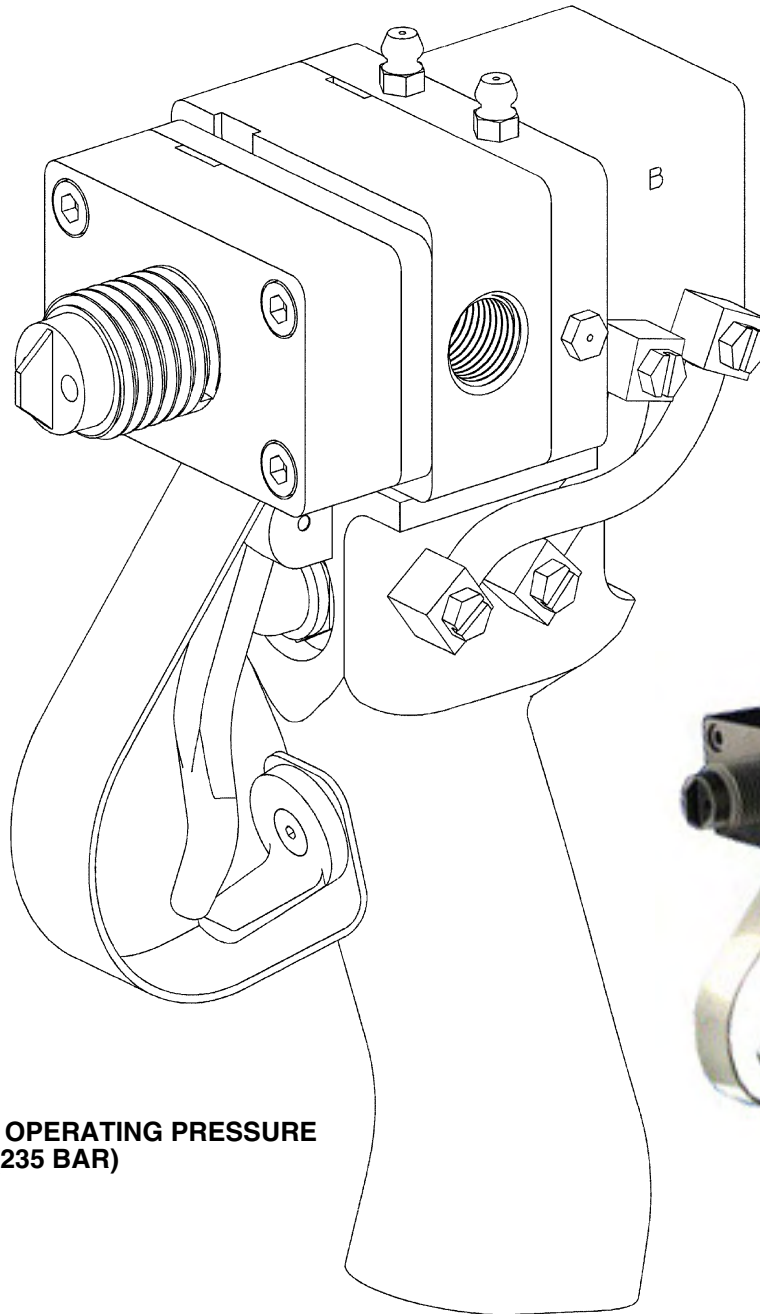


400 AUTOVALVE INSTRUCTION / PARTS LIST

400 -PL Revision E

PNEUMATIC

May 2005



**MAXIMUM OPERATING PRESSURE
3500 PSI (235 BAR)**

**THIS MANUAL CONTAINS IMPORTANT WARNINGS
AND INSTRUCTIONS**

READ AND RETAIN FOR REFERENCE

OPERATION

The **ON-OFF** operation of the valve is controlled by movement of the piston inside the air cylinder (1).

In the **OFF** position, the piston advances and the front Seal (13) seats into the seat plate (8).

In the **ON** position, the piston and seals retract from the seat plate (8), which allows A & B fluids to pass through the manifold.

A disposable Series 160 mixer can be attached to the manifold. If the operating pressure exceeds 150 psi (10 bar), we recommend a metal jacket be used over the plastic mix tube. Refer to Catalog 110 for details.

Note: For all reference numbers in parenthesis, see pages 5-12.

Your 400 AUTOVALVE in general...

- Designed to dispense two-component adhesives and sealants.
- Dispenses low or high viscosity urethanes, epoxies and silicones.
- Can be mounted for beads or timed shots; optional handle is available for hand held applications.
- Provides an ON-OFF function. The metering of the adhesives in the proper ratio of A:B is controlled by the metering pumps.

INSTALLATION

Connect Supply Lines

The A & B fluid hoses are connected to the side of the valve body (7), between the valve and the pumps, and should be as short as possible. It is a good practice to install check valves in the hoses just before the valve. Optional fitting with check valve is listed on page 15.

For stationary mount, the air lines will be connected to the side of the air cylinder (1). Air to the back of the cylinder to close and air to the front to open. If the optional handle is used, air is connected to the barbed fitting (105) on the side of the handle.

The air line should have minimum pressure of 80 psi.

Start- Up

1. With the hand-held model, start metering pumps and purge the air out of the A & B hoses and Autovalve. After the A and B fluids come out of the manifold, attach a mixer to the manifold and hold the valve upside down with the mixer pointing up. Dispensing A & B will purge the last pockets of air in the valve body.

A stationary mount or gantry installation requires a swivel mounting bracket. To complete purging, turn the valve with the mixer pointing up and dispense A & B.

2. Take a ratio check by weight of A:B after the manifold. The Autovalve does **No Metering**. The Volume Ratio of A:B is controlled by the metering pumps. However, between the metering pumps and the Autovalve are hoses. These hoses will expand under pressure and cause lead-lag problems. Lead-lag refers to the uneven starting of the A fluid before the B fluid. TAH offers 1:1 and wide ratio manifolds to reduce this problem. The selection of the correct manifold depends on both the volume and viscosity ratio of A and B. Consult TAH Technical Services for details at 800-257-5238.

MAINTENANCE

Two-component adhesives are messy and difficult to handle. It is important to note that Routine Maintenance must be observed. If one delays maintenance until the valve stops, clean-up is very time consuming.

Routine Maintenance

1. Release pressures in A and B fluid hoses. Remove manifold and clean. We recommend overnight soaking in a suitable solvent.
2. At the end of each shift, lubricate the back seals. We recommend our special Autogrease. Pump Autogrease through the grease fitting (4) and out the plug (11). Using extra grease will extend seal life.
3. The O-Rings (6) and Lip Seals (3) are in a very harsh environment. In addition to resisting the adhesives, they must be inert to the strong solvents used in cleaning the valve.

The following options are available:

A. Chemical Compatibility with O-Rings.

Usually the adhesives do not chemically attack the O-Rings. However, during cleaning the valves are often immersed in aggressive solvents. The following types of O-rings are available:

| Type of O-Ring | Color | Recommended for Contact With: |
|----------------------|----------------|---|
| Viton® | Green or Brown | Methylene Chloride Alcohol Carbon Tetrachloride |
| EP | Black | MEK Ketones Acetone |
| Teflon® Encapsulated | Clear/Orange | All Chemicals |

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Teflon® is a registered trademark of E.I. DuPont De Nemours

B. Selection of Lip Seals. The lip seal consists of a U-Cup with an interior O-Ring. The following types of lip seals are available:

1. Polyurethane U-Cup with an interior Viton® O-Ring. Good general purpose seal with good chemical and wear resistance. U-Cup colored orange with a brown Viton® O-Ring.
Recommended for filled abrasive adhesives.
2. Viton® U-Cup with an interior Viton® O-Ring. Good chemical resistance, but it is a soft seal with poor wear resistance. U-Cup colored black with brown O-Ring.
3. Polytuff U-Cup and an interior SS Spring. Excellent chemical and wear resistance. U-Cup colored white with SS Spring.

Other combinations available upon request.

C. Chemical Compatability. The "A" or "B" resins can attack the seal material. An attacked seal will swell or become brittle in 3 to 14 days. If this occurs, choose an alternate seal material. Listed below are the general guidelines.

For specific recommendations for Meter Mix Dispensing, contact our Technical Service Department at 800-257-5238.

TAH Part # 451-007-A-11 (Polyurethane)
Color: Orange

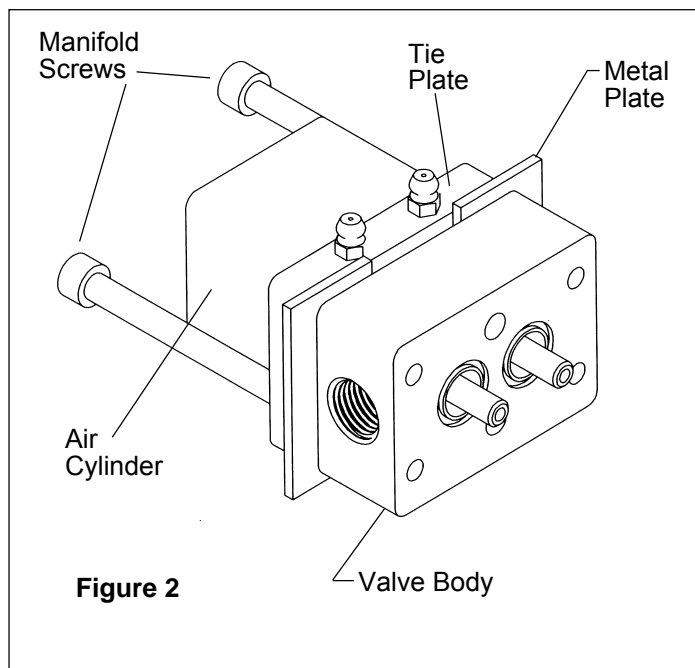
Epoxies - General
Polyurethanes
Polysulfides

TAH Part # 451-007-A-01 (Polytuff)
Color: White

Epoxies - Amine Catalyst
Polyesters
Acrylics

Disassembly and Cleaning

1. Remove the manifold and seat plate (8).
Pry bar slots are provided.
2. Remove the air cylinder bolts (2) and wiggle the air cylinder apart. If the assembly is frozen, use the pry bar slots on the valve body (7) to separate the valve body (7) from the tie plate (5). Insert flat pieces of metal between the valve body and the tie plate as per Figure 2. Thread the manifold screws (36) into the back of the tie plate and push the valve body apart. Apply uniform pressure to prevent the body from cocking and bending the air cylinder shafts (75).
3. Once apart, the parts should be cleaned. We recommend overnight soaking in suitable solvent. All parts can be soaked except the handle and air cylinder.



