

Audi-Larm™ Audible Alarm

MAINTENANCE AND REPAIR



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

1000 Cranberry Woods Drive
Cranberry Twp. Pennsylvania, U.S.A. 16066

REPLACEMENT KITS AND PARTS LIST

Replacement and Maintenance Kits: 2216/4500 psi

Audi-Larm Audible Alarm Replacement Kit		
10037310	Audi-Larm Audible Alarm 2216 psi, complete	
10037312	Audi-Larm Audible Alarm 4500 psi, complete	
Maintenance Kit		
10045831	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85055	Striker Spring
	10044574	Striker and Pellet
68523	Retaining Ring	
Bell Replacement Kit		
10090907	485829	Bell
	54197	Lock Washer Lock
	635245	Screw (2)
Piston Replacement Kit		
10090908	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85052	Piston Plug
	85049	Piston Assembly
Striker Replacement Kit		
10044574	Striker and Pellet	
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037952	Screw
	10041962	Washer
Urethane O-Ring for discontinued 1 piece nipple design		
10090910	633553	Nipple O-Ring Kit (pack of 10)
Teflon O-Ring for current 2 piece nipple design		
10052355-SP10	10052355	Nipple O-Ring Kit (pack of 10)

Parts List and Exploded View: 2216/4500 psi

Item	P/N	Description
1	10038417	Audi-Larm Body
2	10148231	Fitting, Nipple, 2216 psi
2a	10148232	Fitting, Nipple, 4500 psi
2b	10062086	Fitting, Nipple, 2216 psi (Rev 1 Discontinued)
2c	10062087	Fitting, Nipple, 4500 psi (Rev 1 Discontinued)
3	93031	Washer, CGA Nut
4	10120808	Coupling Nut, 2216 psi
4a	10120809	Coupling Nut, 4500 psi
5	10052355	Nipple O-Ring
5a	633553	Nipple O-Ring (Discontinued)
6	10038031	Dust Cover Assembly
7	10041011	Washer
8	10037952	Screw
9	10036291	Pressure Relief Valve* 2216 psi
9a	10036292	Pressure Relief Valve* 4500 psi
9b	10086491	Relief Valve Plug w/O-ring
10	485829	Bell
11	54197	Lock Washer (2)
12	635245	Screw, #8-32 x 7/16 LG (2)
13	10044574	Striker and Pellet
14	85055	Striker Spring
15	85049	Piston Assembly
16	85052	Piston Plug
17	635953	Piston Bore O-Ring
18	635954	Piston Nose O-Ring
19	66395	Piston Plug O-Ring
20	68523	Retaining Ring
21	455941	Spring, 2216 psi
21a	474352	Spring, 4500 psi
22	474369	Adjusting Nut
23	485070	URC Adapter with O-Ring
23a	10086390	URC Adapter Plug w/O-Ring
	635068	O-Ring for URC (not shown)
24	804382	High Pressure Hose*
25	635037	O-Ring
26	635278	Back-up Ring
27	63198	O-Ring
28	101240808	Retaining Screw
	809028	Christo-Lube Lubricant (2 cc tube)
	28907	Teflon Tape
	29787	Loctite 222
	26875	Loctite 271
	494992	Liquid Silicone Lubricant

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

REPLACEMENT KITS AND PARTS LIST

Replacement and Maintenance Kits: 3000 psi

Audi-Larm Audible Alarm Replacement Kit		
10043947	Audi-Larm Audible Alarm 3000 psi, complete	
Maintenance Kit		
10045831	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85055	Striker Spring
	10044574	Striker and Pellet
	68523	Retaining Ring
Bell Replacement Kit		
10090907	485829	Bell
	54197	Washer, Lock, #8
	635245	Screw, #8-32 x 7/16 LG
Piston Replacement Kit		
10090908	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85052	Plug, Piston
	85049	Piston Assembly
Striker Replacement Kit		
10044574	Striker and Pellet	
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037952	Screw, 10-32 UNF, SST
	10041962	Washer, Flat, SST
Urethane O-Ring for discontinued 1 piece nipple design		
10090910	633553	Nipple O-Ring Kit (pack of 10)
Teflon O-Ring for current 2 piece nipple design		
10052355-SP10	10052355	Nipple O-Ring Kit (pack of 10)

