AirEase Reamer

INSTALLATION & OPERATION MANUAL

P/N **TRM 24-7-517**

AUTOMATION PERIPHERALS

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SAFETY

Automation Peripherals is concerned with the safety and welfare of its customers and their employees. Careful consideration has been given to the design and safety hardware supplied in this product. The product described in this document contains safety equipment that is intended as a supplement to the customer's complete safety program.These safety precautions are not meant to replace any related Federal, State or Municipal laws, regulations or guidelines pertaining to safety. Automation Peripherals believes that the appropriate levels of safety for an installation of this product can best be determined by safety professionals most familiar with the intended application, and we consider it the responsibility of the customer to ensure that this level of safety be accomplished. We recommend that each customer consult with such professionals in order to provide a work place that allows for the safe application, use and operation of this product.

SPECIFICATIONS

Cycle Time .....2-3 seconds

Dimensions .....14.25" x 8.19" x 7.57"

Weight

- *Reamer only.....22 lbs.*
- *Reamer with mister .....23 lbs.*
- *Reamer and snip .....26 lbs.*
- *Reamer, mister and snip .....27 lbs.*

Material .....Steel housing

Cutter Speed .....1,000 RPM

Torque .....80 In-lb.

Operating Pressure .....80-100 PSI at 15 CFM

Anti-Spatter Compound .....AP-356 only

Lubricator Oil .....IR-1024 only

INSTALLATION

– Mounting The reamer must be installed in a position so the nozzle can approach the reamer, wire snip and misting equipment (if applicable without interference.) Personnel must be able to safely access the unit for routine maintenance. Possible mounting methods:

1. Use the pre-drilled holes in back of the housing plate (see Mounting Template included) to bolt to a flat surface.

OR

2. Weld back plate to a support structure (see Mounting Template included).

– Air-line Connection

1. Use only filtered, unlubricated air.
2. 80 to 100 PSI should be used for best results.
3. 1/4-NPT - connect flexible hose to Automation Peripherals quick coupler (included).

SET-UP AND ADJUSTMENTS

– Tools Required

3/4-inch wrench (reamer bit)

7/16-inch wrench (jam nut in clamping arm)

1/8-inch Allen wrench (set screws in clamping arm)
1/4-inch Allen wrench (provided with reamer for clamping pin)

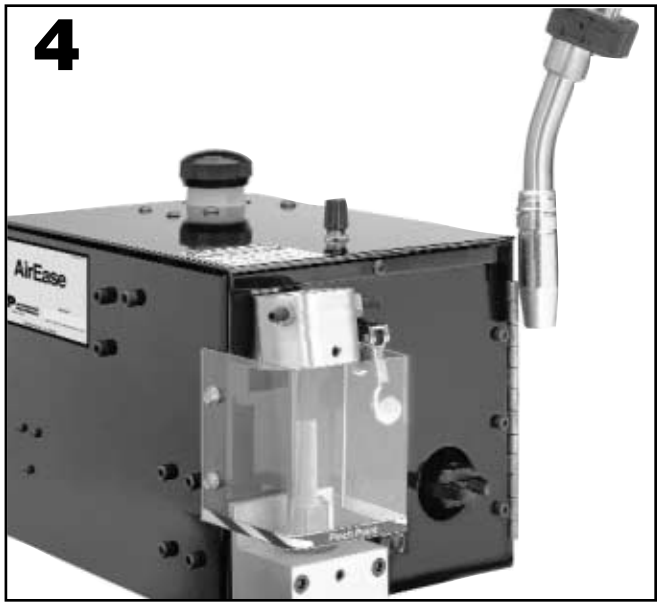
1-1/4 inch wrench (for reamer bit adapter, if required)

– Robot Programming and Reamer Set-up Procedure

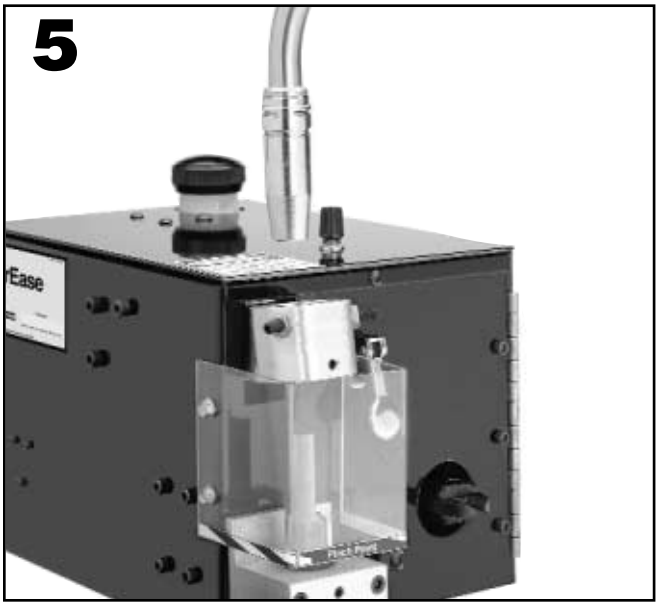
1 Disconnect air supply from reamer.

2. Loosen jam nuts (7/16-inch wrench) and back out set screws as far as possible (1/8-inch Allen wrench).

3. Loosen clamping pin with 1/4-inch Allen wrench (provided for you). To loosen clamping pin, insert Allen wrench through hole in back of reamer and into the clamping pin adjustment screw. Use sight hole in top of cover to locate adjustment screw. Turn counterclockwise to loosen.



4. Prior to programming first approach point, align torch with the corner of the reamer.



5. Now that the torch is square to the reamer station, the robot can be jogged to the reaming point in world/ cartesian mode.

6. Program robot cleaning point. The nozzle is in the correct position when you push down on clamping arm and there is approximately 1/32-inch "play" in the vertical motion.

7. Using a 3/4-inch wrench, turn reamer bit 90 degrees, repeat four times. With each 90 degree turn, manually slide the reamer bit into the torch nozzle. This will ensure the cutter engages the nozzle and is centered in the nozzle. If misaligned, jog the robot in world/cartesian mode 'x' and 'y' to align reamer bit.

8 Program cleaning point.

9. Adjust set screws until they gently touch nozzle. (NOTE: Too much adjustment can push torch out of alignment.) Tighten (lock into place) set screws with jam nut. Tighten jam nuts to secure set screws.

10 Adjust clamping pin until it touches nozzle, then turn Allen wrench another half turn.

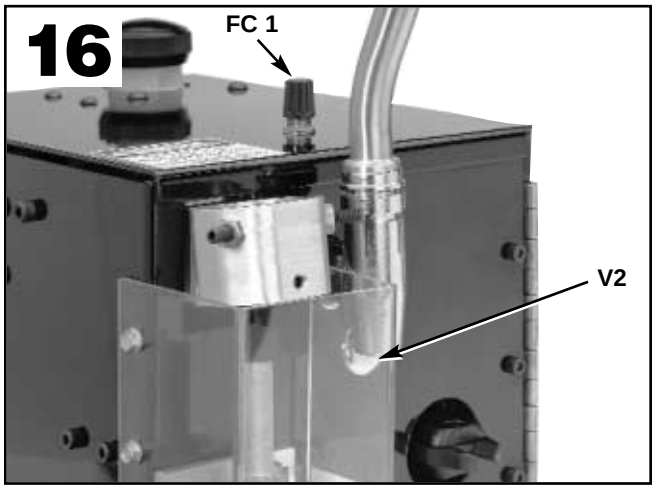
11 Program robot approach and exit point. This point will be the same location and is recommended to be 3 inches directly above the clamping arm in line with reamer bit.

12 Program departure points until the robot can safely return to the Home position.

13 Remove Allen wrench.

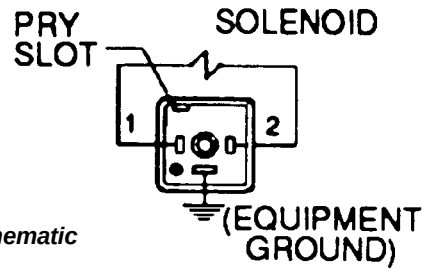
14 Reconnect air supply to reamer.

15 Cycle through program to check operation.



16. If reamer has anti-spatter mister, program the robot to move to a position which activates valve V2, holding the nozzle against the paddle. Adjust the amount of fluid by turning the flow control valve FC1.

