PremAire® System

1/4 TURN SECOND STAGE REGULATOR

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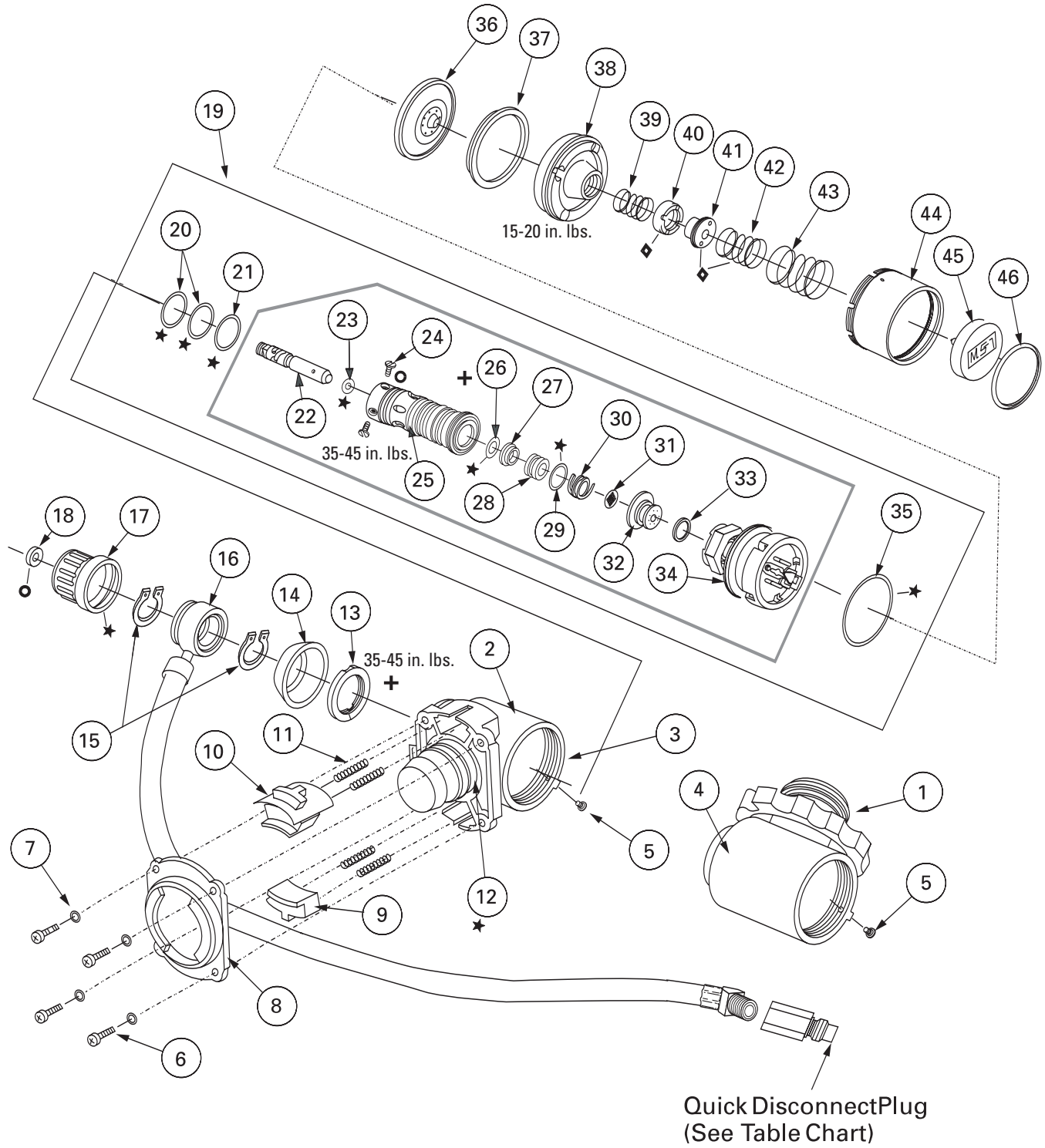
MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 502 (L) Rev. 0

Prnt. Spec. 10000005389 (I) Mat. 10064383
Doc. 10064383

REGULATOR COMPONENTS					
Item	**Part No.**	**Description**	**Item**	**Part No.**	**Description**
1		MASK MOUNTED REGULATOR ASSEMBLY THREADED (with Bypass)	21	**635343**	O-Ring
	813737	With Front Hose	22	**488797**	Slide
	813738	With Rear Hose	23	**635240**	O-Ring
2		MASK MOUNTED REGULATOR ASSEMBLY QUICK DISCONNECT (with Bypass)	24	**488810**	Screw, Guide Bypass (3)
	813806	With Front Hose	25	**488812**	Sleeve Bypass (35 - 45 in. lbs.)
	813807	With Rear Hose	26	**635241**	O-Ring
3	**10004539**	Quick Connect (Housing only)	27	**489355**	Valve
4	**812636**	Threaded Connector (Housing only)	28	**490656**	Spool
5	**636088**	Screw	29	**635243**	O-Ring
6	**636227**	Screw (4)	30	**488779**	Spring
7	**632036**	Lock Washer (4)	31	**488808**	Screen, Bypass
8	**812849**	Retaining Plate	32	**488796**	Spool Power Stage
9	**818179**	Button	33	**488782**	Diaphragm Power Stage
10	**812841**	Release Tab	34	**800040**	Valve and Leaver Assembly
11	**637895**	Spring (4)	35	**634814**	O-Ring
12	**635796**	O-Ring	36	**488783**	Diaphragm
13	**488811**	Locknut, Bypass (35 - 45 in. lbs.)	37	**488755**	Ring, Spacer
14	**488785**	Cap, Bypass	38	**803135**	Base, Shutoff (15 - 20 in. lbs.)
15	**635244**	Retaining Ring (4)	39	**803134**	Diaphragm Spring
HOSE ASSEMBLY			40	**488740**	Screw, Adjusting
16	**813741**	24 Inches	41	**488741**	Ring, Thrust
	813742	42 Inches	42	**800685**	Stop Spring
17	**495277**	Handwheel Assembly	43	**492238**	Spring, Shutoff
18	**637089**	Locknut, Handwheel	44	**813713**	Cap Shutoff
19	**803138**	Valve Core Assembly	45	**813712**	Pushbutton Shutoff
20	**635242**	O-Ring (2)	46	**638141**	Retaining Ring