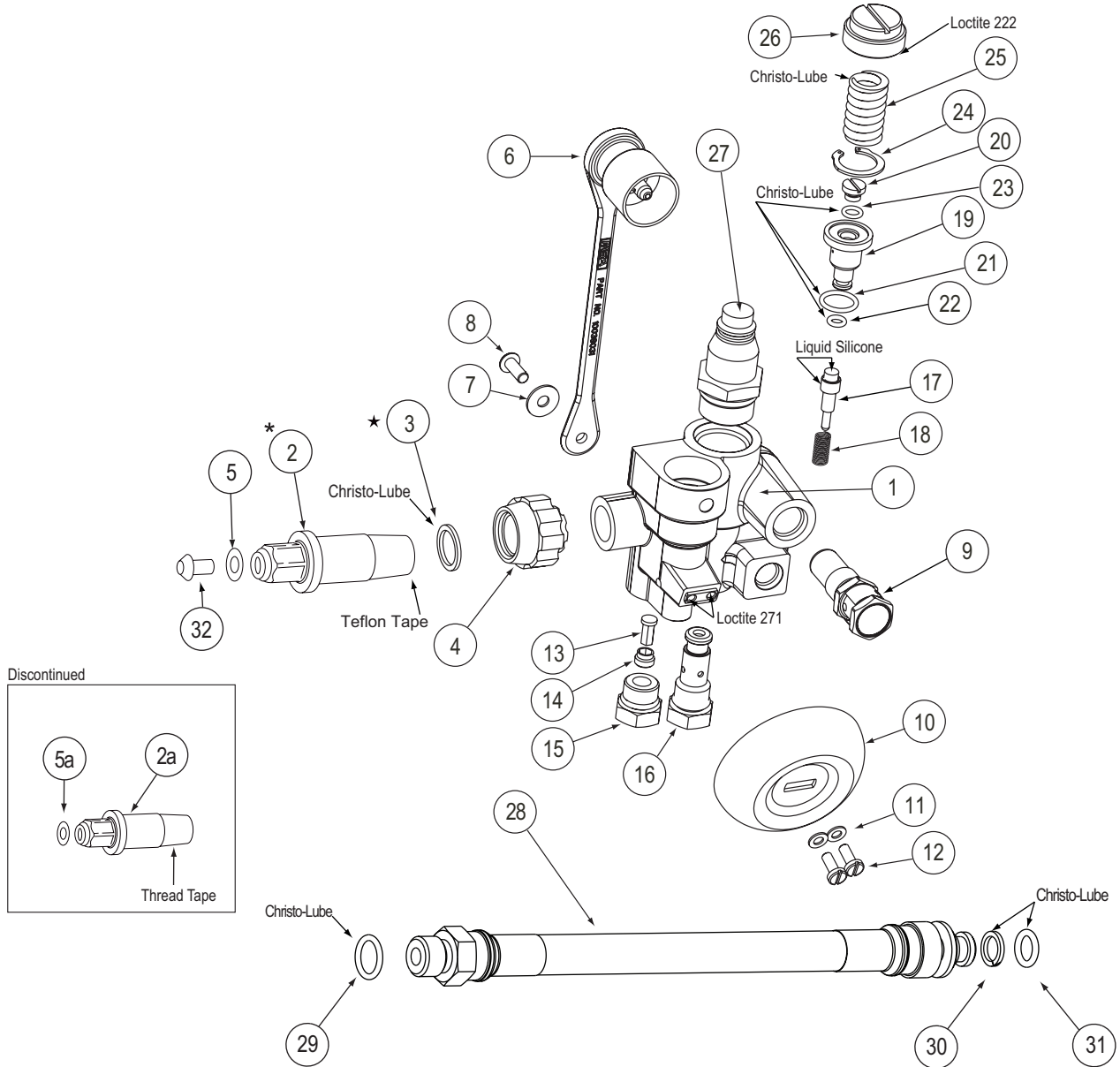
Parts List and Exploded View: 3000 psi

Item	P/N	Description
1	10045593	Audi-Larm Housing
2	10148231	Fitting, Nipple, 3000 psi
2a	10062086	Fitting, Nipple, 3000 psi (Rev 1 Discontinued)
3	93031	Washer, CGA Nut
4	10120808	Coupling Nut
5	10052355	Nipple O-Ring
5a	633553	Nipple O-Ring (Discontinued)
6	10038031	Dust Cover Assembly
7	10041962	Washer, Flat, SST
8	10037952	Screw
9	10036291	Pressure Relief Valve* 2216 psi
10	485829	Bell
11	54197	Lock Washer (2)
12	635245	Screw, #8-32 x 7/16 LG (2)
13	476441	Sintered Filter
14	80495	Screen Holder
15	10043943	SAE Plug, Size 6 with O-Ring
16	10043945	Check Valve*
17	10044574	Striker and Pellet
18	85055	Striker Spring
19	85049	Piston Assembly
