

## 900S068 6 INCH AIR MOTOR ASSEMBLY

**IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING, OR SERVICING THIS EQUIPMENT**

**WHEN REPAIRING THE AIR MOTOR TURN OFF THE AIR SUPPLY AND BLEED THE MATERIAL PRESSURE FROM THE PUMPING SYSTEM.**

### SERVICE KITS

Use only Johnstone replacement parts to insure compatibility and longest life.

- Air Cylinder Repair Kit: 900S070RKN
- Air Valve Repair Kit: 300S826RK

### SPECIFICATIONS

Air Inlet Port Size	3/4" NPT
Exhaust Port Size	3/4" NPT
Minimum Air Supply	3/4" NPT
Static Pressure Ratio 900-001 Pump	24:1
Static Pressure Ratio 300-701x Pump	16:1
Air Pressure Operating Range	20 PSI (1.36BAR) to 100 PSI (6.8 BAR)

**WARNING:**  
**DO NOT OPERATE AIR MOTOR AT PRESSURES ABOVE 100PSI (6.8 BAR).**

### MAINTENANCE SCHEDULE

#### MONTHLY:

Add 10W oil to the lubricator.

Check for air leaks.

If air is exhausting out of the muffler when the air motor is stalled rebuild the air motor.

### OPERATION

Supply air pressure to the Inlet port of the Air Valve.  
Adjust the Air Regulator to change the material pressure. Increase the air pressure for more PSI and decrease the air pressure for less PSI.



### REPLACEMENT PROCEDURE

Turn off the air supply to Air Motor.  
Depressurize the Pump Material pressure.  
Remove the Air supply hose.  
Remove the collar and hex nuts from the connector assembly (900-022).  
The Air motor can be remove from the pump.  
Remove the spacer rods and attach them to the new Air Motor and tighten (100 Ft Lbs).  
Install the air motor on the pump flange.  
Tighten the collar assembly to the air piston rod (120 Ft Lbs).  
Screw the Hex Nuts on the Spacer rods and tighten (100 Ft Lbs).  
Connect the Air Supply hose to the air valve inlet port.



## How the Pneumatic Circuit works

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- The diagram illustrates a pneumatic cylinder assembly with two poppets and two directional valves. At the top, a 'Main Directional Valve' is connected to a 'PSI' pressure source. Its output line leads to a 'Control Valve', which is also connected to a 'vent' (atmosphere). The 'Control Valve' has two outputs: one leading to the 'Upper Poppet' and another leading to the 'Lower Poppet'. The 'Upper Poppet' is located above the 'Piston and Rod assembly' within the 'Air Cylinder'. The 'Lower Poppet' is located below the 'Piston and Rod assembly'. Both poppets are connected to a common vent line. The 'Piston and Rod assembly' is shown in the center of the 'Air Cylinder'. The 'Lower Poppet' is connected to a vent line that also leads to a 'vent' (atmosphere).

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## 900S068 6 inch Air Motor

Air Motor Part Description			
In Repair Kit	Part No.	Amount	Description
YES	350-008	2	O'ring Main air Valve
YES	360-469	1	O'ring Top of air cylinder
YES	400-023	1	Packing Nut
YES	350-010	1	O'ring Piston seal in Packing Nut
YES	350-130	1	O'ring Packing Nut thread seal
No	300-852	1	Lower Poppet Valve
YES	300-854	1	Lower Poppet Pin Assembly
YES	350-312	1	O'ring Lower Poppet
YES	350-336	1	O'ring Lower Poppet
NO	360-615	1	Tube fitting for Lower poppet valve
NO	360-615	22in.	Air tubing for Lower Poppet Valve
YES	360-479	1	Retaining Ring Lower Poppet
YES	360-514	1	Spring Lower Poppet
NO	402-319	1	Air Piston
YES	350-275	1	O'ring Air Piston Assembly
NO	402-231	1	Air Piston Rod
NO	402-229	1	Upper piston insert
NO	402-230	1	Lower piston insert
YES	350-832	1	O-ring for Piston assembly
NO	402-255	1	6 inch Air Cylinder
NO	402-251	1	6 inch Bottom Plate
YES	402-259	1	6 inch gasket
NO	402-248	1	6 inch Bottom Cushion
YES	350-811	1	O-ring for Cushion
NO	360-547	2	Shoulder Screws for Cushion
NO	350-016	6	Hex head cap screws