Rebuilding Autovalve

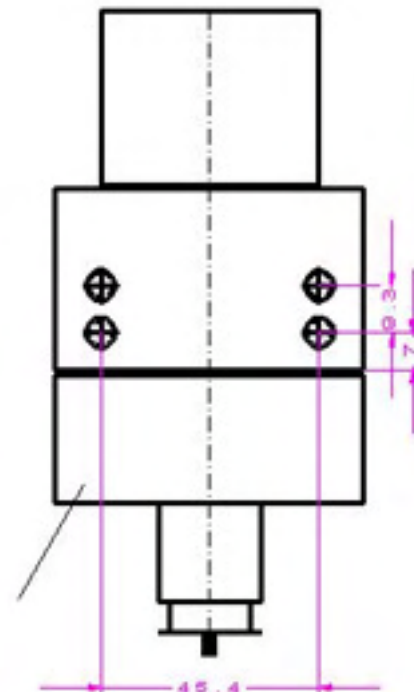
1. After cleaning, inspect the following components:
 - a. Seat Plate (8) on sealing surface.
 - b. Manually retract and extend the shafts (75) from air cylinder (1).
 - c. If the optional handle is used, connect air into the inlet and check 4-way action of cartridge valve (103).
2. Refer to page 14, for repair kit which contains lip seals, O-Rings, and front seals.
3. Lubricate lip seals (3) and shafts (75) with Autogrease.
4. Insert four back lip seals (3): two into tie plate (5) and two into the valve body (7). The lip seals are two pieces: an O-Ring and U-Cup. They should always be installed with the O-Ring facing the front of the valve (facing the manifold).
5. Push the air cylinder (1) thru the tie plate (5) and the valve body (7) and engage the screws (2).
6. Push front seal (13) and washer (12) onto adjustment screw (14). To prevent binding, apply Autogrease to the threads on the adjustment screws (14). Thread the seal and adjustment screw assembly into air cylinder shafts.
7. Assemble the seat plate (8) onto the valve body (7).

Final QC Check

Before the manifold is assembled, we recommend air be connected to the air cylinder (1) and the open/close function of the front seals (13) be inspected for leakage.

The front seals cold flow into the proper shape as the valve is used. It may be necessary to pressurize the air cylinder, but not the A & B fluids, for one to ten minutes to allow the seals to break in.

SHCS 10-24 x 1/2" length
could be rethreaded to M5



TROUBLESHOOTING

| Problem | Cause | Solution |
|-------------------------------|---|---|
| No Flow | Manifold clogged Air pressure too low Air valve damaged Valve fouled | Remove manifold and clean Require 80 psi inlet pressure See Note 1 below Disassemble (see Maintenance) |
| Valve Leaks | Front Seals (13) not seated Front Seals (13) damaged | See Note 2 below Replace Seals |
| Valve Drools | Air trapped in manifold | Review Start-Up Procedure |
| Off Ratio A:B | Metering Pumps | Check pumps |
| A & B backs up into Tie Plate | Seals (3) damaged | Replace Back Lip Seals (page 3) |
| Material not mixing | Mixer fouled Off Ratio A:B | Replace Mixer Take Ratio Check |
| Mixer Leaks | Manifold fouled | Clean nose of manifold |
| Lip Seals Deteriorate | Chemical Attack | See Routine Maintenance (page 2) |

Note 1. Inspect air cartridge valve (103) in handle (90). The On-Off function of the valve is controlled by this cartridge valve in the handle. The air cylinder requires air in the back to close and air in the front to open.

To inspect the cartridge valve, disconnect the two air lines on the air cylinder (1). When the trigger is depressed, air should be flowing only through the back air line and not through the front air line.

When the trigger (91) is released the air should reverse.

Note 2. The front seals cold flow into the Seat Plate (8). With valve closed, maintain air pressure on air cylinder to break in seals.

400 AUTOVALVE

PART NUMBER

4 0 - 100 18

O-Rings:

- V Viton®-Brown
- E E-P Black
- T Teflon® Encapsulated

Lip Seals:

- F Viton® U-Cup and Viton® O-Ring
- P PU U-Cup and Viton O-Ring
- T Teflon® U-Cup and Teflon® O-Ring
- G Polytuff U-Cup and SS Spring
- EP U-Cup and EP O-Ring

Front Seal:

- T Teflon® Seal
- M Metal Seal w/ Hardened Seat Plate

Air Cylinder:

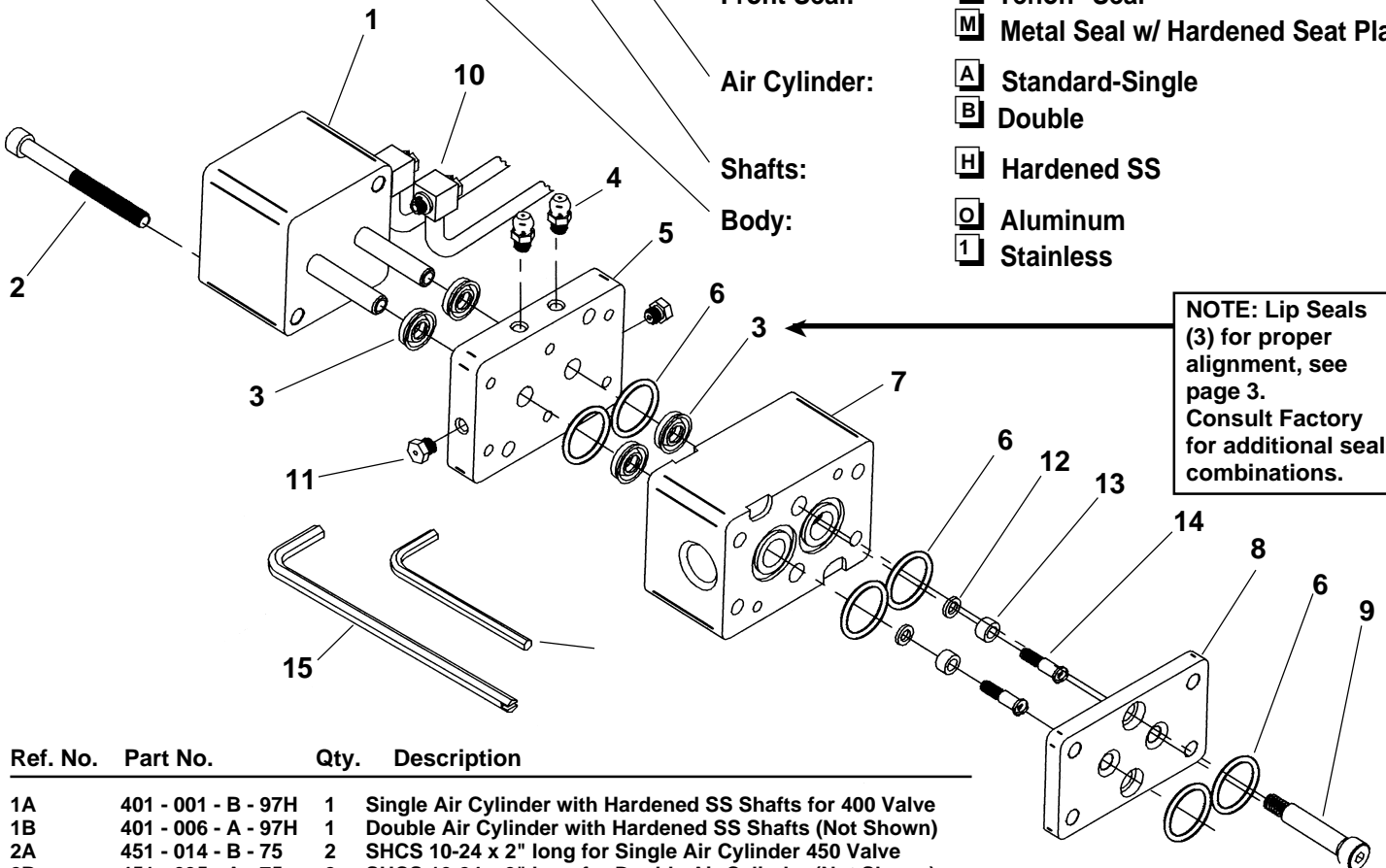
- A Standard-Single
- B Double

Shafts:

- H Hardened SS

Body:

