First Stage Regulator (Prior Design)

MAINTENANCE AND REPAIR

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

MSA
The Safety Company

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TAL 616 (L) Rev. 12

Prnt. Spec. 10000005389 (l) Mat. 10051132
Doc. 10000017840

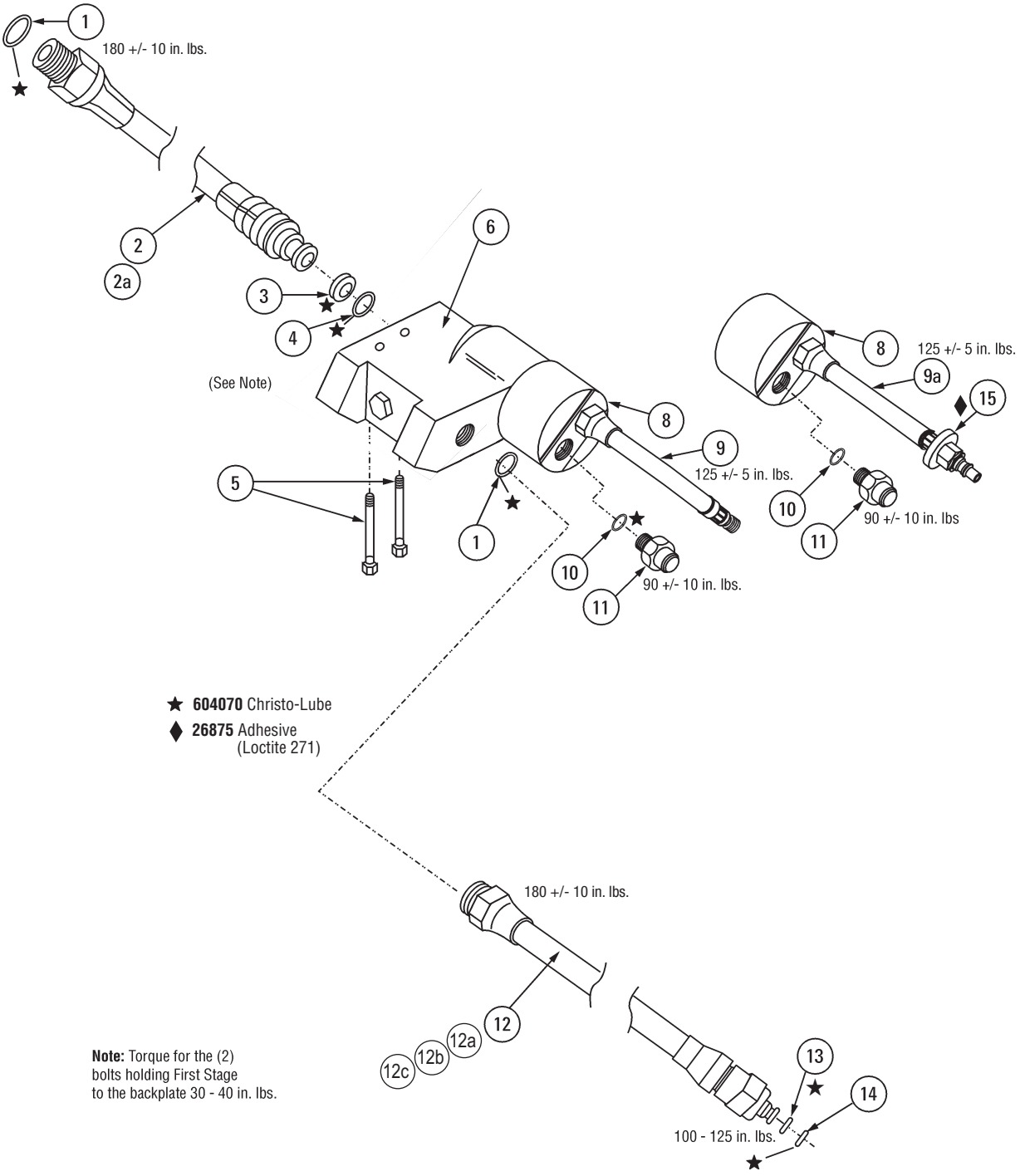
FIREHAWK® FIRST STAGE REGULATOR

FIREHAWK FIRST STAGE REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1	**638166**	O-Ring
2	**804382**	High Pressure Hose — 180 +/- 10 in. lbs.*
2a	**10037954**	Hose (Black Rhino) — 180 +/- 10 in. lbs.*
3	**635278**	Backup Ring
4	**63198**	O-Ring
5	**495929**	Pin (2 Req'd) — 10 - 15 in. lbs.
6	**488750**	Regulator Body
8	**805051**	Cap — 180 +/- 10 in. lbs.
9	**10020781**	Threaded Hose — 125 +/- 5 in. lbs.*
9a	**10020779**	Quick-Connect Hose — 125 +/- 5 in. lbs.*
10	**635037**	O-Ring
11	**481999**	Relief Valve — 90 +/- 10 in. lbs.
12	**817582**	Hose Assembly, High Pressure MMR, 20"*
12a	**804381**	Hose Assembly, High Pressure MMR, 20" for Quick-Fill*
12b	**10040239**	Hose Assembly, High Pressure MMR, 26"*
12c	**10004650**	Hose Assembly, High Pressure MMR, 26" for Quick-Fill*
13	**635277**	Backup Ring
14	**638167**	O-Ring
15	**10047742**	Rubber Washer QC Hose (only)

*Includes Back-Up and/or O-rings as needed.