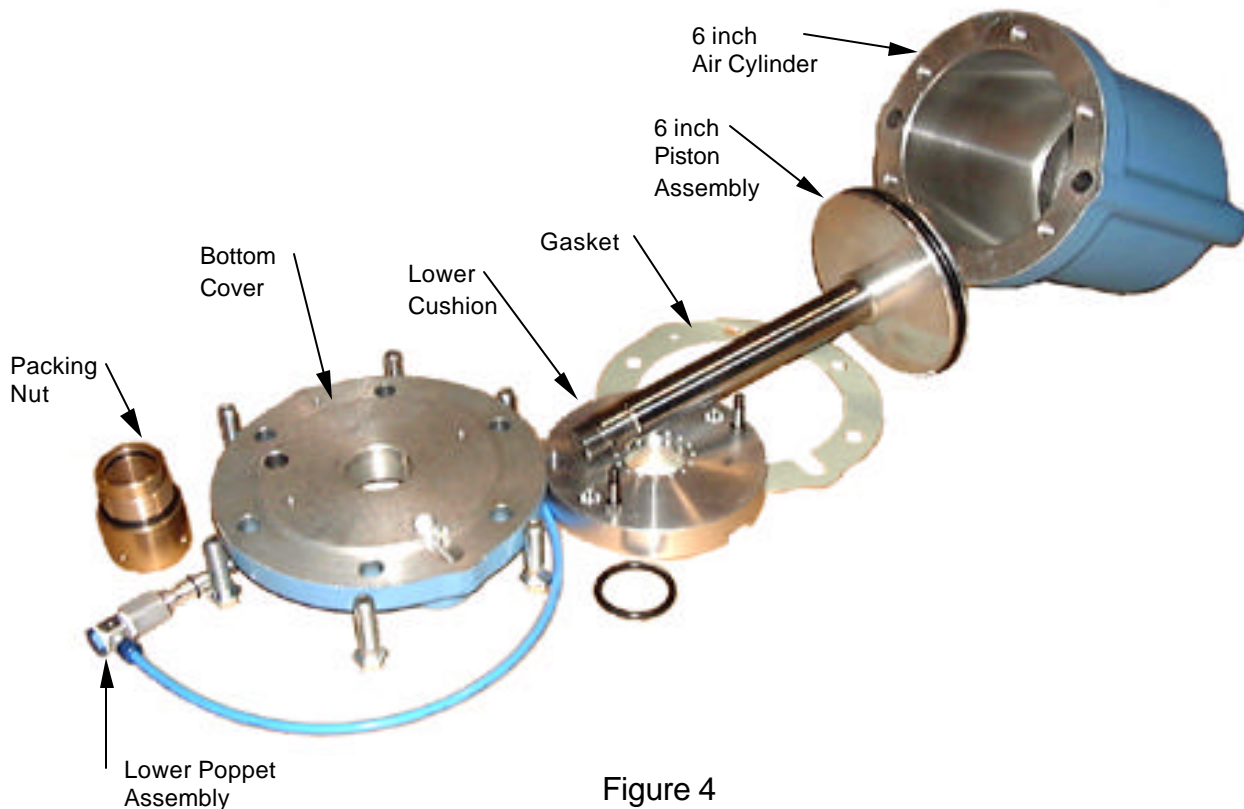


Figure 4

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## 900S068 6 inch Air Cylinder Rebuilding