- O Aluminum
- 1 Stainless



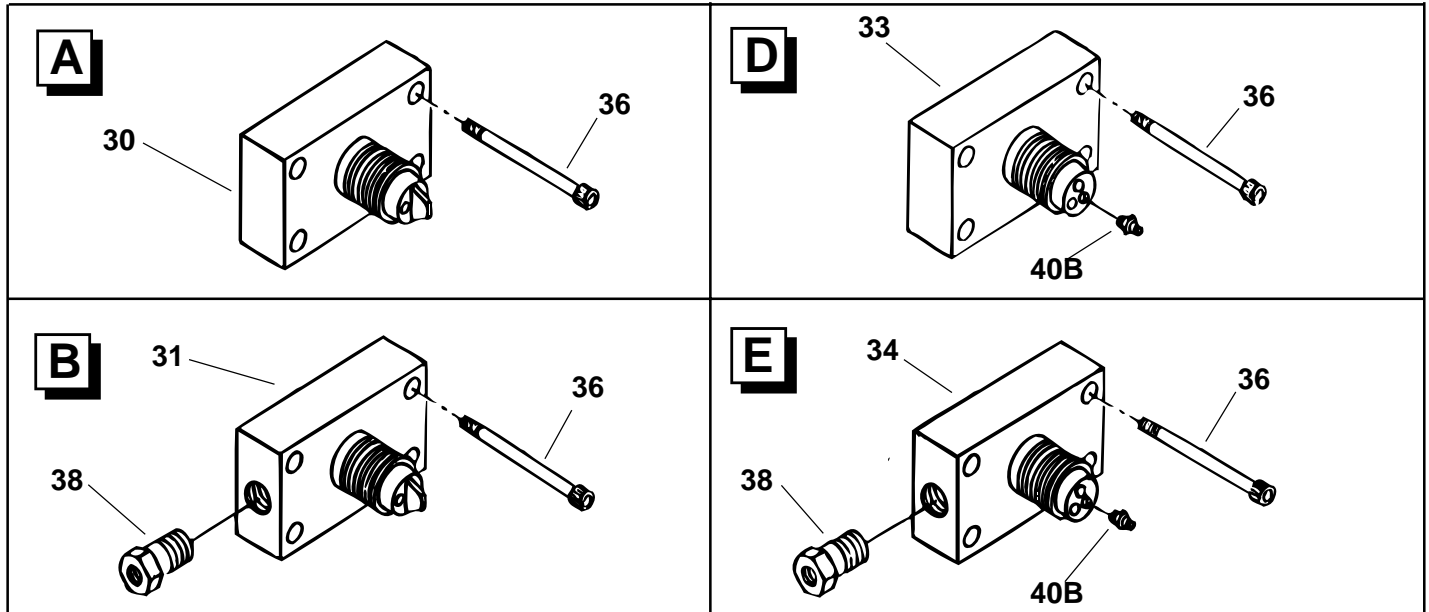
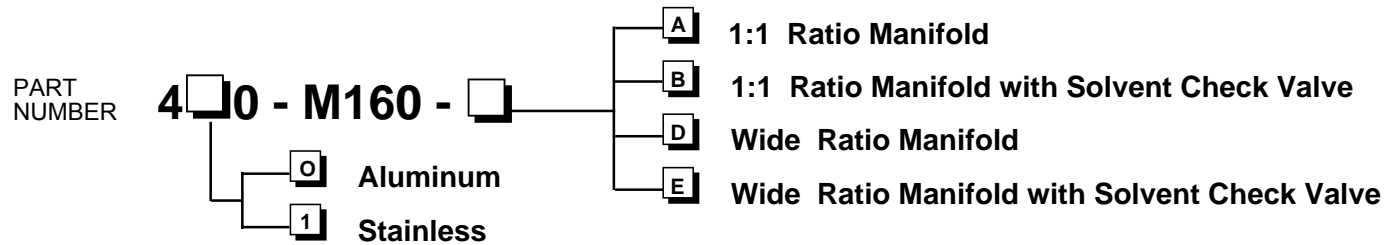
NOTE: Lip Seals (3) for proper alignment, see page 3. Consult Factory for additional seal combinations.

***NOTE: Items 8B, 12B and 13B are for use with M option front seal.**

| Ref. No. | Part No. | Qty. | Description |
|----------|-----------------------|------|---|
| 1A | 401 - 001 - B - 97H | 1 | Single Air Cylinder with Hardened SS Shafts for 400 Valve |
| 1B | 401 - 006 - A - 97H | 1 | Double Air Cylinder with Hardened SS Shafts (Not Shown) |
| 2A | 451 - 014 - B - 75 | 2 | SHCS 10-24 x 2" long for Single Air Cylinder 450 Valve |
| 2B | 451 - 035 - A - 75 | 2 | SHCS 10-24 x 3" long for Double Air Cylinder (Not Shown) |
| 3A | 451 - 002 - A - 04 | 4 | Lip Seal: Viton® U-Cup and Viton® O-Ring |
| 3B | 451 - 007 - A - 11 | 4 | Lip Seal: PU U-Cup and Viton® O-Ring |
| 3C | 451 - 007 - A - 04T | 4 | Lip Seal: Teflon® U-Cup and Teflon® O-Ring |
| 3D | 451 - 007 - A - 01 | 4 | Lip Seal: Polytuff U-Cup and SS Spring |
| 3E | 451 - 007 - A - 02E | 4 | Lip Seal: EP U-Cup and EP O-Ring |
| 4 | 451 - 003 - C - 75 | 2 | Grease Fitting, 10-32 |
| 5 | 451 - 004 - B - 97 | 1 | Aluminum Tie Plate |
| 6A | B - 501 - 03 | 6 | Viton® O-Ring |
| 6B | B - 501 - 01 | 6 | EP O-Ring |
| 6C | 451 - 005 - A - 04 | 6 | Teflon® Encapsulated O-Ring |
| 7A | 401 - 008 - A - 97 | 1 | AlumBody 9/16- 18 Inlet Ports for 400 Valve |
| 7B | 401 - 008 - A - 98 | 1 | SS Body 9/16- 18 Inlet Ports for 400 Valve |
| 8A | 401 - 009 - A - 98 | 1 | Stainless Steel Seat Plate for 400 Valve |
| 8B* | 401 - 009 - A - 98H | 1 | Hardened Stainless Steel Seat Plate for 400 Valve |
| 9 | 401 - 010 - A - 98 | 2 | Stainless Steel SHSS 1/4" Dia x 1" long for 400 Valve |
| 10 | 451 - 015 - A - 96-01 | 2 | Assembled Air Tube and Fitting 10-32 Thread |
| 11 | 451 - 016 - C - 96 | 2 | Plugs: Brass 10-32 with Fiber Washer |
| 12A | 401 - 002 - A - 98 | 2 | Stainless Steel Washer for 400 Valve |
| 12B* | 401 - 002 - A - 83 | 2 | Plastic Washer for 400 Valve |
| 13A | 401 - 003 - B - 04 | 2 | Front Seal for 400 Valve |
| 13B* | 401 - 017 - A - 98 | 2 | Stainless Steel Front Seal for 400 Valve |
| 14 | 401 - 004 - A - 98 | 2 | Stainless Steel Adjustment Screw for 400 Valve |
| 15 | 401 - 005 - A - 75 | 1 | Adjustment Screw Driver for 400 Valve |
| 16 | 451 - 301 - A - 03 | 1 | Auto Grease Cartridge 3oz. (not shown) |
| 17 | 451 - 302 - A - 75 | 1 | Grease Gun 3 oz. Cartridge Complete (not shown) |
| 18 | 401 - 007 - A - 75-P | 1 | 1/8" Short Arm Hex Key |