20	85052	Plug, Piston
21	635953	Piston Bore O-Ring
22	635954	Piston Nose O-Ring
23	66395	Piston Plug O-Ring
24	68523	Retaining Ring
25	474352	Spring
26	474369	Adjusting Nut
27	485070	URC Adapter with O-Ring
28	804382	High Pressure Hose*
29	635037	O-Ring
30	635278	Back-Up Ring
31	63198	O-Ring
32	10124808	Retaining Screw
	809028	Christo-Lube Lubricant (2 cc tube)
	28907	Teflon Tape
	29787	Loctite 222
	26875	Loctite 271
	494992	Liquid Silicone Lubricant

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

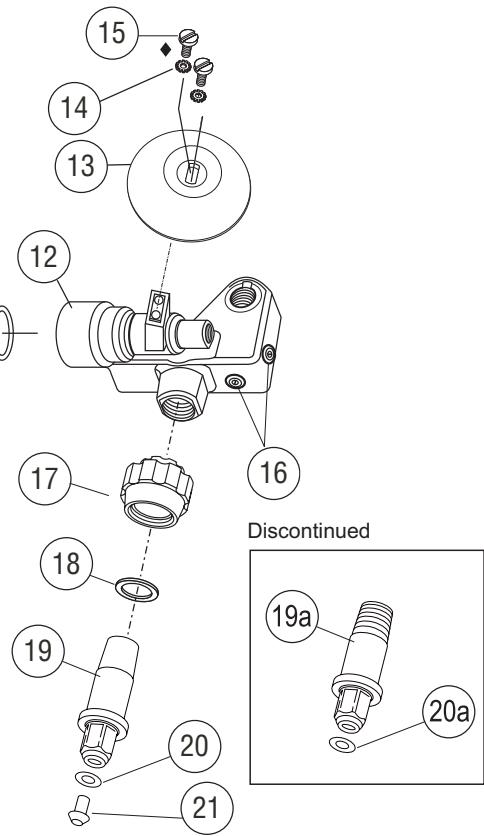
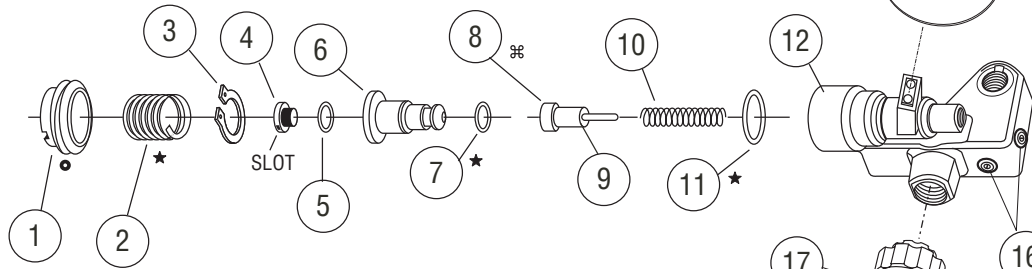
AUDI-LARM AUDIBLE ALARM

Exploded View 3000 psig Audi-Larm Audible Alarm



Audi-Larm Assembly

part number 10012996 (4500 psig)