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### Disassembly:

**NOTE: ENSURE THAT THE AIR PRESSURE AND MATERIAL PRESSURE IS TURNED OFF BEFORE REBUILDING.**

- 1) Remove the Tubing from the Lower Poppet.
- 2) Remove the three hex head bolts that hold the Air Valve to the Air Cylinder
  - a) Remove the Air Valve from the Air Cylinder
    - i) Twisting helps remove it from the cylinder.
- 3) Remove the Lower Poppet assembly.
- 4) Remove the Packing Nut using a spanner wrench #350-083
- 5) Remove the 6 Hex Head Screws that hold the bottom cover to the cylinder.
- 6) Remove the Bottom Cover from the Cylinder.
- 7) Remove the Air Piston Rod assembly by tilting it 45 deg. and pulling it out of the cylinder.
- 8) Remove the O'rings from the Air cylinder, Piston assembly and Lower Cushion.
- 9) Clean and inspect the Cylinder for worn or damaged parts.
  - a) The Air Piston Assembly should NOT be taken apart. Take apart only if a Part is Damaged.

### Assembly:

- 1) Install the O'ring on the Piston and lubricate them.
  - a) If the Piston Assembly is rebuilt.
    - i) Install the Lower Piston Insert and O'ring on the Piston Rod.
    - ii) Locktite the Piston Rod to the Piston and torque to 50 Ft. Lbs.
    - iii) Install the Upper Cushion, Flat washer, Lock Washer and locktite the Hex Screw and torque to 20 Ft. Lbs.
- 2) Install the two O'rings on the Packing Nut assembly and lubricate them.
- 3) Thread the Packing Nut into the Bottom Cover and tighten to 60 Ft. Lbs.
- 4) Lubricate the Air Cylinder with 90W oil.
- 5) Align the Air cylinder poppet ports with the Bottom Cover poppet air ports. See figure #5