400 AUTOVALVE MANIFOLDS, For series 160 Disposable Mixers

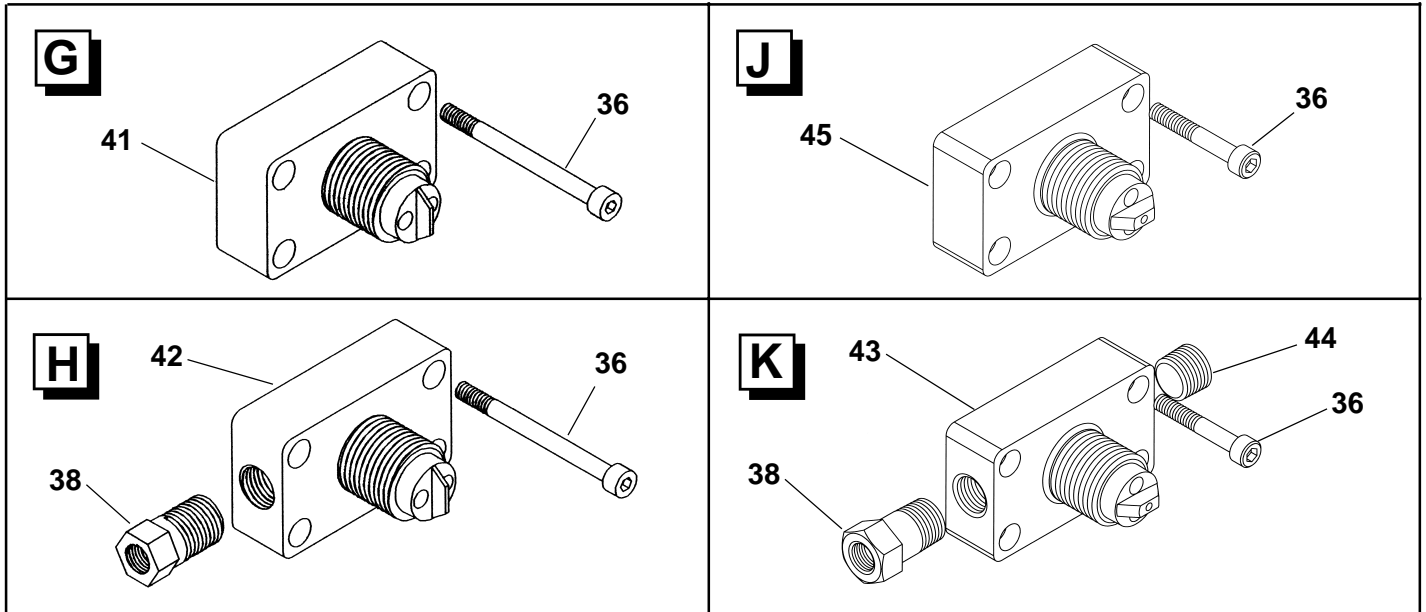
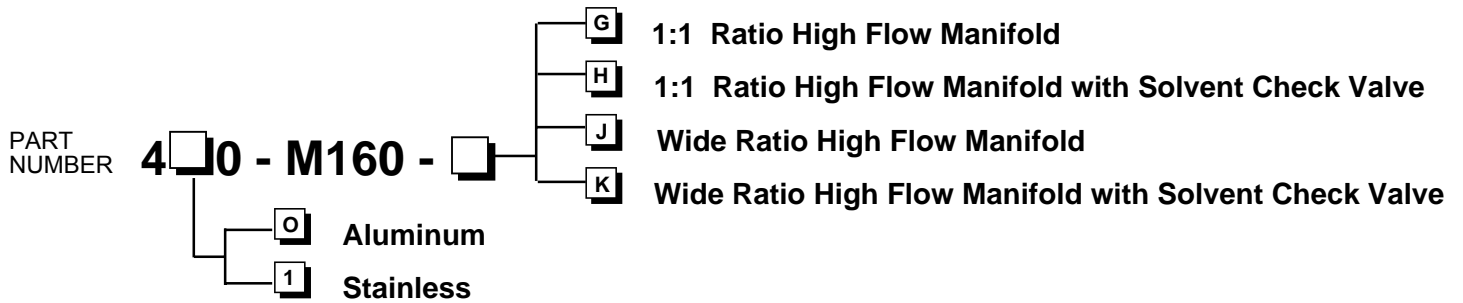
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| Ref. No. | Part No. | Qty. | Description |
|----------|--------------------|------|--|
| 30A | 451 - 012 - B - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, 1:1 Ratio |
| 30B | 451 - 012 - B - 98 | 1 | SS Manifold/160 Ser. 7/8" -14 Thread, 1:1 Ratio |
| 31A | 451 - 033 - B - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, 1:1 Ratio with 1/4"NPT Solvent Port |
| 31B | 451 - 033 - B - 98 | 1 | SS Manifold/160 Ser. 7/8" -14 Thread, 1:1 Ratio with 1/4"NPT Solvent Port |
| 33A | 451 - 151 - A - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio |
| 33B | 451 - 151 - A - 98 | 1 | SS Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio |
| 34A | 451 - 152 - A - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio with 1/4"NPT Solvent Port |
| 34B | 451 - 152 - A - 98 | 1 | SS Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio with 1/4"NPT Solvent Port |
| 36 | 401 - 011 - A - 75 | 4 | SHCS 10-24 x 2 1/4" long for 400 Manifold |
| 38A | 501 - 131 | 1 | Check Valve: Brass Solvent Flush |
| 38B | 501 - 131SS | 1 | Check Valve: Stainless Steel Solvent Flush |
| 40A | 451 - 036 - A - 85 | 1 | Polypropylene fitting, 10-32 with .09" orifice |
| 40B | 451 - 037 - A - 85 | 1 | Polypropylene fitting, 10-32 with .06" orifice |
| 40C | 451 - 038 - A - 85 | 1 | Polypropylene fitting, 10-32 with .04" orifice |

400 AUTOVALVE MANIFOLDS, For series 160 Disposable Mixers

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ADDITIONAL MANIFOLDS AVAILABLE UPON REQUEST:

- 1/2" MNPT*
- 30 ppm & 60 ppm flow rates for foam applications*

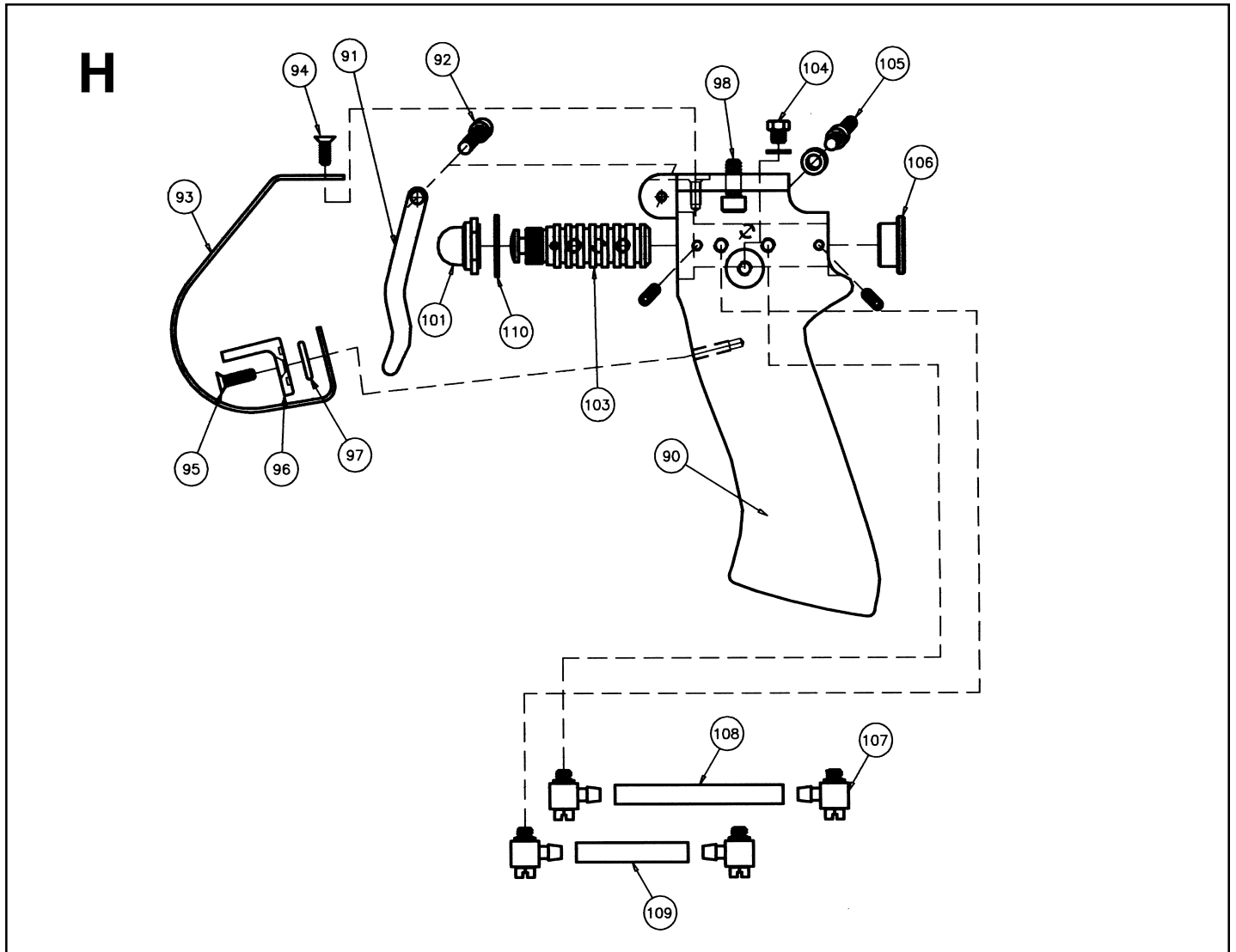
* Note: These manifolds will not accept our 160 Series nozzles.

| Ref. No. | Part No. | Qty. | Description |
|----------|--------------------|------|--|
| 41A | 401 - 013 - A - 97 | 1 | Alum Manifold/160 Ser. 7/8" - 14 Thread, 1:1 Ratio, High Flow |
| 41B | 401 - 013 - A - 98 | 1 | SS Manifold/160 Ser. 7/8" - 14 Thread, 1:1 Ratio, High Flow |
| 42A | 401 - 014 - A - 97 | 1 | Alum Manifold/160 Ser. 7/8" - 14 Thread, 1:1 Ratio, High Flow with 1/4" NPT Solvent Port |
| 42B | 401 - 014 - A - 98 | 1 | SS Manifold/160 Ser. 7/8" - 14 Thread, 1:1 Ratio, High Flow with 1/4" NPT Solvent Port |
| 43A | 401 - 015 - B - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio, High Flow with two 1/4" NPT Ports |
| 43B | 401 - 015 - B - 98 | 1 | SS Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio, High Flow with two 1/4" NPT Ports |
| 44A | 551 - 102 | 1 | 1/4" NPT Plug |
| 44B | 561 - 102 | 1 | SS 1/4" NPT Plug |
| 45A | 401 - 115 - A - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio, High Flow |
| 45B | 401 - 115 - A - 98 | 1 | SS Manifold/160 Ser. 7/8" -14 Thread, Wide Ratio, High Flow |
| 46 | 401 - 113 - A - 97 | 1 | Alum Manifold/160 Ser. 7/8" -14 Thread, 1:1 Ratio, High Flow with two 1/4" NPT Ports (not shown) |