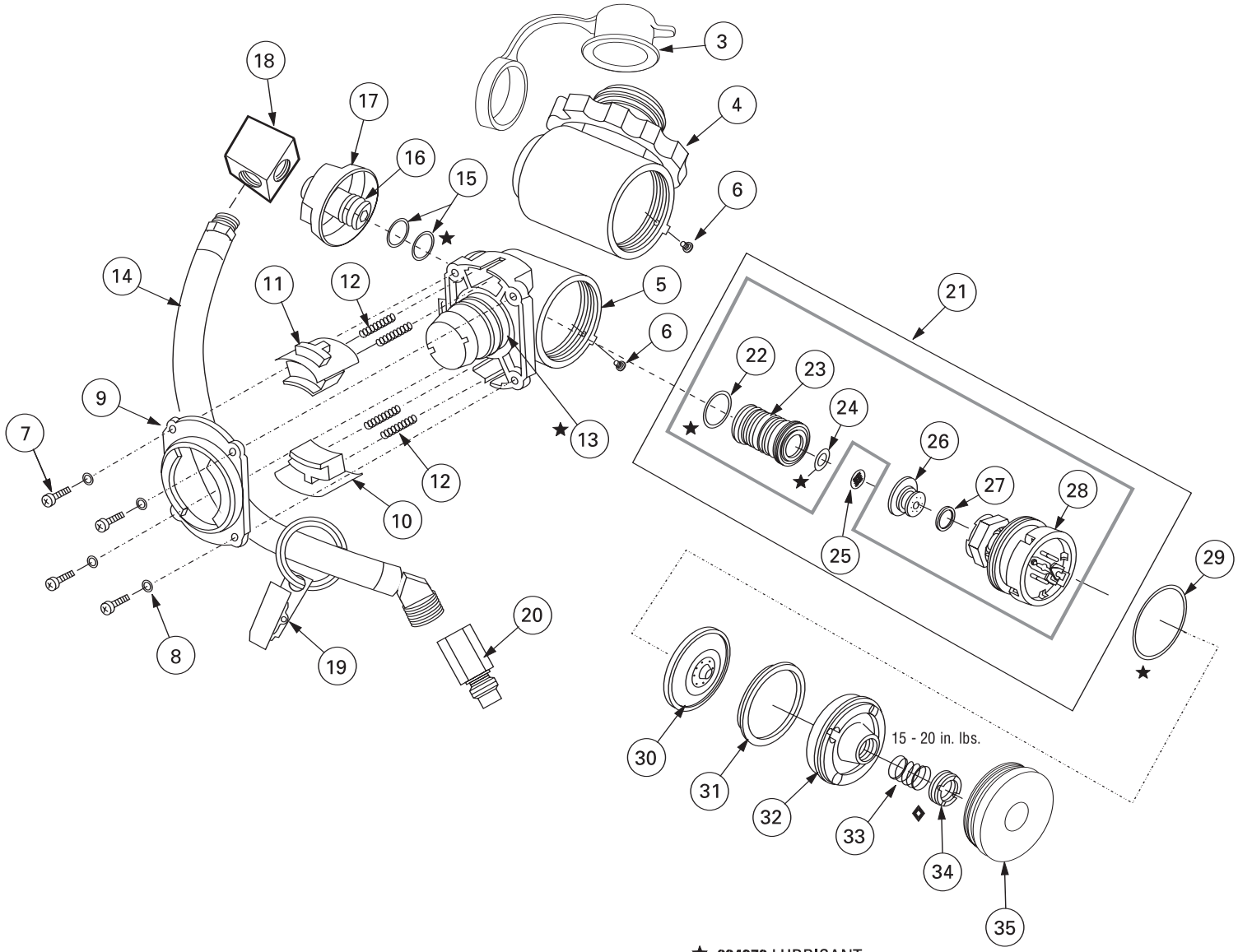
1/4 Turn Second Stage Regulator w/ Bypass



★ **604070** LUBRICANT
○ **29787** Sealant (Loctite 222)
✚ **602706** 425 Assure Adhesive
◆ **603556** Adhesive

REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1		MASK MOUNTED REGULATOR ASSEMBLY THREADED (with Bypass)
	496048	With Front Hose
	496049	With Rear Hose
2		MASK MOUNTED REGULATOR ASSEMBLY QUICK DISCONNECT (with Bypass)
	812858	With Front Hose
	812859	With Rear Hose
	DUST COVERS	
3	**801130**	Quick Connect 1/4 Turn
	495456	Threaded
4	**10004539**	Quick Connect (Housing only)
5	**812636**	Threaded Connector (Housing only)
6	**636088**	Screw
7	**636227**	Screw (4)
8	**632036**	Lock Washer (4)
9	**812849**	Retaining Plate
10	**818179**	Button
11	**812841**	Release Tab
12	**637895**	Spring (4)
13	**635796**	O-Ring
	HOSE ASSEMBLY	
14	**497102**	30 Inches Front
	497103	42 Inches Rear
	800975	Front
	800076	Rear
15	**635241**	O-Ring (2)
16	**496240**	Shaft
17	**496266**	Knob
18	**496238**	Swivel Block
19	**804790**	Clip
20	**QUICK DISCONNECT PLUG (SEE CHART)**	
21	**496109**	**Valve Core Assembly**
22	**635343**	O-Ring
23	**496108**	Sleeve
24	**635243**	O-Ring
25	**497197**	Screen
26	**488796**	Spool Power Stage
27	**488782**	Diaphragm Power Stage
28	**800040**	Valve and Leaver Assembly
29	**634814**	O-Ring
30	**488783**	Diaphragm
31	**488755**	Ring, Spacer
32	**803135**	Base, Shutoff (15 - 20 in. lbs.)
33	**803134**	Diaphragm Spring
34	**488740**	Screw, Adjusting
35	**496267**	End Cap