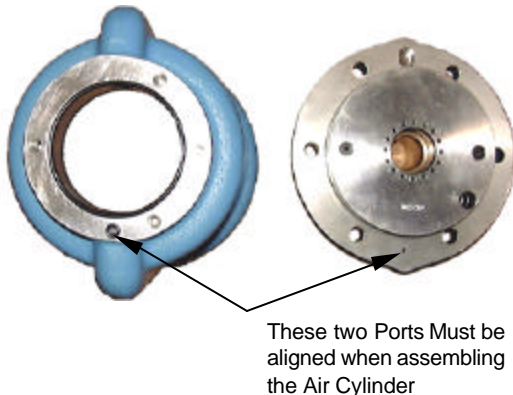


Figure #5

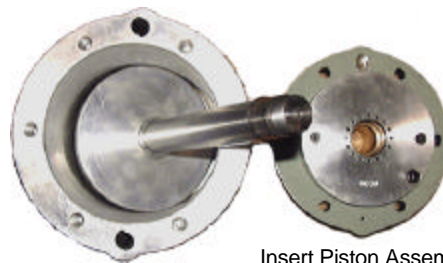


Figure #6

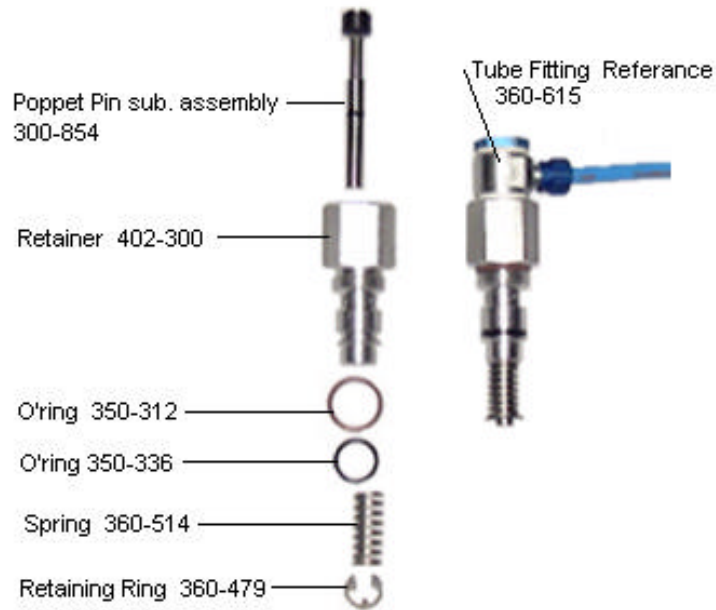
- 6) Insert the Piston Assembly into the bore at a 45 deg. angle and straighten it so that the Piston is square at the bottom of the bore. See figure #6
- 7) Install the Gasket on the bottom cover. The Slot and Poppet hole should align. See figure #6
- 8) Install the Bottom Cover onto the Air Cylinder. Make sure that the poppet ports align up.
- 9) Install the 6 Hex Head Screws and torque them evenly to 30 Ft. Lbs.
- 10) Install the Two large Air Valve O'rings 350-008 and Small one 360-469 at the top opening of the Air cylinder and lubricate them.
- 11) Install the Air valve so that the poppet ports line up. See figure 2 (page 2)
- 12) Install the Three 3/8-16 Hex Screws and lock washers and tighten them to 20 Ft. Lbs.
- 13) Attach the tubing from the air valve to the lower poppet.

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## 300-852 LOWER POPPET ASSEMBLY

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**NOTE: WHEN REPAIRING THE AIR MOTOR TURN OFF THE AIR SUPPLY AND BLEED THE MATERIAL PRESSURE FROM THE PUMPING SYSTEM**



### Repair Kit 300-855 Includes:

300-854 Poppet Pin sub-assembly.  
350-312 O'ring  
350-336 O'ring  
360-514 Spring  
360-479 Retaining Ring.

### Rebuilding Instructions:

#### DISASSEMBLY:

- 1) Remove Poppet from Bottom Cover of the Air Motor.
- 2) Remove the tube fitting from the Poppet.
- 3) Using Pliers remove the retaining ring.
- 4) Pull off the spring and remove the pin assembly by pushing it through the Retainer.
- 5) Remove the Two O'rings on the Retainer.
- 6) Clean the Retainer and look for damage.

#### ASSEMBLY:

- 1) Install the two O'rings on the retainer and lubricate.
- 2) Lubricate and install new Pin sub-assembly into the Retainer.
- 3) Slide the Spring over the Pin that is past the retainer body.
- 4) Insert the Retaining ring into the groove on the Pin assembly.
  - a) The groove will be in the middle of the spring at this time.
  - b) Hold the Retaining ring with pliers and spin the spring counter clock wise until the Retainer is past the end of the spring.
- 5) Ensure that the Retainer is securely in the groove on the pin.
- 6) Install the Tube Fitting in the end of the Poppet.
- 7) Thread the Poppet into the Bottom Cover of the Air Motor and tighten to 20 Ft. Lbs.

