PR14® First Stage Regulator: AirHawk II® Air Mask

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

MINE SAFETY APPLIANCES COMPANY
CRANBERRY TWP., PENNSYLVANIA, U.S.A. 16066

Prnt. Spec. 10000005389(I) Mat. 10104220
Doc. 10104220

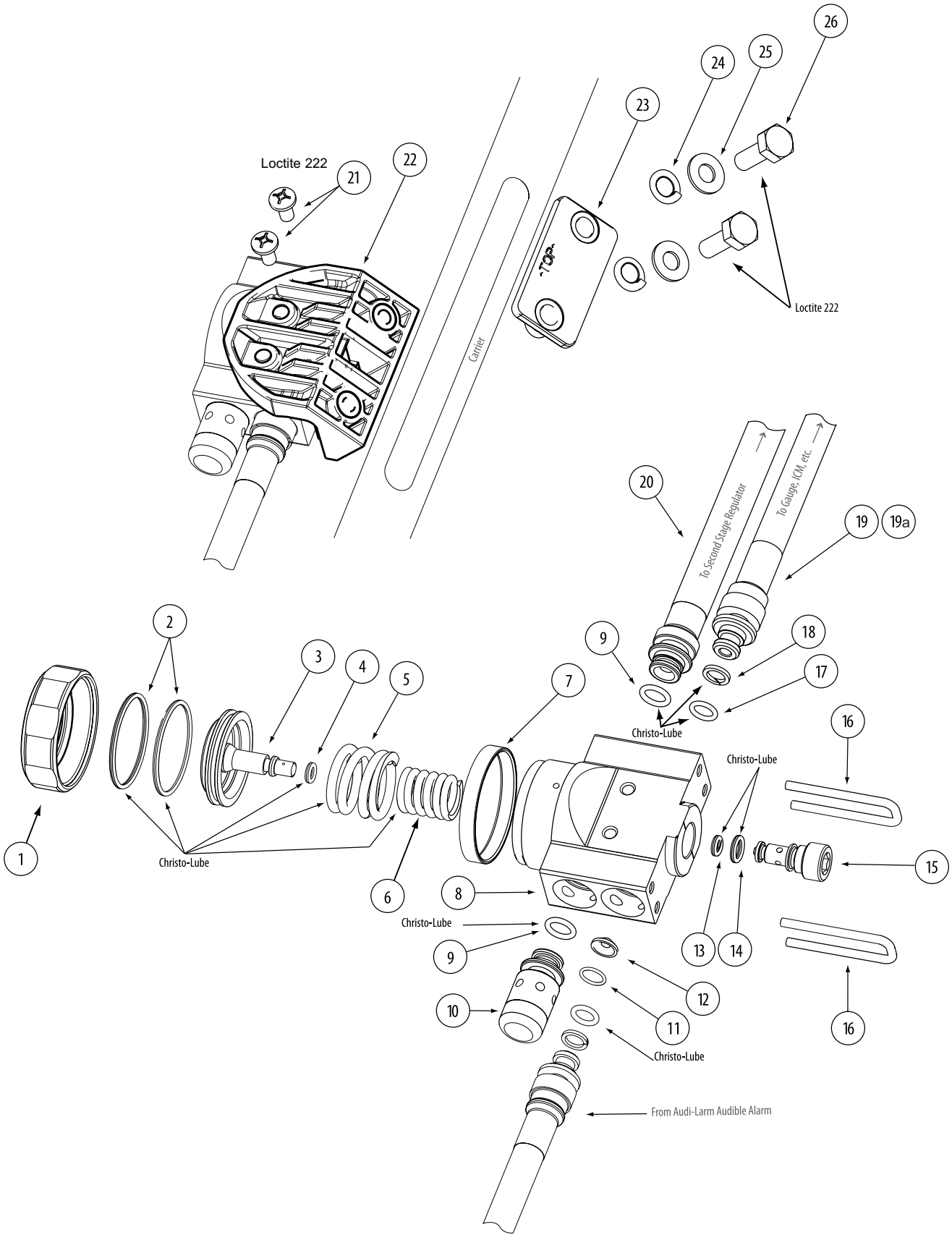
PR14 FIRST STAGE REGULATOR

PR14 First Stage Regulator Replacement Kit		
10053736	PR14 First Stage Regulator	
PR14 First Stage Regulator Kit		
10065408	10050616	Seat
	633553	O-ring (bottom)
	10058236	O-ring (top)
	10050617	Piston
	10052365	O-ring (2 required)
	10052364	O-ring
	10051663	Inlet Filter
	10052367	Inlet Filter O-ring
	10053273	O-ring (2 required)
	63198	O-ring (2 required)
	635278	Back-up Ring (2 required)
	10052622	Screw (2 in kit)
10055349	10047898	Slider
	10055563	Screw (2 required)
	10014878	Flat Washer (2 required)
	631356	Lock Washer (2 required)