1/4 Turn Second Stage Regulator w/o Bypass and Shutoff Cap



REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1		MASK MOUNTED REGULATOR ASSEMBLY THREADED (with Bypass)
	497643	With Front Hose
	497644	With Rear Hose
2		MASK MOUNTED REGULATOR ASSEMBLY QUICK DISCONNECT (with Bypass)
	812860	With Front Hose
	812861	With Rear Hose
	DUST COVERS	
3	**801130**	Quick Connect 1/4 Turn
	495456	Threaded
4	**10004539**	Quick Connect (Housing only)
5	**812636**	Threaded Connector (Housing only)
6	**636088**	Screw
7	**636227**	Screw (4)
8	**632036**	Lock Washer (4)
9	**812849**	Retaining Plate
10	**818179**	Button
11	**812841**	Release Tab
12	**637895**	Spring (4)
13	**635796**	O-Ring
	HOSE ASSEMBLY	
14	**497102**	30 Inches Front
	497103	42 Inches Rear
	800975	Front
	800076	Rear
15	**635241**	O-Ring (2)
16	**496240**	Shaft
17	**496266**	Knob
18	**496238**	Swivel Block
19	**804790**	Clip
20	**QUICK DISCONNECT PLUG (SEE CHART)**	
21	**496109**	**Valve Core Assembly**
22	**635343**	O-Ring
23	**496108**	Sleeve
24	**635243**	O-Ring
25	**497197**	Screen
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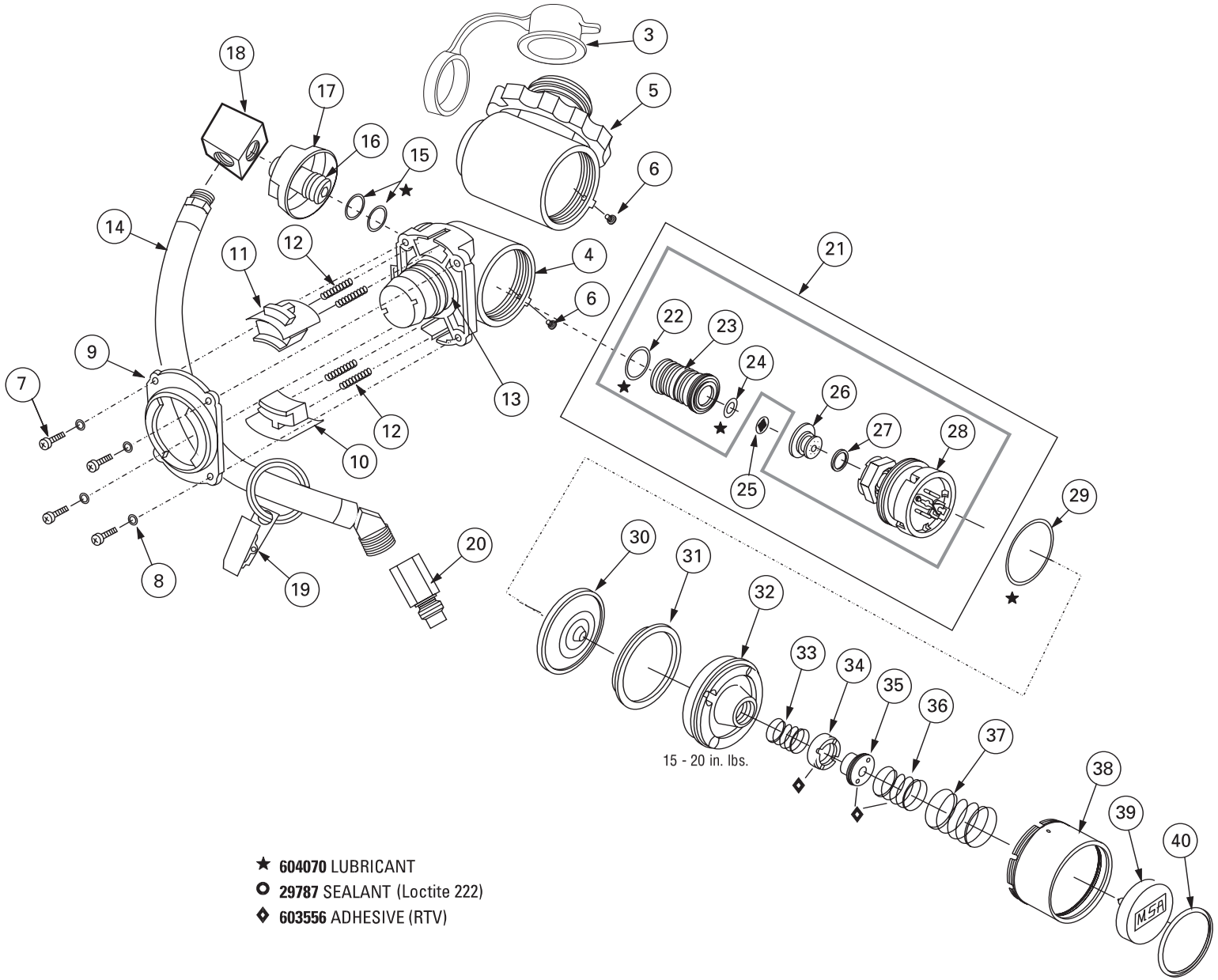
35	**488741**	Ring, Thrust
36	**800685**	Stop Ring
37	**492238**	Spring, Shutoff
38	**813713**	Cap, Shutoff
39	**813712**	Pushbutton, Shutoff
40	**638141**	Retaining Ring

1/4 Turn Second Stage Regulator w/o Bypass



NOTES

SECOND STAGE REGULATOR DISASSEMBLY

All repair procedures assume that the regulator is disassembled from the apparatus and facepiece. To do this:

- Be sure the cylinder valve is completely closed.
- Disconnect the regulator from the facepiece.
- Be sure nothing is blocking the regulator outlet. Crack the bypass valve to release any trapped air.
- If desired, disconnect the intermediate-pressure hose from the first stage regulator at the hose fitting using a 11/16" open-end wrench. Refer to the INTRODUCTION Tab of this Binder for General Notes and required tools.

Note: Refer to the appropriate illustrated parts lists for the apparatus being repaired.

REMOVING THE SHUT-OFF CAP, SPRING, AND STOP SPRING

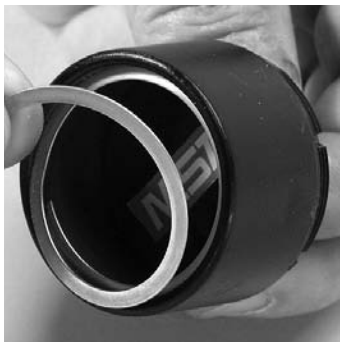
1. Remove the setscrew from the regulator housing. Unthread the shut-off cap with push button and remove spring.