## 300S826 Air Valve Assembly

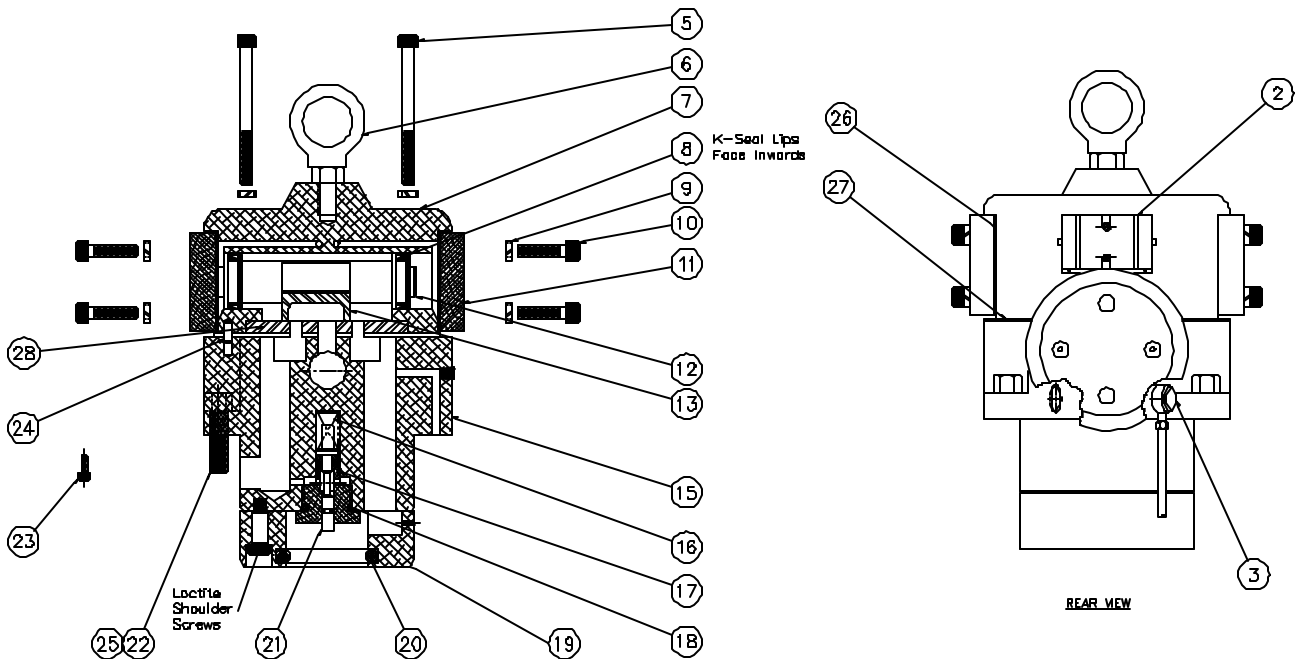


figure #8

Air Valve Part Description 300S826RK Repair Kit				
Detail Number	In Repair Kit	Part No.	Amount	Description
2	NO	360-604	1	Control Valve
4	NO	350-568	1	¾ NPT Silencer
5	NO	350-916	4	Socket Head Screw ¼-20 x 2 ¾
6	NO	360-097	1	3/8 in Eye bolt
7	NO	402-313	1	Valve Body
8	YES	360-518	2	K-Seal (Seal lips face inwards)
9	NO	361-233	12	Lock Washer High collar ¼
10	NO	350-285	8	Socket Head screw ¼-20 x 1"
11	NO	402-322	2	End Cap
12	NO	402-315	1	Valve Piston
13	Yes	402-316	1	Slide Valve
15	NO	402-314A	1	Adapter
16	Yes	360-514	1	Spring for Upper Poppet
17	Yes	350-420	1	O'ring for Upper Poppet
18	Yes	350-362	1	O'ring for Upper Poppet
19	NO	300-828	1	Upper Cushion assembly
20	Yes	350-811	1	O'ring for Upper Cushion Assembly
21	Yes	300-856	1	Upper Poppet Pin assembly
22	NO	350-185	3	Hex Head Screws 3/8-16 x 1 ¼
23	NO	360-517	2	Socket Head Screw 6-32 x 3/8
25	NO	350-180	3	Lock Washer 3/8
26	Yes	402-238	2	End Cap Gaskets
27	Yes	402-246	1	Valve Body Gasket
28	Yes	402-317	1	Valve Plate



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## 300S826 Air Valve Assembly Rebuilding Instructions

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**NOTE: WHEN REPAIRING THE AIR MOTOR TURN OFF THE AIR SUPPLY AND BLEED THE MATERIAL PRESSURE FROM THE PUMPING SYSTEM**

