solvents used for exterior surface cleaning must have flash points above 100°F (37.8°C). Since electrostatic equipment is involved, these solvents must also be non-polar.

Solvents used for equipment flushing should have flash points equal to or higher than those of the coating material being sprayed.

1. The atomizer bell will normally be fully cleaned during a bell flush cycle. Flushing should be done before any down time or break in production. A bell flush cycle may also be required while spraying batch parts of the same color. Verify that high voltage is off and that the atomizer bell is spinning before flushing through the bell.

2. If there is any remaining paint build-up on any areas of the bell after flushing, the bell should be removed for hand cleaning. The bell's leading edge, splash plate, and serration cuts are some examples of areas for special attention.

Bell Cup Soaking

Bell cups and splash plates can be soaked in a heated solution for up to 2 hours in an ultrasonic cleaner (120°F (49°C) maximum).

Manual Inspection

3. Visually inspect the bell cup edge for signs of abrasion. If the edge is worn or chipped as the result of a collision with a part, replace the cup immediately.

4. Remove splash plate. Inspect for wear on the bell cup where the fluid leaves the large diameter of the splash plate. If any undercut in this area, the cup should be replaced. If worn, replace entire splash plate assembly.

5. Splash plates may be soaked to loosen dried material. Clean with a soft bristle brush. Blow out center holes to dislodge material. Never use any kind of pick instrument to clean these holes, as it will damage them.

6. Soaking the bell in solvent may aid in loosening or removing paint build-up. It is recommended that the splash plate be removed and cleaned separately.

7. Use a soft bristle brush dipped in solvent to remove paint build-up from the serration cuts, paint feed holes or slots, and external and internal surfaces of the bell.

8. A soft, lint free rag dampened with solvent may be used to remove any paint residue from the external and internal surfaces of the atomizer.

9. After removing all paint build-up or residue, rinse the bell in clean solvent and blow dry.

10. Before reinstalling the bell on the shaft, check the mating surfaces of the thread and taper for any paint build-up or residue. Also, check the fluid tip, fluid tube outside diameter, and the shaft for any further paint build-up. These surfaces should be cleaned before installing the bell.

11. It is recommended that extra bell cups be purchased. The cups can then be cleaned off-line in an automated cup cleaner when the second set is in production.

12. Reinstall cups to proper torque 50-70 lbs•in (5.64-7.91 Nm).

CLEANING SHAPING AIR SLOTS AND ANNULUS

In order to maintain uniform pattern control, the shaping air holes of the inner ring and the shaping air cap must be clean and free of any blockage.

It is best to leave the shaping air supply ON during normal production break cleaning periods. Shaping air can be reduced to 70 slpm during this time. This will help material from entering the passage ways.

Periodically (weekly or sooner) the outer shaping air cap and the inner shaping air ring should be removed and thoroughly cleaned. Use of an ultrasonic cleaner would make cleaning of hole diameters easier. Inspect all holes for blockage. Blow holes clear with compressed air after some time of soaking in solvent. **DO NOT use any type of pick to clear the holes.** Damage may result to parts and could affect performance of the equipment. If holes are damaged (oversized holes, blockage, gouges) it must be replaced.

AEROBELL PREVENTIVE MAINTENANCE SCHEDULE

Procedure	Frequency							
	Mid-Shift	End of Shift	Weekly	2 Weeks	Monthly	3 Months	6 Months	Yearly
Mid Shift Cleaning • Wipe shroud • Visually inspect cup	X							
End of Shift Cleaning • Wipe shroud • Wipe bell cup down • Change cloth cover, if equipped		X						
Shaping Air Shroud and Cap • Clean shroud • Clean shape air cap	X	X	X					
Bell Cup Removal/ Inspection/Cleaning/ Tightening		X	X					
Fluid Tube Inspection/ Cleaning		X	X					
Inspect Valve and Seat Assembly for Leaking				X				
Replace Valves and/or Seats in Valve Module or CCV Valve							X	X
High Voltage Cable Inspections					X			
High Voltage Testing								X
Regreasing of High Voltage Cables						X		
Inspect all Screws • Replace if broken • Inspect for wear • Tighten per specifications						X		
Inspect Turbine Spindle Taper and Threads	X							
Replace Bell Cups						X	X	X
Replace Splash Plates						X	X	X

AEROBELL PREVENTIVE MAINTENANCE SCHEDULE

Procedure	Frequency							
	Mid-Shift	End of Shift	Weekly	2 Weeks	Monthly	3 Months	6 Months	Yearly
Inspect and Clean Spindle, Bore, and Fluid Tube OD		X	X					
Inspect for Fluid Leaks	Daily							
Low Voltage Cable Inspection					X			

DISASSEMBLY PROCEDURES

NOTE

➤ Mean time to repair entire assembly is 60 minutes.

Inspect Bell Cup Daily

Check for signs of damage such as nicks, heavy scratches, dents, or excessive werar. Replace the cup assembly with any of these conditions.

Atomizer Bell Cup Removal, Disassembly, Cleaning, and Reassembly

- Remove the shaping air cap by unscrewing counter-clockwise. Use an RPM-419 wrench to aid in removal.

- To remove atomizer bell, place RPM-419 (wrench) over flats of shaft to lock shaft. Unscrew atomizer bell by hand turning counter-clockwise.

- If the atomizer is tight and can't be removed by hand, use the second RPM-419 (wrench) to place over the wrench flats of the atomizer bell.

  If the splash plate of the atomizer bell cup needs to be removed, do not use a hex key with a ball end. This will cause the head to strip or "round-out" prematurely. Use a 1/16" hex key with a squared-off end for best results. Before removing the three (3) flat head screws, make sure the sunken hex of the screws are cleaned out to full depth. Push the splash plate off its seat from behind using a plastic bolt to prevent damage to the plate. Once the screws are removed, they must be discarded and replaced by new ones. When reassembling, tighten screws to 2-4 lbs•in torque (0.23-0.45 Nm).

  Inspect the splash plate, screws, and bell cup for wear. Check splash plate teeth for wear. If teeth are missing or severely undercut, replace splash plate and screws (see Figure 10). Pay special attention to the center four holes in the splash plate. Look for erosion between the holes. Replace any part if necessary.

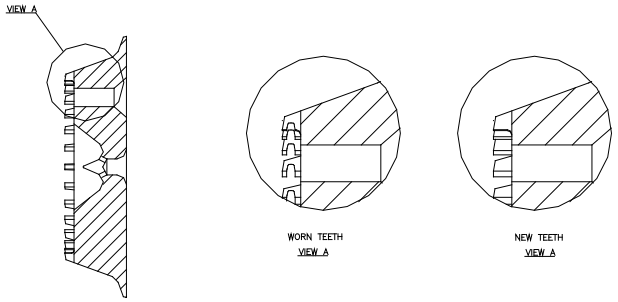


Figure 10: Worn Splash Plate Teeth

- Before reassembling the atomizer bell, ensure the tapers of the shaft and bell which mate are totally clean, as well as the shaft and bell threads.

- Place RPM-419 (wrench) over wrench flats of shaft to lock the shaft.

- Screw atomizer bell onto shaft in clockwise direction. Torque 50-70 lbs•in (5.65-7.91 Nm)

- Reinstall shaping air cap into shroud. Note when screwing RPM-4 in place, it will become tight after approximately 2 1/2 turns. At this point, use the RPM-419 (wrench) to tighten further. The RPM-4 will break free and become loose again and can then be tightened down fully until it bottoms against the shroud.

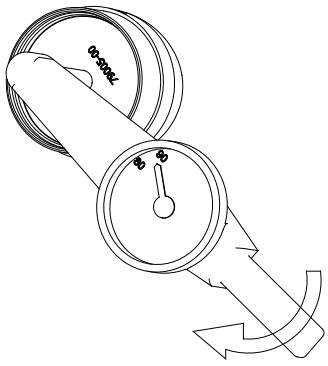
Shaping Air Cap and Shaping Air Ring Removal, Cleaning, and Reassembly (78297-00 and 78298-00 (70mm))

Remove the shaping air cap and shaping air ring assembly from the atomizer with the RPM-419 wrench. Insert the pin of the wrench into the hole of the shaping air cap. Turn counter-clockwise to remove. Remove the inner shaping air ring by placing the 79005-00 tool into the back of the assembly. Align the pins of the tool with the holes of the shaping air ring. Use a 3/8" socket driver in the tool, turn counterclockwise to remove.

Clean all parts to remove any debris or build-up. Use a soft bristle brush to clean the shaping air slots of the shaping air ring. Dry all parts before reassembling.

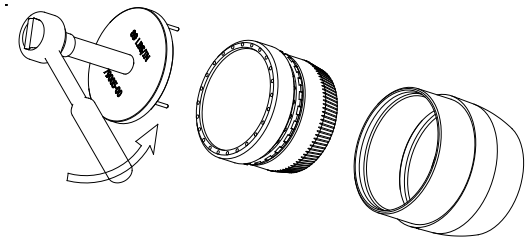
To reassemble, insert shaping air ring into the shaping air cap and tighten clockwise. Tighten to 89 lbs•in (40 Nm) torque. When tight, the shaping air cap and shaping air ring should be flush with each other at the face (± .007-inches, ± .18mm). If not, remove and check for debris and reassemble.

Reinstall the assembly on to the atomizer shaping air manifold until it stops on the RPM-3 shroud. Tighten 1/8-1/4 turns more.



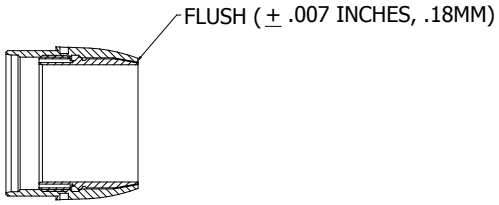
INSTALLATION OF 78297-00 AND 78298-00 (70MM)

Figure 11: Installation of 78297-00 and 78298-00 (70mm)



DIS-ASSEMBLY OF 79297-00 AND 78298-00 (70MM)

Figure 12: Disassembly of 78297-00 and 78298-00 (70mm)



78297-00 AND 78298-00 ASSEMBLY (70MM)

Figure 13: Assembly of 78297-00 and 78298-00 (57mm)

RPM-4 and RPM-5 (57mm)

Remove the shaping air cap and shaping air ring from the atomizer with the RPM-419 wrench. Insert the pin end of the wrench into the hole of the shaping air ring and remove by turning counter-clockwise.

Separate shaping air cap from the shaping air ring by using the RPM-419 wrench. Install the pin end of the wrench into the hole of the shaping air cap and shaping air ring. Remove the shaping air cap by turning counter-clockwise.

Clean all parts to remove debris or build-up. Use a soft bristle brush to clean the slots of the shaping air ring. Dry all parts before reassembly. Inspect front edges of both parts. Replace parts if any damage is seen. Damaged areas will create a distortion in the spray pattern.

To reassemble, install the shaping air cap onto the shaping air ring with the RPM-419 wrench until the face of the shaping air cap is flush with the shaping air ring. **DO NOT ORVERTIGHTEN!** Inspect parts at the front, the shaping air annulus must be visually even all the way around the entire part. Uneven annulus will cause the spray pattern to be distorted.

Reinstall the assembly onto the shaping air manifold. When tightening into place, it will become tight after approximately 2 1/2 turns. At this point, use the RPM-419 wrench to tighten further. The RPM-4 will break free and become loose again and can be tightened down fully until it bottoms against the RPM-3 shroud.

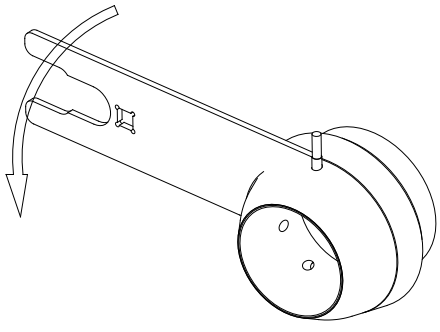


Figure 14: RPM-4 and RPM-5 Disassembly (57mm)

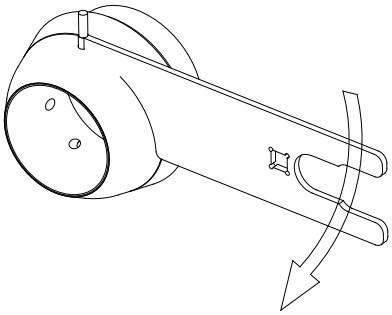


Figure 15: RPM-4 and RPM-5 Assembly (57mm)

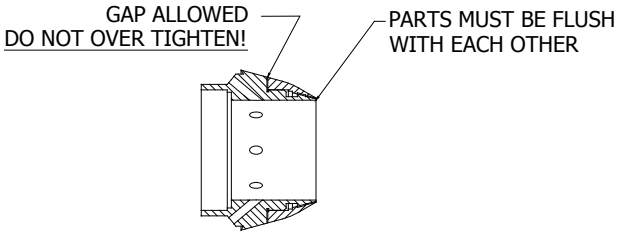


Figure 16: 78297-00 and 78298-00 Assembly (57mm)

RPM-79 and RPM-80 (30mm)

Remove the shaping air cap and shaping air ring from the atomizer with the RPM-419 wrench. Insert the pin end of the wrench into the hole of the shaping air ring and remove by turning counter-clockwise.

Separate shaping air cap from the shaping air ring by using two (2) RPM-419 wrenches. Install the pin end of the wrench into the hole of the shaping air cap and ring and remove the shaping air cap by turning counter-clockwise.

Clean all parts to remove debris or build-up. Use a soft bristle brush to clean the slots of the shaping air ring. Dry all parts before reassembly. Inspect front edges of both patrs and replace parts if any damage is seen. Damaged areas will create a distortion in the spray parttern.

To reassemble, install the shaping air cap on to the shaping air ring with the RMP-419 wrench until the face of the shaping air cap is flush with the shaping air ring. **DO NOT OVERTIGHTEN!** Inspect parts at the front. The shaping air annulus must be visually even all the way around the entire part. Uneven annulus will cause the spray pattern to be distorted.

Reinstall the assembly on to the shaping air manifold. When tightening into place, it will become tight after approximatly 2 1/2 turns. At this point, use the RPM-419 wrench to tighten further. The RPM-4 will break free and become loose again and can be tightened down fully until it bottoms against the RPM-3 shroud.