2. Remove the stop spring out of the groove at the bottom of the shut-off base hub. Remove any RTV adhesive from the shut-off base.

3. Turn the shut-off cap so the threads are pointing down. Place a small screwdriver under the notched end of the spiral retaining ring.

4. Turn and lift the small screwdriver to remove the end of the spiral retaining ring out of the shut-off cap groove.

5. Grasp the spiral retaining ring with your fingers and pull the spiral retaining ring out of the shut-off cap groove. Discard the spiral retaining ring. Do not reuse the spiral retaining ring.



6. Turn the shut-off cap upside down to remove the push button.

REPLACING THE REGULATOR QUICK-CONNECT O-RING

1. Insert the O-ring removal tool under the O-ring and remove it. Be careful not to scratch the O-ring groove.

Note: If an O-ring removal tool is not available, refer to Lubricating, Cleaning, or Replacing the Release Tab for easier access to the O-ring.

REMOVING THE SHUT-OFF BASE

1. Fit the large spanner wrench on the socket driver. Unscrew the shut-off base from the regulator housing.

2. Using the small spanner wrench, remove the thrust ring.

3. Using the small spanner wrench, unscrew the adjusting screw from the shut-off base. Remove the diaphragm spring. Clean sealant residue from the parts.

SECOND STAGE REGULATOR DISASSEMBLY

REMOVING THE DIAPHRAGM

Note: Use extreme care when removing the diaphragm. Do not bend, twist, or distort the lever assembly. Do not touch the exposed lever assembly after removing the diaphragm.

1. Use the plastic stick to lift the diaphragm and spacer ring from the housing.

Note: If the diaphragm is torn or has any visible damage, it must be replaced.

REMOVING THE VALVE CORE FROM THE SECOND STAGE REGULATOR

1. Remove the shut-off assembly and diaphragm.

2. Remove the intermediate-pressure hose from the second stage.

3. Using the retaining-ring pliers, remove the retaining ring which was exposed when the hose assembly was removed.
4. Remove the bypass cap.

5. Fit the large spanner wrench on the socket driver. Unscrew and remove the bypass locknut.

⚠ CAUTION

Do not press the lever assembly or unscrew the base and lever assembly from the valve body. This could affect operation.

6. Gently push the end of the bypass sleeve toward the regulator housing to unseat the O-ring and remove the valve core.

Remove and discard the O-rings.

REMOVING THE POWER STAGE DIAPHRAGM

1. Remove the valve core.

⚠ CAUTION

The bypass spring and bypass screen may fall out of the assembly; take care not to misplace them.

2. Place a 1" open-end wrench on the valve and lever assembly hex. Temporarily place the bypass handwheel on the slide.

⚠ CAUTION

Do not press on the lever assembly. Do not unscrew the base and lever assembly or the divider skirt from the valve body. This could damage the bottom lever pad and cause inconsistent operation.

SECOND STAGE REGULATOR DISASSEMBLY

3. Turn the handwheel counter-clockwise to separate the valve and lever assembly from the bypass sleeve. Set the spring aside. Discard the screen.

4. Remove the power stage spool from the valve and lever assembly.

Note: If necessary, turn the valve body so the hex end is down, then tap the hex gently on a hard surface.

5. Remove the power stage diaphragm and discard it. Use the plastic stick if necessary to remove the diaphragm.

6. Remove and discard the bypass sleeve O-ring from the large end of the bypass sleeve.

REMOVING THE BYPASS VALVE

1. Remove the valve core.
2. Unscrew the bypass sleeve from the valve and lever assembly (see valve core disassembly and repair). Take care not to misplace the bypass spring, bypass screen, or power stage spool. Discard the bypass sleeve O-ring.

3. Using the flat-blade screwdriver, remove the three bypass guide screws.

4. Push the threaded end of the slide toward the bypass sleeve until the slide is completely out of the sleeve. This will push out the bypass spool, valve, and O-ring.

NOTES

SECOND STAGE REGULATOR REASSEMBLY

Refer to the INTRODUCTION Tab of this Binder for General Notes and required tools.

INSTALLING A PUSH BUTTON INTO THE SHUT-OFF CAP

1. Place the push button into the non-threaded end of the shut-off cap. The arrow end goes into the shut-off cap first and points down.

INSTALLING A NEW SPIRAL RETAINING RING

1. Place one end of the new spiral retaining ring into the shut-off cap groove.
2. Separate the spiral ring and work the ring into the groove by moving it around the shut-off cap.
3. Place a small screwdriver in the notch end of the spiral retaining ring. Push the notch end into the shut-off cap groove. Ensure that the new spiral retaining ring is in the shut-off cap groove.

NOTES

SECOND STAGE REASSEMBLY

LUBRICATING, CLEANING, OR REPLACING THE RELEASE TAB

1. Before starting this procedure, place a #4 rubber stopper (P/N 060380) in the second stage regulator outlet to prevent debris, water, or hardware from dropping into the regulator.

2. Remove the screws, lock washers, and the retaining plate.

Note: The retaining plate slotted area allows the release tabs to move up and down freely inside the retaining plate.

3. Carefully remove the release tabs and springs.
4. Clean the release tabs with either water or a mild soapy solution. Rinse and wipe dry.
5. Clean the springs with either water or a mild soapy solution and rinse.
6. Verify that the #4 rubber stopper is inserted firmly in the second stage regulator outlet. Clean and rinse the cavity that the release tabs slide into. The cavity is located on the quick-connect body on the second stage regulator. Wipe dry.
7. Remove and replace the O-ring if necessary.

REPLACING THE REGULATOR QUICK-CONNECT O-RING

1. Apply a light film of Christo-Lube lubricant to the new O-ring.
2. Roll the new O-ring over the end of the probe and seat it into the O-ring groove. If the O-ring is not seated, air may leak.

REASSEMBLING THE RELEASE TABS

1. Before reassembly, inspect all parts for damage (wear, cracking, chipping, etc.). If necessary, replace with new parts.

2. Apply a skim coat of Christo-Lube lubricant to the release tab rubbing surfaces and the release tab cavity (on the regulator quick-connect housing).
3. Insert the springs into the release tab. The springs seat into the release tab pocket.

Note: Turn the regulator body so that the quick-connect is facing on an angle to ensure that the springs stay in the release tab, and that the springs seat in the quick-connect housing small pockets.

4. Insert the release tab into the quick-connect housing cavity. Also, be sure to seat the springs into the small pockets in the housing cavity surface.
5. Repeat for the second release tab.