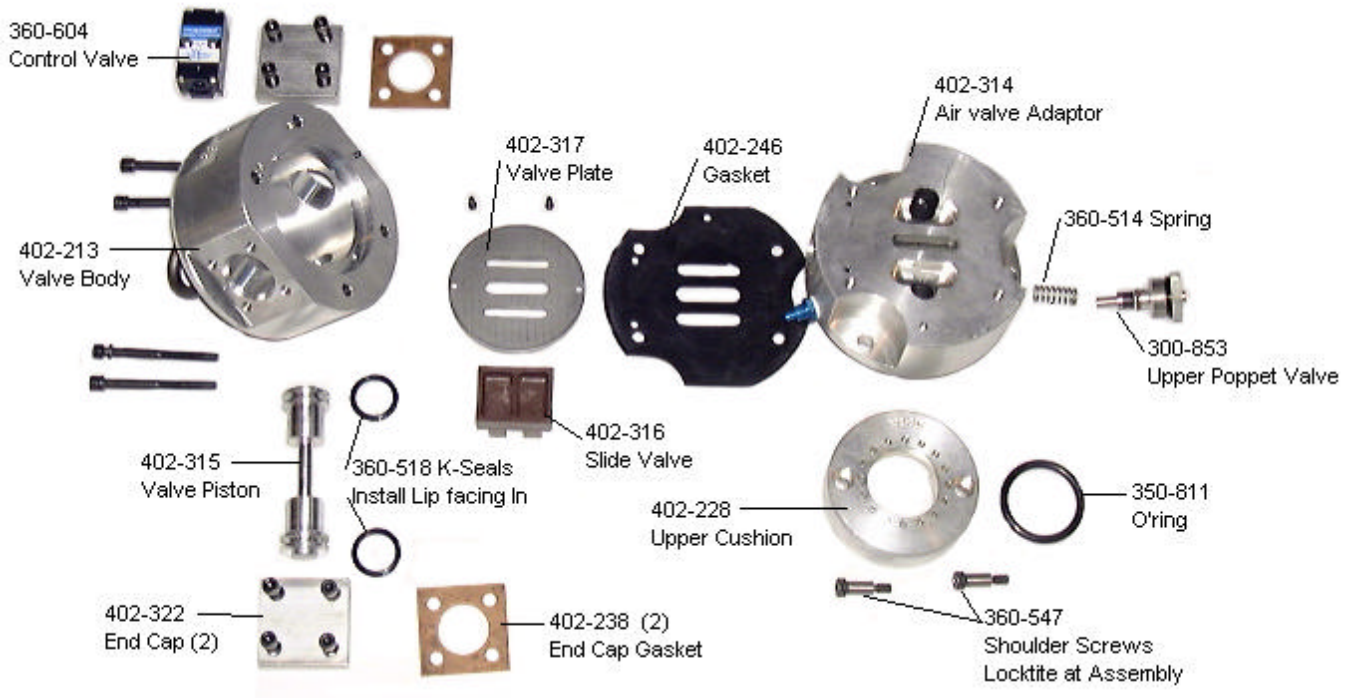


figure #9

### DISASSEMBLY:

- 1) Remove the Tubing from the Lower Poppet.
- 2) Remove the three hex head bolts that hold the Air Valve to the Air Cylinder.
  - a) Remove the Air Valve from the Air Cylinder
  - b) Twisting helps remove it from the cylinder.
- 3) Remove the 360-604 Control by unscrewing the (2) slotted screws.
- 4) Remove the 402-213 Valve Body by unscrewing the (4) SHCS and Lock washers on the top surface.
- 5) Remove both 402-322 End Caps by unscrewing the (8) SHCS and Lock washers.
- 6) Remove the 402-317 Valve Plate and 402-316 Slide Valve by unscrewing the (2) SHCS in the valve Plate.
- 7) The 402-315 Valve Piston Can be Removed by pushing out thru the bore.
  - a) Remove the 360-518 K-Seals.
- 8) Remove the O'ring from the 402-228 Upper Cushion Assembly.
- 9) Using a 1 1/8" socket the 300-853 Upper Poppet Valve can be removed without removing the Upper Cushion. The 360-514 Spring should be removed at this time.
- 10) Clean all parts and replace any damaged parts.