Firehawk First Stage Regulator Assembly

part number 10026233 (with Threaded Hose 10020781 / Relief Valve 481999)
part number 10026234 (with Quick-Connect Hose 10020779 / Relief Valve 481999)



First Stage Regulator Assemblies

(Less High Pressure Hose, Pressure Gauge & Hose Assembly and Second Stage Regulator)

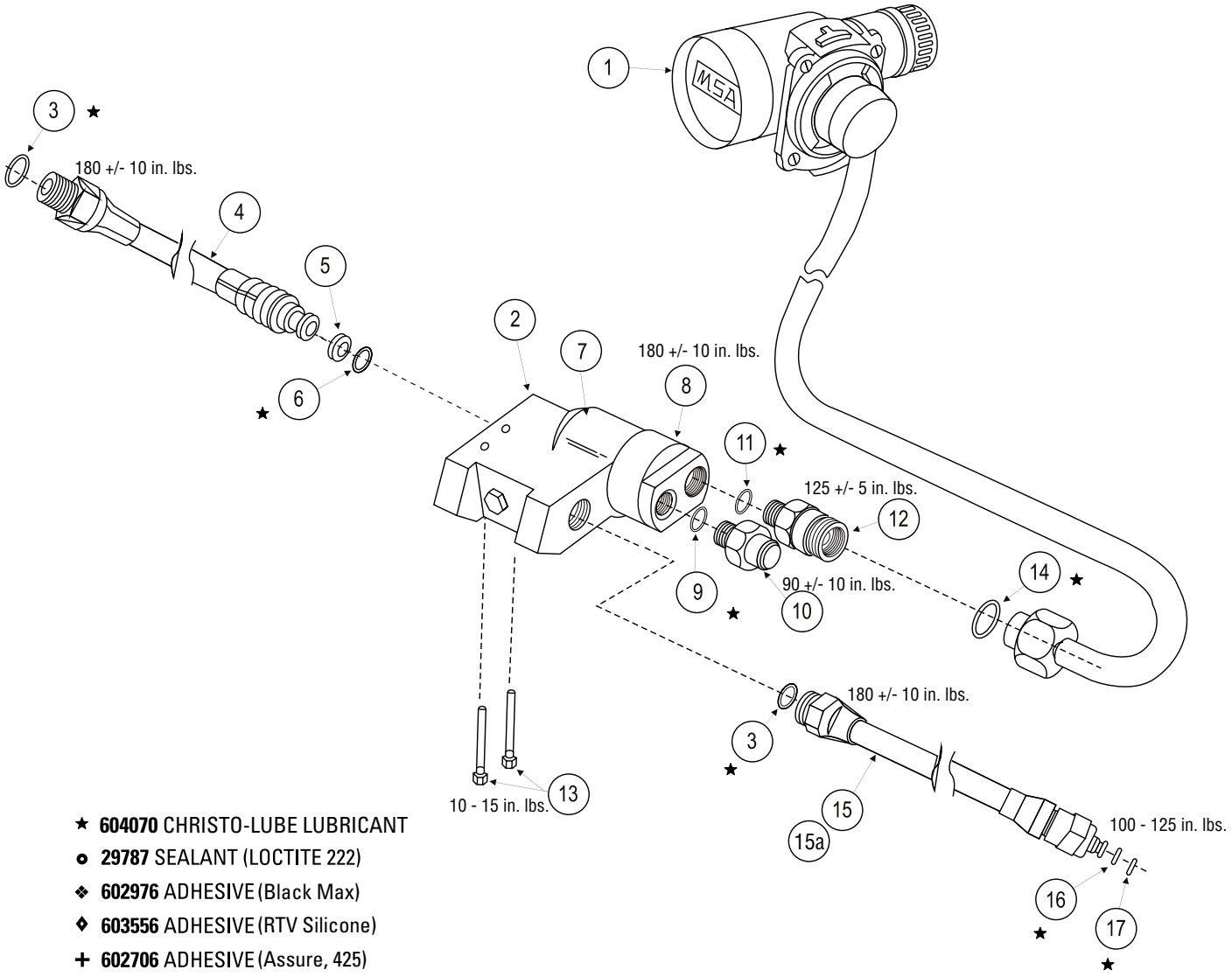
FIRST STAGE REGULATOR

CURRENT FIRST STAGE REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1	**812857**	MMR Assembly (Quick-Connect , 1/4 Turn)
2	**488885**	First Stage Regulator Assembly
3	**638166**	O-Ring (2 Req'd)
4	**804382**	High Pressure Hose — 180 +/- 10 in. lbs.*
5	**635278**	Backup Ring
6	**63198**	O-Ring
7	**488750**	Regulator Body
8	**805051**	Regulator Cap — 180 +/- 10 in. lbs.
9	**635037**	O-Ring
10	**481999**	Relief Valve — 90 +/- 10 in. lbs.
11	**633776**	O-Ring (1/4 Turn only)
12	**805052**	Low Pressure Hose Adapter (1/4 Turn only) — 125 +/- 5 in. lbs.
13	**495929**	Pin (2 Req'd) — 10 - 15 in. lbs.
14	**63198**	O-Ring
15	**10040239**	Hose Assembly, High Pressure MMR, 26"*
15a	**10004650**	Hose Assembly, High Pressure MMR, 26" for Quick Fill*
16	**635277**	Backup Ring
17	**638167**	O-Ring

*Includes Back-Up and/or O-rings as needed.