6. Secure the retaining plate to the regulator using the four screws and four lockwashers. Tighten the screws.

Note: The lockwasher must be used to lock the screws into the housing.

7. Check to verify that each release tab moves freely in the cavity and snaps back after activation.
8. Engage the regulator quick-connect to a facepiece adapter to verify proper operation.

SECOND STAGE REASSEMBLY

INSTALLING THE BYPASS VALVE

1. Remove the valve from the spool and discard the valve. Using the O-ring removal tool, remove the O-ring from the spool. Discard the O-ring.
2. Place a new bypass valve on the end of the spool. Be sure the valve seats in the recess.

Note: Do not lubricate the valve seat.

3. Place a thin film of Christo-Lube on the new bypass spool O-ring and install the O-ring in the groove.

4. Place a thin film of Christo-Lube lubricant on the new slide O-ring, starting at the bullet-nosed end. Push the O-ring into the groove on the slide.

5. Insert the slide into the bypass sleeve, threaded-end first. This is inserted into the large end of the bypass sleeve.

6. Install the complete valve and spool assembly into the bypass sleeve, with the rubber bypass valve end inserted first. Push until the valve is firm against its seat.

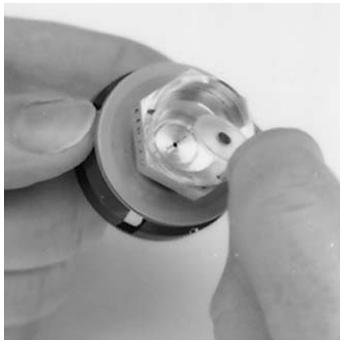
7. Turn the slide until its grooves line up with the tapped holes in the bypass sleeve.

8. Place one drop of Loctite #222 on the threads only of each guide screw before installation. Using the flat-blade screwdriver, tighten each guide screw. Be careful not to overtighten.
9. To re-install the bypass valve, refer to installing the valve core.

INSTALLING THE POWER STAGE DIAPHRAGM

Note: Remove any debris before reassembling.

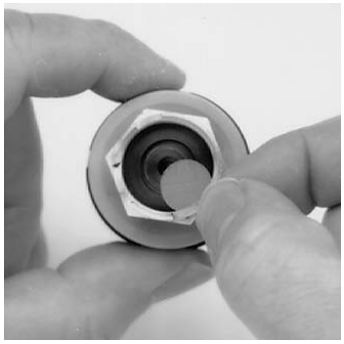
1. Place a new diaphragm into the valve and lever assembly. Make sure the flat side of the diaphragm **faces up** and that the diaphragm rib nests into the matching groove inside the assembly. Use the plastic stick if necessary to be sure the diaphragm is seated.



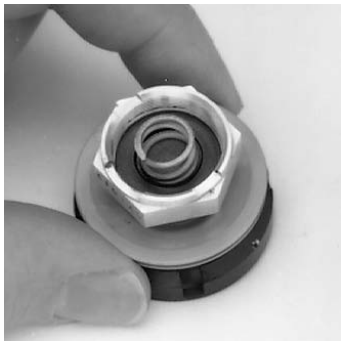
2. Place the power stage spool into the valve assembly. The ring of holes should be against the power stage diaphragm.

SECOND STAGE REASSEMBLY

3. With the base and lever assembly facing down, place a new bypass screen into the power stage spool.



4. Place the bypass spring on top of the screen.



⚠ CAUTION

Do not grasp the lever base during the next step.

5. Place two drops of Urethane Adhesive (P/N 603571) or Loctite Assure #425 (P/N 602706) on the large threads of the bypass sleeve.

⚠ CAUTION

Hold the valve body hex, not the base and lever assembly, ensuring the base and lever will not change calibration.

Note: Make certain that the bypass sleeve O-ring remains in its groove on the end of the bypass sleeve during reassembly.

6. Place a 1" open-end wrench on the hex flats of the valve and lever assembly.
7. Place a crow's foot on inch lbs torque wrench. Place a 1/4 inch crow's foot on hex flats of slide. Torque the slide into the valve and lever assembly to a torque of 40 +/- 5 inch lbs.
8. Install the valve core.

INSTALLING THE VALVE CORE

1. Place transparent tape over the exposed threads of the valve core to protect the O-ring.
2. Place a thin film of Christo-Lube™ lubricant on the **new** valve core O-ring.

3. Roll the O-ring in place in the groove closest to the valve body. Remove all tape.

⚠ CAUTION

Do not push the top lever while installing the valve core. This could damage the pad seal and affect operation.

4. Line up the slot on the valve body with the lug inside the regulator housing. Press the valve core gently into the housing.

Note: Resistance will develop when the O-ring is forced into its seat. The valve core is seated when it will not rotate.

5. Screw on the bypass locknut. Using the inch-pound torque wrench and the large spanner wrench, **tighten to 35-45 inch pounds.**

SECOND STAGE REASSEMBLY

6. **Place two drops of urethane adhesive (P/N 603571) or loctite Assure #425 (P/N 602706)** on the exposed threads of the valve core. Do not permit thread sealant to contact the regulator housing.

7. Install the bypass cap.
8. Install the **new** retaining ring **flat-side down** to secure the bypass cap.
9. Install the intermediate-pressure hose and bypass handwheel.
10. Adjust static pressure.

INSTALLING A NEW DIAPHRAGM AND SPRING

1. Lay the diaphragm on a flat, clean surface and place the spacer ring into the diaphragm outer rim.

   Push gently on the spacer ring. Damage to the lever assembly could affect operation.

2. Install the assembly into the regulator housing by pushing gently on the spacer ring.

3. Fit the large spanner wrench on the inch-pound torque wrench.
4. Screw the shut-off base into the regulator housing.
5. Torque to 15-20 inch-pounds.

6. Insert the small diaphragm spring through the center hole in the shut-off base so it rests over the center nipple of the diaphragm. The spring has to fit around the rib on the top of the diaphragm.
7. Thread the adjusting screw into the shut-off base.

ADJUSTING THE STATIC PRESSURE SETTING

1. Remove the setscrew from the regulator housing. Unthread the shut-off cap with push button and remove the spring (if not disassembled).
2. Using the small spanner wrench, unscrew the thrust ring from the shut-off base.

Note: Be sure that the adjusting screw remains in the shut-off base.