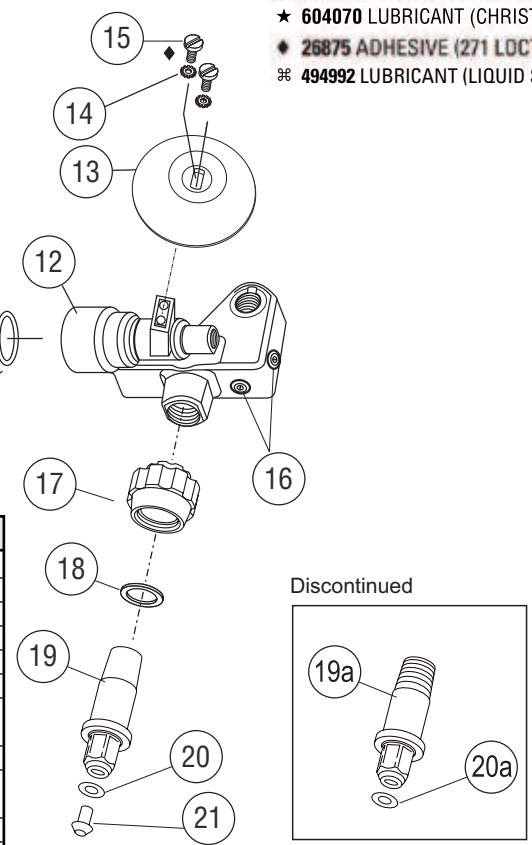
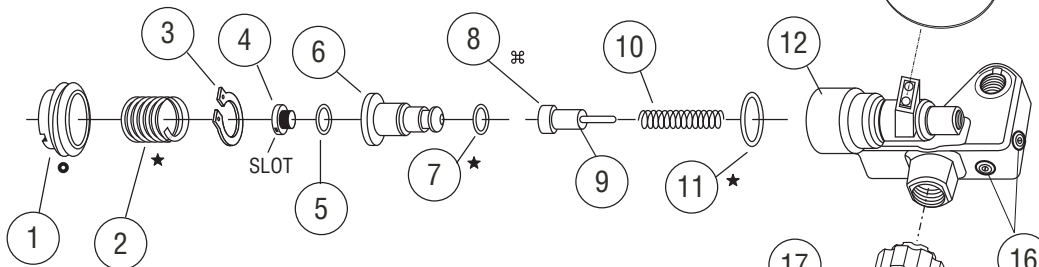


Item	P/N	Description	Item	P/N	Description
1	474369	Adjusting Screw	14	54197	Lock Washer (2 Req'd)
2	474352	Spring	15	635245	Screw (2 Req'd)
3	68523	Retaining Ring	16	68524	Pipe Plug
4	85052	Piston Plug	17	10120809	Handwheel
5	66395	O-Ring	18	93031	Washer
6	85049	Piston	19	10148232	Fitting, Nipple, 4500 psi
7	635954	O-Ring	19a	10062087	Fitting, Nipple, 4500 (Rev 1 Discontinued)
8	85053	Valve Pellet	20	10052355	O-Rint
9	85051	Striker	20a	633553	Nipple O-Ring (Discontinued)
10	85055	Spring	21	10124808	Retaining Screw
11	635953	O-Ring			
12	10016092	Housing			
13	485829	Bell			

Audi-Larm Assembly

part number 10012944 (2216 psig)
w/Relief Valve (484892)

part number 10012995 (3000 psig)
w/Plug (492089) and O-Ring (633776)



- 29787 SEALANT (LOCTITE 222)
- ★ 604070 LUBRICANT (CHRISTO LUBE)
- ◆ 26875 ADHESIVE (271 LOCTITE)
- ⌘ 494992 LUBRICANT (LIQUID SILICONE)

Item	P/N	Description	Item	P/N	Description
1	474369	Adjusting Screw	14	54197	Lock Washer (2 Req'd)
2	455941	Spring	15	635245	Screw (2 Req'd)
3	68523	Retaining Ring	16	68524	Pipe Plug
4	85052	Piston Plug	17	10120808	Handwheel
5	66395	O-Ring	18	93031	Washer
6	85049	Piston	19	10148231	Fitting, Nipple, 2216/3000 psi
7	635954	O-Ring	19a	10062086	Fitting, Nipple, 2216/3000 psi (Rev 1 Discontinued)
8	85053	Valve Pellet	20	10052355	O-Ring
9	85051	Striker	20a	633553	Nipple O-Ring (Discontinued)
10	85055	Spring	21	10124808	Retaining Screw
11	635953	O-Ring			
12	10016092	Housing			
13	485829	Bell			