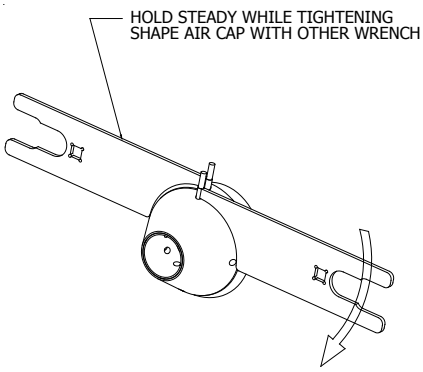


Figure 18: RPM-79 and RPM-80 Assembly (30mm)

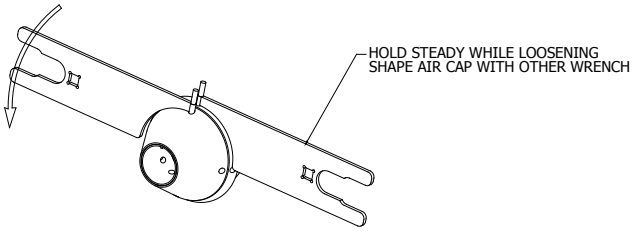


Figure 19: RPM-79 and RPM-80 Disassembly (30mm)

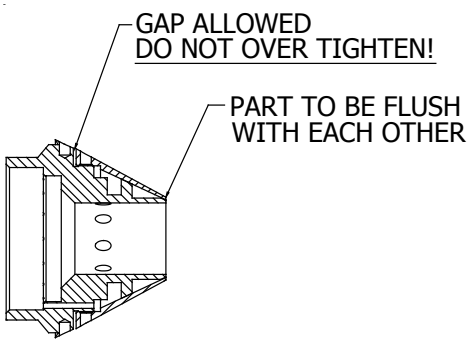


Figure 20: RPM-79 and RPM-80 Assembly (30mm)

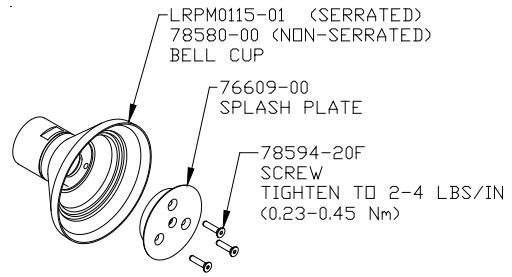
RPM-452-1 Bell Cup Assembly

This bell cup requires a shaft plug for operation. To assemble the shaft plug, install the small end into the end of the turbine shaft until it bottoms on the shaft. Install bell cup and tighten. There will be a soft feel when tightening. This is normal. The shaft plug is conforming to the inside of the bell cup. Tighten to a final torque of 50-70 lbs•in (5.65-7.91 Nm).

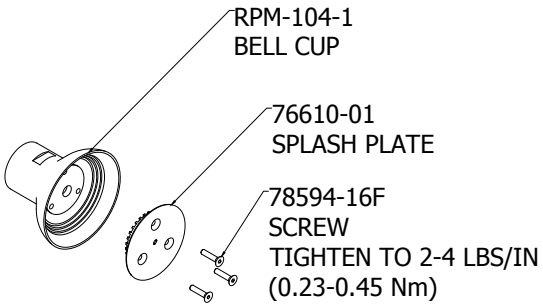
Shaft Plug Removal

The shaft plug may stay in the bell cup or in the end of the shaft. Remove the shaft plug from the shaft by gripping around the outer diameter with a pair of pliers and twist outwardly. To remove from inside the bell cup, use a pair of long nose pliers and pull straight out. In any case, be careful not to damage metal components of shaft or bell cup.

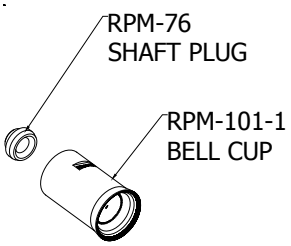
It is recommended that the shaft plug be replaced if removed from the shaft or bell cup.



LRPM-4001-01 Serrated and LRPM-4001-02 Non-Serrated Bell Cup Assembly (70mm)



RPM-457-1 Bell Cup Assembly (57mm)



RPM-452-1 Bell Cup Assembly (30mm)

Figure 21: Bell Cup Assembly

Quick Change Aerobell Removal

1. Prior to removing the quick change assembly, flush the paint feed line and bell with solvents. If flushing is not possible and paint is in the atomizer feed tube, place a rag over the bell end of the atomizer and proceed to step 2.

2. Unlatch three draw latches while carefully supporting the shroud.

3. Pull quick change rotary atomizer away from the manifold. **Do not** allow any paint to drip from the manifold into the air ports on the back of the air turbine.

⚠ CAUTION

► Be sure to carefully hold the shroud while unlatching the three (3) latch butttons that secure the quick change assembly into the manifold. The quick change assembly weighs approximately 7 lbs. and may be dropped and damaged if not properly supported.

Quick Change Aerobell Rotary Atomizer Reassembly

1. Re-assemble the shroud, atomizer bell, shaping air ring and cap onto the quick change assembly by reversing the previous instructions.

2. Before installing the quick change assembly back into the manifold, check the condition of the four (4) o-rings located on the four (4) air fittings of the manifold. If any are damaged or missing, replace them.

3. Check the condition of the o-ring (79001-05), located on the fluid inlet of the fluid tubes on the rear of the turbine. Replace if damaged or missing. Lightly lubricate the 79001-05 o-ring with Petrolatum jell.

4. Install the quick change assembly into the manifold. Align properly (it is easiest to align the shaping air fitting which is furthest from the center line). Press the quick change assembly straight forward as much as possible (don't force it on).

5. Latch the three (3) latch button assemblies, which will draw the quick change assembly fully into place in the manifold.

⚠ CAUTION

► Disassembly and repair of the turbine during warranty period is not allowed. See “Limited Warranty” in the "Warranty Policy" section of this manual, and also refer to "Aerobell Air Bearing Turbine Assembly" manual for details.

Aerobell Turbine Disassembly and Repair

Disassembly and repair of the turbine is covered in the current "Aerobell Air Bearing Turbine Assembly" service manual. When returning the air bearing turbine to Ransburg for repair, return the Quick Change Assembly atomizer or turbine only.

Valve and Seat Removal (MCV Style)

Inspect weep ports for contamination or other visible leakage around valves. Follow instructions as follows for damage to valves, seats, or performing preventative maintenance.

Using the valve removal tool (A11922-00), engage the four (4) pins on the tool to the corresponding four (4) hole pattern in the top of the valve. Using an 1/2" (13mm) socket, end wrench, or adjustable wrench, remove the valve by turning counter-clockwise.

Tighten knurled thumb screw and tool to engage 1-2 threads on the valve cap. This will aid in pulling the valve from its bore once it is loose.

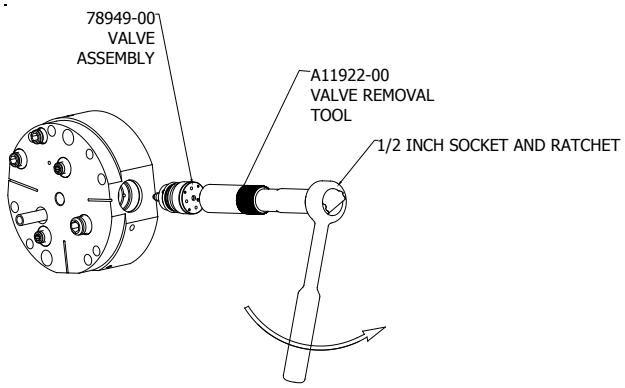


Figure 22: Valve Removal

Using the seat removal tool (A10766-00), insert the small hex end into the block to engage the seat hex. Using a 3/8" (10mm) socket, end wrench, or adjustable wrench, remove the seat by turning counter-clockwise.

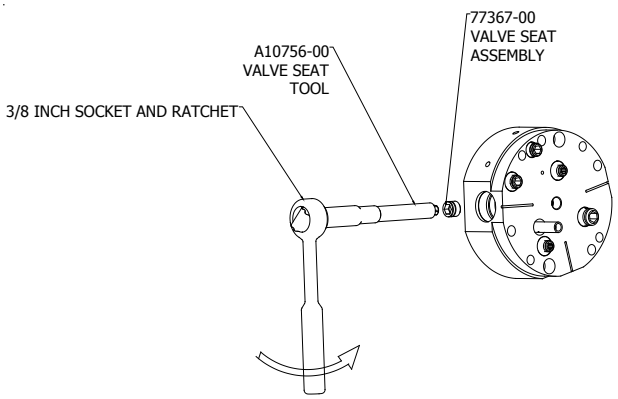


Figure 23: Valve Seat Removal

VALVE AND SEAT INSTALLATION (MCV STYLE)

Valve and Seat Inspection

Inspect the valves and seats for any build-up or leakage of materials. Valves should be cleaned with an appropriate cleaning solvent to remove the material on it.

NOTE

► A seat should not need to be replaced unless there are indications of valve leakage in operation.

NOTE

► Carefully start the seat assembly into the pocket. It may be easily cross-threaded.

Seat Replacement

Lubricate the o-ring on the seat assembly using a suitable lubricant, then by hand, using the seat removal tool (A10766-00), carefully start the seat assembly into the pocket of the manifold.

Hand tighten the seat in place. Using a torque wrench with a 3/8" (10mm) socket, torque the valve seats to 15-20 lbs•in (1.7-2.3 Nm).

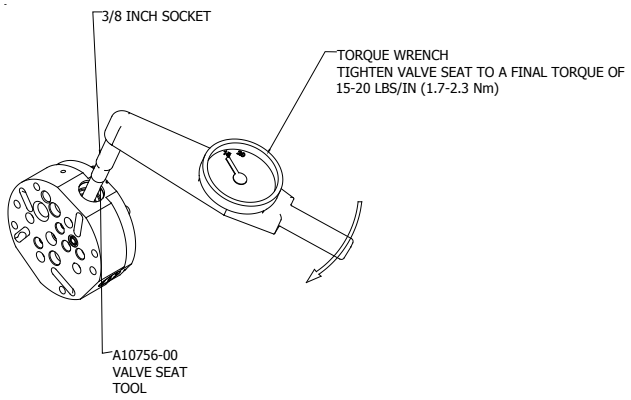


Figure 24: Valve Seat Installation

⚠ CAUTION

► Always use a torque wrench to torque the sets in place. Over-torquing the sets may cause permanent unrepairable damage to the manifold.

Lubricate the valve o-rings with a suitable o-ring lubricant. By hand, thread the valve into the pocket in a clockwise direction. Tighten using a 1/2" (13mm) socket and torque to 15-20 lbs•in (1.7-2.3 Nm).

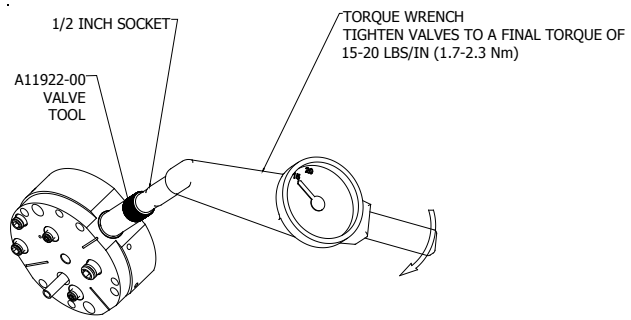


Figure 25: Valve Installation

FLUID TUBE ASSEMBLY

Insert fluid tube into the turbine body bore from the back side. Install and tighten the four (4) SSF-3137 screws to a final torque of 7-10 lbs•in (0.79-1.13 Nm). Install 79001-05 o-ring on to the exposed end of the fluid tube. Make sure this o-ring is not damaged. Leaks will occur if the item is damaged.

Inspect the fluid tube outlet end to make sure it is centered in the shaft bore. Mis-alignment may cause fluid tube to touch rotating shaft or bell cup which may result in turbine failure or fluid tube damage. If tube is bent or otherwise damaged, replace with a new part.

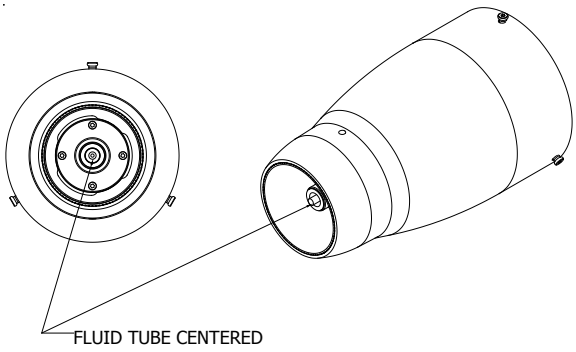


Figure 26a: Fluid Tube Assembly

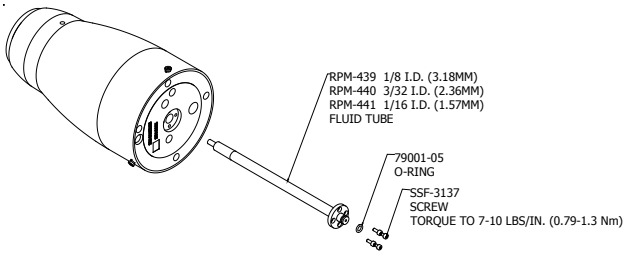


Figure 26b: Fluid Tube Assembly

BELL CUP INSTALLATION (ALL)

Ensure that shaft taper and threads are clean before installing a bell cup. Also, make sure that the threads and taper on the bell cup are clean.

Place one (1) RPM-419 wrench on the flats of the turbine spindle. Use another RPM-419 with a torque wrench fitted into the 3/8" square of the wrench. Hold the shaft while applying pressure to the torque wrench in a clockwise direction. Tighten bell cup onto the turbine shaft to a final torque of 50-70 lbs•in (5.65-7.91 Nm).