MMR Regulator Assembly

NFPA - 1981-1997 Edition Compliant



★ **604070** CHRISTO-LUBE LUBRICANT
⚬ **29787** SEALANT (LOCTITE 222)
❖ **602976** ADHESIVE (Black Max)
♦ **603556** ADHESIVE (RTV Silicone)
+ **602706** ADHESIVE (Assure, 425)
⌘ **494992** LUBRICANT (LIQUID SILICONE)
♦ **26875** ADHESIVE (271 LOCTITE)

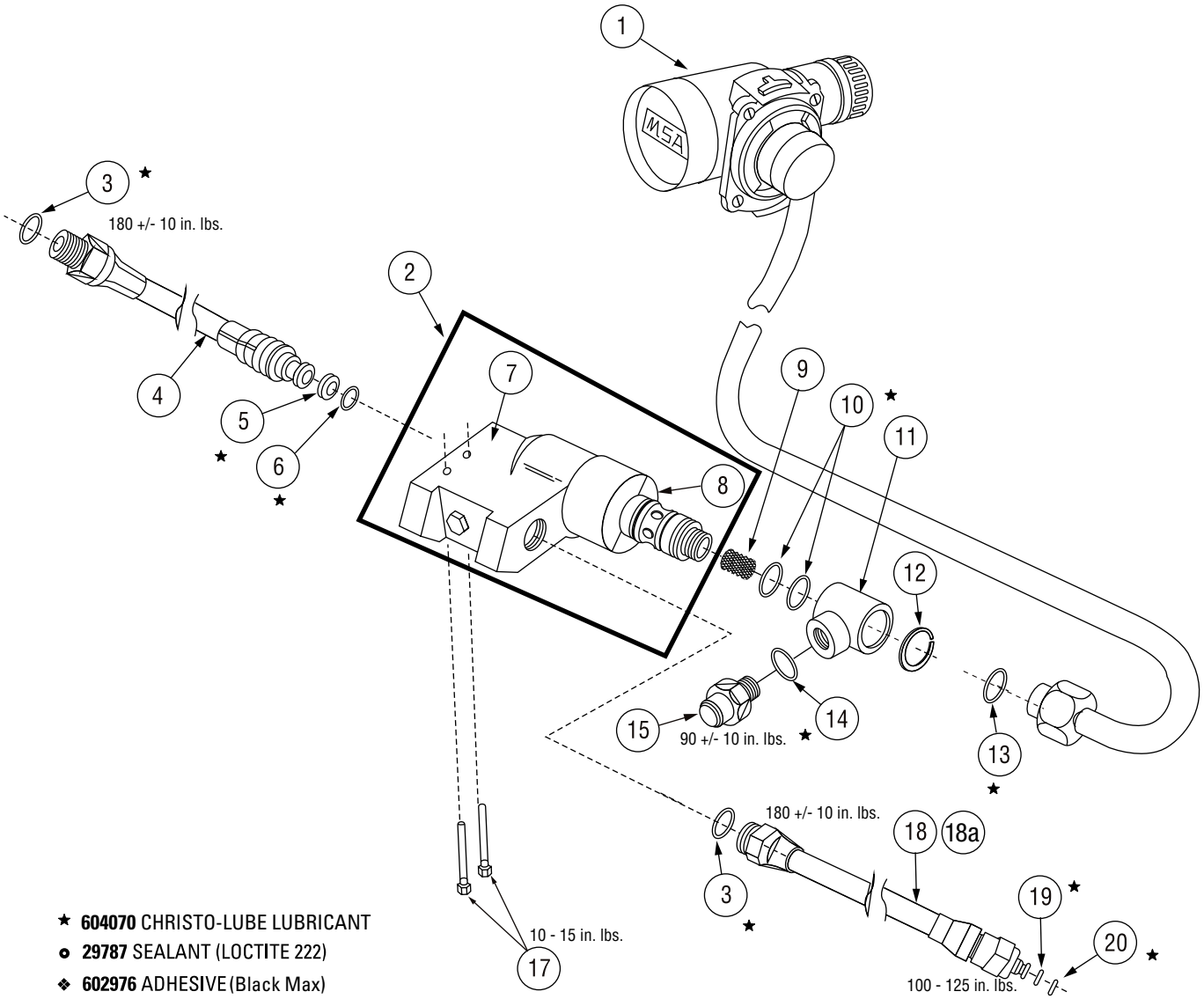
FIRST STAGE REGULATOR

PRIOR FIRST STAGE REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1	**812857**	MMR Assembly (Quick-Connect , 1/4 Turn)
2	**488885**	First Stage Regulator Assembly
3	**638166**	O-Ring (2 Req'd)
4	**804382**	High Pressure Hose — 180 +/- 10 in. lbs.*
5	**635278**	Backup Ring
6	**63198**	O-Ring
7	**488750**	Regulator Body
8	**--------**	Cap
9	**495928**	Screen
10	**635036**	O-Ring (2 Req'd)
11	**488819**	Relief Valve Swivel
12	**635035**	Retaining Ring
13	**63198**	O-Ring
14	**635037**	O-Ring
15	**481999**	Relief Valve — 90 +/- 10 in. lbs.
17	**495929**	Pin (2 Req'd) — 10 - 15 in. lbs.
18	**10040239**	Hose Assembly, High Pressure MMR, 26"*
18a	**10004650**	Hose Assembly, High Pressure MMR, 26" for Quick-Fill*
19	**635277**	Backup Ring
20	**638167**	O-Ring

*Includes Back-Up and/or O-Rings as needed.