400 AUTOVALVE MOUNT

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PART NUMBER **400 - MOUNT -** _____ H-01 Hand Held – Pneumatic Switch



| Ref. No. | Part No. | Qty. | Description |
|----------|-------------------------|------|---|
| 90 | 451 - 023 - C - 97 | 1 | Handle / Aluminum / Cartridge Option |
| 91 | 451 - 025 - A - 97 | 1 | Trigger for Mount H or E |
| 92 | 451 - 027 - A - 75 | 1 | Trigger Bolt, 8-32 x 3/4" long |
| 93 | 451 - 336 - A - 98 | 1 | Trigger Guard for 400/450 Switches |
| 94 | 451 - 337 - A - 75 | 1 | 6-32 x 5/16" FSHCS for 400/450 Switches |
| 95 | 451 - 338 - A - 75 | 1 | 6-32 x 1/2" FSHCS for 400/450 Switches |
| 96 | 451 - 333 - A - 97 | 1 | Safety Lock for 400/450 Switches |
| 97 | 451 - 334 - A - 02 | 1 | 1/2" OD x 1/16" O'Ring for 400/450 Switches |
| 98 | 451 - 040 - A - 75 | 2 | SHCS 10-24 x 1/2" long for Mount S, E or H |
| 101 | 451 - 326 - A - 75 | 1 | Protective Rubber Boot for 400/450 Switches |
| 103 | 451 - 026 - A - 96 | 1 | 4 Way Cartridge Valve for Pneumatic Handle |
| 104 | 451 - 048 - A - 96 | 1 | Brass Plug 10-32 |
| 105 | 451 - 021 - A - 96 | 1 | 10-32 Barbed Air Fitting |
| 106 | 451 - 339 - A - 83 | 1 | 3/4" Dia. Acetal Plug |
| 107 | 451 - 015 - A - 96 - 01 | 4 | 10-32 UNF Elbow Air Fitting |
| 108 | 451 - 020 - A - 90 - 02 | 1 | 1/8" ID Air Tubing x 2.25" |
| 109 | 451 - 020 - A - 90 - 01 | 1 | 1/8" ID Air Tubing x 1.50" |
| 110 | 451 - 332 - A - 75 | 1 | E-Clip |

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Vertriebs
GmbH **ESSKA**

Web: <http://www.esska.de>
Mail: info@esska.de

Note: Ref. Numbers 101, 103, and 110 can be purchased assembled as P/N 451-331-A-96

400 AUTOVALVE MOUNT

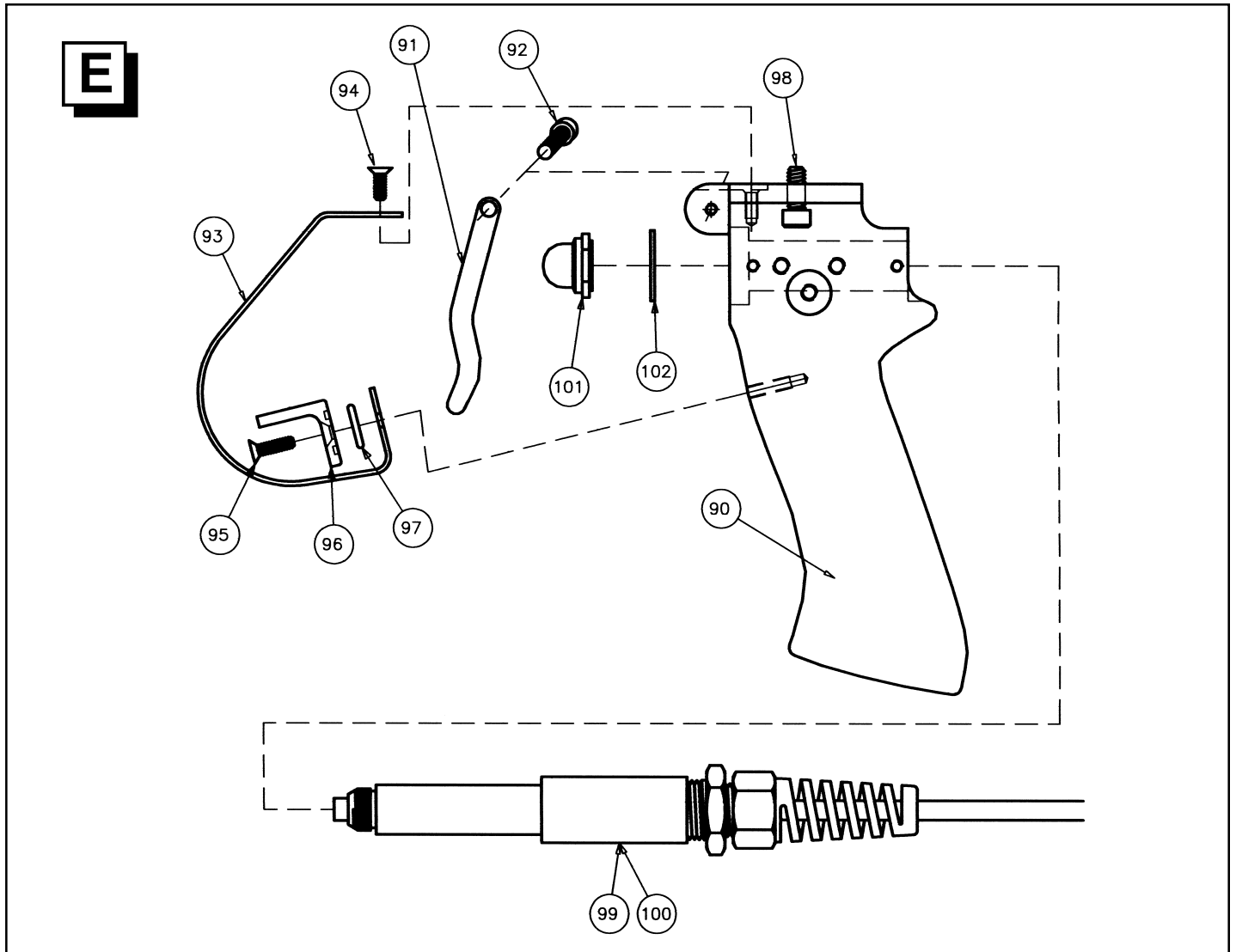
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PART
NUMBER

400 - MOUNT - 

E-01 Hand Held – Electric Momentary Switch (24 volt)

E-02 Hand Held – Electric Push on/off Switch (24 volt)



| Ref. No. | Part No. | Qty. | Description |
|----------|--------------------|------|---|
| 90 | 451 - 023 - C - 97 | 1 | Handle / Aluminum / Cartridge Option |
| 91 | 451 - 025 - A - 97 | 1 | Trigger for Mount H or E |
| 92 | 451 - 027 - A - 75 | 1 | Trigger Bolt, 8-32 x 3/4" long |
| 93 | 451 - 336 - A - 98 | 1 | Trigger Guard for 400/450 Switches |
| 94 | 451 - 337 - A - 75 | 1 | 6-32 x 5/16" FSHCS for 400/450 Switches |
| 95 | 451 - 338 - A - 75 | 1 | 6-32 x 1/2" FSHCS for 400/450 Switches |
| 96 | 451 - 333 - A - 97 | 1 | Safety Lock for 400/450 Switches |
| 97 | 451 - 334 - A - 02 | 1 | 1/2" OD x 1/16" O'Ring for 400/450 Switches |
| 98 | 451 - 040 - A - 75 | 2 | SHCS 10-24 x 1/2" long for Mount S, E or H |
| 99 | 451 - 320 - A - 97 | 1 | Momentary Switch Assembly for 400/450 Series |
| 100 | 451 - 321 - A - 97 | 1 | Complete Push on/off Switch Assembly for 400/450 Series |
| 101 | 451 - 326 - A - 75 | 1 | Protective Rubber Boot for 400/450 Switches |
| 102 | 451 - 327 - A - 75 | 1 | CS Flat Washer for 400/450 Switches |

400 AUTOVALVE MOUNT

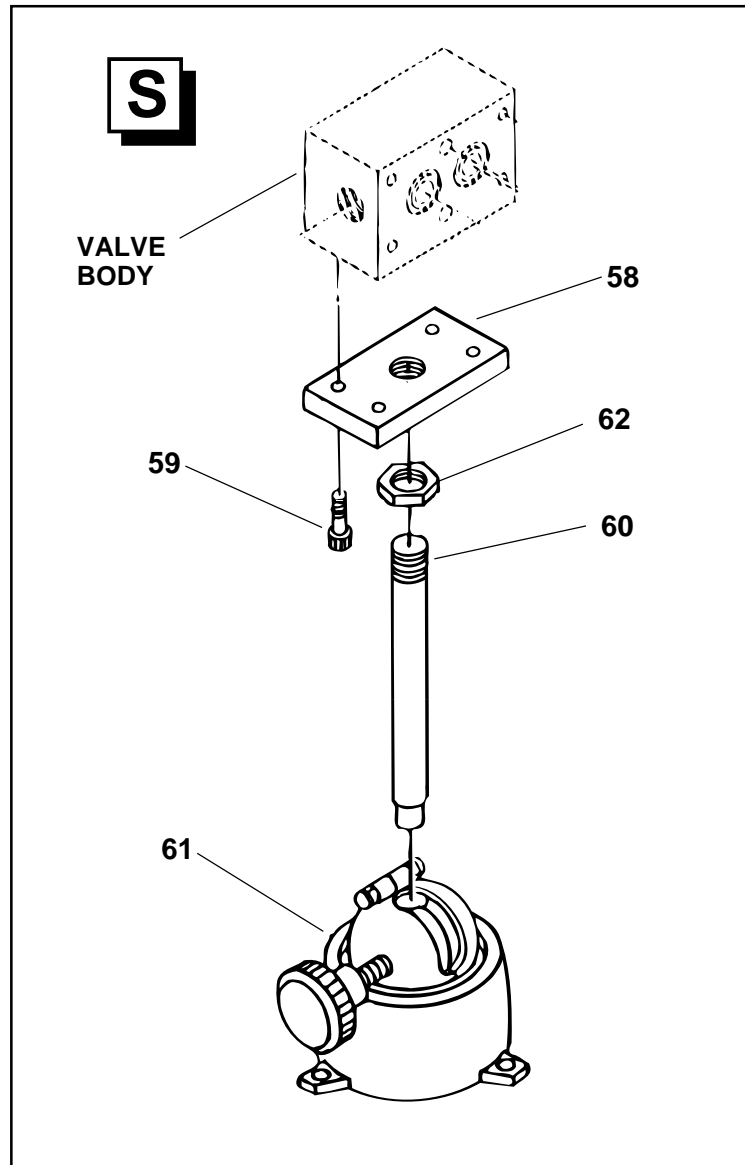
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PART
NUMBER