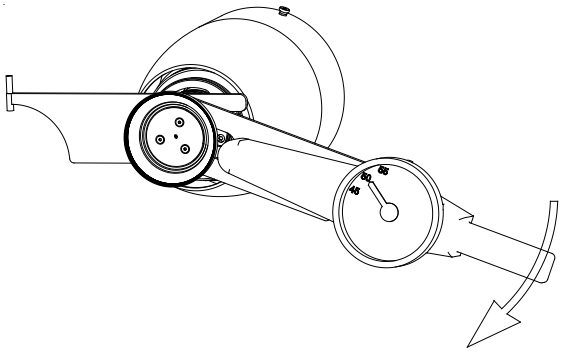


Figure 27: Bell Cup Installation

⚠ CAUTION

► Failure to tighten the bell cup in place may cause vibration of the applicator and/ or premature turbine failure.

Example: A desired true torque is desired using a 9-inch effective length torque wrench. Wrench offset is 1 3/4-inches (1.75-inches).

L	**=**	**9-inches**
TT	**=**	**50 lbs•in**
E	**=**	**1 3/4-inches**

DR is dial reading.

$$DR = \frac{50\ (9)}{(9 + 1.75)} \qquad DR = 42\ lbs•in$$

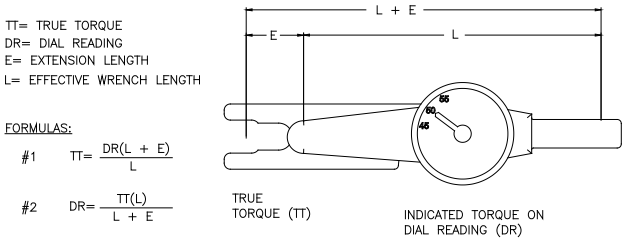


Figure 28: Effective Length Torque Wrench

CCV VALVE CONFIGURATIONS AND INSTALLATION

1. If RPM-415 one valve assembly is used, screw the spanner nut of the valve into the inlet of the manifold (hand tight).

2. If RPM-408, -409, or -416 valve assemblies are used, install RPM-61 insert into manifold first. Tighten spanner nut (hand tight) then tighten per step #3.

3. It is recommended to leave the valve assembly hand tight until all air and fluid connection are made to the rear manifold and to the valves before tightening the spanner nut, in case the valve assemblies need to be rotated for clearance purposes. After all connnections are made, tighten spanner nut with CCV-7 spanner tool 1/8-1/4 turn more after valve is seated. You may also tighten the valve assemblies using a torque wrench fitted with an adapter for the 1 1/16" spanner nut. Torque to 132-156 lbs•in (14.9-17.6 Nm).

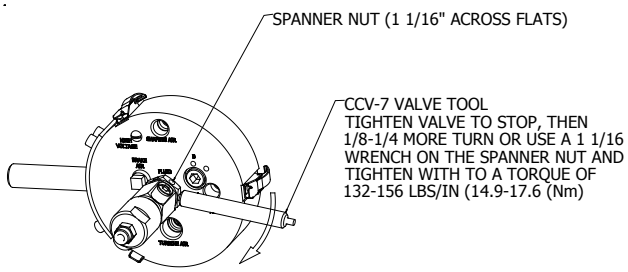


Figure 29: Typical Installation Specification for All Valve Assemblies

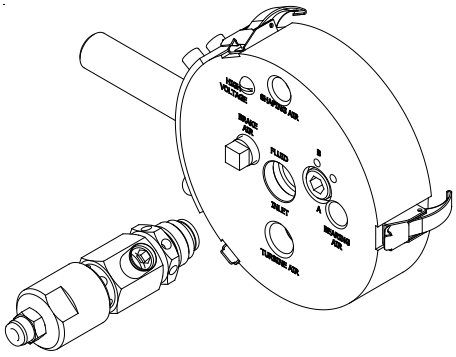


Figure 30: RPM-415 Valve Configuration

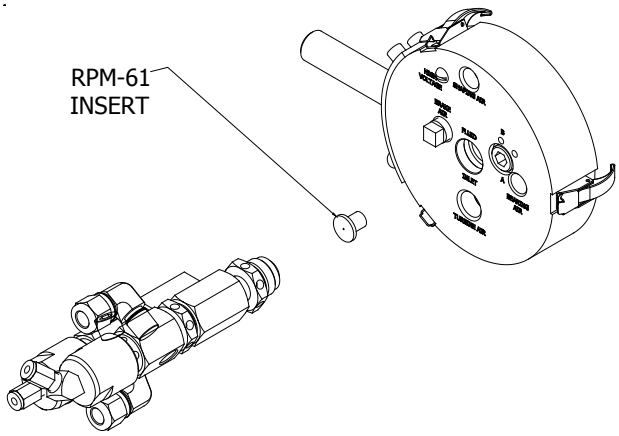


Figure 31: RPM-408 Valve Assembly Configuration - Required RPM-61 Insert

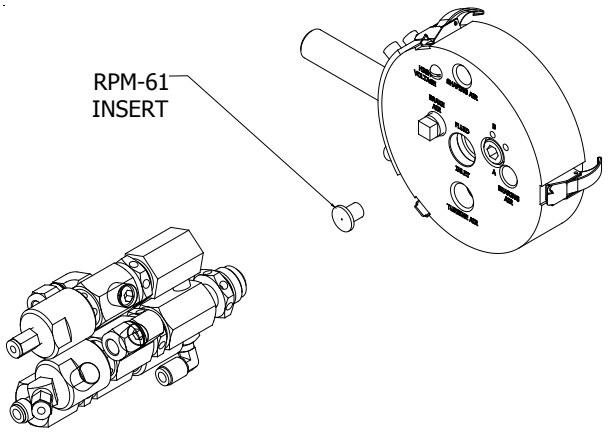


Figure 32: RPM-409 Valve Assembly Configuration - Required RPM-61 Insert

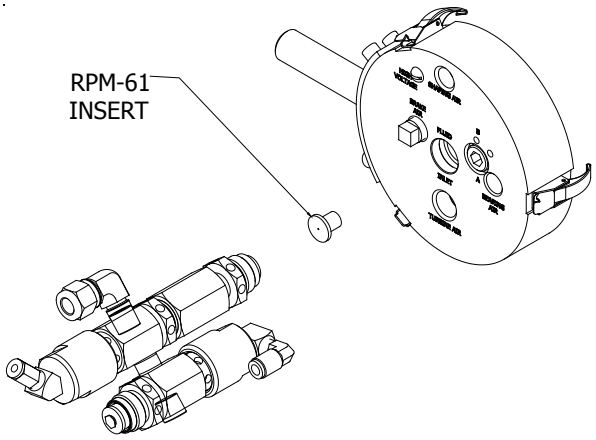


Figure 33: RPM-416 Valve Assembly Configuration - Required RPM-61 Insert

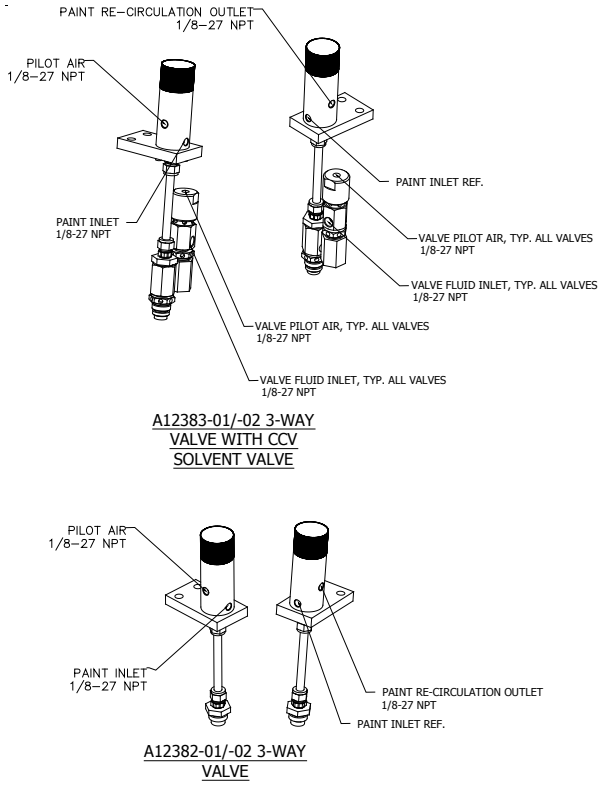


Figure 34: 3-Way Valves

ATOMIZER ASSEMBLY REMOVAL/REPLACEMENT (MCV STYLE)

To quickly remove the turbine and valve assembly section from the mounting manifold, first make sure that fluid passages are cleaned and flushed if possible. Ensure that the turbine has stopped spinning and that the high voltage is turned off. Turn off bearing air supply and relieve or turn any other air or fluid pressures off and allow to bleed down. Hold the turbine assembly with one hand underneath the unit for support. Use your other hand to release the three (3) clips by lifting the back edge. Pull the atomizer assembly straight away from the manifold.

To replace the atomizer assembly, first verify that the three (3) o-rings are present in the valve manifold assembly, one for the cup, paint, and solvent inlet. Examine the mating o-rings on the manifold pipettes, ensure that they are not damaged. Align the "black" colored pin on the valve manifold with the groove in the mounting manifold. Press firmly into place. Push down on the front of the clip until it is over the keeper button. Next, push down on the rear of the clip until it snaps into place. Repeat this for the other two (2) clips.

Turn bearing air back on and make sure that the bell cup rotates freely by hand.

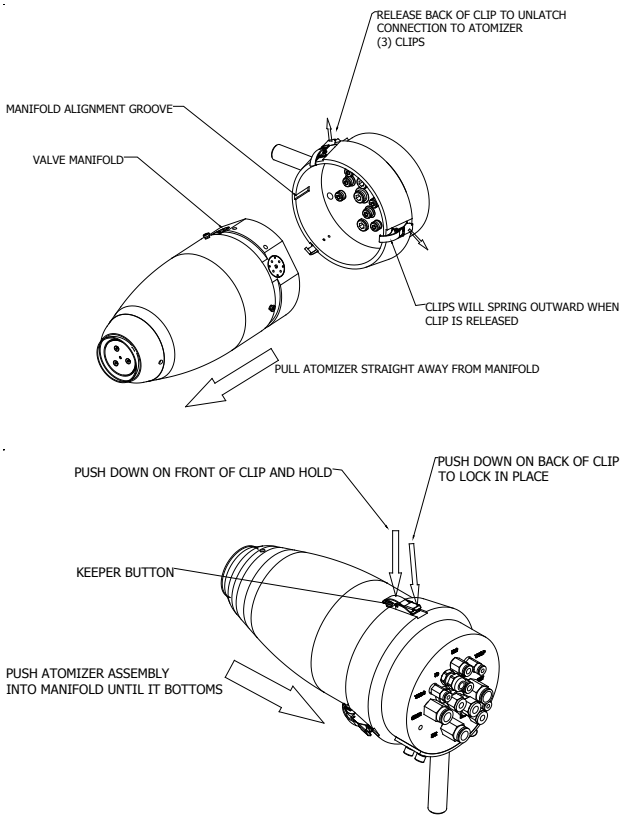


Figure 35: Atomizer Assembly Replacement

VALVE MANIFOLD ASSEMBLY/REMOVAL (MCV STYLE)

When removing the quick-disconnect aomizer, the valve manifold assembly may remain in the mounting manifold. To remove, thread two (2) 8532-64C bolts into the threaded holes, 180° apart from each other. Pull valve manifold straight out. (5/16-18 threaded bolts or M8 X 1.25" bolts are sufficient).

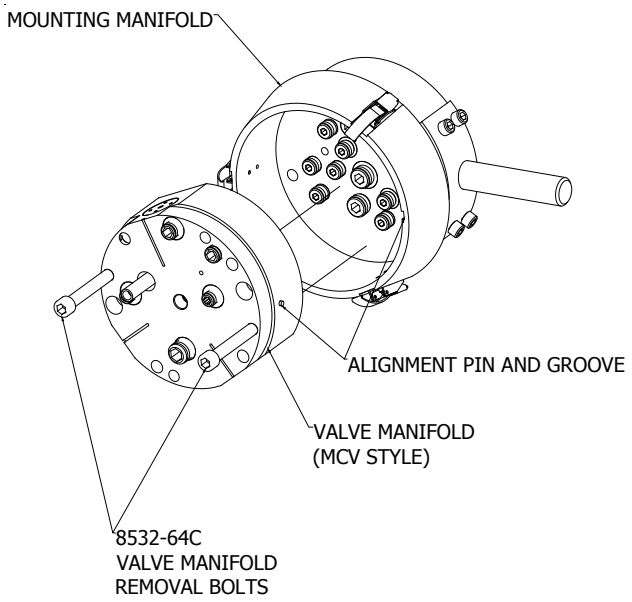


Figure 36: Valve Manifold Assembly/Removal (MCV Style)

FIBER OPTIC REMOVAL/ REPLACEMENT
(77602 Valve Manifold Assembly)

To remove the fiber optic sensor, grasp the exposed end and turn counter-clockwise. Be careful not to lose the o-ring on the opposite side.

To replace, insert into the cavity and turn clockwise until it stops. The sensor should be flush on the opposite side when correctly installed. Do not use pliers to tighten, damage to sensor may occur, hand tighten only.

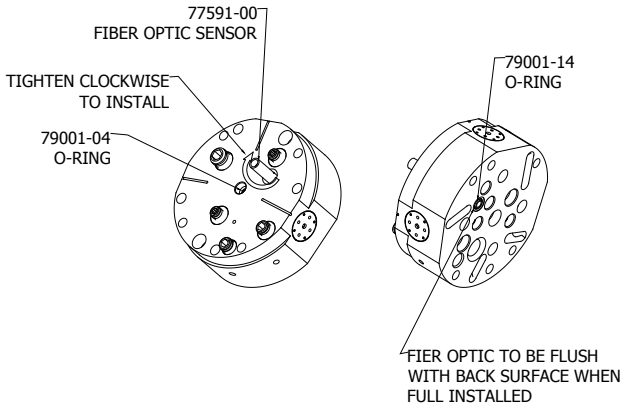


Figure 37a: Fiber Optic Removal/ Replacement

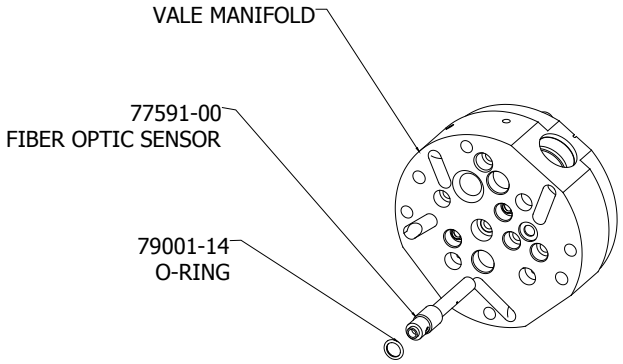


Figure 37b: Fiber Optic Removal/ Replacement

MOUNTING RING REMOVAL/REPLACEMENT

Remove the three (3) socket head cap screws with a 3/16-inch hex key wrench. Slide ring off back of atomizer.