3. Attach the regulator to a tester suitable for the MMR SCBA. Refer to the test procedures in the TESTER instructions.
4. Reassemble the intermediate pressure hose to the first stage (if disconnected) and pressurize the system.
5. Adjust the static pressure by turning the adjusting screw with the small spanner wrench. The static pressure should be 1.1 to 1.5 inches water column.

6. Using a toothpick, place one drop of RTV silicone adhesive in the joint between the adjusting screw and shut-off base.

7. Clean any excess RTV adhesive from the thrust ring threads. Place one drop of RTV adhesive on the shut-off base threads (above the adjusting screw).
8. Screw the thrust ring into the shut-off base until it is flush with the top surface of the base, or it contacts the adjusting screw. Do not over-tighten.

SECOND STAGE REASSEMBLY

INSTALLING THE STOP SPRING

1. Place the stop spring over the shut-off base hub. Push down on the spring until the bottom coil snaps into place. Do not distort or stretch the spring, or shut-off performance may be affected.

INSTALLING THE SHUT-OFF BUTTON AND SPRING IN THE SHUT-OFF CAP

1. Place the shut-off button and the spring into the shut-off cap.
2. Screw the shut-off cap on the regulator housing until the shut-off cap touches the shut-off base. Further tighten the cap clockwise until the next indexing mark lines up with the setscrew hole in the regulator housing.

Note: The cap slot locations are the six marks above the threads on the cap.

3. Carefully thread the setscrew in until the top of the setscrew is snug in the regulator housing.

4. Re-check the static pressure setting. The final setting must be 1.1 to 1.5 inches water column. Also flow test to check the final assembly.

NOTES

SECOND STAGE W/BYPASS DISASSEMBLY

SECOND STAGE REGULATOR W / BYPASS

1. Be sure the air source is completely closed.
2. All repair procedures assume that the air source assembly is disconnected from the manifold.
3. Be sure that nothing blocks the regulator outlet. Open the bypass valve to relieve pressure in the system.
4. Close the bypass valve fully.

⚠ WARNING

Do not disconnect the air source when pressure is shown on the air source gauge. Always be sure that you have released all pressure from the regulator. Removing the coupling nut with the regulator pressurized may result in serious personal injury or death.

REMOVING THE SECOND PRESSURE HOSE FROM THE MANIFOLD

1. Disconnect the quick-disconnect hose from the manifold.

2. Remove the quick-disconnect plug, use an adjustable wrench on the hose fitting and a 5/8” wrench on the quick-disconnect plug. Turn counter-clockwise to unthread.
3. Remove any Teflon tape debris from the quick-disconnect plug.
4. To replace quick-disconnect plug, first wrap 1-1/2 turns of Teflon tape in a clockwise direction around the threads (looking into the threaded end of the hose fitting). Begin wrapping at the second thread from the end. Do not put tape on the first thread as small pieces could break off in the air stream and affect the flow performance of the regulator.
5. Thread the parts together hand-tight, then wrench tighten an additional 1-1/2 turns. Do not overtighten.

REPLACING THE SECOND STAGE PRESSURE HOSE AND TWO O-RINGS.

1. The hose assembly and o-rings must be replaced if the hose is frayed or cracked, or shows other signs of damage.

2. Use the 7⁄16 wrench to remove the handwheel locknut. Remove the bypass handwheel assembly.

Note: Retaining-ring pliers must be set up for an external retaining ring (position #1).

3. Using retaining-ring pliers, remove the exposed retaining ring.

4. Pull the hose assembly off the bypass sleeve.
5. Using the o-ring removal tool, remove and discard the two o-rings.
6. Remove the intermediate-pressure hose from the manifold.

SECOND STAGE W/BYPASS REASSEMBLY

INSTALLING A NEW SECOND STAGE INTERMEDIATE-PRESSURE HOSE

1. Place a thin film of Christo-Lube lubricant on the new o-rings. Place transparent tape over the bypass guide screws to protect the o-rings. Slide the new o-rings in place, using care not to nick them. Be sure to remove all transparent tape.

2. Position the swivel with its grooved end away from the regulator housing. Push the swivel end of the hose over the by-pass sleeve and onto the o-rings until the swivel contacts the retaining ring.

3. Place a new retaining ring in the groove on the by-pass sleeve.

4. Place a thin film of Christo-Lube lubricant in the groove on the hose swivel, where the rubber rim of the handwheel fits.

5. Place the bypass handwheel on the slide, making sure to line up its square hole with the square on the slide.

6. Place a single drop of Loctite #222 thread sealant on the exposed threads of the bypass slide.

7. Use the 7/16 wrench to thread the handwheel locknut on the slide.

8. To install the second stage pressure hose into the quick-connect manifold.
9. Pressurize the system and leak-test the hose.

FLOW TESTING THE MASK-MOUNTED REGULATOR

For performance testing, refer to the test procedures in the instructions supplied with the regulator tester to be used.

ADJUSTING THE STATIC PRESSURE SETTING

1. Remove the setscrew from the regulator housing. Unthread the shut-off cap with push button and remove spring. (If not disassembled).
2. Using the small spanner wrench, unscrew the thrust ring from the shut-off base.

Note: Be sure that the adjusting screw remains in the shut-off base.

3. Attach the regulator to the tester suitable for the MMR Air Mask. Refer to the test procedures in the instruction supplied with the MSA regulator tester.
4. Reassemble the intermediate pressure hose (if disconnected) and pressurize the system.
5. Adjust the static pressure by turning the adjusting screw with the small spanner wrench. The static pressure should be 1.1 to 1.5 inches water column. Using a toothpick, place one drop of RTV silicone adhesive in the joint between the adjusting screw and shut-off base.
6. Clean any excess RTV adhesive from the threads of the thrust ring. Place one drop of RTV adhesive on the threads of the shut-off base above the adjusting screw.
7. If used, screw the thrust ring into the shut-off base until it is flush with the top surface of the base, or it contacts the adjusting screw. Do not over-tighten.

SECOND STAGE W/BYPASS REASASSEMBLY

INSTALLING THE STOP SPRING

1. Place the stop spring over the shut-off base hub. Push down on the spring until the bottom coil snaps into place. Do not distort or stretch the spring, or shut-off performance may be affected. If used, see Installing Shut-off button.