17 **Set-up for the Wire Snip** The wire snip is controlled by a single solenoid valve. The valve is actuated by a maintained electrical signal. The solenoid valve comes with a prewired cable plug. The plug has three wires, one for ground and the other two to operate the solenoid. Each application is different. Refer to the devices manual on which this will be wired.



General wiring schematic

19 Teach robot to move and align the wire stick-out of the torch between the jaws of the snip ***(Figure 2),*** if applicable.

– Reamer

The Automation Peripherals torch reamer is a stand-alone reamer, requiring only shop air to function. The reamer requires no logic inputs or outputs (I/0) to execute the reaming operation.

Commercially available torch reamer designs currently use either a clamping device to hold in place the nozzle being reamed, or do not clamp the nozzle at all.

Clamping the nozzle is superior because the nozzle does not rotate with the reamer. On a typical clamping reamer, when the robot is ready to exit the reamer, it makes sure the torch is unclamped as a precautionary measure. If the torch is not unclamped, it will tear the torch apart as the robot moves away.

The Automation Peripherals reamer is unique because it clamps the torch as the robot moves it into the reamer, and releases the torch as the robot removes it from the reamer. This action happens regardless of where the reamer is in the process cycle. This is accomplished through the use of a self-clamping actuator arm. As the actuator arm is depressed, a spring-loaded pin extends out of the arm into the torch receiver barrel. This locks the torch nozzle against two adjustable set screws. The actuator is designed with a five-to-one mechanical clamping advantage when depressed. This prevents the nozzle from rotating during the reaming process and unclamps it as the torch is retracted.

To start the process, the robot moves the torch into the self-clamping actuator arm assembly. As the actuator arm is depressed, it engages the actuator arm limit switch valve. When engaged, the actuator arm limit switch valve starts the air motor rotating and the air slide moving up. The air slide moves the rotating air motor, which is equipped with a reamer bit, up into the nozzle of the torch. An air switch valve is used as a top limit for the air slide. When the reamer contacts the limit switch the reamer will stop its upward movement and rotation. The location of the trip limit is adjustable to accommodate different types of nozzles. This is the end of the cleaning cycle.

The double air pilot valve is used to prevent the reamer from repeating the cycle. The reaming process will only cycle once for every depression of the actuator arm. In addition, if the actuator arm is released at any time during the reaming process, the air motor stops rotating and the air slide retracts. See reamer pneumatic schematic for reference (see page 9).

The unit is housed in a sheet-metal box. Only the air motor/reaming bit, part of the actuator arm and lubricator are exposed. The air slide, both limit switch valves, both airpilot valves and all associated air-lines are isolated from the reaming process.

– Anti-Spatter Mister (optional)

The robot should move and aim the nozzle of the torch at the spray nozzle tube, which dispenses AP-356 Anti-Spatter compound, ***(see Figure 1)***.

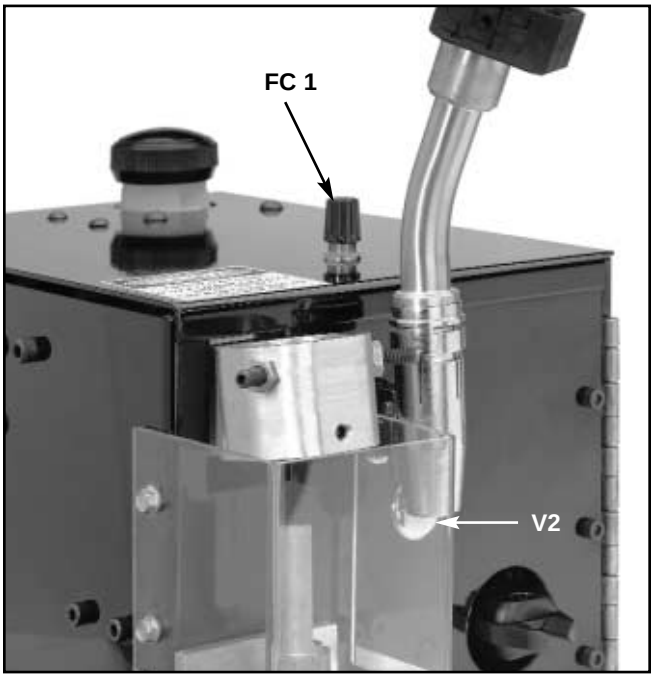


Figure 1 - Torch in position for cleaning by misting.

When valve V2 is actuated, air is delivered to the syphon-type spray nozzle tube. The pilot-operated fluid valve is actuated, allowing flow of anti-spatter compound to the nozzle.

The mist adjust control, (FC 1), adjusts the force and the amount of compound that is delivered into the torch as a mist. The mist pattern can be controlled with an adjustable choke on the end of the spray nozzle tube. To deliver an appropriate amount of compound, these controls must be adjusted interactively with the dwell time of the torch in the cleaning position.

– Wire Snip (optional)

The robot should move and aim the wire stick-out of the torch between the jaws of the snip ***(see Figure 2).***

NOTE: To ensure a proper stick-out, additional wire may need to be fed out before snipping.

When the solenoid is actuated, air is delivered to the valve, and the snip jaws cut the wire. After the cut is complete, deactivate the solenoid to open the jaws of the snip.

There is no adjustment to the wire snip. This unit operates on the air inlet pressure.

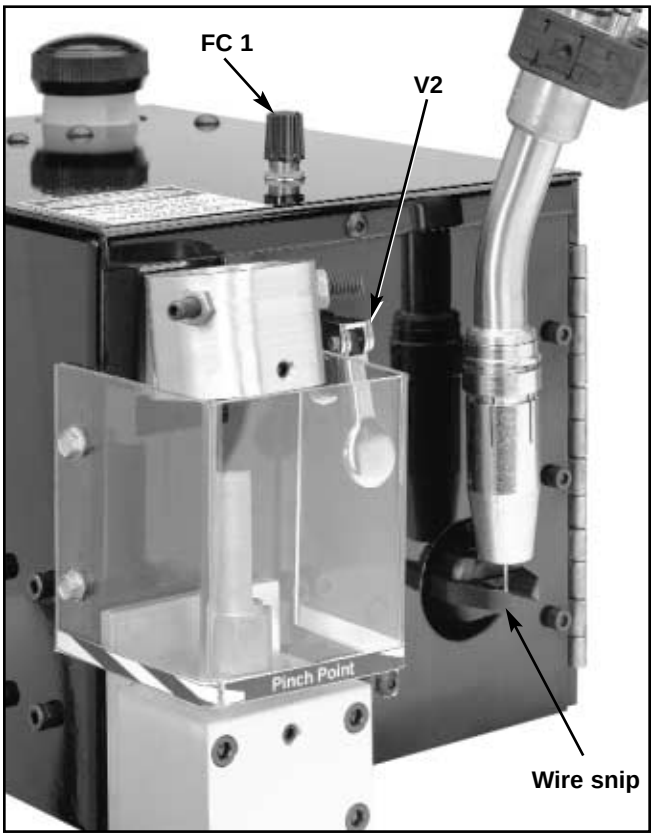
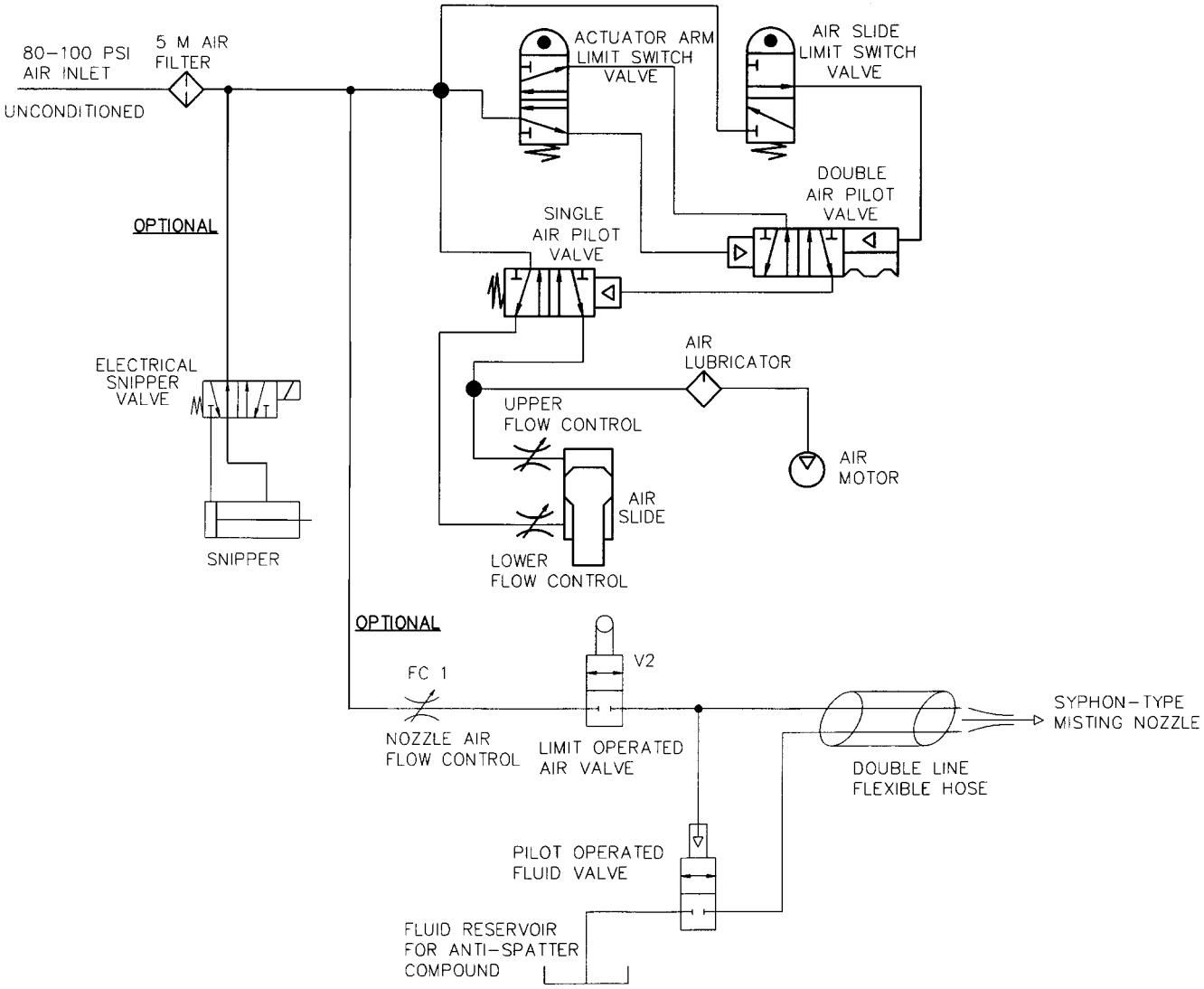