MMR Regulator Assembly

NFPA - 1981-1997 Edition Compliant



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⌘ **494992** LUBRICANT (LIQUID SILICONE)
♦ **26875** ADHESIVE (271 LOCTITE)

AIRHAWK DISASSEMBLY AND REPAIR

AIRHAWK™ USER'S MAINTENANCE INSTRUCTIONS

⚠ WARNING

All repair procedures assume that the First Stage Regulator is disconnected from the apparatus.

First Stage Regulator

1. Remove the coupling nut and insert.
   a. Place a wrench on the First Stage Regulator body flats to secure the body.
   b. Place a wrench on the insert flats.
   c. Turn the wrench counter-clockwise to loosen and remove the insert.
   d. Slide the coupling nut off the "back" end of the insert.
   e. Using the O-ring removal tool, remove the washer from inside the coupling nut. Remove the old O-ring from the insert (nipple)(P/N 635037) and remove the O-ring (P/N 633553) from tip of insert (nipple). Be careful not to damage the O-ring sealing area
2. Remove the O-ring and Screen Filter.
   a. Using the O-ring removal tool, remove the old o-ring (P/N 66040) and screen filter (P/N 10038601) from the coupling nut insert port. Be careful not to damage the O-ring sealing area.
3. Installing the O-ring and Screen Filter.
   a. Insert the smaller end of the screen filter into the insert port.
   b. Apply a thin film of Liquid Silicone Lubricant to the new O-ring. Insert the new O-ring on top of the screen filter.
4. Installing the coupling nut and insert.
   a. Slide the new washer on the back end of the insert.
   b. Apply a thin film of Christo-Lube Lubricant to the new washer.
   c. Slide the coupling nut on the back end of the insert.
   d. Use transparent tape to cover the insert threads. Install a new O-ring on the insert. Apply a thin film of Christo-Lube™ Lubricant to the O-ring Remove the transparent tape.

NOTE: Prior to applying Loctite™, ensure the threads are wiped clean.

   a. Apply two drops of Loctite (271) to the insert threads.
   b. Apply a thin film of Christo-Lube™ Lubricant to the O-ring. Slide the new O-ring over the tip of the insert (nipple).
   c. Thread the coupling nut and insert into insert port of the First Stage Regulator torque to 240 +/- 20in. lbs.
   d. Rotate the coupling nut on the insert to ensure it moves freely.
5. Remove the Relief Valve
   a. Place a wrench on the First Stage Regulator cap flats to secure the body.
   b. Place a wrench on the hex flats of the Relief Valve. Turn the wrench count-clockwise to loosen and remove the relief valve.
   c. Remove the old O-ring (P/N 635037) from the relief valve.
6. Installing the Relief Valve.
   a. Use transparent tape to cover the relief valve threads. Install a new O-ring on the relief valve. Apply a thin film of Christo-Lube Lubricant to the new O-ring. Remove the transparent tape.
   b. Thread the Relief Valve and O-ring into the First Stage Regulator body. Torque to 90 +/- 10 in. lbs.

⚠ CAUTION

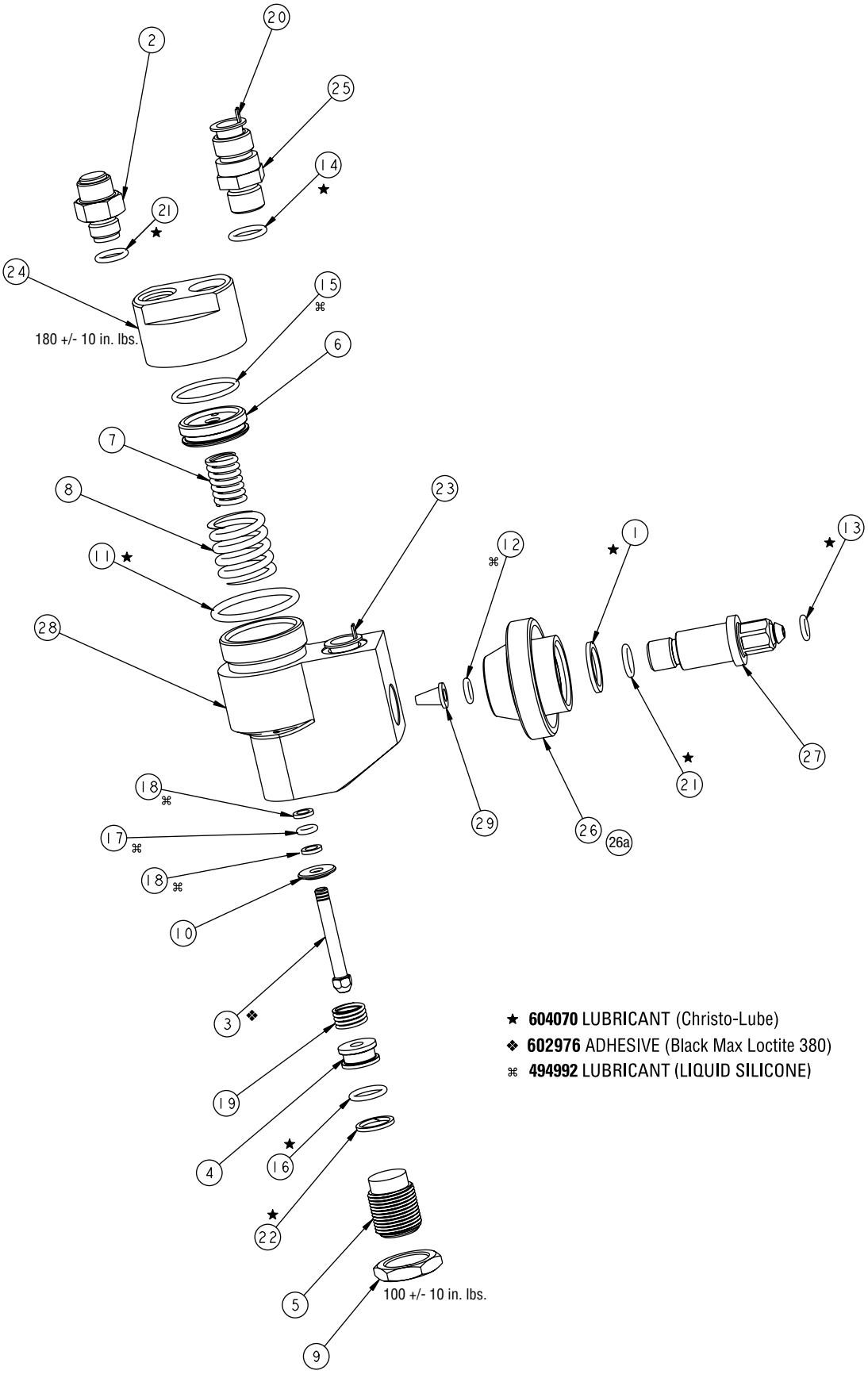
Do not over-tighten parts or you may damage the First Stage Regulator Body.