Install mounting ring by lining up the shaping air outlet port approximately with the exposed aluminum area on the back of the turbine body. slide ring onto turbine body. Adjust slightly to line up the screw holes. Install and tighten screws to a final torque of 10-15 lbs•in (1.13-1.70 Nm).

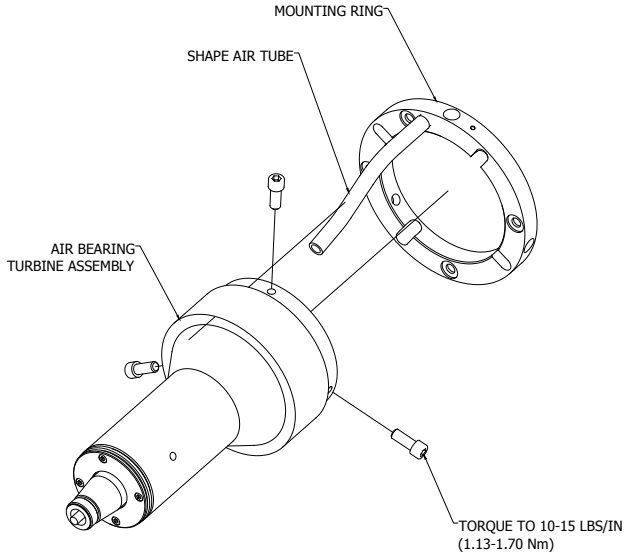


Figure 38: Mounting Ring Removal/Replacement

SHAPING AIR MANIFOLD REMOVAL/REPLACEMENT

70mm Style

Remove the three (3) socket head cap screws using a 3/16-inch hex key wrench. Slide manifold off front of turbine body.

Install the manifold by lining up the shaping air tube with the shaping air hole in the manifold. Twist the manifold to line up screw holes. Install and tighten screws to a final torque of 10-15 lbs•in (1.13-1.70 Nm).

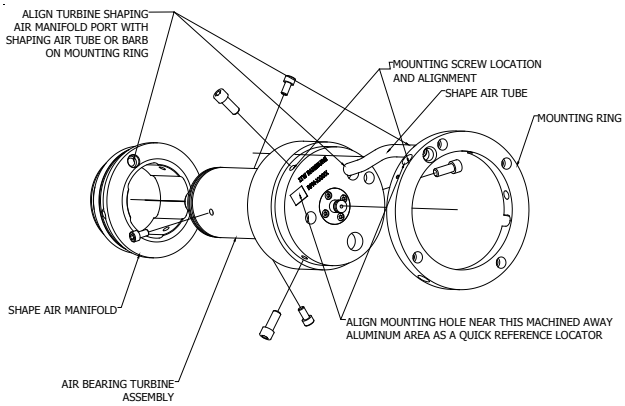


Figure 39: 70mm Mounting Ring and Shape Air Manifold Alignment

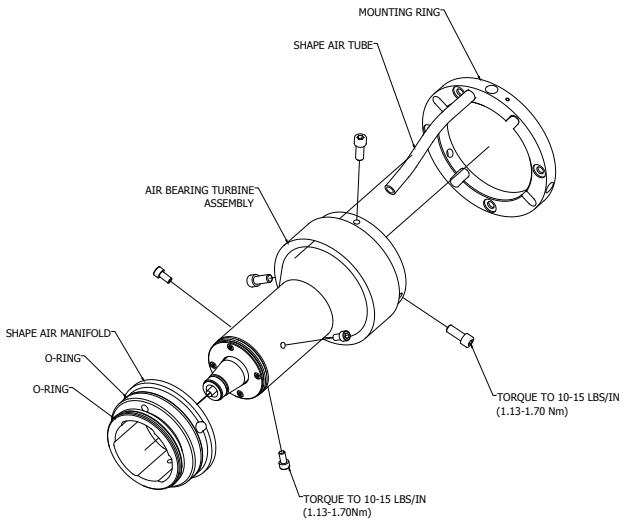


Figure 40: 70mm Shape Air Manifold

57mm and 30mm Styles

Remove the front cover of the turbine body by removing the four (4) socket head cap screws with a 2.5mm hex key wrench. Remove white colored seal and blue colored ring. Remove three (3) socket head cap screws from shape air manifold with a 3/16-inch hex key wrench. slide manifold off front of turbine body.

NOTE

► Plastic shape air tube must be cut off before removal.

Install the manifold by lining up the shaping air barb fitting with the shaping air tube. Install the plastic tubing onto the barbs of the fitting. Slide the manifold into position by twisting until screw holes line up. Install and tighten screws to a final torque of 10-15 lbs•in (1.13-1.70 Nm). Install blue colored ring over front of turbine body. Place white colored seal between turbine body and turbine front cover plate. Install the four (4) screws to a final torque of 3-5 lbs•in (0.23-0.56 Nm).

NOTE

► White colored plastic ring should be free to rotate, **do not** crush or damage edge.

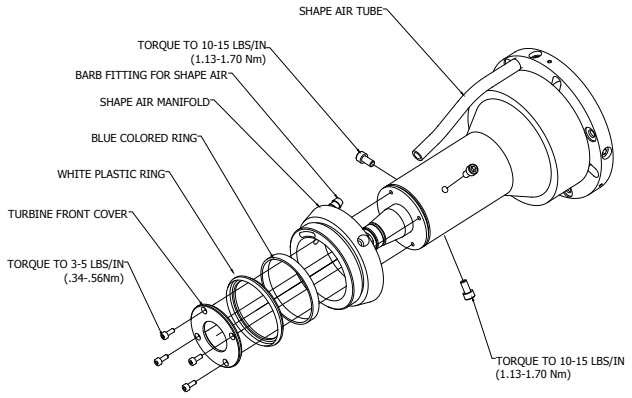


Figure 41: 57mm and 30mm Shape Air Manifold

SHROUD REMOVAL/ REPLACEMENT

Remove the three (3) screws, spacers, and keeper buttons by using a 1/16-inch hex key wrench.

To replace, align holes of shroud with screw holes of the mounting ring. Install spacer into shroud hole followed by the keeper button and screw. Tighten screw to a final torque of 1-3 lbs•in (0.11-0.34 Nm).

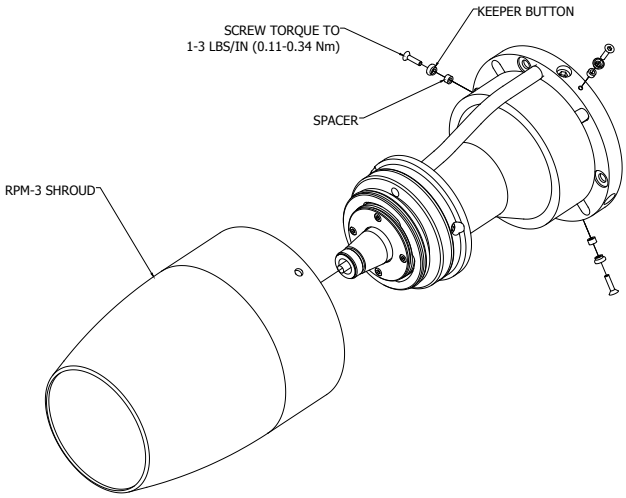


Figure 42: Shroud Removal

TROUBLESHOOTING GUIDE

General Problem	Possible Causes	Corrective Action
Bad Spray Pattern	1. Bell cup damaged	1. Replace bell cup.
	2. Low voltage	2. See "Low or No High Voltage" below.
	3. Bad fluid regulator	3. Repair or replace regulator in system.
	4. Paint lodged in shaping air ring	4. Disassemble and clean.
	5. Damaged shape air parts	5. Replace parts.
	6. Plugged holes in cup	6. Disassemble and clean.
Low or No High Voltage	1. High current draw	1. Paint resistivity to be .1 MΩ to ∞ (solvent-borne direct charging).
	2. Solvent valve is actuated	2. Remove solvent valve air pilot signal (high voltage must be interlocked with the solvent valve air pilot signal to prevent solvent flow while high voltage is energized).
	3. a. Loss of low voltage cable connection between MicroPak and cascade b. Loss of cable between atomizer and Voltage Master power supply	3. Inspect connections.
	4. Improper limiting current and voltage settings	4. To re-adjust settings, refer to "MicroPak and Voltage Master 2" operating manuals.
	5. Atomizer grounding out (usually indicated by high current draw or by Micro-Pak over-current fault light)	5. a. Clean atomizer externally with non-polar solvent. b. Check the atomizer for internal fluid-leaks. c. Check for fluid leaks at quick-disconnect mounting. d. Check for arcing (usually indicated by sparking sounds).
	6. Faulty low voltage connections (usually indicated by MicroPak feedback fault light)	6. Check low voltage connection at MicroPak and cascade.

(Continued On Next Page)

TROUBLESHOOTING GUIDE (Cont.)

General Problem	Possible Causes	Corrective Action
Low or No High Voltage (Cont.)	7. MicroPak or cascade failure	7. Refer to "MicroPak" manual for detailed "Troubleshooting Guide".
	8. Improper color change (i.e., paint or solvent in dump line)	8. Optimize color change.
	9. Faulty high voltage connection	9. Verify that high voltage cable is fully sealed in the cascade and atomizer or junction tank.
	10. Damaged high voltage cable	10. Remove and inspect/replace.
	11. Dielectric grease breakdown of high voltage parts	11. Check cascade and high voltage cable. Replace defective parts.
Low Transfer Efficiency (or light coverage)	1. Low or no high voltage	1. Verify high voltage at bell cup edge. Normally, a high voltage setting of 70-100kV is appropriate for most applications.
	2. Poor grounding of parts being coated	2. Verify that parts being coated are properly grounded (the electrical resistance between the part and ground must not exceed 1 megohm.
	3. Excessive turbine speed	3. For optimum transfer efficiency and spray pattern control, the bell rotational speed should be set at the minimum required to achieve proper atomization of the coating material.
	4. Excessive shaping air	4. Shaping air should be set at the minimum volume required to gently direct the spray pattern toward the part being coated. Excessive shaping air will cause some atomized particles to "blow-by" the part or bounce back onto the atomizer.
	5. Excessive target distance	5. The recommended target distance is between 6 and 12-inches (152.4-304.8mm).

(Continued On Next Page)

TROUBLESHOOTING GUIDE (Cont.)

General Problem	Possible Causes	Corrective Action
No Turbine Air	1. Turbine drive air not present	1. Verify supply air pressure.
	2. Bearing air return signal not present	2. a. Verify bearing air return signal. b. Increase bearing air supply pressure to 90 psig (±10 psig) (620.5 +/- 68.9 kPa) minimum 60 psig (413.7 kPa).
	3. Brake air is activated	3. Remove brake air signal (turbine air and brake air must be interlocked to prevent both from being used simultaneously).
Speed Feedback Fault	1. Damaged fiber optic cable between robot plate and control panel	1. Repair or replace fiber optic cable.
	2. Connection at mounting manifold is loose	2. Reinstall cable.
	3. Fiber optic transmitter failure	3. Replace fiber optic transmitter.
	4. Bad transceiver module	4. Replace transceiver module.
	5. Excessive vibration	5. a. Check bell cup for damage. b. Check bell cup for excessive paint build-up. c. Ensure bell cup is tightenend properly. d. Check cup and shaft tapers for cleanliness.
	6. Fiber optic cable not fully installed	6. Insert cable to full depth.
No Fluid Flow	1. Turbine is not rotating	1. Verify rotation of turbine (the paint valve air pilot must be interlocked with the turbine speed feedback signal to ensure that paint does not flow into the air bearing).
	2. System fluid regulator does not actuate	2. a. Verify fluid supply. b. Verify that iar pilot signal is present.
	3. Fluid valve does not actuate	3. a. Verify that air pilot signal is present. b. Fluid valve air pilot pressure is too low. Increase air pressure to 70 psig minimum (482.6 kPa).

(Continued On Next Page)

TROUBLESHOOTING GUIDE (Cont.)

General Problem	Possible Causes	Corrective Action
No Fluid Flow (Cont.)	4. Clogged fluid tube 5. Plugged bell cup 6. Worn bell cup splash plate	4. Remove and inspect fluid tube. 5. disassemble and clean. 6. Check splash plate for worn or missing teeth. Replace.
Continuous Fluid Flow	1. Flud valve open 2. Fluid valve seat damaged or worn (MCV type)	1. a. Remove air pilot signal. b. If still open, replace fluid valve. 2. Replace fluid valve seat.
Uncontrollable Fluid Flow	1. Insufficient back pressure to fluid regulator 2. Fluid regulator does not control flow	1. Replace fluid tube with the next smaller inner diameter size. 2. Disassemble fluid regulator and inspect for failed components.
Fluid and/or Air Leakage Between the Valve Module and Mounting Manifold	1. Fittings loose 2. O-ring is missing 3. O-ring is damaged	1. Tighten or replace. 2. Install o-ring. 3. Visually inspect for damage and replace.
Fluid Leakage Around Fluid Valve	1. Damaged o-ring(s) on outer diameter of valve body (MCV style) 2. Damaged or worn needle seals inside valve assembly. 3. Dirt or debris in valve	1. Replace o-ring(s). 2. Replace valve assembly. 3. Remove debris. If damage to seat exists, replace valve and/or seat.