Figure 2 - Torch in position for wire snip.

Reamer Pneumatic Schematic



– Oil Filling Procedure

1. Disconnect air supply.
2. Swivel lubricator to vertical position. ***(see Figure 3)***
3. Loosen plastic bowl by turning it 1/4-inch counter-clockwise. This vents the oiler, making oil addition possible.
4. To access the oil fill point, use a Phillips screwdriver. Fill with air tool oil or equivalent (P/N IR1024).
5. Reinstall Phillips screw, and retighten plastic bowl.
6. Return lubricator to horizontal position for operation. ***(see Figure 4)***

NOTE: Lubricator will not deliver oil in vertical position.

NOTE: Check oil supply once a month. Oil in sight glass should be more than 1/3 full.

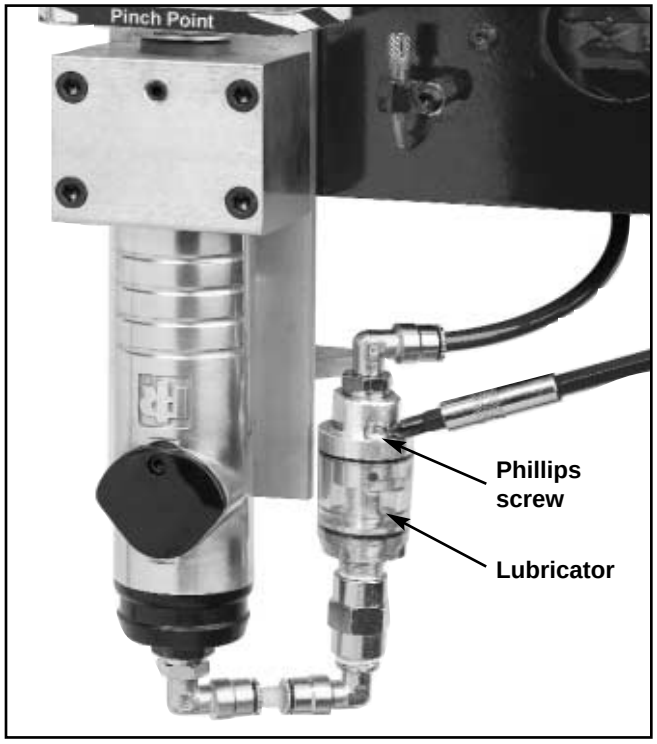


Figure 3 - Lubricator in vertical oil fill position.

– Reamer Bit Replacement Procedure

1. Disconnect air supply from reamer.
2. Remove reamer bit cover.
3. Loosen reamer bit with 3/4-inch wrench; hold with hand near nut.
4. To loosen reamer bit, use handle of hammer to tap wrench.
5. Remove old reamer bit.
6. Insert new reamer bit.
7. Use fingers to tighten reamer bit.
8. Replace reamer bit cover.
9. Reconnect air supply to reamer.

Figure 4 - Lubricator in horizontal operating position.

– Anti-Spatter Reservoir Filling Procedure

Remove the cap and fill the reservoir with AP-356 Anti-Spatter compound until full. The fluid level can be visually checked through the liquid-level sight slot in the side of the housing ***(see Figure 5).*** Replace the cap.

CAUTION: ***Use of Anti-Spatter compound other the AP-356 may cause damage to the AirEase Reamer. Automation Peripherals will not warrant damage of this nature.***

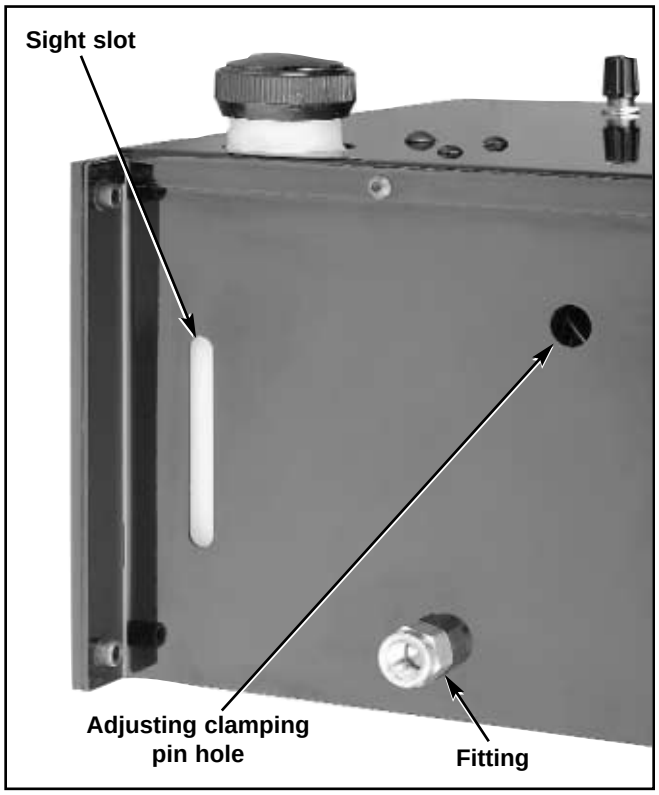


Figure 5

– Reamer Slide Speed Adjustment Procedure

There are two flow controls on the reamer slide assembly – an upper flow control and a lower flow control.

The upper flow control regulates the speed of the reamer assembly as it moves up. To make the reamer slide assembly move up slower, turn the upper flow control screw clockwise. To make the reamer slide assembly move up faster, turn the top flow control screw counterclockwise.

The lower flow control regulates the speed of the reamer slide assembly as it moves down. To make the reamer assembly move down slower, turn the lower flow control screw clockwise. To make the reamer slide assembly move down faster, turn the lower flow control screw counterclockwise. See part illustration on page 21 for location..

– Reamer Slide Travel Adjustment Procedure

Adjustment for reamer travel is located behind the air motor. The amount of upward travel is controlled by an air limit switch that is triggered by an actuator/plate mounted to the air slide. Achieve proper reamer travel by changing the location of the actuator using the two spacers provided. (see Illustration on page 19, items #63 and 69). Placing a spacer on top of the actuator allows for more reamer travel. Placing a spacer below the actuator decreases reamer travel.