NOTE: The First Stage Regulator must be leak tested following any disassembly. Refer to the Leak Test section of this manual for procedures to check all connections.

AIRHAWK FIRST STAGE REGULATOR

FIRST STAGE REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1	**93031**	Washer
2	**481999**	Relief Valve
3	**488798**	Piston Shaft
4	**488799**	Nylon Seat
5	**488833**	Regulator Screw
6	**488853**	Regulator Piston
7	**488854**	Spring
8	**488855**	Spring
9	**490605**	Locknut
10	**490645**	Washer
11	**630493**	O-Ring
12	**66040**	O-Ring
13	**633553**	O-Ring
14	**633776**	O-Ring
15	**634667**	O-Ring (fluorosilicone)
16	**634669**	O-Ring (fluorosilicone)
17	**634670**	O-Ring (fluorosilicone)
18	**634672**	Backup Ring (2 req'd)
19	**635032**	Compression Spring
20	**635033**	Caplug
21	**635037**	O-Ring (2 req'd)
22	**635311**	Backup Ring
23	**63825**	Caplug
24	**8055051**	Regulator Cap
25	**805052**	Low Pressure Hose Adapter
26	**10005456**	Handwheel (2216 psi)
26a	**10005457**	Handwheel (4500 psi)
27	**10037654**	Nipple Fitting
28	**10037669**	Regulator Body
29	**10038601**	Inlet Filter