Item	P/N	Description
1	10050623	Regulator Cap
2	10052365	O-ring (2 required)
3	10050617	Piston
4	10052364	O-ring
5	10050620	Outer Spring
6	10050621	Inner Spring
7	10052621	Seal Ring
8	10050615	Regulator Body
9	10053273	O-ring
10	10053426	Pressure Relief Valve
11	10052367	Intlet Filter O-ring
12	10051663	Inlet Filter
13	10058236	O-ring (top)
14	633553	O-ring (bottom)
15	10050616	Seat
16	10050622	U-clip (2 required)
17	63198	O-ring
18	635278	Back-up Ring (2 required)
19	10082852	High Pressure Hose*
19a	10083121	High Pressue Hose for Quick-Fill*
20	10051882	Intermediate Pressure Hose, Threaded*
	10051883	Intermediate Pressure Hose, Quick-Connect*
	10051884	Intermediate Pressure Hose, ExtendAire System*
	10089107	Intermediate Pressure Hose, Single
20a	10082526	FireHawk M7 Responder Intermediate Pressure Hose Assembly
21	10052622	Screw (2 required)
22	10051664	Mounting Bracket
23	10047898	Slider
24	631356	Lock Washer (2 required)
25	10014878	Washer (2 required)
26	10055563	Bolt (2 required)
	10069386	PR14 Test Bracket (not shown)
	29787	Loctite 222
	604070	Christo-Lube
	600920	Snoop Leak Detector

*Includes Back-up Ring and O-rings as needed.

PR14 FIRST STAGE REGULATOR



PR14 FIRST STAGE REGULATOR

Table of Contents

Note: Depressurize the AirHawk II Air Mask before maintenance or repair.

- Close the cylinder valve.
- Squeeze the shut-off buttons.
- Open the bypass.
- Disconnect the Audi-Larm Audible Alarm.

⚠ WARNING

DO NOT attempt to maintain or repair the AirHawk II Air Mask while pressurized. Attempting to disassemble a pressurized Air Mask can cause parts to become airborne or swing at very high rates of speed. Failure to follow this warning can result in serious personal injury or death.

DISASSEMBLY

Removing the PR14 First Stage Regulator

To remove the PR14 First Stage Regulator from the carrier:

1. Use a Phillips screwdriver to remove the screws.
2. Remove the regulator from the mounting bracket.
3. Remove residual thread-locking material from the screws.
4. Remove residual thread-locking material from the regulator body threads.

Note: If necessary, use compressed air to remove thread-locking material and other fragments.

Removing the Mounting Bracket

Remove the regulator from the mounting bracket. (See **Removing the PR14 First Stage Regulator** for instructions.)

1. Use a **7/16" wrench** to remove the mounting bracket bolts.
2. Remove the mounting bracket.

3. Remove the plastic slider.
4. Remove residual thread-locking material from the bolts and mounting bracket threads.

PR14 FIRST STAGE REGULATOR

Removing the Intermediate Pressure Hose and High Pressure Control Module Hose

1. Remove the u-clip.

2. Pull the hose firmly to remove it from the regulator body.

3. Use the o-ring removal tool to remove the o-ring.

Note: Be careful not to damage the o-ring sealing surfaces.

4. Discard the o-ring.

5. Pull the hose firmly to remove it from the regulator body.

6. Use the o-ring removal tool to remove the o-ring and back-up ring from the hose fitting.

Note: Be careful not to damage the o-ring sealing surfaces.

7. Discard the o-ring and back-up ring.

Removing the High Pressure Audi-Larm™ Audible Alarm Hose and Pressure Relief Valve

1. Remove the u-clip.

2. Pull the hose firmly to remove it from the regulator body.
3. Use the o-ring removal tool to remove the o-ring and back-up ring from the hose fitting.

Note: Be careful not to damage the o-ring sealing surfaces.

4. Discard the o-ring and back-up ring.

5. Use the o-ring removal tool to remove the filter o-ring.

6. Discard the o-ring.
7. Allow the filter to drop out.
8. Discard the filter.

9. Pull the relief valve firmly to remove it from the regulator body.

10. Use the o-ring removal tool to remove the o-ring.
11. Discard the o-ring.

Note: Be careful not to damage the o-ring sealing surfaces.