AIREASE TROUBLESHOOTING

COMPONENT	PROBLEM	SUGGESTED REMEDY
Reamer	Nothing moves.	• Check inlet air pressure, 80-100 PSI. • Check for kinks in air lines. • Check actuator arm limit switch valve, (item 12 on exploded view, page 18). If it is on, check how far it reaches into air schematic.
Reamer	Air slide does not go down.	• May be obstruction in air slide ciruit, screw out lower needle valve on lower flow control on slide to pass possible contaiminates.
Reamer	Air slide does not go up.	• May be obstruction in air slide ciruit, screw out upper needle valve on upper flow control on slide to pass possible contaiminates.
Reamer	Air slide moves too slow.	• Check inlet air pressure, 80-100 PSI. • See Reamer Slide Speed Adjustment Procedure on page 11.
Reamer	Air slide moves too fast.	• See Reamer Slide Speed Adjustment Procedure on page 11.
Reamer	Cutter hits side of nozzle.	• Check torch alignment. Realign. • Verify proper reamer cutter to nozzle configuration.
Reamer	Cutter goes too high or too low.	• See Reamer Slide Travel Adjustment Procedure on page 11.
Reamer	Nozzle rotates on welding gun.	• Tighten clamping pin. After contacting the nozzle, tighten clamping pin a half turn. • Check torch alignment.
Reamer	Torch doesn't release.	• Loosen clamping screw.
Mister	No air coming out of mister nozzle.	• Check inlet air pressure, 80-100 PSI. • Check adjustment of flow control on page 8, fig. 2 • Check for kinks in air-lines. • Check for blockage in air nozzle. Take off choke and place thumb over end of nozzle, then press mist paddle switch.
Mister	No anti-spatter coming out of mister nozzle.	• Check reservoir for anti-spatter compound. • Check adjustment of flow control on page 8, fig. 2 • Check for kinks in air-lines. • Check for blockage in air nozzle. Take off choke and place thumb over end of nozzle, then press mist paddle switch.
Wire Snip	Wire snip does not actuate.	• Check inlet air pressure. • Check for kinks in air-lines. • Check wiring on solenoid valves for damage. • Check device on which solenoid valve is wired, i.e., PLC, Robot Input, etc.

Should you have any questions or concerns not listed in AirEase Troubleshooting section, please call Automation Peripherals (phone 1-888-693-5776, fax 1-888-693-5777).

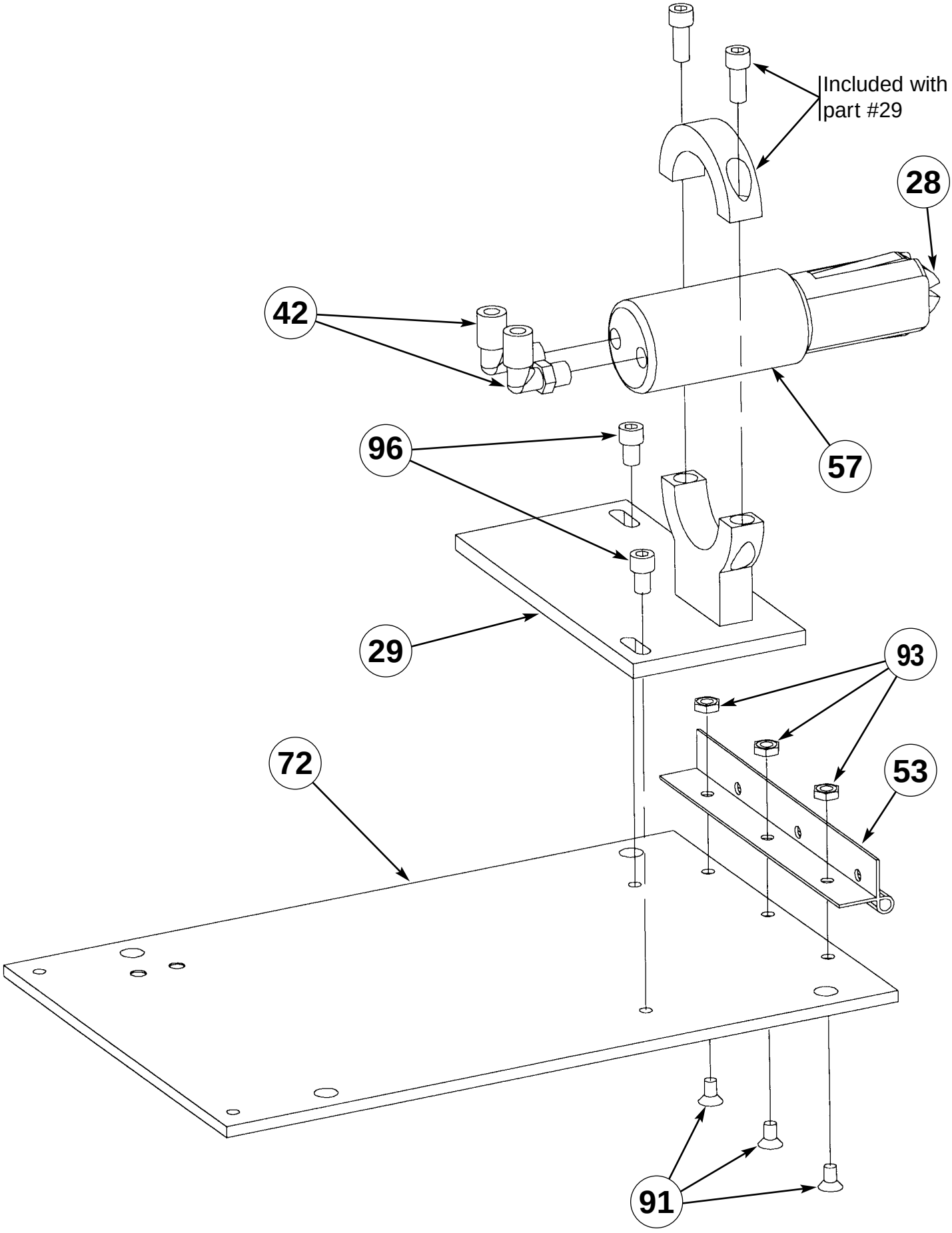
AIREASE PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION
1	30482	Spray Nozzle, 90 Degree
2	98500	Air Lubricator
3	200030	Cap for Reservoir Bottle
4	11646R	Snip Solenoid
5	1292-1	Fitting for Reservoir Bottle
6	1294-1	Universal Tee
7	1J-156-07	5/32" OD Green Tubing (ft.)
8	1J-169-07	1/4" OD Blue Tubing (ft.)
9	1R-5LN-A	Ingersol Air Motor w/Adapter
10	234-955	Air slide Limit Switch Valve
11	33B	Brass Hex Nipple 10-32
12	358-955-N	Actuator Arm Limit Switch Valve
13	2543-04-04	Fitting
14	6510-53-32	Male Connector 5/32", Tube 10-32 NPT
15	6520-02-32	1/8" x 10/32" Male Elbow SW
16	6560-04-00	Union "Y", 1/4" Tube Fitting
17	6800-53-04	Reducer, 5/32", 1/4" Tube Fitting
18	7391A78	1/4" Allen Wrench
19	8876T39	Clamp
20 (not shown)	85985K31	Plug
21	8FAST	Bolts & Nuts Pkg.
22	9-1005-36	Yellow Spring “D”
23	9637K82	Spring
24	AO-20-05	Button Air Valve
25	AO-30-1	Air Pilot Actuator
26	AP-1	Silver Actuator
27	BSC2B20X50	Air Slide
28	CD4 - CH	Jaws
29	TTX-010-105618	Wire Snip Bracket
30	TTX-009-106964	Seal (10/98)
31	F14F11B	1/4" NPT Air Filter
32	IR-10Z4	Lubricator Oil (4 oz.)
33	L12PA4520	Single Air Pilot Valve
34	L12PP4520	Double Air Pilot Valve
35 (not shown)	L1-K1	Repair Kit–Single Air Pilot Valve
36 (not shown)	L1-K2	Repair Kit–Double Air Pilot Valve
37	M010	Flow Control
38	M2MN	1/4" NPT Male Muffler
39	P6510-04-02	Straight 1/4", 1/8" Fitting
40	P6510-04-04	Straight 1/4", 1/4" Fitting
41	P6510-53-04	Straight 5/32", 1/4" Fitting
42	P6520-04-02	90 Deg. Elbow, 1/4" - 1/8" Fitting
43	P6520-04-04	90 Deg. Elbow, 1/4" - 1/4" Fitting
44	P6520-53-02	90 Deg. Elbow 5/32", 1/8" Fitting
45	P6520-53-04	90 Deg. Elbow 5/32", 1/4" Fitting