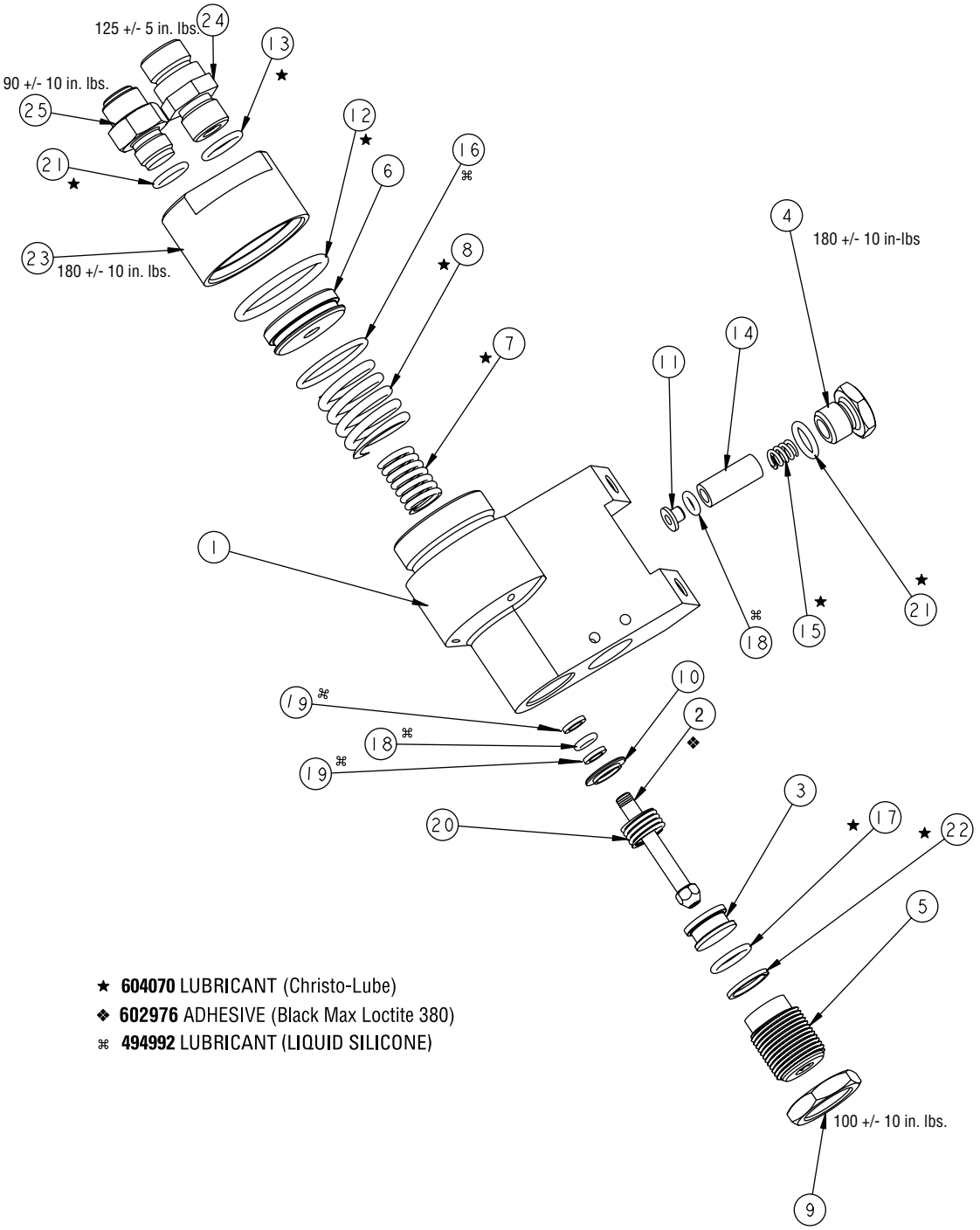
Airhawk First Stage Regulator Assembly



FIRST STAGE REGULATOR

FIRST STAGE REGULATOR COMPONENTS		
Item	**Part No.**	**Description**
1	**488750**	Regulator Body
2	**488798**	Shaft, Piston
3	**488799**	Seat, Nylon
4	**488818**	Plug, Regulator — 180 +/- 10 in. lbs.
5	**488833**	Screw, Regulator
6	**488853**	Piston, Regulator
7	**488854**	Spring, .331 ID
8	**488855**	Spring, .635 ID
9	**490605**	Locknut — 100 +/- 10 in. lbs.
10	**490645**	Washer, Aluminum
11	**495927**	Insert, Filter
12	**630493**	O-Ring
13	**633776**	O-Ring
14	**634664**	Filter
15	**634665**	Spring
16	**634667**	O-Ring
17	**634669**	O-Ring
18	**634670**	O-Ring
19	**634672**	Backup Ring (2 req'd)
20	**635032**	Compression Spring
21	**635037**	O-Ring (2)
22	**635311**	Backup Ring
23	**805051**	Regulator Cap — 180 +/- 10 in. lbs.
24	**805052**	Adapter (1/4 Turn only) — 125 +/- 5 in. lbs.
25	**481999**	Relief Valve — 90 +/- 10 in. lbs.

First Stage Regulator



FIRST 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.

REPLACING THE INLET FILTER

⚠ CAUTION

Use the liquid silicone lubricant (P/N 494992) in the first stage regulator where specified. Do not use any other type of lubricant.

Refer to the appropriate illustrated Parts Lists for the apparatus being repaired. All repair procedures require that the regulator and Audi-Larm Audible Alarm are disassembled from the apparatus cylinder carrier.

⚠ CAUTION

Wear eye protection throughout maintenance procedures to avoid eye injury.

- Be sure that the cylinder valve is completely closed.
- Be sure that nothing blocks the MMR outlet. Allow any trapped air to bleed from the apparatus by cracking the bypass valve.

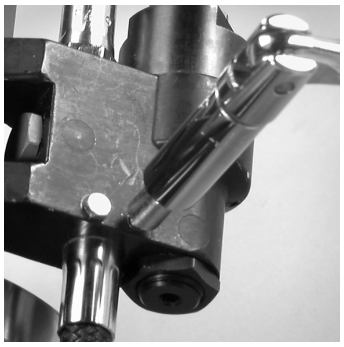
⚠ CAUTION

Do not disconnect the Audi-Larm coupling nut when pressure is shown on the harness 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, death, or damage to equipment.

- Unscrew the alarm coupling nut from the cylinder valve.
- Use a 7/16" wrench to remove the two bolts and washers holding the first stage regulator to the backplate. Leak Test after each repair (see the LEAK TEST Tab in this Binder).

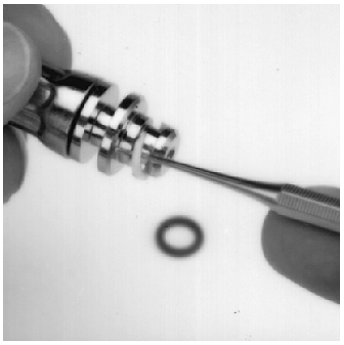
1. Removing the High Pressure Hose

a. Using a 1/4" socket, remove the two screw-pins from the regulator body.



b. Pull firmly on the high pressure hose to remove it from the regulator body.

c. Remove the old O-ring and backup ring. Be careful not to damage the O-ring seal area.



REMOVING THE INLET FILTER

1. Place a 5/8" socket on the plug and turn it counter-clockwise to unthread.

2. Spring, filter, insert, and O-ring will fall out of the regulator body. Discard the O-ring. Use the small end of the O-ring removal tool if the O-ring and insert do not fall out.

FIRST STAGE REGULATOR DISASSEMBLY

3. Remove the O-ring from the plug. Discard the O-ring. Be careful not to damage the O-ring seal area of the plug.
4. Clean the plug and spring for reassembly.