(Continued On Next Page)

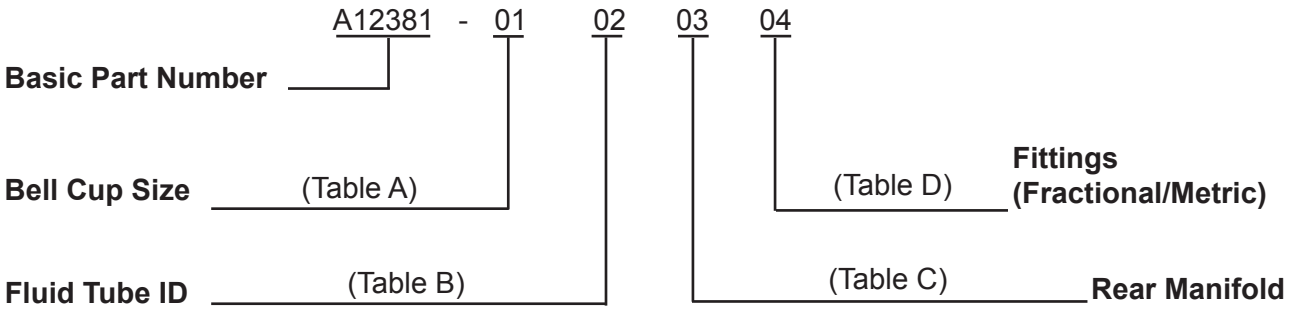
TROUBLESHOOTING GUIDE (Cont.)

General Problem	Possible Causes	Corrective Action
Turbine Cannot Attain Desired Speed	1. Excessive vibration	1. a. Check bell cup for damage. b. Check bell cup for excessive paint build-up. c. Bell cup loose - tighten to proper torque. d. Check cup and shaft tapers for cleanliness.
	2. Low or no bearing air	2. a. Check bearing air pressure (60 psi minimum) (413.7 kPa). b. Check filters for contamination. c. Poor turbine air pressure - plant air. e. Damaged speed control cards. f. Increase turbine air supply tubing.
	3. Flooded turbine with paint or solvent.	3. a. Ensure turbine speed and paint flow are interlocked. b. Add regulators down-stream of pumps for paint and solvent.

PARTS IDENTIFICATION

A12381 AEROBELL MODEL IDENTIFICATION

When ordering, use part number as indicated by Tables A, B, C, and D.
(Four digits must follow the the basic part number as shown in the example below.)



*** Model number and serial number of the atomizer is located on the face of the rear manifold assembly. (See "Important Numbers" in the "Introduction" section.)**

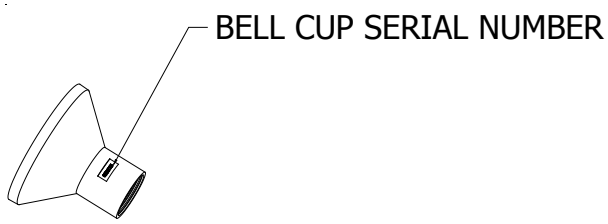


Figure 43: Bell Cup Serial Number

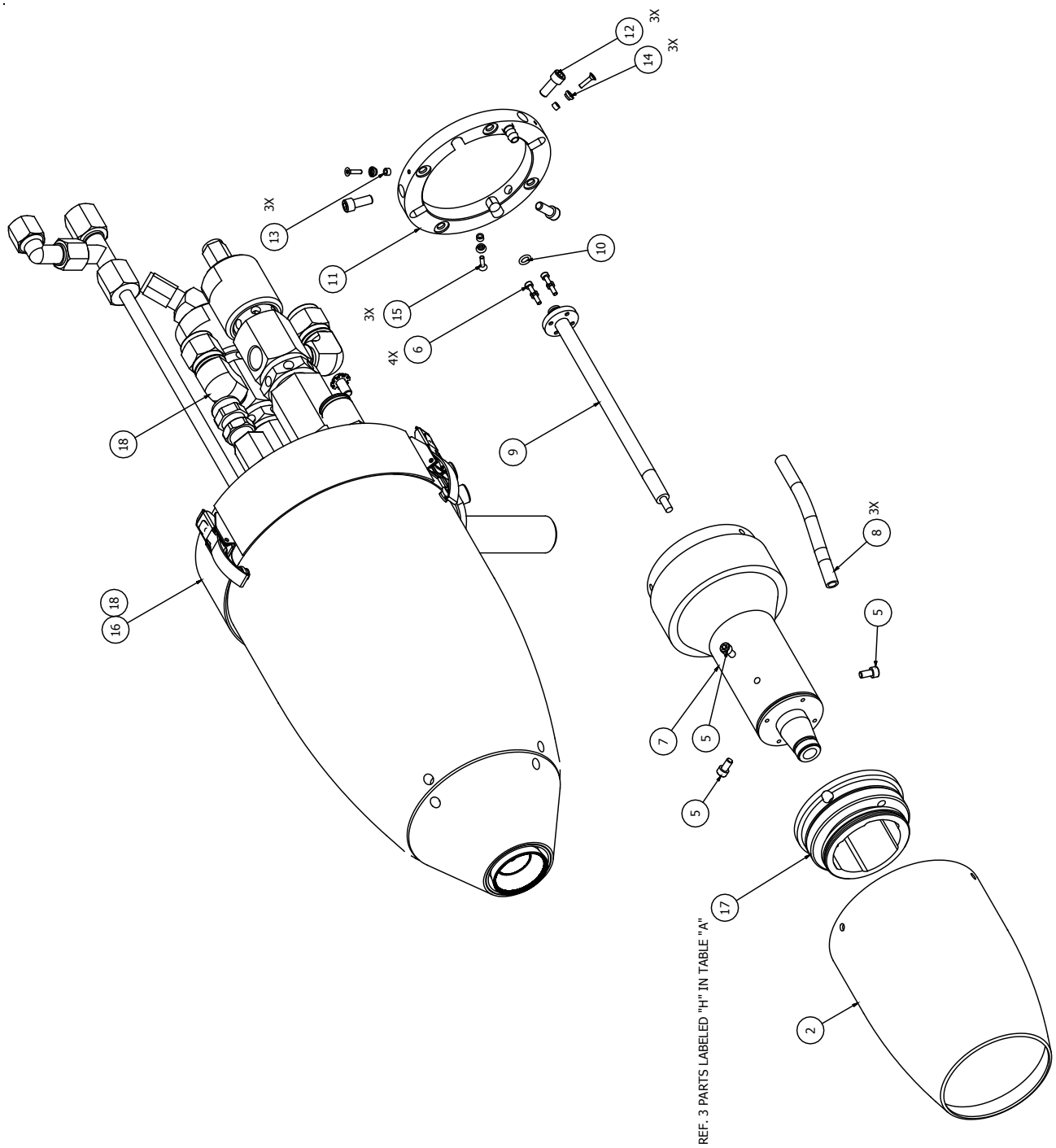


Figure 44: A12383 Aerobell Parts

A12381 AEROBELL - PARTS LIST (Figure 44)

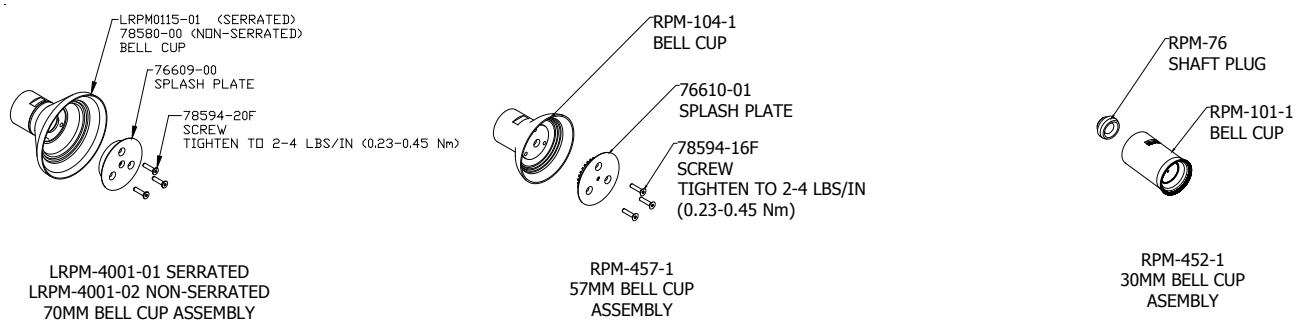
		Description	Qty
1	**Table A - "A"**	Bell Cup	1
2	RPM-3	Shroud	1
3	**Table A - "B"**	Shaping Air Cap	1
4	**Table A - "C"**	Shaping Air Ring	1
5	SSF-317	Screw, Socket Head Cap, #10-32 X 3/8" Lg.	3 6
6	SSF-3137	Screw, Socket Head Cap, M3 X .5" Pitch X 8mm Long	4
7	RPM-401-1	Air Bearing Turbine	1
8	H-2338	Tubing, Polyethylene, 3/8" OD X 1/4" ID	**Table C - "J"**
9	**Table B - "D"**	Fluid Tube Assembly	1
10	79001-05	O-Ring, Solvent Proof	1
11	**Table C - "G"**	Mounting Ring Assembly	1
12	SS-7936-NI	Cap Screw	3
13	RPM-14	Spacer	3
14	RPM-21	Keeper Button	3
15	SSF-4240	Screw, Flat Head, #4-40 X 1/2" Lg., Steel	3
16	**Table C - "F"**	Valve Manifold	1
17	**Table A - "H"**	Manifold Part	1
18	----	----	--
19	**Table C - "E"**	Valve Assembly Configuration Type	1

PARTS LIST BULLET DEFINITION TABLE (Figure 44)

6 Apply 7969-05 purple threadlock to threads.

TABLE A - BELL CUP SIZE

Dash #	Description	"A" Bell Cup	"B" Shape Air Cap	"C" Shape Air Ring	"H" Manifold Part	"H" Manifold Part	"H" Manifold Part
00	----	----	----	----	----	----	----
01	30mm Bell Cup	RPM-452-3	RPM-80	RPM-79	SSG-8166	RPM-2	RPM-402
02	57mm Bell Cup	RPM-457-1	RPM-4	RPM-5	SSG-8166	RPM-2	RPM-402
03	70mm Bell Cup	LRPM-4001-02	78297-00	78298-00	78436-00	78435-00	78301-00



LRPM-4001-01 SERRATED
LRPM-4001-02 NON-SERRATED
70MM BELL CUP ASSEMBLY

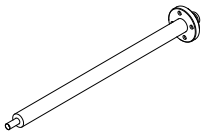
RPM-457-1
57MM BELL CUP
ASSEMBLY

RPM-452-1
30MM BELL CUP
ASEMBLY

Figure 45: Bell Cup Assembly

TABLE B - FLUID TUBE ID

Dash #	Description	"D"
00	----	--
01	1/16" (1.6mm) Fluid Tube	RPM-441
02	3/32" (2.4mm) Fluid Tube	RPM-440
03	1/8" (3.2mm) Fluid Tube	RPM-439



RPM–441 1/16" ID (1.57MM)
RPM–440 3/32" ID (2.36MM)
RPM–439 1/8" ID (3.18MM)

Figure 46: Fluid Tube Sizes

TABLE C - REAR MANIFOLD

Dash #	Description	"E" Rear Manifold	"F" Valve Manifold	"G" Mounting Ring	"J" Shape Air Tube
00	No Rear Manifold, CCV Valve Style	----	----	RPM-405	4 7/8"
01	No Rear Manifold, MCV Valve Style	----	----	77692-00	5"
02	CCV Style Rear Manifold, No Valves	RPM-425	----	RPM-405	4 7/8"
03	CCV Style Rear Manifold, Trigger Valve	RPM-425	RPM-415	RPM-405	4 7/8"
04	CCV Style Rear Manifold, Trigger/Dump Valves	RPM-425	RPM-416	RPM-405	4 7/8"
05	CCV Style Rear Manifold, Trigger/Solvent Valves	RPM-425	RPM-408	RPM-405	4 7/8"
06	CCV Style Rear Manifold, Trigger/Dump/ Solvent Valves	RPM-425	RPM-409	RPM-405	4 7/8"
07	CCV Style Manifold, 3-Way Valve	RPM-425	A12382-01	RPM-405	4 7/8"
08	CCV Style Manifold, 3-Way Valve	RPM-425	A12382-02	RPM-405	4 7/8"
09	CCV Style Manifold, 3-Way Valve, (1) CCV Valve	RPM-425	A12383-00	RPM-405	4 7/8"
10	MCV Style Rear Manifold, Trigger/Dump/Solvent	A12387-00	77602-02	77692-00	5"

TABLE D - FITTINGS

Dash #	Description	"G"
00	----	--
01	Fractional Fitting Kit for TSK-4927, MCV Valve Style	A12388-01
02	Metric Fitting Kit for TSK-4927, MCV Valve Style	A12388-02
03	Fractional Fitting Kit for RPM-425, Manifold Only, Not Valves	A12392-01
04	Metric Fitting Kit for RPM-425, Manifold Only, Not Valves	A12392-02