AIREASE PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION
46	PC102B-4	1/4" NPT Cross 4-way Fitting
47	PC127B-4	1/4" Tee Run
48	PC86Q-44	1/4" Female, 1/4" Tube Bulkhead
49	PCIP-M4	1/4" Industrial Quick Coupler
50	PCISC-F4	Industrial Socket Coupler, 1/4" NPT
51	PNV11-44-2	Needle Valve
52	PS403	Replacement for F14F11B Filter
53	1260SS	Housing Hinge
54	RKW20	Seal Kit for BSC2B20X50
55	TA-1	Paddle
56	211-1	Hose Barb 10-32 to 1/8" Tube
57	SP-01F	Wire Snip
58	TTR-100	Reservoir Bottle
59	10-32X1-1/2	HEX-COUPLER Standoff
60	TTX-009-104779	Actuator Arm
61	TTX-009-104780	Clamping Arm Pin
62	TTX-009-104781	Arm Bracket
63	TTX-009-104782	Slide High Limit Switch - High Limit Switch Actuator
64	TTX-009-104783	High Limit Switch Mounting Bracket
65	TTX-009-104784	Slide Air Motor Adapter
66	TTX-009-104785	Air Motor Mounting Bracket
67	TTX-009-104786	Start Switch Actuator Tab
68	TTX-009-104787	Slide Spacer
69	TTX-009-105288	Slide High Limit Switch Spacer (2)
70	TTX-009-105301	Nozzle Retainer
71	TTX-009-105305	Housing
72	TTX-009-105306	Back Housing
73	TTX-009-105307	Top Cover
74	TTX-009-105624	Clamping Arm Spacer Pin
75	TTX-009-105629	Reamer Bit Cover
76	TTX-009-106963	Bushing (10/98)
77	35669	Socket Head Cap Screw #5-40 x 3" (3)
78	37008	Nylon Insert Lock Nut #5-40 (3)
79	72092	Socket Head Cap Screw 1/4-20 x 1/2" (2)
80	80211	Socket Head Cap Screw 1/4-20 x 2" (4)
81	31810	Self Drilling Screw, Hex Head 10-16 x 1/2" (2)
82	81029	Button Head Socket Cap Screw #10-24 x 3/8" (2)
83	81048	Button Head Socket Cap Screw 1/4-20 x 3/8" (2)
84	80199	Socket Head Cap Screw 1/4-20 x 1/4" (2)
85	81826	Socket Set Screw 1/4-20 x 1/4" (3)