INSTALLING THE SHUT-OFF BUTTON AND SPRING IN THE SHUT-OFF CAP

1. Place the shut-off button and the spring into shut-off cap.
2. Screw the shut-off cap on the regulator housing until the shut-off cap touches the shut-off base. Further tighten the cap clockwise until the next indexing mark lines up with the setscrew hole in the regulator housing.

Note: The cap slot locations are the six marks above the threads on the cap.

3. Carefully thread the setscrew in until the top of the setscrew is snug in the regulator housing.
4. Re-check the static pressure setting. The final setting must be 1.1 to 1.5 inches water column. See adjusting static pressure.

FLOW-TESTING THE AIR MASK

For performance testing, refer to the test procedures in the instructions supplied with the regulator tester to be used.

NOTES

SECOND STAGE W/O BYPASS DISASSEMBLY

SECOND STAGE W/O BYPASS DISASSEMBLY

⚠ WARNING

Do not disconnect an escape cylinder coupling nut if pressure is shown on the gauge. Always be sure to release all pressure from the system. Removing the coupling nut with the regulator pressurized may result in serious personal injury, death, or damage to equipment.

⚠ CAUTION

Leak-test after each repair (see Leak-Testing).

SECOND STAGE REGULATOR DISASSEMBLY

All repair procedures assume that the regulator is disassembled from the apparatus and facepiece.
To do this:

- Be sure the cylinder valve is completely closed.
- Disconnect the regulator from the facepiece.
- Be sure nothing is blocking the regulator outlet. Allow any trapped air to bleed from the apparatus.
- If desired, disconnect the intermediate-pressure hose at the hose fitting using an open-end wrench. (Refer to General Notes).

Note: Use only specified thread sealants in their specified locations. Use of sealants other than the ones specified may damage MMR components. The following procedures are only used with regulator with push button shut off.

REMOVING THE VALVE CORE WITHOUT BYPASS

Note: Internal parts of the valve core are not replaceable. The valve core must be replaced as a complete unit. However, the screen may be removed and replaced, as can the o-ring at the swivel block end.

1. Remove the end cap, diaphragm, and spring (See Removing the Diaphragm and Spring).
2. Disconnect the unpressurized mask-mounted regulator from the facepiece.

3. Using a 1" open-end wrench, unscrew the knob securing the hose to the regulator.

4. Pull the swivel shaft gently out of the regulator body.

5. Using the o-ring removal tool, pull the inlet screen from the regulator. Inspect the screen for corrosion, dirt, or debris. Replace the screen if necessary.

6. Visually inspect the two o-rings on the inlet swivel shaft. Replace them if they are worn or damaged.

7. Apply a thin film of Christo-Lube lubricant to the o-rings before re-installing the swivel on the regulator. Securely tighten the knob using the 1" open-end wrench. Do not over-tighten.

⚠ CAUTION

Do not press on the lever assembly or unscrew the valve and lever assembly from the valve body. This could affect operation.

8. To remove the valve core from the regulator body, hold the body as shown. Gently push the end of the valve core with your thumbs to unseat the o-ring and valve core.

9. Cup one hand under the body and support the valve core as it slides out of the body.

10. Remove and discard the external sleeve o-ring.

REMOVING THE INTERNAL SLEEVE O-RING, POWER STAGE SPOOL, AND POWER STAGE DIAPHRAGM

⚠ CAUTION

Do not press on the lever assembly. Do not unscrew the base and lever assembly or the divider skirt from the valve core. This could damage the bottom lever pad and affect operation.

1. Place a 1" wrench on the hex flats to secure it.
2. Turn the sleeve counter-clockwise to unthread it.
3. Remove and discard the internal sleeve o-ring.
4. Remove the power stage diaphragm and discard it. Use the plastic stick if necessary to remove the diaphragm.

SECOND STAGE W/O BYPASS REASSEMBLY

INSTALLING THE SLEEVE O-RING, POWER STAGE SPOOL, AND POWER STAGE DIAPHRAGM

1. Clean any debris from inside the valve core before re-assembly.
2. Place a new diaphragm into the valve and lever assembly. Make sure the flat side of the diaphragm faces up and that the diaphragm rib nests into the matching groove inside the assembly. Use the plastic stick if necessary to be sure the diaphragm is seated.

3. Place the power stage spool into the valve assembly with the ring of holes against the power stage diaphragm.

4. Place a thin film of Christo-Lube lubricant on a new o-ring and install it in the groove in the sleeve.

5. Place one drop of Loctite #222 adhesive on the large threads of the sleeve.

Note: Make certain that the sleeve o-ring stays in its groove on the end of the sleeve during reassembly.

Do not grasp the lever base during the next step. Hold the valve body hex, not the base and lever assembly.

6. Place a 1" wrench on the hex flats of the valve and lever assembly. Thread the sleeve into the valve and lever assembly clockwise hand-tight.

INSTALLING THE VALVE CORE

1. Place transparent tape over the exposed threads of the valve core to protect the new external o-ring.
2. Place a thin film of Christo-Lube lubricant on the new external sleeve o-ring.

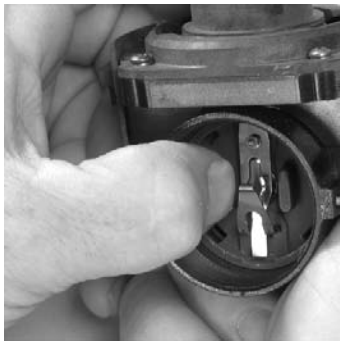
3. Roll the o-ring in place in the groove closest to the valve body. Remove all tape.

4. Line up the wide rectangular slot in the valve body hex with the lug inside the regulator housing.

⚠ CAUTION

Do not push on the top lever while installing the valve core. This could damage the pad seal and affect operation. Place your fingertips on the two shoulders on either side of the lever arms.

5. With the slot and lug lined up, press the valve core gently into the housing. Resistance will develop as the o-ring is forced into its seat.



⚠ CAUTION

Do not turn the valve and lever assembly relative to the valve core. This could damage the pad seal and affect operation.

6. Place one drop of adhesive on the exposed valve core threads. Do not permit thread sealant to contact the regulator housing.
7. Re-install the knob, swivel block, and hose on the regulator housing and tighten using a 1" wrench.

SECOND STAGE W/O BYPASS REASSEMBLY

8. Re-install diaphragm, spring, shut-off base, and the adjusting screw in the regulator housing. See Installing a New Diaphragm or Spring.