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## 300S826 Air Valve Assembly Rebuilding Instructions

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### ASSEMBLY:

- 1) Install the O'rings 350-420 and 350-362 on the Upper Poppet Retainer and lubricate.
- 2) Lubricate the 300-856 Upper poppet Pin assembly and install it into Upper Poppet Retainer.
- 3) Drop the 360-514 Spring into the Upper Poppet bore of the 402-314 Adaptor and screw the Upper poppet assembly and torque to 20 Ft. Lbs.
- 4) Install the 350-811 O'ring into the Upper Cushion.
  - a) If the Upper Cushion was removed, replace it using the two 360-547 Shoulder Screws and LOCTITE.
- 5) Install Both 360-518 K-Seals on the 402-315 Valve Piston. The Seal Lips MUST FACE INWARDS and Lubricate the seals.
- 6) Push the 402-315 Valve Piston into the 402-213 Valve Body. The piston should go in very easy.
- 7) Install the 402-316 Slide valve onto the 402-315 Valve piston and Lubricate it with a light oil.
- 8) Install the 402-317 Valve Plate in the 402-213 Valve Body so that the 6-32 line up with the holes in the plate. Do Not Over Tighten the Screws. Torque to 10 Inch Lbs.
- 9) Install both 402-322 End Caps and 402-238 End Cap Gasket using the eight SHCS  $\frac{1}{4}$  x 1  $\frac{1}{4}$ " and Lock washers and torque to 10 Ft. Lbs.
- 10) Install the Valve body assembly on the air valve adaptor.
  - a) Line up the 402-246 Gasket so that the Pilot Ports line up and the. Location pin. The scalaps of the gasket should match the scalaps of the air valve adaptor.
  - b) Insert the (4)  $\frac{1}{4}$  x 2  $\frac{3}{4}$ " SHCS and lock washers thru the Valve body and line them up with the holes in the air valve adaptor. Ensure that the Pilot ports line up.
  - c) Tighten the SHCS to 10 Ft. Lbs of torque.
- 11) Install the 350-604 control on the Valve body. The slotted screws should be tightened to 20 inch Lbs of torque.
  - a) There is a detent on the valve and it must match the detent hole in the Valve body.
- 12) Install the Two large Air Valve O'rings 350-008 and Small one 360-469 at the top opening of the Air cylinder and lubricate them.
- 13) Install the Air valve so that the poppet ports line up. See figure 2 (page 2)
- 14) Install the Three 3/8-16 Hex Screws and lock washers and tighten them to 20 Ft. Lbs.
- 15) Attach the tubing from the air valve to the lower poppet.