ITEM NO.	PART NO.	DESCRIPTION
86	36201	Hex Jam Nut 1/4-20 (2)
87	25358	Set Screw 1/4-20 x 1" (2)
88	72116	Socket Head Cap Screw 1/4-20 x 3" (1)
89	37018	Nylon Insert Lock Nut 1/4-20 (1)
90	81222	Flat Head Socket Cap Screw 1/4-20 x 1/2 (3)
91	81199	Flat Head Socket Cap Screw #10-24 x 1/2" (3)
92	81029	Button Head Socket Cap Screw #10-24 x 3/8" (2)
93	36027	Hew full Nut #10-24 (7)
94	39548	Socket Head Cap Screw M5-.8 x 25mm (4)
95	39520	Socket Head Cap Screw M4-.7 x 22mm (2)
96	80200	socket Head Cap Screw 1/4-20 x 3/8" (4)
97	23057	Socket Head Cap Screw #5-40 x 1" (2)
98	33074	Flat Washer, 3/16"
99	80148	Socket Head Cap Screw #10-24 x 1" (2)
100	92765A614	Oval Point Set Screw 1/2-13 x 1" (1)
101	90291A535	Nylon Tipped Set Screw 1/4-20 x 3/8" (2)
102	Pur-811-109251	Shim Washer .01 Thick (2)
103	39524	Socket Head Cap Screw M4-.7 X 10mm (2)
104	33219	Fender Washer 3/8" ID X 1-1/4" OD (1)
105	39546	Socket Head Cap Screw M5-.8 X 16mm (2)
106	81039	Button Head Socket Cap Screw #10-32 X 3/8" (2)
107	64026	Button Head Socket Cap Screw #10-24 X 1/4" (2)
108	80144	Socket Head Cap Screw #10-24 X 1/2" (3)
109	11862R	Clamp, Nozzle
	AP-356-Q	Anti-Spatter Compound, 1 Quart
	AP-356-1	Anti-Spatter Compound, 1 Gallon
	AP-356-5	Anti-Spatter Compound, 5 Gallon
	AP-356-55	Anti-Spatter Compound, 55 Gallon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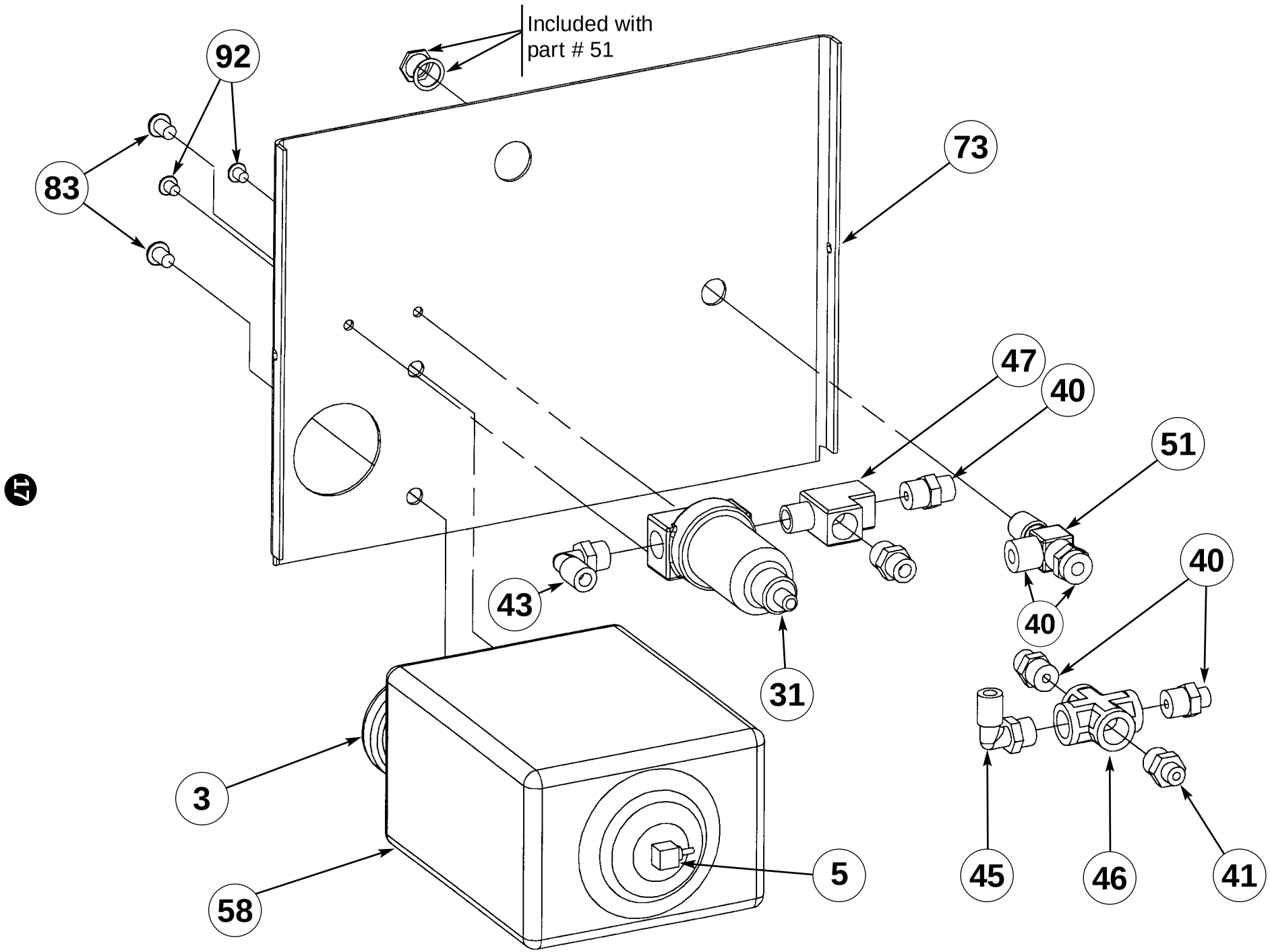
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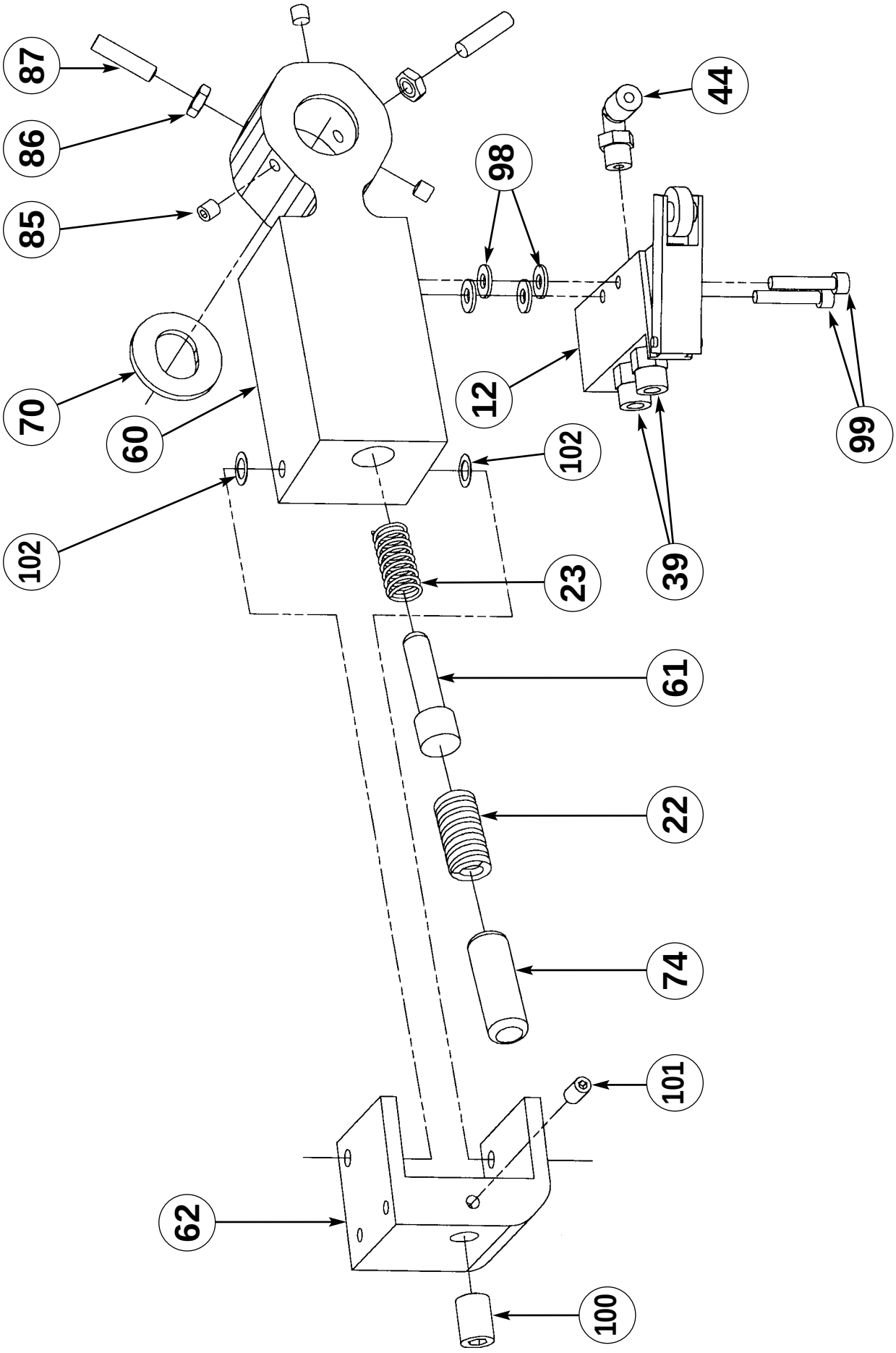
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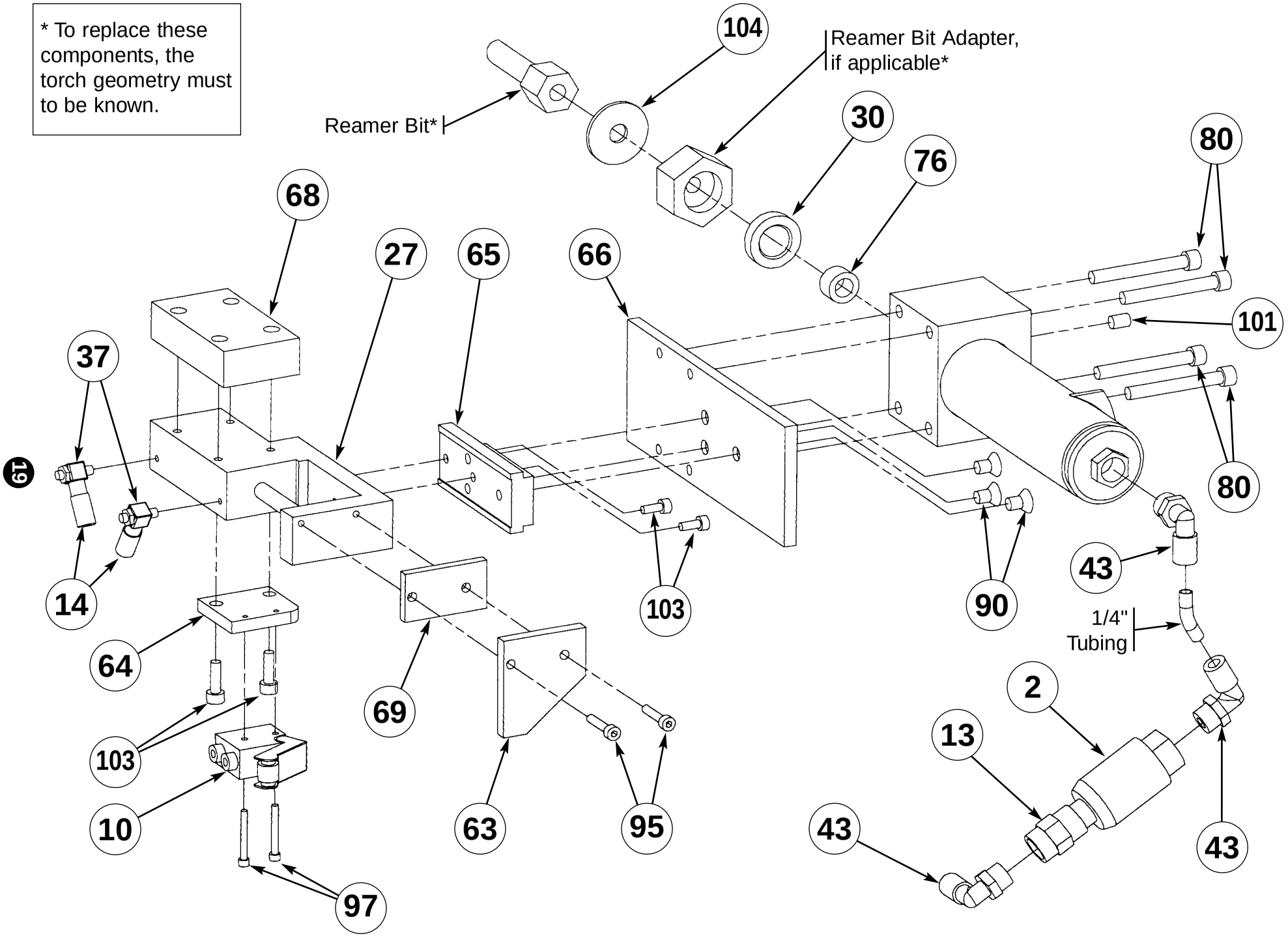
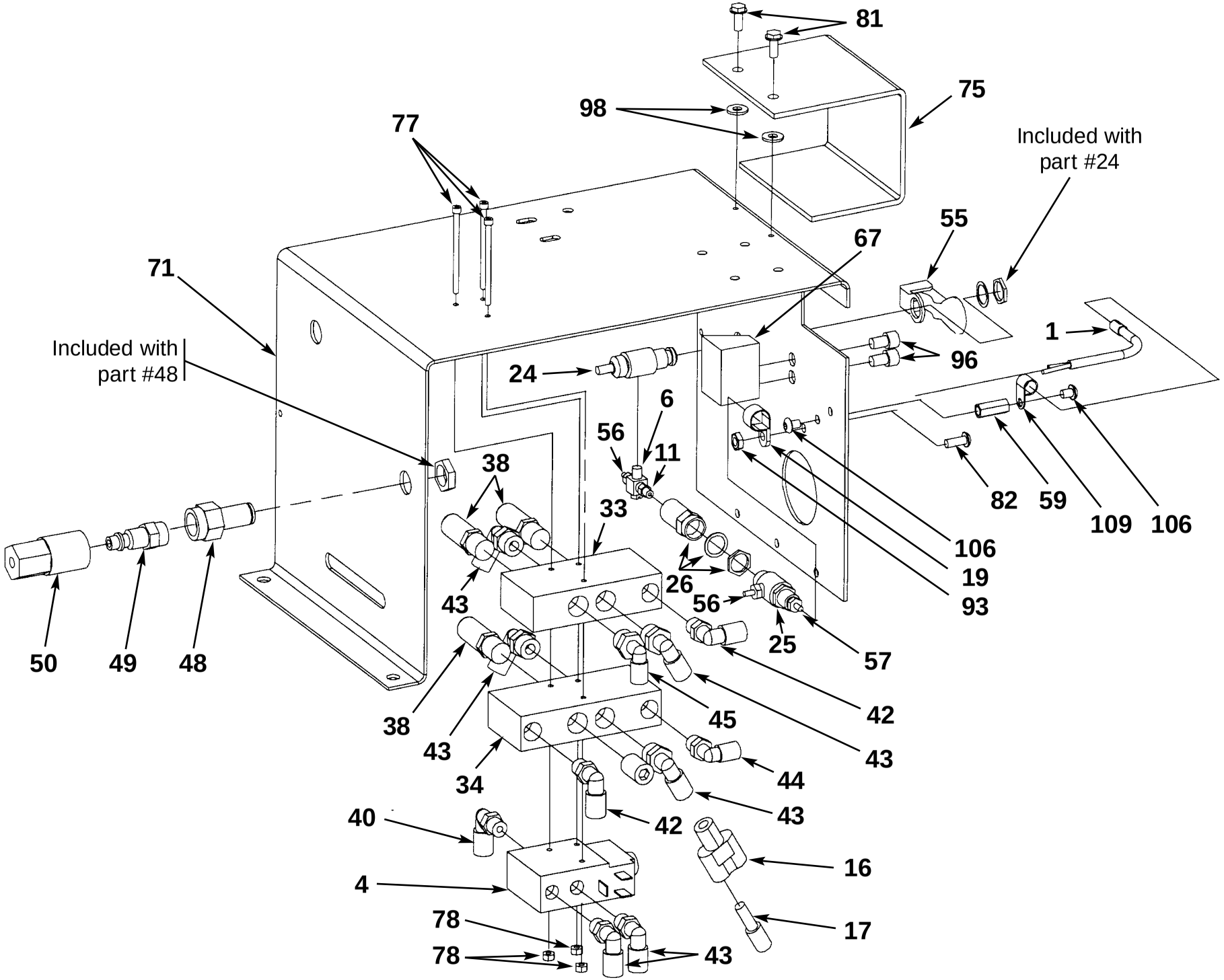
* To replace these components, the torch geometry must to be known.