400 - MOUNT -



Swivel Base



| Ref. No. | Part No. | Qty. | Description |
|----------|------------------------|------|---------------------------|
| 58 | 451 - 039 - A - 97 | 1 | Base Plate, Aluminum |
| 59 | 451 - 040 - A - 75 | 4 | SHCS 10-24 x 1/2" long |
| 60 | 451 - 041 - A - 97 | 1 | Connecting Bar on Mount-S |
| 61 | 451 - 042 - A - 75 | 1 | Swivel Vise |
| 62 | 451 - 041 - A - 97/NUT | 1 | Connector Nut on Mount-S |

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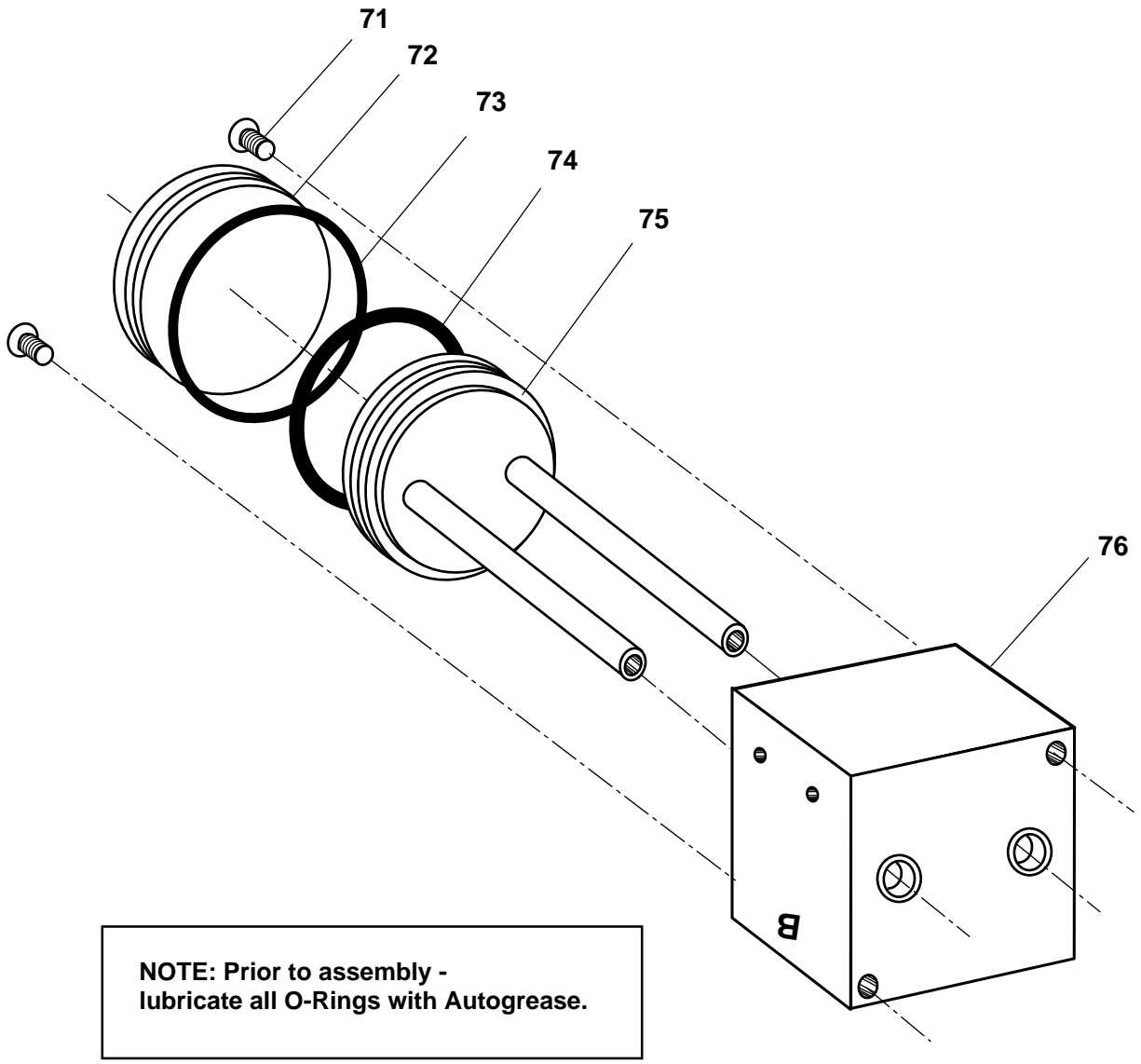
ESSKA

Web: <http://www.esska.de>
Mail: info@esska.de

400 AUTOVALVE SINGLE AIR CYLINDER, ("B" Model) Hardened SS shafts

PART NUMBER **401 - 001 - B - 97H**

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NOTE: Prior to assembly - lubricate all O-Rings with Autogrease.

| Ref. No. | Part No. | Qty. | Description |
|----------|---------------------|------|---|
| 71 | 401 - 409 - A - 75 | 2 | BHCS 1/4 - 20 x 1/2" long |
| 72 | 401 - 408 - A - 97 | 1 | Aluminum Back Plate |
| 73 | 401 - 407 - A - 00 | 1 | Brown Viton® O-Ring (Back Plate) |
| 74 | 401 - 406 - A - 00 | 1 | Brown Viton® O-Ring (Piston) |
| 75 | 401 - 405 - A - 98H | 1 | Replacement Piston and Hardened SS Shafts |
| 76 | 401 - 404 - A - 97 | 1 | Replacement Body with Front Seals |

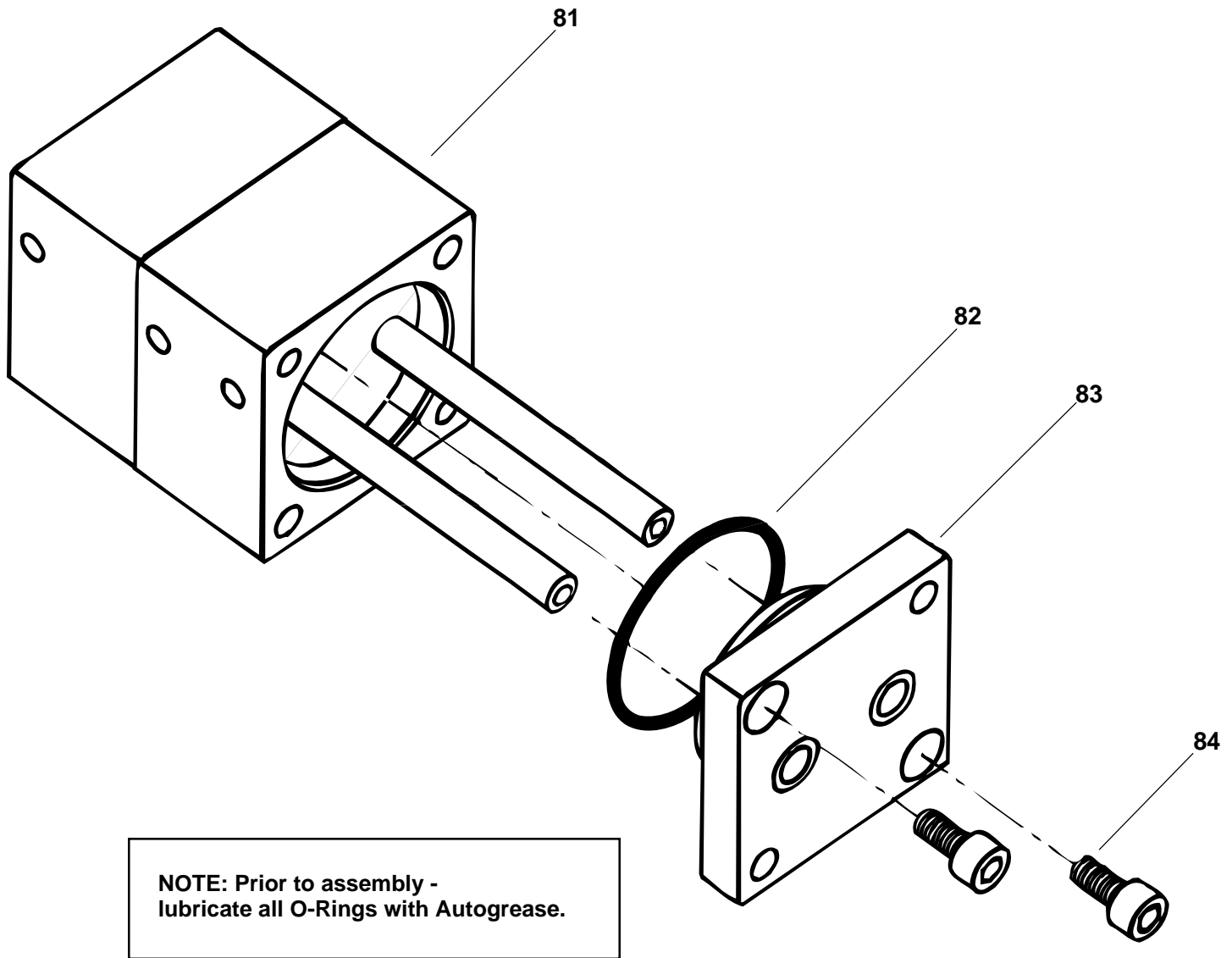
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400 AUTOVALVE DOUBLE AIR CYLINDER, Hardened SS shafts

PART NUMBER **401 - 006 - A - 97H**

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| Ref. No. | Part No. | Qty. | Description |
|----------|--------------------|------|--|
| 81 | 401 - 201 - A - 97 | 1 | Double Air Cylinder Body with 10-32 Air Ports |
| 82 | 401 - 407 - A - 00 | 1 | Brown Viton® O-Ring (Front Plate) |
| 83 | 401 - 202 - A - 97 | 1 | Aluminum Front Plate for 400 Double Air Cylinder |
| 84 | 401 - 203 - A - 75 | 2 | SHCS 10-32 x 1-1/2" long for 400 Double Air Cylinder |