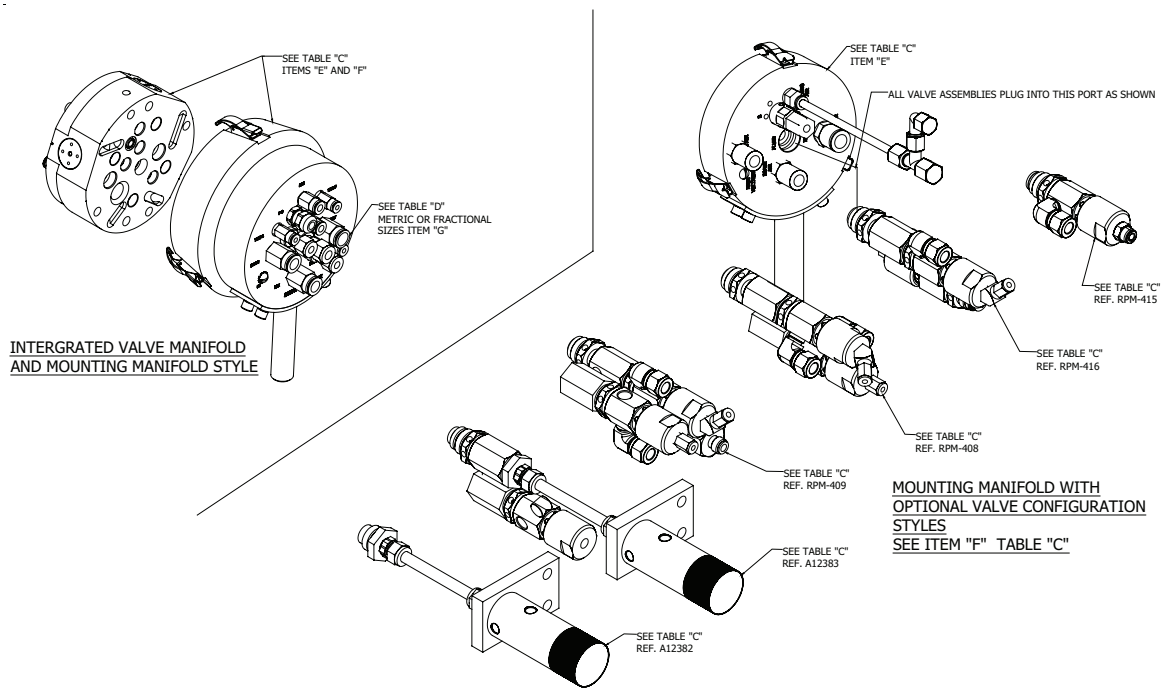


Figure 46: Rear Manifold and Fittings

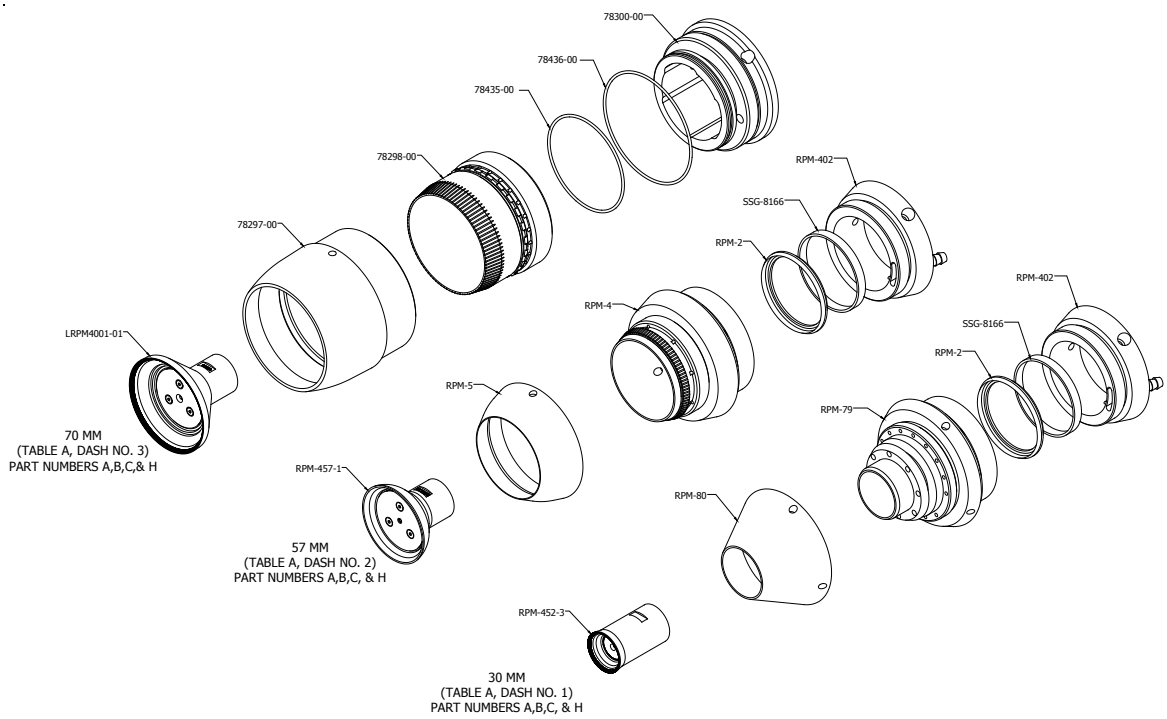


Figure 47: Shape Air And Bell Cup Configurations

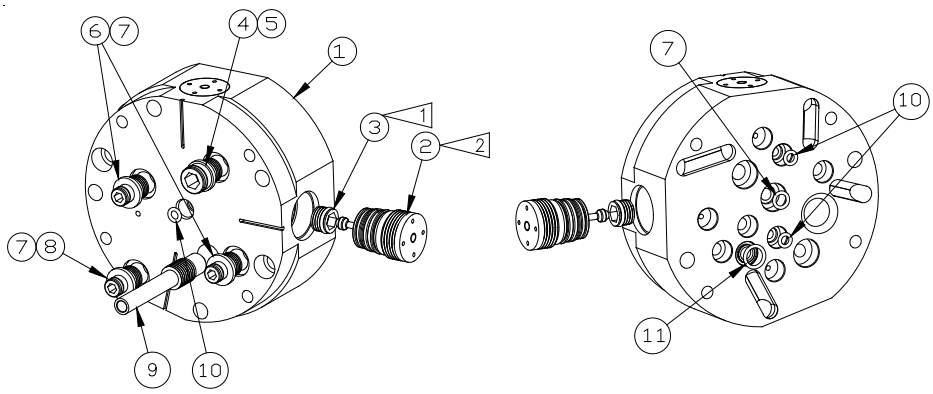


Figure 48: 77602-02 Valve Module Assembly

77602-02 VALVE MODULE ASSEMBLY - PARTS LIST (Figure 48)

Item #	Part #	Description	Qty
1	77590-00	Valve Module Mach.	1
2	78949-00	Valve Assembly	3 ▷2◁
3	77367-00	Valve Seat Assembly	3 ▷1◁
4	75845-02	Fitting	1
5	79001-07	O-Ring	1
6	75845-01	Fitting	2
7	79001-05	O-Ring	3
8	75845-01	Fitting	1
9	77591-00	Transmitter, Fiber Optic	1
10	79001-04	O-Ring, Solvent Proof	3
11	79001-14	O-Ring, Solvent Proof	1

PARTS LIST BULLET DEFINITION TABLE (Figure 48)

▷2◁ Install valve assemblies as shown. Lubricate all o-rings with Amojell (sparingly) to aid installation. Torque to 15-20 lb•in (1.69-2.26 Nm) after valve is down.

▷1◁ Install valve seat assemblies as shown. Torque to 15-20 lbs•in (1.69-2.26 Nm).

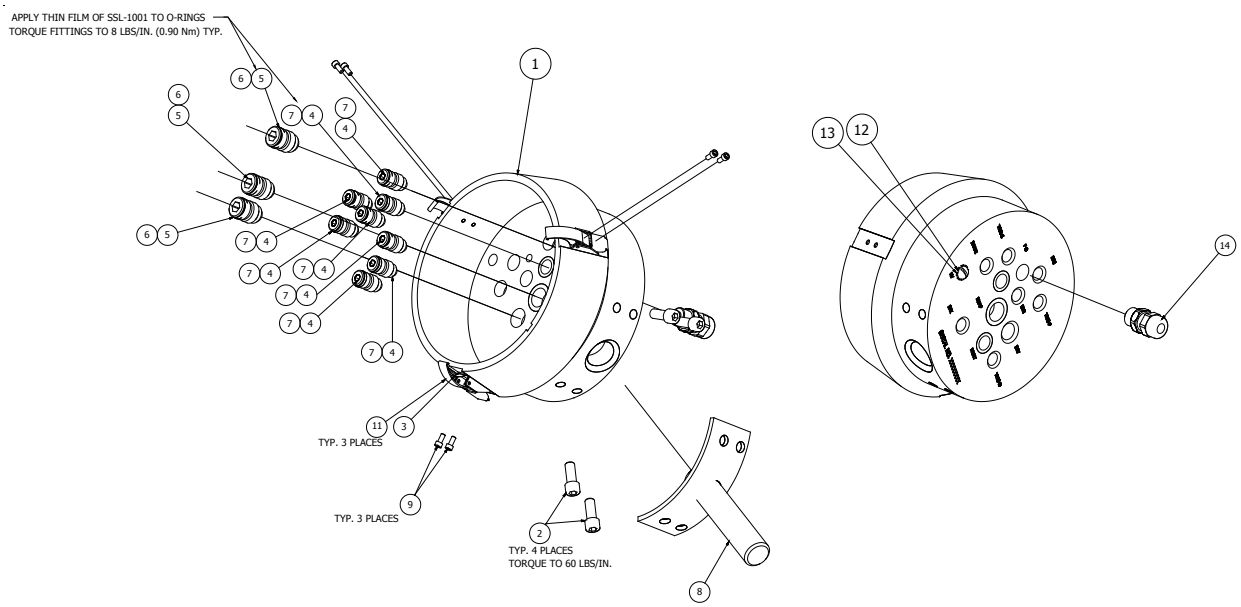


Figure 49: A12387-00 Rear Manifold - MCV Style

A12387-00 REAR MANIFOLD - MCV STYLE - PARTS LIST (Figure 49)			
Item #	**Part #**	**Description**	**Qty**
1	A12386-00	Rear Manifold, Classic Aerobell	1
2	SS-7936-NI	Cap Screw	4
3	RPM-34	Spring	3
4	77596-01	Fitting *	8
5	77596-02	Fitting *	3
6	79001-07	O-Ring, Solvent Proof	3
7	79001-06	O-Ring, Solvent Proof	8
8	RPM-403	Stud Assembly	1
9	SSF-3115	Screw, SHCS	6
10	--	--	--
11	RPM-20	Draw Latch	3
12	SS-945-CD	Screw	1
13	SSN-1615-ZN	Lockwasher	1
14	20869-14	Fitting, Fiber Optic	1

NOTE: * Torque 77596-XX fittings to 8 lbs•in.