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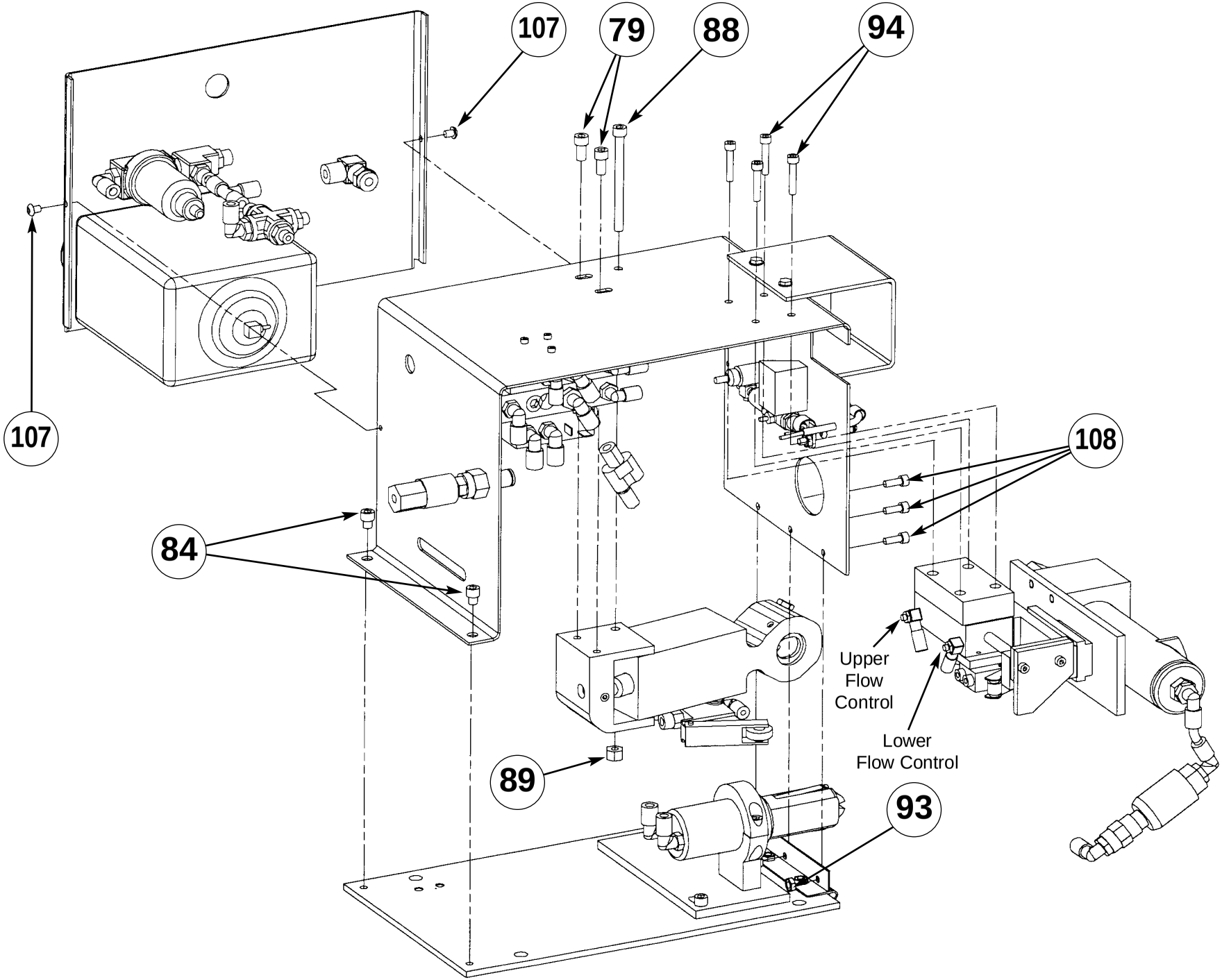
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Lower
Flow Control
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MATERIAL SAFETY DATA SHEET FOR ANTI-SPATTER

REVISED DATE: 10/97
PRODUCT NAME: AP 356
HAZARDOUS MATERIAL DESC: NON HAZARDOUS

PRODUCT CODE: 007090
DUNS NO: 00-653-3327
CHEMICAL FAMILY: NOT APPLICABLE

SECTION 1 - PRODUCT AND COMPONENT DATA

CHEMICAL NAME(S)	CAS REGISTRY	%	ACGIH TLV-TWA
1) Dihydrogen Oxide (water)	007732-18-5	>85%	None known
2) Modified Fatty Alkanolamide	None	<15%	None known
3) Tetra Ethylene Diamine Tetracetate	64-02-8	Trace	None known
4) Eloacid Brilliant Scarlet 3R	2611-82-7	Trace	None known

PHYSICAL DATA:

Boiling Point .....<212 deg.
Specific Gravity.....1
Vapor Pressure.....17.5mm Hg @20 C (Water)
Solubility 100%
Evaporation Rate .....1 m-q/1 (Water)
Appearance and Odor ..Red, no appreciable odor

Melting Point .....Not applicable
% Solid By Wt .....Not applicable
Vapor Density.....17.3 gm-3 (Water)
% Volatility by Vol .....Not applicable
Material Is.....Liquid

SECTION 2 - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) .....Not applicable
Extinguishing Agents .....Water, foam, dry chemical, carbon dioxide (CO2)
Unusual Fire and Explosion Hazards .....None known
Flammable Limits In Air .....Not applicable

SECTION 3 - REACTIVITY DATA

Stability.....Stable
Conditions to Avoid ....None
Incompatibility .....Oxidizers, alkalies, acids

Hazardous Decomposition Products.....None
Hazardous Polymerization.....Will not occur

SECTION 4 - SPILL, LEAK AND DISPOSAL PRACTICES

Steps to be taken in case material is released or spilled: Absorb with an inert ingredient such as sand, earth or vermiculite, and dispose of in accordance with Federal, State and Local regulations.
Waste Disposal Methods: Consult with Federal, State or Local authorities for approved procedures.