⚠ CAUTION

Do not press on the lever assembly or unscrew the valve and lever assembly from the valve body. This could affect operation.

9. Adjust static pressure (see Adjusting Static Pressure).

SECOND STAGE REGULATOR WITHOUT SHUT-OFF BUTTON

1. Thread the end cap into the regulator housing until the cap contacts the shut-off base. Then tighten the end cap until the next screw recess in the cap lines up with the setscrew boss. Thread the setscrew into the housing until the top of the setscrew is flush with the housing.
2. Perform the Static Pressure Test and the Flow Test to check the final assembly.

FLOW TESTING THE MASK-MOUNTED REGULATOR

For performance testing, refer to the test procedures in the instructions supplied with the regulator tester to be used.

FLOW TESTING THE MASK-MOUNTED REGULATOR

For performance testing, refer to the test procedures in the instructions supplied with the regulator tester to be used.

ADJUSTING THE STATIC PRESSURE SETTING

1. Remove the setscrew from the regulator housing. Unthread the shut-off cap with push button and remove spring. (If not disassembled).
2. Using the small spanner wrench, unscrew the thrust ring from the shut-off base.

Note: Be sure that the adjusting screw remains in the shut-off base.

3. Attach the regulator to the tester suitable for the MMR Air Mask. Refer to the test procedures in the instruction supplied with the MSA regulator tester.
4. Reassemble the intermediate pressure hose (if disconnected) and pressurize the system.
5. Adjust the static pressure by turning the adjusting screw with the small spanner wrench. The static pressure should be 1.1 to 1.5 inches water column. Using a toothpick, place one drop of RTV silicone adhesive in the joint between the adjusting screw and shut-off base.
6. Clean any excess RTV adhesive from the threads of the thrust ring. Place one drop of RTV adhesive on the threads of the shut-off base above the adjusting screw.
7. If used, screw the thrust ring into the shut-off base until it is flush with the top surface of the base, or it contacts the adjusting screw. Do not over-tighten.

INSTALLING THE STOP SPRING

1. Place the stop spring over the shut-off base hub. Push down on the spring until the bottom coil snaps into place. Do not distort or stretch the spring, or shut-off performance may be affected. If used, see Installing Shut-off button.

INSTALLING THE SHUT-OFF BUTTON AND SPRING IN THE SHUT-OFF CAP

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Note: The cap slot locations are the six marks above the threads on the cap.

3. Carefully thread the setscrew in until the top of the setscrew is snug in the regulator housing.
4. Re-check the static pressure setting. The final setting must be 1.1 to 1.5 inches water column. See adjusting static pressure.

FLOW-TESTING THE AIR MASK

For performance testing, refer to the test procedures in the instructions supplied with the regulator tester to be used.

TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Leaks in system	o-rings should be replaced	See P/N 496958
Air leaks found in regulator	Leak in air inlet o-rings	Remove hose assembly,
Regulator has low flow performance	Static pressure out of adjustment	Adjust static pressure
	Inlet screen may be blocked	Replace screen
	Screen in valve core may be blocked	Replace screen
	Diaphragm spring is damaged or distorted	Replace spring
	Diaphragm is damaged	Replace the diaphragm
	Valve core damaged	Replace valve core assembly
	Valve and Lever assembly may be damaged	Replace valve core
	Power stage diaphragm orifice may be blocked	Replace valve core

The troubleshooting hints listed on this page applies to all configurations of the PremAire Supplied-Air Respirator System

TROUBLE	PROBABLE CAUSE	REMEDY
Regulator has low-flow performance	Air-supply valve not fully open, or pressure at wrong setting.	Be sure air source valve handwheel is fully open and that inlet pressure is between 60-100 psig.
	Second-stage inlet filter may be plugged.	Remove the regulator service and return to MSA Repair Center
	Second-stage regulator may require adjustments.	Return to MSA Repair Center
	Cylinder valve or air course not fully opened.	Fully open cylinder valve handwheel.
Air leaking at second stage regulator.	Swivel O-rings leaking.	Disconnect the regulator hose assembly. Inspect replace the O-rings. See repair instructions.
	Facepiece connection leaking.	Remove the regulator and inspect or replace the O-ring and spider gasket within the Quick-Disconnect Adapter (P/N 635796). See repair instructions of inhalation check valve and spider gasket.

TROUBLESHOOTING (cont'd.)

TROUBLE	PROBABLE CAUSE	REMEDY
Air leaking from manifold	Manifold port(s) not plugged	Check all manifold ports to make sure they are plugged.
	O-ring missing from "ESCAPE CYLINDER" port or incorrectly installed.	Check "ESCAPE CYLINDER" port for leakage. Disassemble and check to make sure O-ring is present and not damaged. See leak test instructions and repair instructions.
High-pressure hose is leaking.	If leak is from the end-fittings, O-rings may need to be replaced.	See leak test instructions and repair instructions.
Emergency-escape cylinder empties too quickly.	Plunger valve leaking air back to vortex tube.	Disassemble the cylinder connection. Remove the plunger from the plunger housing and inspect the O-rings. Clean or replace as necessary.
	Cylinder valve or air source open during air-line use.	Close cylinder valve while breathing from air-supply hose. **⚠ WARNING** **Failure to close the cylinder valve during use will deplete the compressed gas supply, leaving none for escape. Failure to follow this procedure may result in serious personal injury or death.**
	Leak at First Stage Regulator	See leak test instructions.
Emergency-escape cylinder pressure gauge indicates low pressure.	Cylinder temperature may be very cold.	Bring cylinder indoors and let it sit until it equals room temperature (approx. 68˚F), then recheck pressure gauge. **⚠ WARNING** **DO NOT attempt to heat cylinder. Attempting to do so may cause the cylinder to rupture, resulting in serious personal injury or death.**
	Cylinder may need recharging.	Recharge cylinder.
	Gauge needle may be stuck.	Tap lightly on the gauge lens. If gauge reading does not change, check to be sure indicator needle is not bent or damaged. If operation or accuracy of gauge is still doubtful, do not use. Return to repair center.
	Cylinder valve assembly may have leaks.	Conduct a thorough leak test on cylinder valve ass'y. See leak test instructions.
Respirator will not function with emergency-escape cylinder.	Plunger valve not functioning.	Disassemble the cylinder plunger housing. Remove the plunger valve and inspect the O-rings. Replace if necessary. See Emergency-Escape Cylinder instructions.