AUDI-LARM AUDIBLE ALARM

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AUDI-LARM AUDIBLE ALARM DISASSEMBLY

Only MSA-certified personnel may maintain and repair the apparatus. Use only replacement parts from MSA to assure proper performance. Thoroughly understand all instructions, inspection procedures, cautions, and warnings that pertain to the breathing apparatus.

Most repairs require standard tools. However, certain special tools, tapes, lubricants, and a tester from MSA are required. See the Required Tool List.

Follow maintenance procedures exactly. Deviation from written repair procedures is unacceptable, unless approved by authorized MSA personnel.

⚠ WARNING

Relieve all pressure from the system. Close the cylinder valve. Be sure that nothing blocks the regulator outlet. Open the bypass valve to release trapped air. Failure to follow this warning can result in serious personal injury or death.

Removing the Bell

Notice

Alarm bell is not serviceable as screws are secured with a permanent thread locker. Attempting to tighten or remove screws may result in damage. If bell is damaged or loose, replace both bell and housing. Refer to Installing the Bell section for additional details.

Removing the Dust Cover (URC Equipped only)

1. Use a 1/8" hex wrench to remove the screw.



Removing the Nipple O-Ring

1. Using a 1/8" hex wrench, remove the retaining screw (P/N 10124808) and discard.



2. Remove the o-ring and discard.

NOTE: Be careful not to scratch the o-ring groove.

AUDI-LARM AUDIBLE ALARM

Removing the Nipple O-Ring (Discontinued)

1. Use the o-ring removal tool (P/N 636060) to remove the o-ring.



NOTE: Be careful not to scratch the o-ring groove.

2. Discard the o-ring.

Removing the Coupling Nut

1. Remove the nipple.
 - a. Secure the alarm body with a wrench or vise.

Note: Use protective sleeves on the jaws of the vise.

- b. Use a 7/16" deep-well socket to unscrew the nipple.



- c. Remove the nipple and coupling nut.

- d. Remove the washer.



- e. Clean Teflon tape residue from the thread.

Disassembling the Audi-Larm Audible Alarm

1. Remove the Audi-Larm coupling nut from the Audi-Larm Audible Alarm.



2. Use a large flat-blade screwdriver to remove the adjusting screw.

3. Remove the spring.



4. Use retaining-ring pliers to remove the ring. Apply only enough pressure to remove the ring.

- a. Discard the retaining ring.

5. Unscrew and remove the piston plug and o-ring.



- a. Discard the o-ring.

6. Screw the extraction tool (P/N 482426) into the back of the piston.



AUDI-LARM AUDIBLE ALARM

⚠ CAUTION

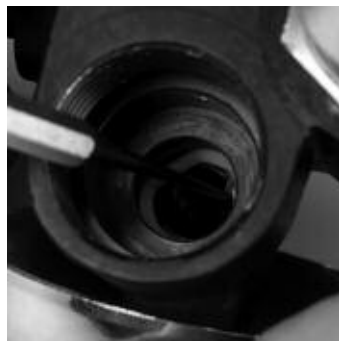
Be careful not to damage the piston valve seat on the opposite end of the piston.

7. Remove the piston by gently rocking and pulling the extraction tool.



8. Remove the extraction tool.
9. Remove and discard the piston o-ring and piston plug o-ring.
10. Turn the alarm over to remove the striker and spring from the alarm housing.
11. Discard striker, valve pellet and spring.

12. Remove and discard the o-ring beneath the alarm housing shoulder.



13. Wipe all dirt and debris from the piston.

Removing the Relief Valve

⚠ WARNING

If label on Relief Valve is missing or damaged, install a new Relief Valve. Failure to follow this warning can result in serious personal injury or death.