SECTION 5 - TOXICITY AND FIRST–AID PROCEDURES

Medical Conditions Aggravated by Exposure: None known
Eyes: Eye irritant (modified fatty alkanolamide). Flush immediately with large quantities of water
Skin: None known. Wash skin with soap and water
Inhalation: Not applicable
Ingestion: May cause nausea (modified fatty alkanolamide). Give large quantities of water
Chronic Toxicity: None known
Note to Physician: None

SECTION 6 - PERSONAL PROTECTION AND CONTROLS

Ventilation: No special requirements
Respiratory: No special requirements
Skin Protection: Protective gloves, apron
Eye Protection: Wear safety glasses or splash goggles
Other Control Measures: Safety shower and eyewash station should be available

SECTION 7 - SPECIAL PRECAUTIONS

NONE

SECTION 8 - NFPA RATING

0 = Least 1 = Slight 2 = Moderate 3 = High 4 = Extreme

	HEALTH	FIRE	REACTIVITY
Water		NO RATING	
Modified fatty alkanolamide	1	0	0
Tetre ethylene diamine tetracetate		NO RATING	
Eloacid brilliant scarlet 3R	1	1	0

MATERIAL SAFETY DATA SHEET FOR LUBRICATOR OIL

INGERSOLL - RAND
1OZ4; 10P; IOG55; IOG, 50P; 50G

REVISION DATE
1 1 -DEC-86

DATE ISSUED
30-JUNE-90

IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME: Air tool lubricant
PRODUCT#: B4DO01C
CHEMICAL NAME: Petroleum-based lubricating oil
CAS #S: Mixture
PRODUCT APPEARANCE AND ODOR: Amber liquid, petroleum odor
SYNONYMS: Air tool lubricants
EMERGENCY TELEPHONE: 212-883-4411
CHEMICAL FAMILY: Petroleum hydrocarbon

COMPONENTS AND HAZARD INFORMATION

COMPONENTS: Petroleum-based lubricating oil
W/W HAZARD DATA (TLV, LD50, LC50, ETC.): TLV 5mg./meter cubed
CAS #s 64742-65-0 or (as an oil mist)
64742-57-0 or
64742-62-7 or
64741-88-4
PROPRIETARY ADDITIVES: Not applicable

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by Exxon

TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION:
ICC: Compound or lubricant. Metal cutting, drawing or drilling.
Dry, liquid or paste. NOI

EMERGENCY FIRST–AID

EYE CONTACT: If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.
SKIN CONTACT: In case of skin contact, remove contaminated clothing, and wash skin thoroughly with soap and water.
INHALATION: Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove person from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen if available. If overexposure to oil mist, remove person from further exposure until excessive oil mist condition subsides.
INGESTION: If ingested, call a physician immediately.

PROTECTION AND PRECAUTIONS

VENTILATION: (Always maintain below permissible exposure limits). Use local exhaust to capture vapor, mist or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor air.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.) Normally not needed at ambient temperatures. Use supplied air respiratory protection in confined or enclosed spaces, if needed. Use filter, dust, fume or mist respirator type under misting conditions. Use can or cartridge; gas or vapor respirator type under conditions exceeding TWA standard.

PROTECTIVE GLOVES: Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION: Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT: Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERING CONTROLS: Keep containers closed when not in use. Do not handle near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE:
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing, and launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

PREPARED BY: **DATE:**

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
FOR OTHER PRODUCT INFORMATION CONTACT:

MATERIAL SAFETY DATA SHEET FOR LUBRICATOR OIL

PHYSICAL DATA

The following data is approximate or typical in values and should not be used for precise design purposes.

BOILING RANGE: Wide range
SPECIFIC GRAVITY: (25˚ C/25˚C) (WATER = 1)< 1.0
MOLECULAR WEIGHT: Wide range
EVAPORATION RATE @I ATM & 25˚C
(77˚F) (N-BUTYL ACETATAE = 1): < 1.0

VAPOR PRESSURE: < 0.1 @ 38˚ C/100˚F
VAPOR DENSITY (AIR = 1): > 8
PERCENT VOLATILE BY VOLUME: Negligible
SOLUBILITY IN WATER @1 ATM & 25˚C
(77˚F): Negligible

POUR, CONCEALING OR MELTING POINT: n/e

FREEZING POINT: n/e

REACTIVITY

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS: Fumes, smoke, carbon monoxide and other decomposition products, in case of incomplete combustion.
CONDITIONS TO AVOID: Open flames.

TOXICITY

ORAL (Acute).....LD 50 > 5 g/kg (total body weight)
DERMAL (Acute) .....LD 50 > 3.16 g/kg (total body weight)
EYE.....N/E
INHALATION (Acute).....N/E
CHRONIC, SUBCHRONIC, ETC. .....N/E
This product does NOT contain ingredients listed on IRAC, NTP, or the OSHA Z List.
This product is NOT carcinogenic.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Keep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations.

WASTE DISPOSAL METHOD: Consult Federal, State, or Local authorities for proper disposal procedures. Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM): AUTOIGNITION TEMPERATURE
160˚C (320˚F) Test Method: COC, N/E
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by Exxon

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):
Estimated values: Lower 1 % Upper 6%

EXTINGUISHING MEDIA AND FIRE–FIGHTING PROCEDURES: Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.
The following procedures for this type of product are based on the recommendations in the National Fire Protection Associations *Fire Protection Guide on Hazardous Materials, Eighth Edition (1984)*: Use water spray, dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water froth may be used to flush spills away from exposure. Minimize breathing gases, vapor fumes or decomposition products. Use supplied-air equipment for enclosed or confined spaces or as otherwise needed.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Not applicable

“EMPTY” CONTAINER WARNING: Empty containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRACE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. “Empty” drums should be completely drained, properly bunged and returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with government regulations. For work on tanks, refer to Occupational Safety and Health Administration (OSHA) regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding or other contemplated operations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT:
BASIS: 5 mg./cubic meter for oil mist in air–OSHA Regulation 29 CRF 1910.1000

VARIABILITY AMONG INDIVIDUALS: Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (signs and symptoms of exposure): Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis. However, based on human experience and available toxicological data, this product is judged to be neither a “corrosive” nor an “irritant” by OSHA criteria. Product contacting the eye may cause irritation. Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion may cause mild to severe pulmonary injury and possibly death.

AUTOMATION PERIPHERALS

Fifteen Month Limited Warranty

Automation Peripherals will repair or replace, at its expense and at its option, any Automation Peripheral machine, machine part, or machine accessory (excluding consumable components) which in normal use has proven to be defective in workmanship or material, provided that the customer returns the product or defective component to the Automation Peripherals service center within fifteen months from the product's original date of shipment from Automation Peripherals and provides Automation Peripherals with reasonable opportunity to verify the alleged defect by inspection. Automation Peripherals will not be responsible for any asserted defect which has resulted from normal wear, misuse, abuse or repair or alteration made by anyone other than an authorized Automation Peripherals facility or representative**.** UNDER NO CIRCUMSTANCES WILL AUTOMATION PERIPHERALS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM DEFECTIVE PRODUCTS. THIS WARRANTY IS AUTOMATION PERIPHERAL'S SOLE WARRANTY AND SETS FORTH THE CUSTOMER'S EXCLUSIVE REMEDY, WITH RESPECT TO DEFECTIVE PRODUCTS; ALL OTHER WARRANTIES, EXPRESS, OR IMPLIED, WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE, ARE EXPRESSLY DISCLAIMED BY AUTOMATION PERIPHERALS.