Removing the Regulator Cap and Seal Ring

1. Mount the PR14 Regulator body in a vise.

Note: Use electrical tape or rubber sleeves on the jaws of the vise.

2. Use a **1 5/8" 6-point socket and breaker bar** to remove the cap.

3. Use the o-ring removal tool to remove the cap o-ring.

Note: Be careful not to damage the o-ring sealing surfaces.

4. Discard the o-ring.

5. Remove the seal ring.

Note: Be careful not to damage the seal ring sealing surfaces.

Removing the Piston, Piston O-Rings, and Springs

1. Screw the mounting screw partially into the piston head.

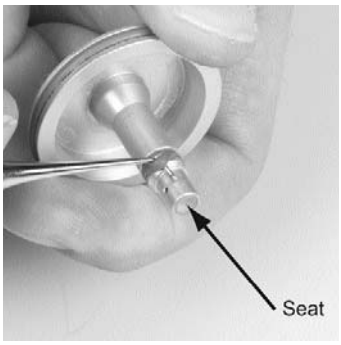
2. Pull gently on the mounting screw to extract the piston from the regulator body.

Note: Be careful not to damage the regulator body sealing surfaces.

⚠ CAUTION

Be careful not to damage the piston.

3. Use the o-ring removal tool to remove the piston seat o-ring.



4. Use the o-ring removal tool to remove the piston head o-ring.

Note: Be careful not to damage the o-ring sealing surfaces.

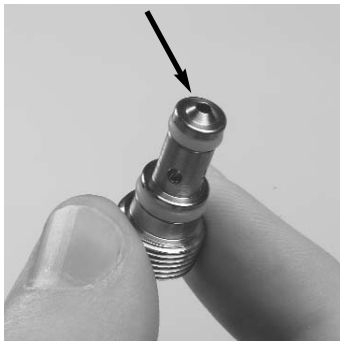
5. Discard all o-rings.
6. Remove the inner spring and outer spring.

Removing the Seat and Seat O-Rings

1. Use a **1/4" hex wrench** to remove the seat from the regulator body.

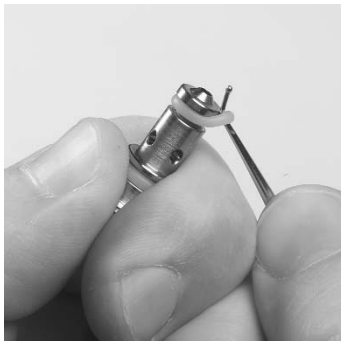
⚠ CAUTION

Be careful not to damage the seat edge.



2. Use the o-ring removal tool to remove the top seat o-ring.

Note: Be careful not to damage the o-ring sealing surfaces.



3. Use o-ring removal tool to remove the bottom seat o-ring.

Note: Be careful not to damage the o-ring sealing surfaces.

4. Discard both o-rings.

REASSEMBLY

Installing the Seat and Seat O-Rings

Seat	**10050616**
Top O-Ring	**10058236**
Bottom O-Ring	**633553**

1. Install the seat.
   a. Apply Christo-Lube to the new o-ring.

b. Install the bottom o-ring.

Note: Be careful not to damage the seat.

c. Apply Christo-Lube to the new top seat o-ring.

d. Install the new o-ring.

Note: Be careful not to damage the seat.

2. Use a **1/4" hex wrench** to screw the seat into the regulator body until it stops.
3. Back the seat out one and one half turns.

4. Continue to unscrew the seat as necessary to align a seat hex point with the regulator body scribe line.

Note: After replacing or reinstalling the seat the regulator MUST be tested and adjusted. Reassemble the regulator, and test and adjust. (See **Testing and Adjusting the First Stage Static Pressure** for instructions.)

Installing the Piston, Piston O-Rings, and Springs

Piston	**10050617**
O-Rings	**10052364**
	10052365
Outer Spring	**10050620**
Inner Spring	**10050621**
Christo-Lube	**604070**

1. Apply Christo-Lube to the piston bore.

2. Apply Christo-Lube to both ends of the outer spring.

3. Install the spring into the regulator body.

4. Apply Christo-Lube to both ends of the inner spring.

5. Install the spring into the regulator body.

6. Apply Christo-Lube to the new piston head o-ring
.
7. Install the new o-ring.

a. Cover the piston sensing holes with tape.

⚠ CAUTION

Be careful not to damage the piston seat.

b. Apply Christo-Lube to the new piston shaft o-ring.

c. Install the new o-ring.