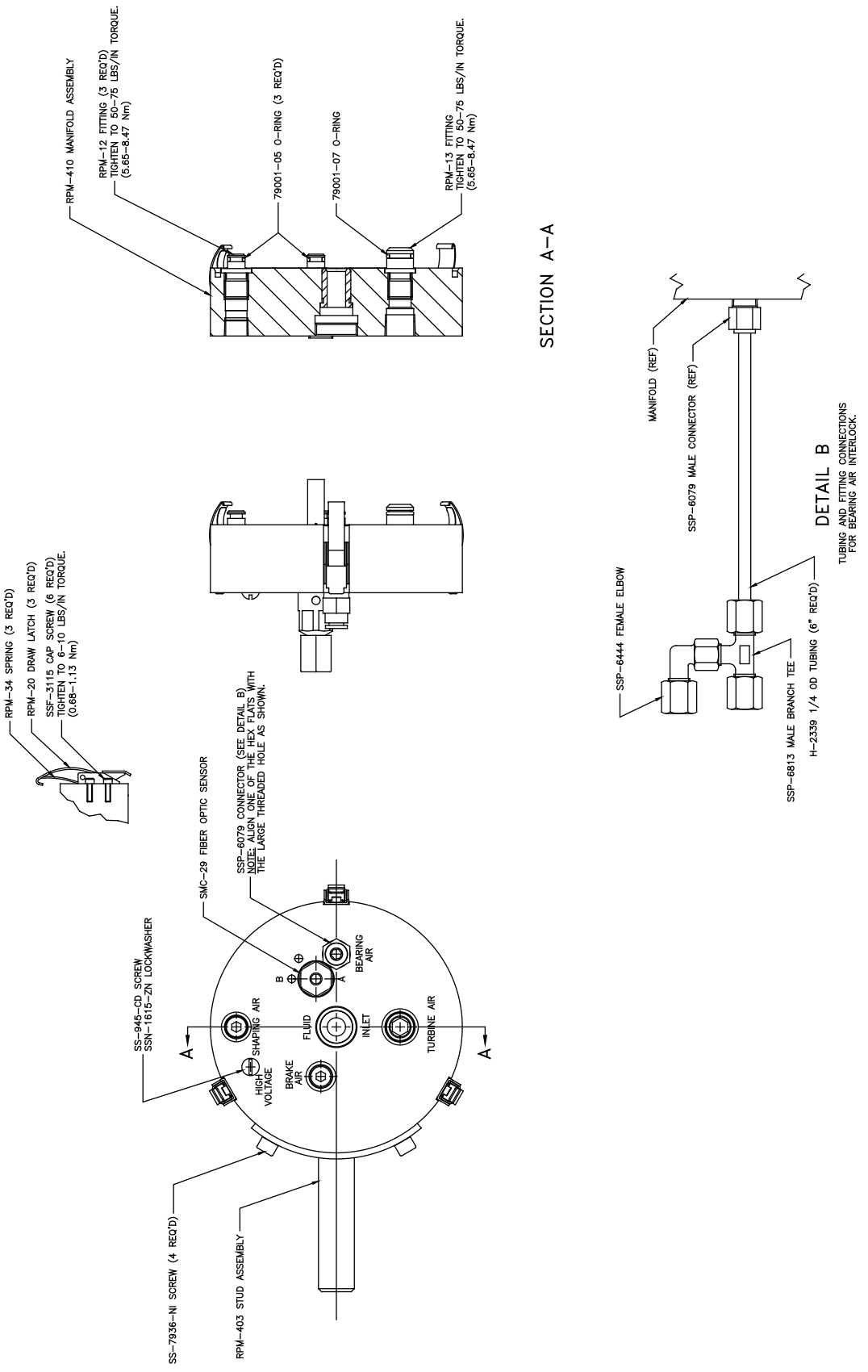


Figure 50: RPM-425 Rear Manifold - CCV Style

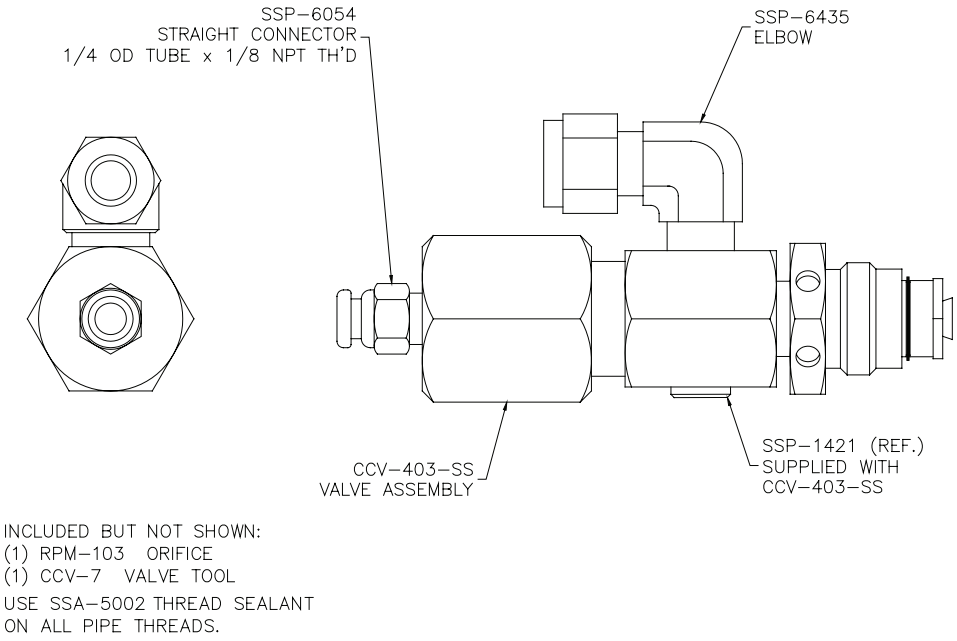


Figure 51: RPM-415 1-Valve Assembly

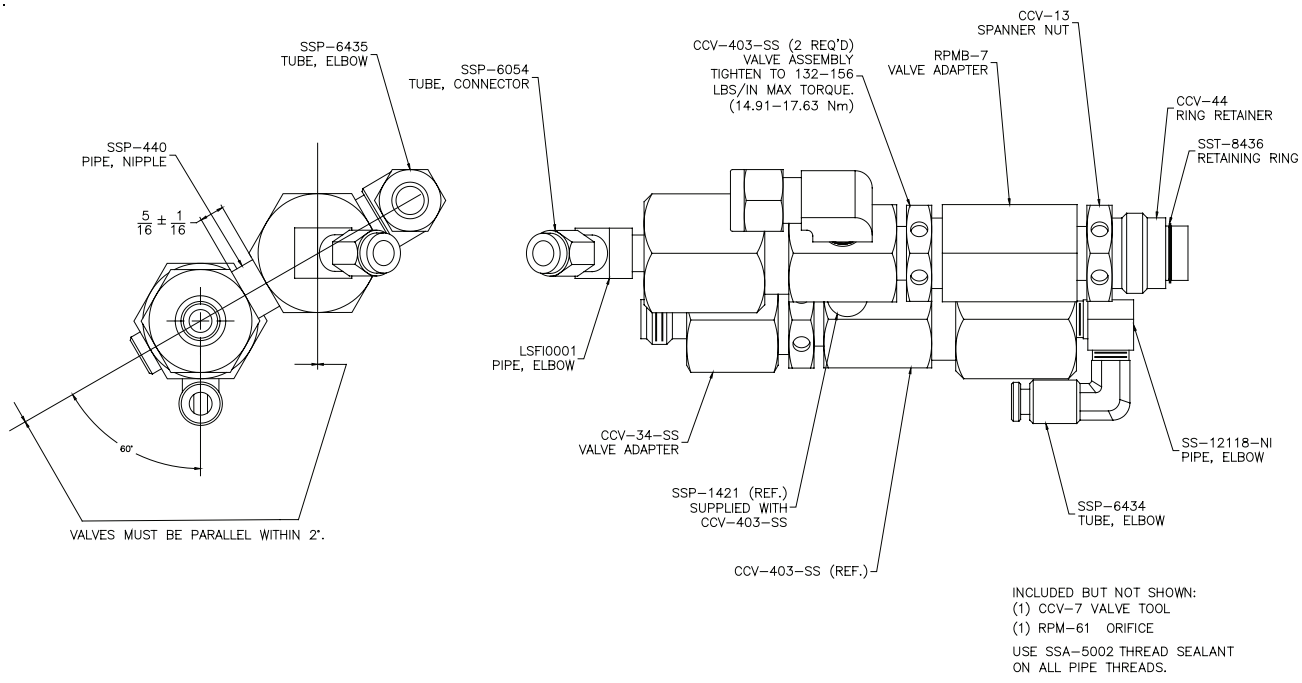


Figure 52: RPM-416 2-Valve Assembly - Trigger and Dump

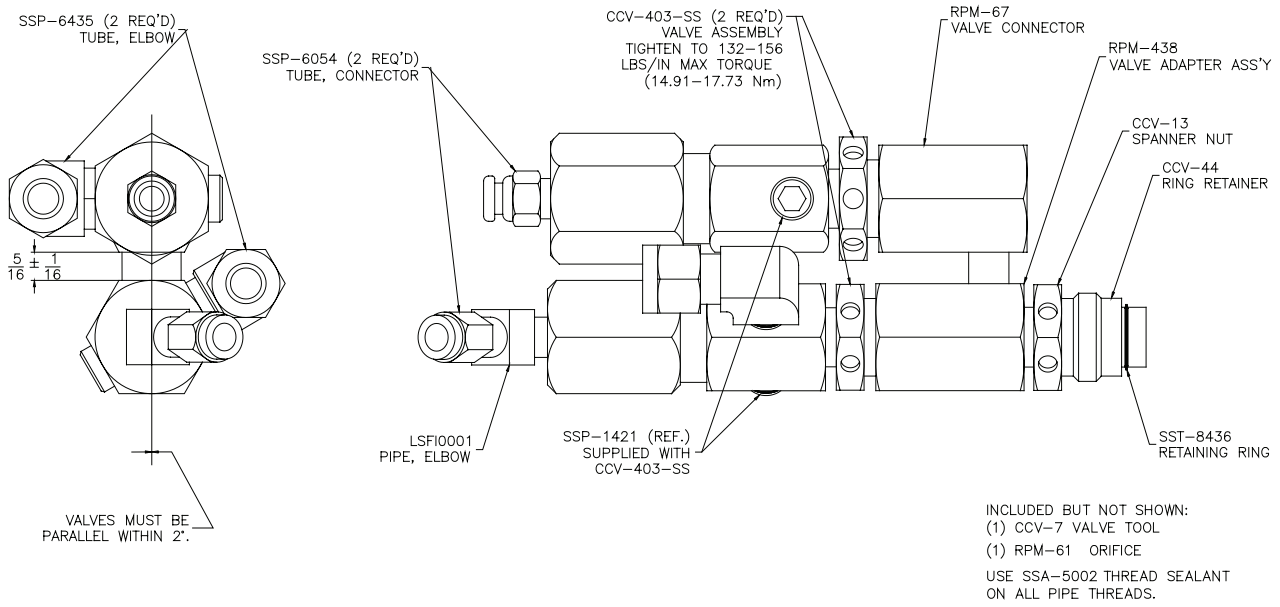


Figure 53: RPM-408 2-Valve Assembly - Trigger and Solvent

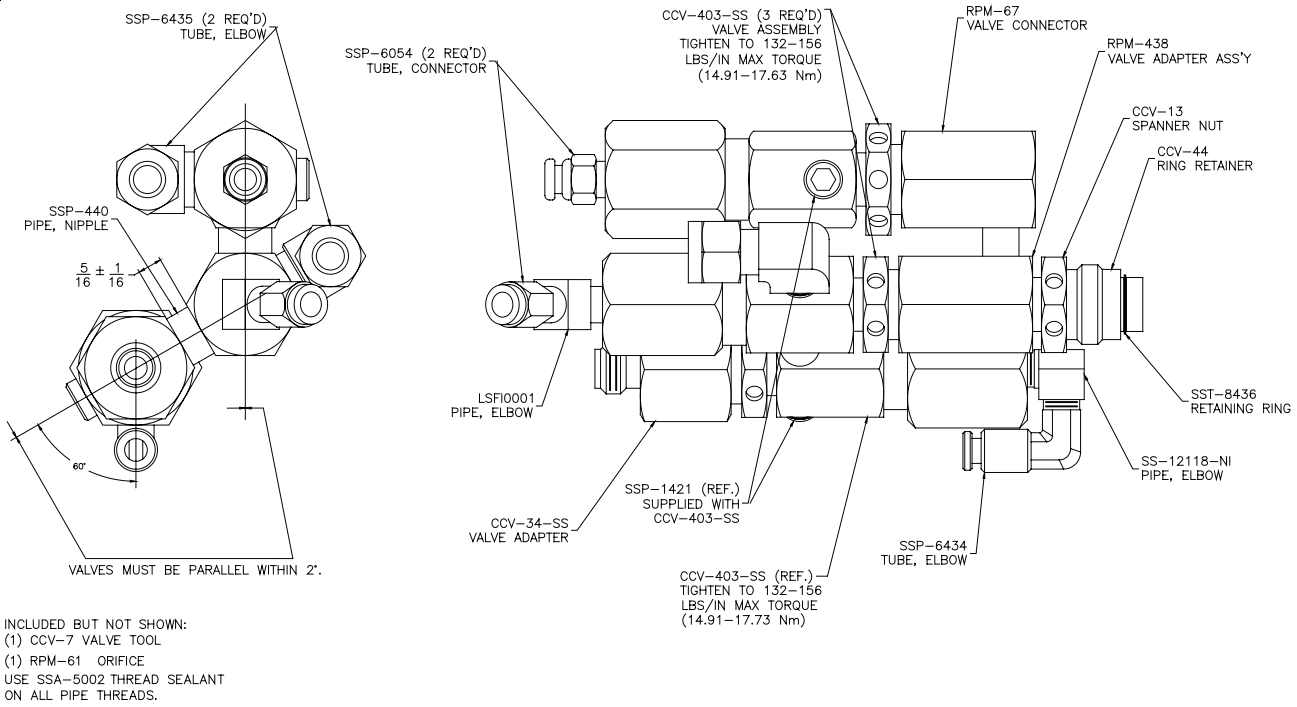


Figure 54: RPM-409 3-Valve Assembly - Trigger, Dump, and Solvent

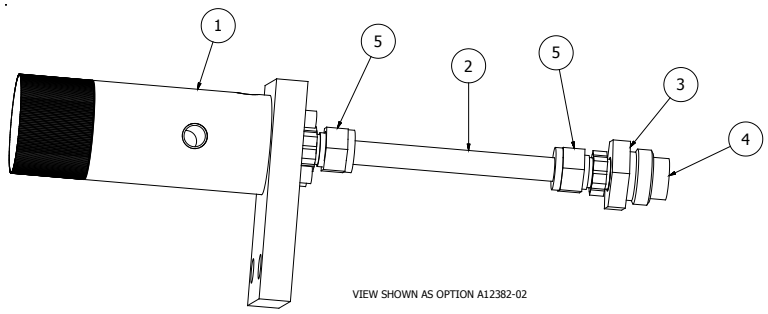


Figure 55: 3-Way Valve With CCV Solvent Valve Configuration

3-WAY VALVE WITH CCV SOLVENT VALVE - PARTS LIST (Figure 55)

Item #	Part #	Description	Qty
1	**"A"**	Valve Assembly, Fluid, 3-Way	1
2	A12384-00	Tube, 3/8" ODT X 0.047" Wall, Stainless Steel	1
3	79303-00	Pork, Outlet	1
4	79304-00	Seal	1
5	LSFI0033-00	Fitting, 3/8" ODT X 9/16" AN, Staineless Steel, Tube Fitting	2

VALVE ASSEMBLY - PART A

Part #	Part "A"	Description
A12382-01	18283-01	Valve Assembly, Fluid, 3-Way, Round Mounting Base
A12382-02	18283-02	Valve Assembly, Fluid, 3-Way, Square Mounting Base

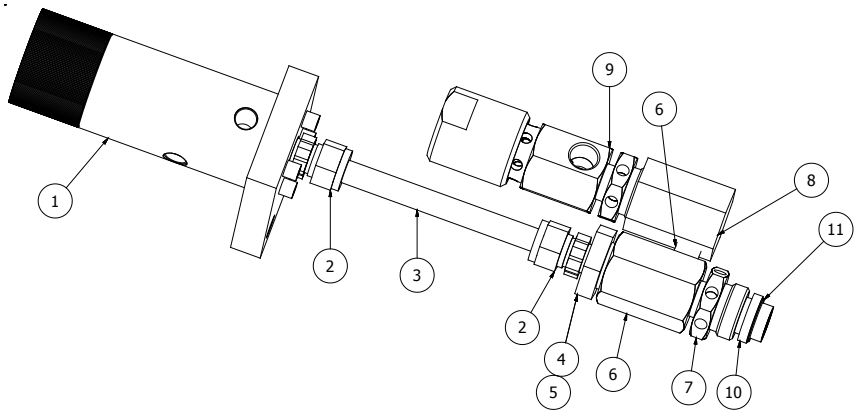


Figure 56: 3-Way Valve Configuration

3-WAY VALVE CONFIGURATION - PARTS LIST - (Figure 56)

Item #	Part #	Description	Qty
1	**"A"**	Valve Assembly, Fluid, 3-Way	1
2	LSFI1133-00	Fitting, 3/8" ODT X 9/16" AN, Stainless Steel, Tube Fitting	2
3	A12384-00	Tube, 3/8" ODT X 0.047" Wall 316, Stainless Steel	1
4	79303-00	Port, Outlet	1
5	79304-00	Seal	1
6	RPM-438	Valve Adapter Assembly	1
7	CCV-13	Spanner Nut	1
8	RPM-67	Valve Connection	1
9	CCV-403-SS	Valve Assembly	1
10	CCV-44	Retaining Ring	2
11	SST-8436	Retaining Ring	1

VALVE ASSEMBLY - PART A

Part #	Part "A"	Description
A12383-01	18283-01	Valve Assembly, Fluid, 3-Way, Round Mounting Base
A12383-02	18283-02	Valve Assembly, Fluid, 3-Way, Square Mounting Base

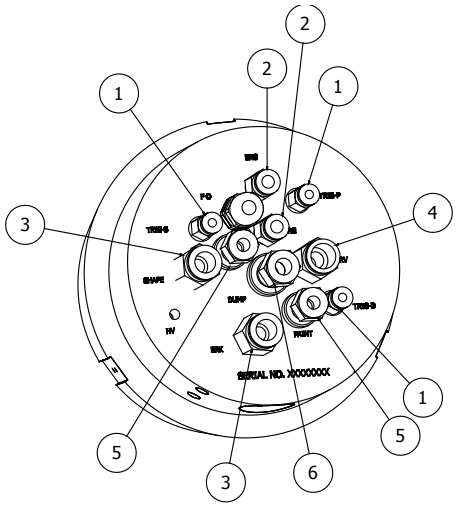


Figure 57: MCV Mounting Manifold Fitting Selection (Metric/Fractional)

MCV MOUNTING MANIFOLD FITTING KIT TABLE (METRIC/FRACTIONAL) - (Figure 57)

Item #	A12388-01 Part # (Fractional)	Description	A12388-02 Part # (Metric)	Description	Qty.	Where Used
1	A12389-01	Tube Fitting, 5/32" OD Tube X 1/8" Uni. Thread	A12389-06	Tube Fitting, 4mm OD X 1/8" Uni. Thread	3	Trig-P, Trig-D, Trig-S
2	A12389-02	Tube Fitting, 1/4" OD Tube X 1/8" Uni. Thread	A12389-07	Tube Fitting, 6mm OD X 1/8" Uni. Thread	2	BRG
3	A12389-04	Tube Fitting, 3/8" OD Tube X 1/4" Uni. Thread	A12389-09	Tube Fitting, 10mm OD X 1/4" Uni. Thread	2	Shape, BRK
4	A12389-05	Tube Fitting, 1/2" OD Tube X 1/4" Uni. Thread	A12389-10	Tube Fitting, 12mm OD X 1/4" Uni. Thread	1	DRV
5	LSFI0022-04	Tube Fitting, AN, 1/4" OD Tube	A12391-00	Tube Fitting, AN, 6mm OD	2	Paint, Solv
6	LSFI0022-07	Tube Fitting, AN, 3/8" OD Tube	A12390-00	Tube Fitting, AN, 10mm OD	1	Dump

NOTE: Tighten fittings to 8 lbs•in (0.90 Nm) torque.