DISASSEMBLING THE FIRST STAGE REGULATOR

1. Remove the MMR intermediate pressure hose. Remove the high pressure hose. Remove the gauge hose.
2. Place a wrench on the flats of the cap and unscrew the cap from the regulator body.
3. Using the O-ring removal tool remove the O-ring.
4. Using the 7/8” socket, loosen and remove the locknut from adjusting screw.

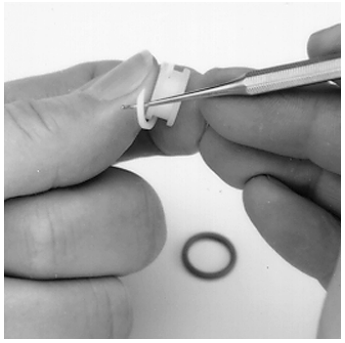
⚠ WARNING

The spring load may force the seat (P/N 488799) and spring from the body.

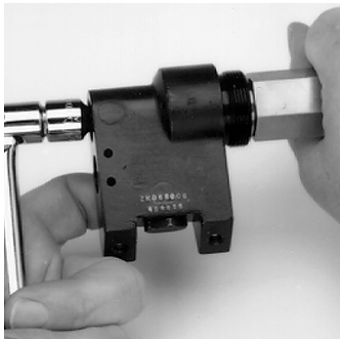
8. Using a 3/16" Allen wrench, unscrew and remove the regulator adjusting screw. Remove the seat.

NOTE: It may be necessary to insert the brass rod through the piston shaft to push the seat out of the regulator body.

9. Using the O-ring removal tool, remove the O-ring and split backup ring from the seat.



10. Insert the 1/4" cushioned socket through the adjusting screw hole to hold the piston shaft. Using the spanner wrench, unthread the piston from the piston shaft. Remove the O-ring from the piston.



11. Using the O-ring removal tool, remove the two springs.

⚠ CAUTION

Be very careful that you do not scratch the piston shaft.

12. Using the plastic stick, remove the piston shaft by pushing from the threaded end of the piston shaft. Be careful not to nick or cut the shaft.

13. Carefully slide the O-ring, back-up rings, and the washer from the piston shaft.

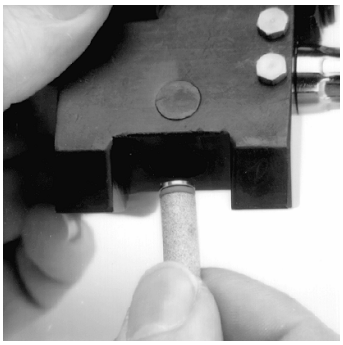
NOTE: It may be necessary to use the O-ring removal tool to remove the second back-up ring.

INSTALLING A NEW INLET FILTER

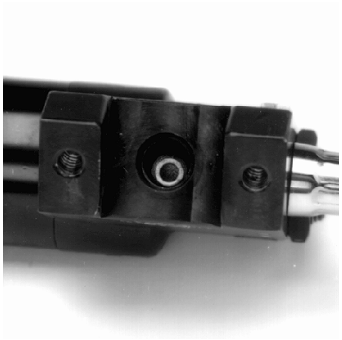
1. Lubricate the O-ring (see General Notes). Insert a new O-ring on the insert.
2. Place the insert into the open end of the filter. Hold the regulator body with the filter downward.

FIRST STAGE REGULATOR REASSEMBLY

3. Push the filter into the regulator with the insert facing in.



4. Lubricate only the ends of the spring with a thin film of Christo-Lube. Insert the spring.



5. Lubricate the new O-ring (see General Notes). Install a new O-ring on the plug.

6. Insert the plug in the regulator body and tighten to a torque of 180 +/- 10 in-lbs.

ASSEMBLING THE FIRST STAGE REGULATOR

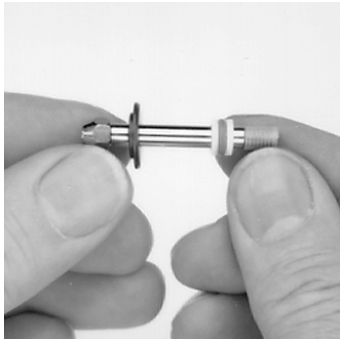
NOTE: If the piston is being reused, clean any remaining sealant from the threads.

⚠ CAUTION

Use the liquid silicone lubricant (P/N 494992) on the O-rings in the first stage regulator where specified. Do not use any other type of lubricant at these locations.

1. Carefully slide the washer on the piston shaft with the shoulder (ribbed) side facing the hex end of the piston shaft.

Cover the threads on the piston shaft with paper or tape to protect the O-rings. Install one backup ring on the piston shaft. Install one O-ring, then the second backup ring on the shaft.



2. Apply liquid silicone lubricant to the new O-ring and two new backup rings.
3. Remove the thread protector. Carefully slide the piston shaft with the new O-ring, back-up rings, and washer into the regulator body.
4. Place one drop of Black Max thread sealant on the piston shaft threads.

NOTE: Position the first stage regulator so that the piston shaft threaded end faces downward. You can continue to reassemble the regulator. However, allow the Black Max sealant to cure overnight before you perform Testing and Adjusting the First Stage Static Pressure.

5. Insert the springs.
6. Apply liquid silicone lubricant to the new O-ring and install the O-ring on the piston.
7. Hold the hex end of the piston shaft with the cushioned 1/4" socket.