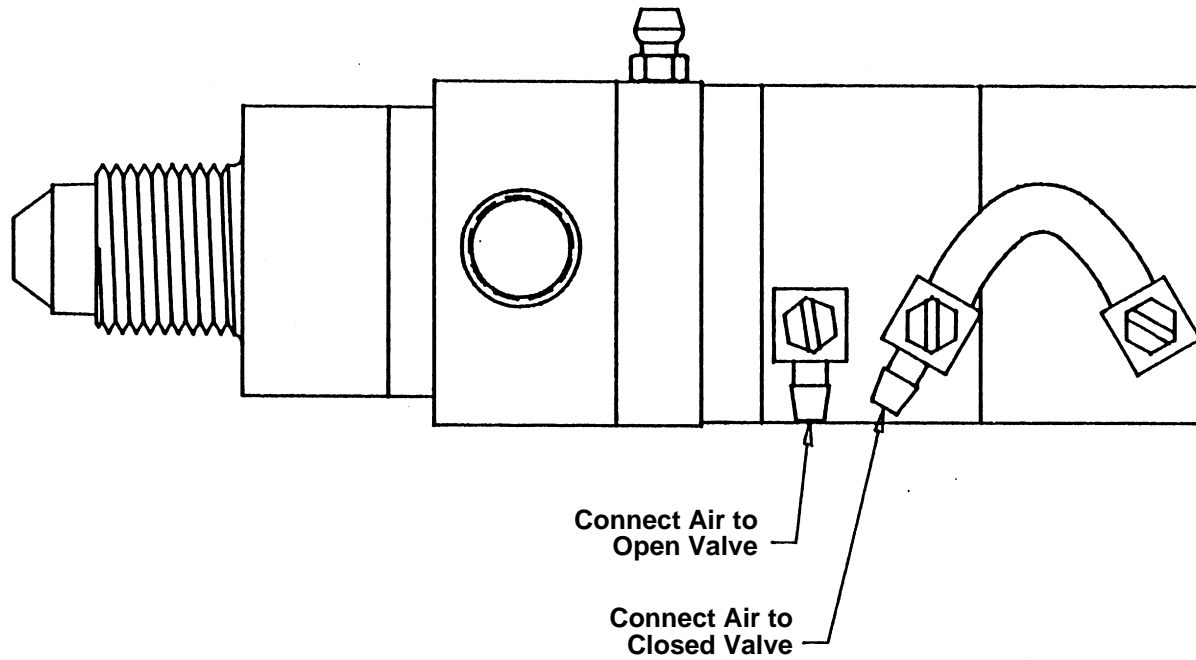
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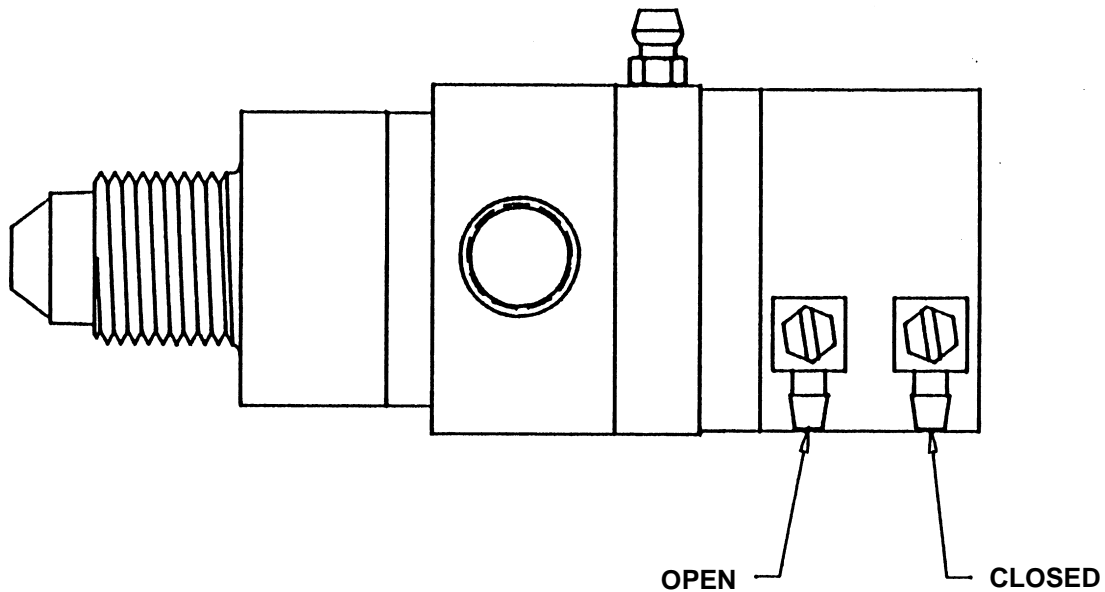
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Mail: info@esska.de

AIR CYLINDERS

DOUBLE AIR CYLINDER

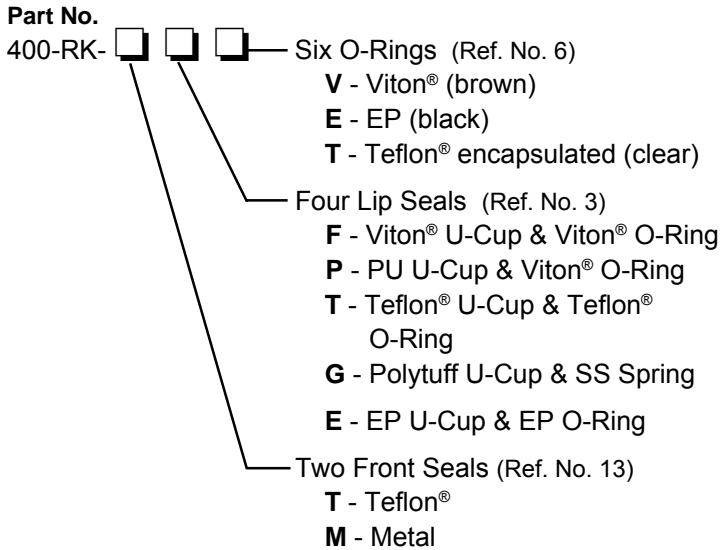


SINGLE AIR CYLINDER



SPARE PARTS KITS

400 Autogun Repair Kits Each Kit contains a complete set of Lip Seals, O-Rings and Front Seals.



Consult Factory for additional seal combinations

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Teflon® is a registered trademark of E.I. DuPont De Nemours

NOTES

Single Air Cylinder Repair Kit

Part No. 400-RK-AIRS/B Which Contains:

| Ref. No. | Qty. | Description |
|----------|------|---|
| 76 | 1 | Cylinder Body, Aluminum with Viton® O-Rings |
| 74 | 1 | Viton® O-Ring for Piston |
| 73 | 1 | Viton® O-Ring for Back Plate |

Double Air Cylinder Repair Kit

Part No. 400-RK-AIR D Which Contains:

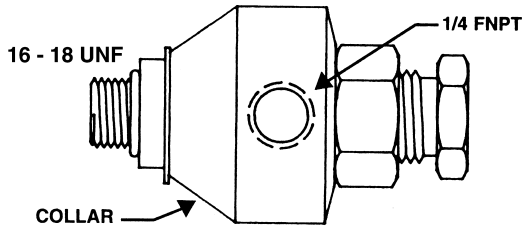
| Ref. No. | Qty. | Description |
|----------|------|--------------------------------|
| 82 | 1 | Viton® O-Ring for Front Plate |
| 83 | 1 | Front Plate with Viton® O-Ring |

Orifice Kit (40) Part No. 450-ORIF/KIT Which Contains:

| Ref. No. | Qty. | Description |
|----------|------|------------------------------------|
| 40A | 1 | Polypropylene Fitting .09" Orifice |
| 40B | 1 | Polypropylene Fitting .06" Orifice |
| 40C | 1 | Polypropylene Fitting .04" Orifice |

HOSE FITTINGS FOR 400 VALVE

Swivel Check Valve Adapters



For A & B materials, we offer a combination check valve/fluid inlet adapter. This rugged, all in one, adapter provides a metal to metal seal for proven low maintenance, in an ideal location. It also incorporates a swivel connection for ease of air purging.

| Part No. | Description |
|-----------------|--|
| 451-F2EFNPT-97C | All SS, except Alum. collar, 1/4" FNPT |
| 451-F3EFNPT-98C | All SS, 1/4" FNPT |

The valve body has 9/16" X 18 inlets. The following fittings are available to connect the A & B hoses.

Note: All fittings are supplied with EP O-Rings. Optional Viton® O-Rings available on request. Substitute V for Viton® instead of Part No. suffix E.