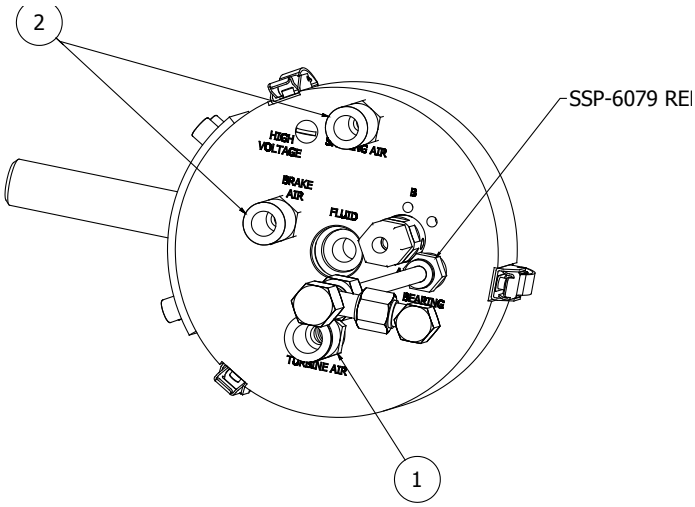


Figure 58: CCV Mounting Manifold Fitting Selection (Metric/Fractional)

CCV MOUNTING MANIFOLD FITTING KIT TABLE (METRIC/FRACTIONAL) - (Figure 58)

Item #	A12392-01 Part # (Fractional)	Description	A12392-02 Part # (Metric)	Description	Qty.	Where Used
1	SSP-6071	1/2" OD Tube X 3/8" NPT	A12389-11	12mm OD Tube X 3/8" Uni. Thread	1	Turbine Air
2	SSP-6066	3/8" OD Tube X 1/4" NPT	A12389-09	10mm OD Tube X 1/4" Uni. Thread	2	Shape Air, Brake Air

NOTE: Tighten fittings to 8 lbs•in (0.90 Nm) torque.

AEROBELL RECOMMENDED SPARE PARTS

Part #	Description	Qty.
RPM-401-1	Air Bearing Turbine	0-1
KK-4458	Draw Latch Repair Kit	1-2
H-2338	Tubing, 3/8" OD X 1/4" ID, Polyethylene	--
SSF-3137	Screw, M3 X .5" X 8mm Long, Socket Head Cap	4
79001-05	O-Ring, Solvent Proof	1-2
SMC-424-XX	Fiber Optic Cable	1
A10560-XX	High Voltage Cable	1
	Select Option Below - Fluid Tube	
RPM-439	1/8" ID (3.18mm)	0-1
RPM-440	3/32" ID (2.36mm)	0-1
RPM-441	1/16" ID (1.57mm)	0-1
	Select Option Below - Bell Cup Assembly W/Splash Plate	
RPM-452-1	30mm Bell Cup Assembly, Titanium, Serrated	0-1
RPM-457-1	57mm Bell Cup Assembly, Titanium, Serrated	0-1
LRPM-4001-01	70mm Bell Cup Assembly, Titanium, Serrated	0-1
LRPM-4001-02	70mm Bell Cup Assembly, Titanium, Non-Serrated	0-1
	Select Option Below - Bell Cup Only	
RPM-101-1	30mm Bell Cup, Titanium, Serrated	0-1
RPM-104-1	57mm Bell Cup, Titanium, Serrated	0-1
LRPM-0115-01	70mm Bell Cup, Titanium, Serrated	0-1
78580-00	70mm Bell Cup, Titanium, Non-Serrated	0-1
76609-00	Splash Plate, 70mm Bell Cup	0-1
78594-20F	Screw, 70mm Bell Cup	1-3
76610-01	Splash Plate, 57mm Bell Cup	0-1
78594-16F	Screw, 57mm Bell Cup	1-3
RPM-76	Shaft Plug, 30mm Bell Cup	0-1
	MCV Valve Manifold Style (76602-02)	
77591-00	Transmitter, Fiber Optic	0-1
78949-00	Valve Assembly	1-3
77367-00	Valve Seat Assembly	1-3
79001-07	O-Ring, Solvent Proof	1-2
79001-05	O-Ring, Solvent Proof	1-2
79001-04	O-Ring, Solvent Proof	1-2
79001-14	O-Ring, Solvent Proof	1-2
	A12387 Rear Mounting Manifold - MCV Style	
KK-4428	Draw Latch Repair Kit	1-2
20869-14	Fitting, Fiber Optic	0-1
79001-07	O-Ring, Solvent Proof	1-3
79001-06	O-Ring, Solvent Proof	2-4
	RPM-425 Rear Mounting Manifold - CCV Style	
SMC-29	Fiber Optic Sensor	0-1
RPM-20	Draw Latch Repair Kit	1-2
79001-07	O-Ring, Solvent Proof	1
79001-05	O-Ring, Solvent Proof	1-3
SSP-6444	Fitting, Female Elbow	0-1
SSP-6813	Fitting, Male Branch Tee	0-1

(Continued On Next Page)

AEROBELL RECOMMENDED SPARE PARTS (Cont.)

Part #	Description	Qty.
	CCV Valve Configurations Selection - RPM-415 1-Valve Assy.	
CCV-403-SS	Valve Assembly	1-2
RPM-103	Orifice	1
	RPM-416 2-Valve Assembly Selection - Trigger and Dump	
CCV-403-SS	Valve Assembly	1-2
SSP-440	Nipple, Pipe	0-1
RPM-61	Orifice	1
	RPM-408 2-Valve Assembly - Trigger and Solvent	
CCV-403-SS	Valve Assembly	1-2
RPM-61	Orifice	1
	RPM-409 3-Valve Assembly - Trigger, Dump, and Solvent	
CCV-403-SS	Valve Assembly	1-2
RPM-61	Orifice	1
SSP-440	Nipple, Pipe	0-1
	A12382 3-Way Valve Assembly	
18283-01	Valve Assembly, Round Mounting Base	1
18283-02	Valve Assembly, Square Mounting Base	1
79304-00	Seal	1
	A12383 3-Way Valve Assembly With CCV Solvent Valve	
18283-01	Valve Assembly, Round Mounting Base	1
18283-02	Valve Assembly, Square Mounting Base	1
CCV-403-SS	Valve Assembly	1
79304-00	Seal	1

ACCESSORIES

Part #	Description
LSCH0009-00	Dielectrice Grease (.88 oz. Tube)
76652-01	Kit for measuring high voltage (Includes Multi-Function Meter (76634-00) and High Voltage Probe Assembly (76667-00)
76652-02	Kit for measuring short circuit (SCI), resistance, and sprayability (Includes Multi-Function Meter (76634-00) and Test Lead Assembly (76664-00)
76652-03	Kit for measuring paint resistivity (Includes Multi-Function Meter (76634-00) and Paint Probe Assembly (7922-00)
76652-04	Deluxe Kit (Performs all functions listed above.) (Includes Multi-Function Meter (76634-00) and Paint Probe Assembly (7922-00), Test Lead Assembly (76664-00), and High Voltage Probe Assembly (76667-00)
A11065-05	Air Heater
74793-01	Cascade RansPak 1000, Right Angle Connection
74793-02	Cascade RansPak 1000, Straight Connection
74947-04	Cable Assembly, Low Voltage Cable, 75-Ft.
74947-05	Cable Assembly, Low Voltage Cable, 100-Ft.
74947-06	Cable Assembly, Low Voltage Cable, 30-Ft.
77620-00	Valve Plug Kit (Microvalve) (MCV Style)
KK-4458	Draw Latch Repair Kit
78152-00	High Voltage Splitter, RansPak 1000
SSW-1064	High Voltage Cable
EPS-4245	Banana Jack

LUBRICANTS AND SEALERS

Part #	Description
A11545-00	Petrolatum Jell Lubricant for all O-Rings
7969-03	Thread Sealant (Blue)
SSA-5002	Thread Sealant (White), Paste

AIR FILTERS / ELEMENT REPLACEMENT

Part #	Qty. Elements Per Carton	Used On
RPM-32	4	RPM-417,
RPM-32	8	Pre-Filter RPM-418, Bearing Air Filter

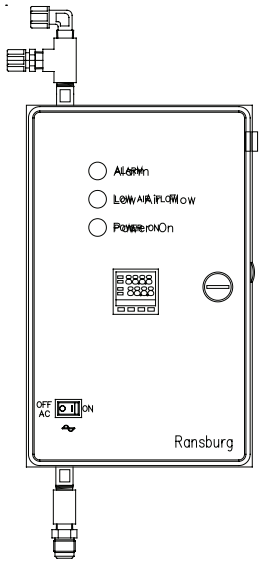


Figure 59: A11065-05 Air Heater

SERVICE KITS	
Part #	**Description**
KK-4461	Rebuild Kit, Air Bearing
KK-4462	RPM Motor Screw Kit
KK-4463	Air Bearing Screw Kit
RPM-32	Pre-Filter Replace Element
RPM-33	Bearing Air Filter Element
A11545-00	O-Ring Lubricant (20. oz. Jar)
KK-4913-00	Fiber Optic Maintenance Kit (Repair)
A11565-00	White, Stretch, Lint Free Covers

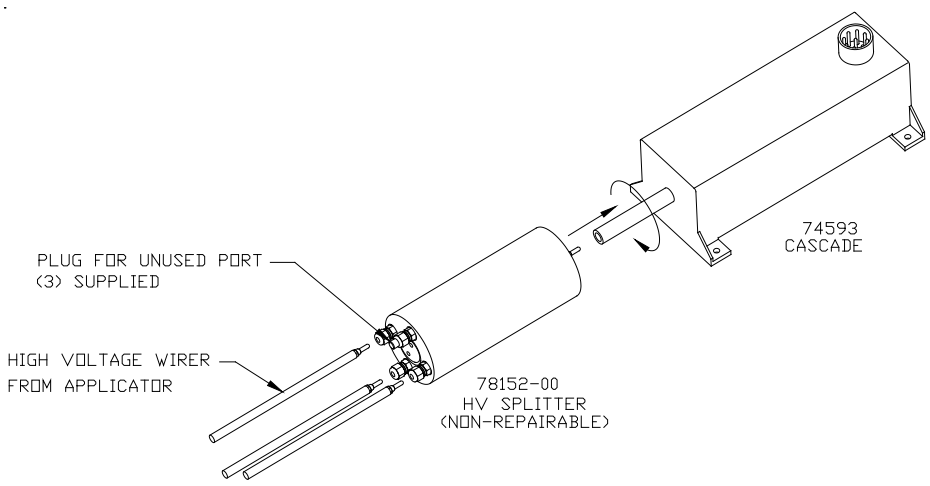
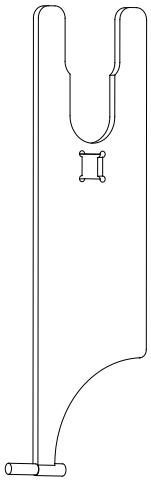
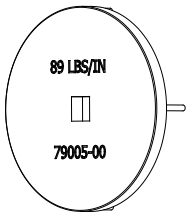


Figure 60: 78152 High Voltage Splitter

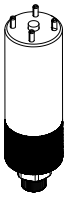
AVAILABLE TOOLS



RPM–419
BELL CUP WRENCH



79005–00
AIR SHROUD ASS'Y. TOOL



A11922–00
VALVE REMOVAL TOOL

CCV–7
VALVE TOOL

A10766–00
VALVE SEAT REMOVAL TOOL

WARRANTY POLICIES

LIMITED WARRANTY

Ransburg will replace or repair without charge any part and/or equipment that falls within the specified time (see below) because of faulty workmanship or material, provided that the equipment has been used and maintained in accordance with 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 RANSBURG APPROVED PARTS, VOID 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, (i.e., 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.**

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. 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 Ransburg's opinion the warranty item in question, or other items damaged by this part was improperly installed, operated or maintained, 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.

Service Manual Price: $50.00 (U.S.)

Manufacturing
1910 North Wayne Street
Angola, Indiana 46703-9100
Telephone: 260/665-8800
Fax: 260/665-8516
www.ransburg.com

Technical/Service Assistance
Telephone: 800/ 626-3565 Fax: 419/470-2040
Telephone: 800/ 233-3366 Fax: 419/ 470-2071

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

ISO 9001 Quality Systems

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