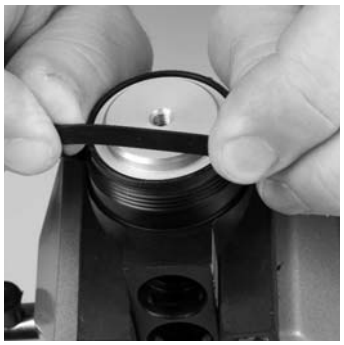
8. Remove the tape or protective paper.

9. Install the piston into the regulator body.

Installing the Regulator Cap and Seal Ring

Seal Ring	**10052621**
O-Ring	**10052365**
Regulator Cap	**10050623**
Christo-Lube	**604070**

1. Install the seal ring onto the regulator body.



Note: Ensure that the flat surface faces out.

2. Apply a small amount of Christo-Lube to the new cap o-ring.

3. Install the o-ring.

Note: Ensure that the o-ring is completely seated.

4. Screw the cap onto the regulator body.
5. Secure the regulator body in a vise.

Note: Use electrical tape or rubber sleeves on the jaws of the vise.

6. Use a **foot-pound torque wrench and 1-5/8" six-point socket** to tighten the cap to **38-42 ft lbs.**

Installing the Pressure Relief Valve

Pressure Relief Valve	**10053426**
O-Ring	**10053273**
Christo-Lube	**604070**

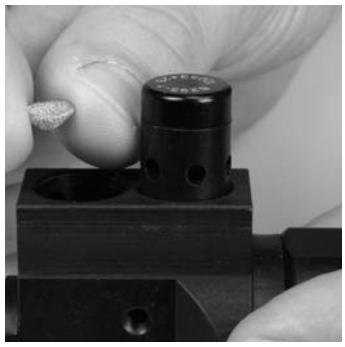
1. Apply Christo-Lube to the pressure relief valve o-ring
2. Install the new o-ring.

3. Install the pressure relief valve into the intermediate pressure port.

Installing the Inlet Filter and O-Ring

Inlet Filter	**10051663**
Inlet Filter O-Ring	**10052367**

1. Install the filter into the high pressure supply port with the cone pointing in.



2. Install the filter o-ring into port and seat it against the filter.

Note: Do not lubricate the filter o-ring.

Installing the High Pressure Audi-Larm Hose

Back Up Ring	**635278**
O-Ring	**63198**
Christo-Lube	**604070**

1. Install the new back-up ring.
2. Apply Christo-Lube to the high pressure hose o-ring.
3. Install the new o-ring.

4. Install the high pressure Audi-Larm hose into the high pressure supply port.

Note: The high pressure supply port is labeled “HP IN.”

5. Install the u-clip to secure the hose and valve.

Installing the High Pressure Control Module Hose

High Pressure Gauge Hose	**10082852**
O-Ring:	**63198**
Back-Up Ring	**635278**
High Pressure Hose for Quick-Fill	**10083121**

1. Install the new back-up ring.

2. Apply Christo-Lube to the high pressure hose o-ring

3. Install the new o-ring.

4. Install the high pressure gauge hose into the high pressure gauge port.

Note: The high pressure gauge port is not labeled.

Installing the Intermediate Pressure Hose

Intermediate Pressure Hose	
Threaded	**10051882**
Quick Connect	**10051883**
ExtendAire System	**10051884**
O-Ring	**10053273**
Christo-Lube	**604070**

1. Apply Christo-Lube to the intermediate pressure hose o-ring.

2. Install the new o-ring.

3. Install the intermediate pressure hose into the intermediate pressure port.

4. Install the U-clip to secure the high pressure and intermediate pressure hoses.

5. Leak test the regulator.

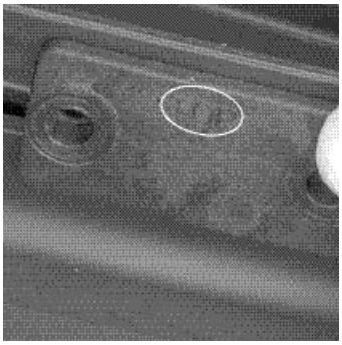
Note: The regulator cannot be leak tested while installed because the seat is inaccessible. (See **AirHawk II Air Mask Leak Testing** for instructions)

PR14 FIRST STAGE REGULATOR

Installing the Mounting Bracket

Bracket	**10051664**
Slider	**10047898**
Screws (2)	**10055563**
Washer (2)	**10014878**
Lock Washer (2)	**631356**
Loctite 222	**29787**

1. Install the plastic slider onto the carrier rail.



Note: Ensure that the word “TOP” is visible.