1. Use an 11/16" wrench to loosen and remove the relief valve.



2. Discard the o-ring.

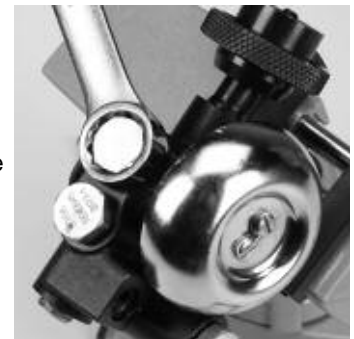
Removing the Check Valve on a 3000 psi System

1. Use an 11/16" wrench to unscrew the check valve.



Removing the Plug and Sintered Filter on a 3000 psi System

1. Use an 11/16" wrench to unscrew and remove the plug.



2. Use a 3/16" nut driver to loosen and remove the filter and filter holder.



3. Discard the filter.

⚠ CAUTION

Be careful not to round hex head or snap off filter inside the alarm body.

Removing the URC Coupling (If Equipped)

1. Place the Audi-Larm block in a vise.

Note: Use protective sleeves to avoid damaging the block.

2. Use a 1" deep-well socket to loosen the URC Adapter from the alarm body.

AUDI-LARM AUDIBLE ALARM

REASSEMBLING THE AUDI-LARM AUDIBLE ALARM

Reassembling the Coupling Nut and Nipple

Coupling Nut	2216/3000 psig:	P/N 10120808
	4500 psig:	P/N 10120809
Nipple	2216/3000 psig:	P/N 10062086
	4500 psig:	P/N 10062087

1. Reinstall the Coupling Nut

- a. Apply Teflon tape to the nipple thread.



2. Apply a small amount of Christo-Lube lubricant to the new washer.



3. Slide the new washer onto the threaded end of the nipple.

4. Slide the coupling nut onto the threaded end of the nipple.

- a. Screw the coupling nut and nipple into the Audi-Larm body.



- b. Use a torque wrench and **7/16" deep well socket** to tighten the nipple to **15 ft lbs.**



⚠ CAUTION

Do not over-tighten to prevent damage to the Audi-Larm body or the nipple thread.

Installing the Nipple O-Ring

P/N 10052355

1. Place the new o-ring in the groove.
2. Begin to thread the new Retaining Screw onto the Nipple Fitting.

3. Using a 1/8" hex socket tighten the Retaining Screw down to 20-25 in-lbs.



NOTE: An improperly seated o-ring can cause an air leak.

Installing the Nipple O-Ring (Discontinued)

P/N 10090910

1. Roll the new o-ring into the groove until seated.



NOTE: An improperly seated o-ring can cause an air leak.

AUDI-LARM AUDIBLE ALARM

Installing the Dust Cover (URC equipped only) P/N 10090909

1. Insert screw with washer through tether into Audi-Larm body.



2. Tighten with a 1/8" hex wrench.

Installing the Bell P/N 10090907

1. Align the bell with the boss on the alarm housing. The rim of the bell must not touch the alarm housing.
2. Apply one drop of Loctite 271 (P/N 26875) into each hole.
3. Insert screws with lock-washers (P/N 54197) into the Audi-Larm body and tighten.



4. Ensure that the bell is tight.

Installing URC Adapter in the Alarm Body

Note: Ensure that the air mask passes annual and monthly tightness and function tests. See **P/N10093079, FireHawk® M7 and M7 Responder® Air Mask Maintenance and Repair: Introduction** for instructions.

1. Install a new URC Adapter
 - a. Secure the Audi-Larm body in a vise.

Note: Use protective sleeves to keep from damaging the block.

2. Screw the coupling into the alarm body by hand.

3. Use a torque wrench and 1" deep-well socket to tighten to 70-75 ft lbs.



Installing High Pressure Relief Valve 2216psi P/N 10036292 4500psi P/N 10036291

1. Remove the protective cap.
2. Install the o-ring.
 - a. Apply a small amount of Christo-Lube Lubricant to the o-ring.
 - b. Protect the threads with thread protector, tape, or paper.

- c. Slide the o-ring over the threads.