Carbon Steel Pipe Adapters

| Part No. | Description |
|-----------------|---------------------------------|
| 451-F2EMNPT-75E | 90 degree Elbow with 1/4" MNPT |
| 451-F3EMNPT-75E | 90 degree Elbow with 3/8" MNPT |
| 451-F2EFNPT-75E | 90 degree Elbow with 1/4" FNPS |
| 451-F3EFNPT-75E | 90 degree Elbow with 3/8" FNPS |
| 451-F2SMNPT-75E | Straight Adapter with 1/4" MNPT |
| 451-F3SMNPT-75E | Straight Adapter with 3/8" MNPT |
| 451-F2SFNPT-75E | Straight Adapter with 1/4" FNPS |
| 451-F3SFNPT-75E | Straight Adapter with 3/8" FNPS |

Carbon Steel 37 Degree JIC Adapters

| Part No. | Description |
|----------------|-------------------------------------|
| 451-F2EJIC-75E | 90 degree Elbow with 1/4" Male JIC |
| 451-F3EJIC-75E | 90 degree Elbow with 3/8" Male JIC |
| 451-F2SJIC-75E | Straight Adapter with 1/4" Male JIC |
| 451-F3SJIC-75E | Straight Adapter with 3/8" Male JIC |

316 Stainless Steel 37 Degree JIC Adapters

| Part No. | Description |
|----------------|-------------------------------------|
| 451-F2EJIC-98E | 90 degree Elbow with 1/4" Male JIC |
| 451-F3EJIC-98E | 90 degree Elbow with 3/8" Male JIC |
| 451-F2SJIC-98E | Straight Adapter with 1/4" Male JIC |
| 451-F3SJIC-98E | Straight Adapter with 3/8" Male JIC |

Viton® is a registered trademark of DuPont Dow Elastomers

Spare O-Rings - For Hose Fitting

| Part No. | Material | Description |
|------------|----------|--------------------|
| 451-FOR-02 | EP | O-Ring for Fitting |
| 451-FOR-00 | Viton® | O-Ring for Fitting |

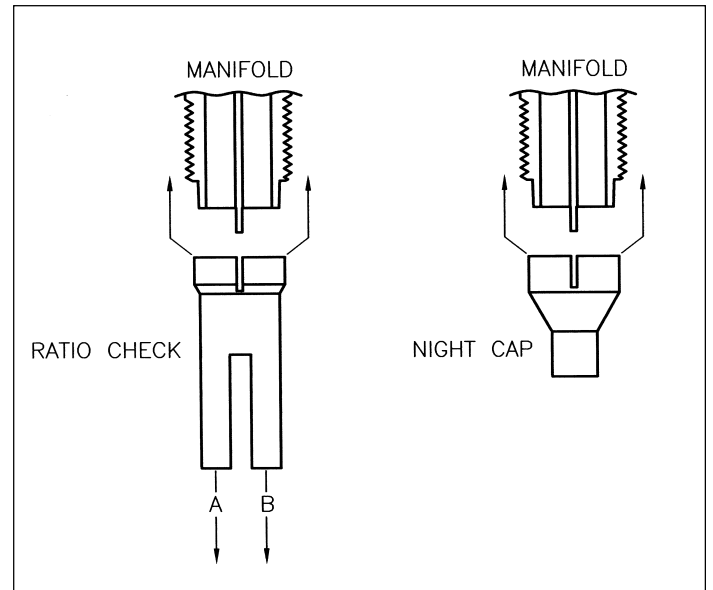
Additional Accessories

Ratio Check Cap

In order to ensure correct A/B ratio, ratio checks should be performed regularly with our new Ratio Check Cap.

Night Cap

At night or on weekends, it is a good idea to seal your system. After the static mixer is removed, a night cap can be installed. This seals the system and makes start-up simpler.



| Part No. | Description |
|------------|------------------------------------|
| 165-RC/01 | Ratio Check Cap with retaining nut |
| 165-Cap/01 | Night Cap with retaining nut |

400 AUTOVALVE ALL PURPOSE GREASE-APG#2

ALL PURPOSE GREASE-APG#2

Data Sheet #112
Prepared: 05/30/97
Supersedes: 12/06/93

This Material Safety Data Sheet complies with 29 CFR 1910.1200-OSHA Hazard Communication Standard

SECTION I - PRODUCT IDENTIFICATION

General of Generic ID: Aliphatic Hydrocarbon Gel
DOT Hazard Classification: None

SECTION II - COMPONENTS

If present, IARC, NTP and OSHA Carcinogens and chemicals subject to the reporting requirements of SARA Title III Section 313 are identified in this section.

| INGREDIENTS | EXPOSURE LIMITS | PERCENT | FOOTNOTE |
|---|--|---------|----------|
| White mineral oil (CAS# 8042-47-5) | PEL-TWA 5 mg/M ³ TLV-TWA 5 mg/M ³ | 84 | (1) |
| Amorphous fumed silica (CAS# 67762-90-7) | PEL-TWA 6 mg/M ³ TLV-TWA 2 mg/M ³ | 12 | |
| PTFE (CAS# 9002-84-0) | Not established | 4 | (2) |

(1) OSHA Short Term Exposure Limit (STEL) for mineral oil mist is 5 mg/M³. ACGIII STEL for mineral oil mist is 10 mg/M³.

(2) PTFE - polytetrafluoroethylene fillers and corrosion inhibitors.

SECTION III

| PROPERTY | MEASUREMENT | PROPERTY | MEASUREMENT |
|----------------|------------------------------|-------------------|---------------------------|
| Boiling Point | 650°F (component) @ 760 mmHg | Specific Gravity | 0.8275 (component) @ 77°F |
| Vapor Pressure | >1 mmHg (component) @ 70°F | Percent Volatiles | Approximately 84% |
| Vapor Density | Not Available | Evaporation Rate | Slower than ether |
| | | Appearance | White paste, slight odor |

SECTION IV - FIRE AND EXPLOSION INFORMATION

Flash Point: 445°F (component) by TCC

Explosive Limit: Not available

Extinguishing media: Dry chemical, carbon dioxide, water spray (fog), regular foam

Hazardous Decomposition Products: May form toxic materials including but not limited to: carbon monoxide, carbon dioxide, various hydrocarbons and trace amounts of COF₂ and CF₄ at temperatures above 1200°F.

Fire Fighting Procedures: no special requirements. Wear self-contained breathing apparatus with a full face piece operated in the positive pressure demand mode. Cool fire exposed containers with water spray.

Special Fire & Explosion hazards: No special requirements.

SECTION V - HEALTH HAZARD DATA

Permissible Exposure Limits: Not established for product. See Section II for PEL/TLVs.

Effects of Acute Overexposure:

EYES: May cause mild irritation. Symptoms may include: stinging, tearing, redness and swelling.

SKIN: May cause mild irritation. Repeated or prolonged contact can dry the skin. Symptoms may include: redness, burning, drying, cracking, and skin burns.

BREATHING: Exposure to vapors or mists is possible. Short-term inhalation toxicity is low. Breathing small amounts incidental to normal handling and use is not likely to cause adverse effects; however, large amounts may be harmful. Symptoms are associated with exposure that occurs above the recommended exposure limits. Symptoms may include: Central Nervous Systems (CNS) effects such as: drowsiness, weakness, fatigue, nausea, headache, unconsciousness, coma and death. Exposure to thermal decomposition products generated by temperatures above 1000°F can cause polymer fume fever, with symptoms of fever, chill, cough and general malaise. This is generally a temporary condition.

400 AUTOVALVE ALL PURPOSE GREASE-APG#2

SWALLOWING: Due to the nature of this material, it is difficult to swallow; however, single dose toxicity for each component is considered to be low. Small amounts swallowed incidental to normal handling and use are unlikely to cause harmful effects, although swallowing large amounts may be harmful. The petroleum based component in this product is considered an aspiration hazard. During swallowing or vomiting, this material can enter the lungs and cause inflammation and/or damage. The liquid may also be absorbed through the lungs and result in injury to other body systems.

FIRST AID:

EYES: If symptoms develop, move individual away from exposure and into fresh air. Flush eyes for at least 15 minutes while holding eyelids apart.

SKIN: Remove any contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Wash any contaminated clothing before reusing.

BREATHING: If affected, remove individual to fresh air. If breathing is difficult, administer oxygen (if you have been trained in its use). If breathing has stopped, give artificial respiration. Keep person warm, quiet and get medical attention.

SWALLOWING: Do not induce vomiting. Keep person warm, quiet and get medical attention. If possible, do not leave person unattended. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis, which can be fatal.

Primary Route(s) of Entry: Inhalation and skin contact.

Effects of Chronic Overexposure: No data was found on chronic overexposures to this product or its components.

Medical Conditions Aggravated by Exposure: Skin contact may aggravate existing dermatitis or other significant skin conditions.

SECTION VI - REACTIVITY DATA

Hazardous Polymerization: Cannot occur.

Stability: Stable

Incompatibility: Avoid contact with strong oxidizing agents, sodium - potassium alloy. Avoid conditions such as: open flame, temperature above 1000°F.

SECTION VII - SPILL OR LEAK PROCEDURES

SMALL SPILL: Vacuum, shovel or sweep up material.

LARGE SPILL: Persons not wearing protective equipment should be excluded from spill area until clean-up has been completed. Only personnel trained in spill clean-up under 29 CFR 1910.120 should be involved with spill clean-up procedures. Stop spill at source. Prevent material from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If run occurs, notify appropriate authorities as required. Vacuum, shovel or sweep spilled product to clean containers for recovery. Transfer contaminated soil and other materials to container for disposal.

Waste disposal: Dispose of in accordance with all local, state, and federal regulations.

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

Respiratory Protection: If workplace exposure limit(s) or product or any component is exceeded (See Section II), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators under specified conditions - see 29 CFR 1910.134 or your safety equipment supplier. Engineering and/or administrative controls should be implemented to reduce exposure.

Ventilation: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below PEL/TLVs.

Protective Gloves: Wear chemical resistant gloves. Contact your safety equipment supplier.

Eye Protection: Chemical splash goggles in compliance with OSHA regulations are advised. Consult your safety equipment supplier.

Other protective equipment: To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Other Regulatory Information:

- CERCLA — Not regulated
- RCRA — Not regulated
- SARA, Section 302 — Not regulated
- SARA, Section 311/312 — Immediate health hazard
- SARA, Section 313 — None known to meet the reporting requirements
- DOT — Proper shipping name: Not applicable
- Hazard Class: Not applicable

Containers of this material may be hazardous when emptied. Since emptied containers retaining product residues, vapors, liquids, and/or solids may pose a hazard. Containers identified as empty should be handled carefully. Observe all hazard precautions presented on the MSDS.

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable and suitable to their circumstances.