2. Position the mounting bracket against the carrier rail.

3. Apply Loctite 222 to each bolt.
4. Insert the bolts through the lock washers, flat washers, and slider into the mounting bracket.

5. Use a torque wrench and **7/16” socket** to tighten the bolts to **35 ±5 in lbs.**
6. Ensure the mounting bracket slides freely.

Installing the PR14 First Stage Regulator

PR14 First Stage Regulator Replacement Kit **10053736**

1. Position the regulator on the mounting bracket.

   a. Align the regulator mounting holes with the mounting bracket holes.

2. Apply Loctite 222 to each screw.

Note: New screws have a pre-applied thread-locker and do not require Loctite 222 application.

3. Install the screws through the mounting bracket into regulator.

4. Tighten the screws to **35-45 in lbs.**

PR14 FIRST STAGE REGULATOR

Testing and Adjusting the First Stage Static Pressure

Note: All static pressure adjustments must be made with the PR14 first stage regulator removed from the mounting bracket.

⚠ WARNING

DO NOT pressurize the system until all hoses and fittings are properly and secured with u-clips. Pressurizing the system with unsecured hoses can cause the hoses to release explosively. Properly install and secure with u-clips all hoses and fittings before pressurizing the system. Failure to follow this warning can result in serious personal injury or death.

Connecting the Test Manifold Assembly, Threaded Hose

1. Use **3/4" wrenches** to disconnect first stage intermediate pressure hose from the AirHawk II hose.

2. Screw the test manifold assembly onto first stage intermediate pressure hose until tight.

3. Screw the AiHawk II hose onto test manifold assembly until tight.

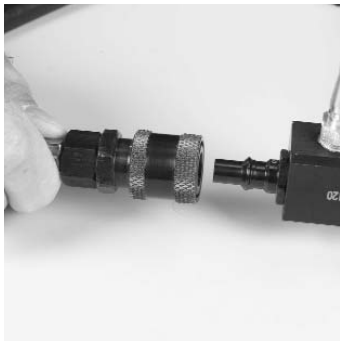
4. Connect the test manifold assembly to PosiChek^3 intermediate pressure hose.

Connecting the Test Manifold Assembly, Quick-Connect and ExtendAire Hoses

1. Disconnect the AirHawk II hose from first stage intermediate pressure hose.

2. Connect test manifold assembly to first stage intermediate pressure hose.

3. Connect the AirHawk II hose to test manifold assembly.



4. Connect the test manifold assembly to PosiChek^3 intermediate pressure hose.

Connecting the Test Manifold Assembly

1. Disconnect the AirHawk II hose from first stage intermediate pressure hose.

2. Connect test manifold assembly to first stage intermediate pressure hose.

3. Connect the AirHawk II hose to test manifold assembly.

4. Connect the test manifold assembly to PosiChek^3 intermediate pressure hose.

Adjusting the First Stage Static Pressure

Note: Depressurize the system before making static pressure adjustments.

Note: When adjusting the regulator seat, always align a seat hex point with the line scribed on the regulator body to ensure that the mounting bracket satisfactorily engages and retains the regulator seat.

1. To DECREASE first stage static pressure, rotate the regulator seat CLOCKWISE.

2. To INCREASE first stage static pressure, rotate the regulator seat COUNTER–CLOCKWISE.

Disconnecting the Test Manifold Assembly

Threaded Hose
O-Ring **10053273**

1. Verify that the system is depressurized.

2. Unscrew the AirHawk II hose from the test manifold assembly.

3. Replace the hose o-ring.

PR14 FIRST STAGE REGULATOR

4. Unscrew the test manifold assembly from the first stage intermediate pressure hose.

5. Screw the AiHawk II hose onto the first stage intermediate pressure hose. Use the inch pound torque wrench and **3/4" crowfoot** to tighten the threaded connection to **125 ± 5 in lbs.**

6. Install the first stage regulator to the mounting bracket. See Installing the Regulator onto the Mounting Bracket for instructions.
7. Test the system for leaks. (See **AirHawk II Air Mask Leak Testing** (P/N 10104247) for instructions.)

Quick-Connect and ExtendAire Hoses

1. Ensure that the system is depressurized.

2. Disconnect the AirHawk II hose from the test manifold assembly.

3. Disconnect the test manifold assembly from the first stage intermediate pressure hose.

4. Connect the Firehawk hose to the first stage intermediate pressure hose.
5. Install the first stage regulator onto the mounting bracket.
6. Test the system for leaks. (See **AirHawk II Air Mask Leak Testing** P/N 10104247 for instructions.)