3. Screw the check valve into the alarm body port and handtighten. Be careful not to cross-thread the relief valve.

4. Using a torque wrench and 11/16" socket tighten to 200-250 in. lbs.



AUDI-LARM AUDIBLE ALARM

Installing the Plug and Sintered Filter on a 3000 psi System

Plug P/N 10043943
Filter P/N 476441
Holder P/N 80495

1. With the filter flange down, slide the non-threaded end of filter holder onto the filter.



2. Insert the filter and holder into a **3/16"** nut driver.



3. Insert the filter holder, filter, and nut driver into the alarm plug port.



4. Finger tighten.

Note: To prevent over-tightening, use a nut driver, not a socket and ratchet wrench.

CAUTION

Do not over-tighten, round hex head, or snap filter off inside the alarm body.

5. Install a new plug and o-ring.
 - a. Apply a small amount of Christo-Lube lubricant to the o-ring.
6. Screw plug into the alarm body port and hand-tighten. Be careful not to cross-thread the plug.
7. Use a torque wrench and **11/16"** socket to tighten to **200-250 in lbs.**

Installing the Check Valve

P/N 10043945

1. Remove protective cap.
2. Install the o-ring and back-up ring.
 - a. Apply a small amount of Christo-Lube lubricant to the o-rings and back-up rings.

- b. Protect the threads with thread protector, tape or paper.



- c. Slide the o-ring over the thread.



3. Screw the check valve into the alarm body port and hand-tighten. Be careful not to cross-thread the check valve.

4. Use a torque wrench and **11/16"** socket to tighten the check valve to **200-250 in lbs.**



Installing the Relief Valve on a 3000psi System

1. Remove the protective cap.
2. Install a new o-ring
 - a. Apply a small amount of Christo-Lube lubricant to the o-ring.
3. Screw the relief valve into the alarm body and hand tighten.

AUDI-LARM AUDIBLE ALARM

4. Use a torque wrench and **11/16"** socket to tighten the relief valve to **200-250 in lbs.** 2216 psig relief valve shown. See 3000 psig exploded view for 3000 psig relief valve location)



Note: Be careful not to cross-thread the relief valve.

Reassembling the Audi-Larm Audible Alarm

Audi-Larm Audible Alarm Maintenance Kit P/N 10045831

Note: Replace all o-rings. Reuse of o-rings is the most frequent cause of alarm malfunction. Apply a small amount of Christo-Lube lubricant to each o-ring before installing.

1. Install the o-ring under the shoulder inside the alarm housing. Use the o-ring removal tool to push the o-ring into place.



2. Apply a small amount of Silicone Lubricant (P/N 494992) to the striker shaft.
3. Place the spring over the striker.

4. Insert the spring and striker into the alarm housing.



5. Ensure that the striker extends through the hole and can touch the bell.
6. Install new o-rings on the piston and the piston plug.

7. Screw the plug into the piston and tighten.



8. Apply a small amount of Christo-Lube lubricant to the beveled shoulder of the piston assembly.

9. Insert the piston into the alarm housing and press it into place.



Note: Be careful not to damage the piston seat. Use of the extraction tool to guide the piston back into the housing will reduce the likelihood of damage. The striker will extend through the forward hole toward the bell.

10. Use retaining-ring pliers to install the new retaining ring flat side out.



Note: The ring must seat in the groove located about 1/16" above the piston. Use the o-ring removal tool if necessary to push the ring into the groove. If the ring is bent, or does not fit tightly, replace it.



AUDI-LARM AUDIBLE ALARM

11. Apply a small amount of Christo-Lube lubricant to both ends of the spring.



12. Insert the adjusting spring into the alarm housing.



13. Insert the screw into the alarm housing and tighten about 1-1/2 turns.

14. Verify proper Audi-Larm operation by performing the required ring-up, set point, and ring-down tests specified in the Audi-Larm Audible Alarm Testing.

Note: After testing, place one drop of Loctite 222 on the adjusting screw threads.

15. Check the alarm for air leaks. See **Leak Testing- Audi-Larm P/N 10093091**).

Note: Check that the alarm bell screws are secure (see Bell section).