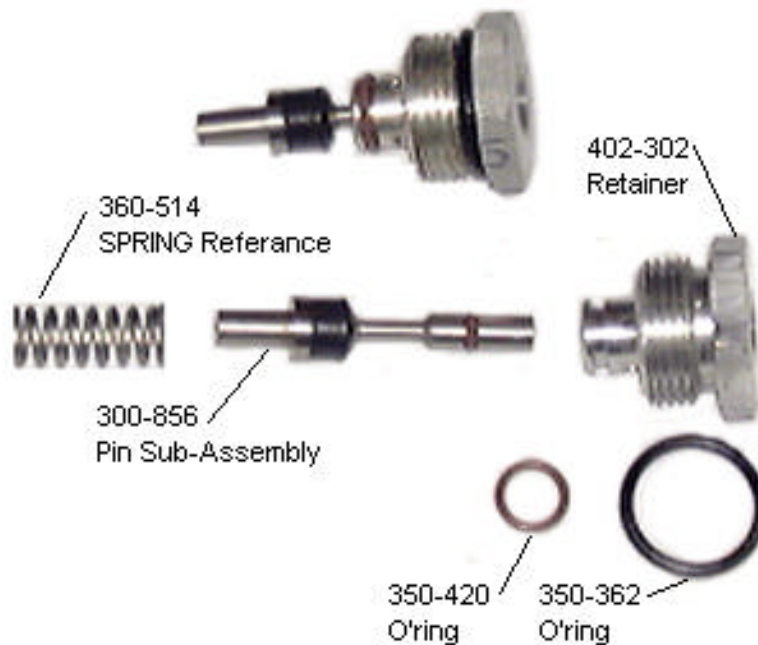


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## 300-853 Upper Poppet Assembly

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**NOTE: WHEN REPAIRING THE AIR MOTOR TURN OFF THE AIR SUPPLY AND BLEED THE MATERIAL PRESSURE FROM THE PUMPING SYSTEM**



**Repair Kit 300-857 Includes:**  
Poppet Pin sub-assembly 300-856  
O'ring 350-420  
O'ring 350-362  
Spring 360-514  
Retaining Ring 360-479.

### DISASSEMBLY:

- 1) Remove the Tubing from the Lower Poppet.
- 2) Remove the three hex head bolts that hold the Air Valve to the Air Cylinder.
  - a) Remove the Air Valve from the Air Cylinder.
  - b) Twisting helps remove it from the cylinder.
- 3) Using a 1 1/8" socket the 300-853 Upper Poppet Valve can be removed without removing the Upper Cushion. The 360-514 Spring should be removed at this time.
- 4) Clean all parts and replace any damaged parts.

### ASSEMBLY:

- 1) Install the O'rings 350-420 and 350-362 on the Upper Poppet Retainer and lubricate.
- 2) Lubricate the 300-856 Upper poppet Pin assembly and install it into Upper Poppet Retainer.
- 3) Drop the 360-514 Spring into the Upper Poppet bore of the 402-314 Adaptor and screw the Upper poppet assembly and torque to 20 Ft. Lbs.
- 4) If the Upper Cushion was removed Replace it using the two 360-547 Shoulder Screws and LOCTITE.

# TROUBLE SHOOTING

<b><u>Problem</u></b>	<b><u>Cause</u></b>	<b><u>Solution</u></b>
<b>AIR MOTOR / AIR VALVE</b>		
Air blowing out exhaust port.	Loose valve body (402-313).	Tighten four bolts (350-916).
	Worn slide valve (402-316).	Replace.
	Worn valve plate (402-317).	Replace.
	Worn valve gasket (402-246).	Replace gasket.
	Worn O'ring of air motor cylinder.	Replace o'ring. (350-275)
	Check control valve for dirt or damage.	Replace valve (360-604).
	Worn K-seals (360-518) on valve piston (402-315).	Replace K-seals.
Air blowing out bottom of air motor.	Worn packing nut assembly.	Replace assembly (300-831).
	Damaged o'ring in packing nut assembly (300-831).	Replace o'ring.
	Damaged or loose gasket.	Replace gasket (402-261).
	Worn or damaged piston rod (402-231N).	Replace piston rod.
	Crack in cylinder (402-257).	Replace cylinder.
Air motor stalling at end of stroke.	Internal piston parts loose.	Disassembly air motor and reassemble parts.
Air motor piston rod stuttering at top of stroke.	Lower poppet (300-852) being held open with dirt or bent pin.	Clean seat of seal or replace lower poppet.
	Damaged or dirty double pilot valve (360-604).	Clean or replace valve.
Air motor piston rod stuttering at bottom of stroke.	Upper poppet (300-853) being held open.	Rebuild or replace upper poppet valve.
	Damaged or dirty double pilot valve (360-604).	Clean or replace valve.