FIRST STAGE REGULATOR REASSEMBLY

8. Position the piston so that the spanner holes face out. Using the spanner, thread the piston on the piston shaft (which is already in the body) until the piston shaft is **flush with the recessed surface of the piston.**

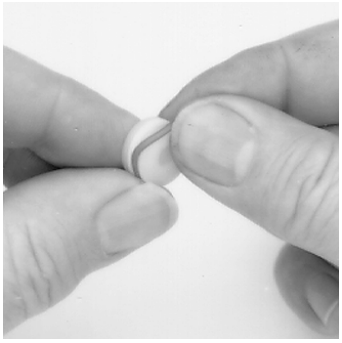
9. Remove the excess sealant with a clean, lint-free cloth.

10. Wrap paper or tape around the regulator body external threads to protect the O-rings. Apply Christo-Lube lubricant to the new O-ring and install it on the body. Remove the paper or tape.

11. Replace the cap and tighten firmly to 180± 10 in-lbs.
12. Insert the spring into the adjusting screw hole. Make sure the spring is centered (standing up straight) and flat on the washer.

NOTE: Wipe the center edge of the seat. Wipe it clean with a paper towel. If the seat is damaged, it must be replaced.

13. Apply Christo-Lube lubricant to the new O-ring and split back-up ring, and insert them into the O-ring groove of the seat.



NOTE: Install the O-ring closest to the recessed end of the seat.

14. Place the seat into the regulator body. Be sure that the **recess side faces the spring** and that the **flat side faces out.**

15. Using the 3/16" Allen wrench, thread the adjusting screw into the body 5 to 6 full turns.

16. Thread the locknut on the adjusting screw, but do not tighten it.
17. Install the gauge hose. Install the harness gauge hose on the first stage regulator.
18. Attach the high pressure hose. Install the high pressure hose on the first stage regulator. (See First Stage Hose Assembly section.)
19. Connect the intermediate pressure hose to the regulator (see installing a new second stage Intermediate Pressure Hose and First Stage Hose Assembly sections.
20. Re-attach the regulator body to the backplate. Install the harness gauge hose on the first stage regulator. (See First Stage Hose Assembly section.)

TESTING AND ADJUSTING THE FIRST STAGE STATIC PRESSURE

1. Attach the apparatus (with a full cylinder) to the regulator tester.
2. The bypass valve and the shut-off button must be in the OFF position.

ATTACHING THE TESTER HOSE & REMOVING THE HIGH PRESSURE RELIEF VALVE

1. Use a 5/8" open-end wrench on the hex flats at the base of the valve. Loosen and remove the valve.
2. Remove the relief valve O-ring.
3. Be sure the coupling nut O-ring is in place. Thread the Audi-Larm coupling nut on the cylinder valve and hand-tighten only.

FIRST STAGE REGULATOR REASSEMBLY

INSTALLING THE TEST ADAPTER ASSEMBLY P/N 10006007

1. Check Adapter O-ring. Replace it if necessary. Thread the Adapter into the high pressure relief valve port and tighten with a wrench.
2. Insert the tester hose assembly into the Adapter until it snaps into place. Be sure that the hose is on the Adapter securely. Perform test.

CHECKING THAT THE REGULATOR BYPASS IS FUNCTIONING

1. Be sure that nothing blocks the regulator outlet. Open the bypass valve slowly and listen for air flow.
2. Close the bypass valve fully.

FIRST STAGE ADJUSTMENT

NOTE: For performance testing, use the test procedures supplied with the tester to be used. See the TESTER section of this Binder.

NOTE: If the gauge does not stabilize and continues to rise above 80 psig, there is a leak in the piston valve area. The valve assembly and all O-rings must be replaced (see first stage regulator disassembly and repair).

⚠ WARNING

DO NOT DISCONNECT THE TEST ADAPTER OR THE TEST PRESSURE GAUGE FROM THE PRESSURE REGULATOR. The test gauge assembly has a relief valve to protect against over-pressurization. Failure to observe this warning may result in serious personal injury or death.

NOTE: All adjustments must be made with input pressure reduced as specified below. Close the cylinder valve and crack the bypass valve. Bleed the system pressure, as read on the harness gauge.

TROUBLESHOOTING

As displayed on the Posi chek menu specifications are as follows:

- Static Mediium Pressure range: 50-90 psi
- Medium Pressure Creep/Drift: 5 psi
- Medium Pressure Droop: -15 psi

For Concerns with Static Medium Pressure adjust the adjusting screw:

- Clockwise lowers pressure
- Counter-clockwise raises pressure

For concerns with Creep or Droop try to replace nylon seat P/N 488799 including O-ring P/N 634669 and back up ring P/N 635311. Ensure end of piston shaft is clean, free of debris and there are no signs of visible damage or wear on the piston head. If the first stage still does not meet specification for Creep or Droop, overhaul first stage regulator.

DISCONNECTING TESTER

1. Close the cylinder valve fully. Relieve pressure from the system. Be sure that nothing blocks the regulator outlet. Open the bypass valve fully to release any trapped air.
2. Disconnect the Audi-Larm coupling nut from the cylinder valve.
3. Remove the tester hose and Adapter.
4. Install a new O-ring on the relief valve.
5. Re-install the high pressure relief valve.
6. Torque the relief valve to 90 +/- 10 in. lbs. with a torque wrench on the hex flats at the base of the valve.

NOTE: Check the system for leaks. See the LEAK-TESTING section in this binder.

NOTES

NOTES

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

MSA
The Safety Company

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