REASSEMBLING THE AUDI-LARM AUDIBLE ALARM TO SCBA

1. Confirm that the o-ring on the high pressure hose is undamaged and lubricated (hose P/N 804382, o-ring P/N 635037).

2. Using a 9/16" crowsfoot wrench, torque the high pressure hose into the Audi-Larm Audible Alarm 180 +/- 10 in.lbs.



AUDI-LARM AUDIBLE ALARM TESTING

MSA recommends that C.A.R.E. facilities use the upgraded Biosystems PosiChek³ SCBA Test Benches to test Audi-Larm accuracy.

Upgrades to the PosiChek³ Machine are available through Biosystems:

54-21-A12 - EP (Enhanced Precision) Upgrade Only, and
54-21-A13 - Sound Detection System Upgrade Only, and
54-21-A14 - EP and Sound Detection System Upgrade Combined.

MSA also authorizes the use of the Audi-Larm tester (P/N 10045522) to evaluate the accuracy of the Audi-Larm Audible Alarm.

⚠ WARNING

If upgrades have not been performed to the Biosystems PosiChek³ Test Bench, MSA requires C.A.R.E. facilities to use the Audi-Larm Tester (P/N 10045522) to check the accuracy of the Audi-Larm Audible Alarm during each flow test of the SCBA. Failure to follow this warning can cause Audi-Larm malfunction, resulting in serious personal injury or death.

Contact Biosystems (www.biosystems.com) for information regarding other necessary upgrades.

TROUBLESHOOTING

Trouble	Probable Cause	Remedy
Audi-Larm does not ring when pressurized.	Audi-Larm bell is loose	Install new screws and washers. Refer to PIN P/N 10041212 (Single Screw) and PIN P/N 10041213 (Dual Screw)
	Dirt or foreign matter may have affected the o-ring seals inside the Audi-Larm or the proper operation of the Audi-Larm striker.	Overhaul Audi-Larm.
	Internal Leak	Overhaul Audi-Larm.
		Overhaul Audi-Larm and replace piston.
Audi-Larm leaks	Audi-Larm insert o-ring is leaking	Try to hand tighten coupling nut further onto the cylinder valve. If this is unsuccessful, the retaining screw and o-ring may need to be replaced.
	Leakage at the pipe thread fitting	Completely leak test all fittings on the Audi-Larm assembly. Relieve pressure, and then tighten if necessary.
Audi-Larm does not fully pressurize	Cylinder pressure too low	Replace cylinder with a fully pressurized cylinder.
	Internal leak	Overhaul Audi-Larm and replace piston.
	External leak	Replace coupling nut nipple O-ring.
Audi-Larm does not start to ring within required range (23 - 27% cylinder volume)	Adjustment too high - 2216 psi Cylinder activation pressure above 595 psi - 3000 psi Cylinder activation pressure above 810 psi - 4500 psi Cylinder activation pressure above 1215 psi	To lower alarm activation pressure turn the adjusting screw counter-clockwise (out) by 1/8 turn increments. Retest the Audi-Larm between each increment.
	Adjustment too low - 2216 psi Cylinder activation pressure below 510 psi - 3000 psi Cylinder activation pressure below 690 psi - 4500 psi Cylinder activation pressure below 1035 psi	To raise alarm activation pressure turn the adjusting screw counter-clockwise (in) by 1/8 turn increments. Retest the Audi-Larm between each increment.
Audi-Larm does not ring continually all the way down to within color code mark or lower (175 psi or less)	Internal Leak	Overhaul Audi-Larm
		Overhaul Audi-Larm and replace piston.
	Rubber pellet is not flat or otherwise shows signs of excessive wear or damage.	Replace striker and pellet
	Tip of piston is scratched, knicked or shows other signs of damage.	Replace piston assembly
	Dirt or foreign matter is present in the striker bore area inside the housing.	Clean striker bore
	Dirt or foreign matter is present on the striker and face of rubber pellet or they are without lubrication.	Clean striker and face of rubber pellet then re-lubricate with Liquid Silicone Lube P/N: 494992
	Dirt or foreign matter is present in the striker port as well as the vent hole of the Audi Housing.	Clean out both ports on the housing
	Corrosion is found on the surface of the brass piston	Wipe corrosion from the brass piston

Note: If after performing the *remedy*, the Audi-Larm still does not perform properly during the Audi-Larm test, it must be replaced.

Note: Overhaul Audi-Larm using maintenance Kit P/N 10045831