

FireHawk[®] M7XT Audi-Larm[™] Audible Alarm

MAINTENANCE AND REPAIR



For More Information, call 1-877-672-3473 (MSA-FIRE) or Visit Our Website at www.MSAsafety.com

MINE SAFETY APPLIANCES COMPANY
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		
10144614-SP	Audi-Larm Audible Alarm 2216 psi, complete	
10144615-SP	Audi-Larm Audible Alarm 4500 psi, complete	
Maintenance Kit (2216 psi)		
10045831	635953	Piston Bore O-ring
	635954	Piston Nose O-ring, 2216 psi
	66395	Piston Plug O-ring
	85055	Striker Spring
	85051	Striker, 2216 psi
	85053	Pellet
	68523	Retaining Ring
Maintenance Kit (4500 psi)		
10146003	635953	Piston Bore O-ring
	633553	Piston Nose O-ring, 4500 psi
	66395	Piston Plug O-ring
	85055	Striker Spring
	10144918	Striker, Assembled
	68523	Retaining Ring
Bell Replacement Kit (4500)		
10090907	485829	Bell
	54197	Lock Washer (2 req'd)
	635245	Screw (2 req'd)
Piston Replacement Kit (2216 psi)		
10090908	635953	Piston Bore O-ring
	953954	Piston Nose O-ring, 2216 psi
	66395	Piston Plug O-ring
	85052	Piston Plug
	85049	Piston Assembly, 2216 psi
Piston Replacement Kit (4500 psi)		
10146004	635953	Piston Bore O-ring
	635553	Piston Nose O-ring, 4500 psi
	66395	Piston Plug O-ring
	85052	Piston Plug
	10144917	Piston Assembly, 4500 psi
Striker Replacement Kit (2216 psi)		
10044574	85051	Striker, 2216 psi
	85053	Pellet
Striker Replacement (4500 psi)		
10146005	10144918	Striker, Assembled, 4500 psi
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037942	Screw
	10041962	Washer
Audi-Larm O-ring Replacement Kit		
10052355-SP10	10052355	Nipple O-ring (pack of 10)

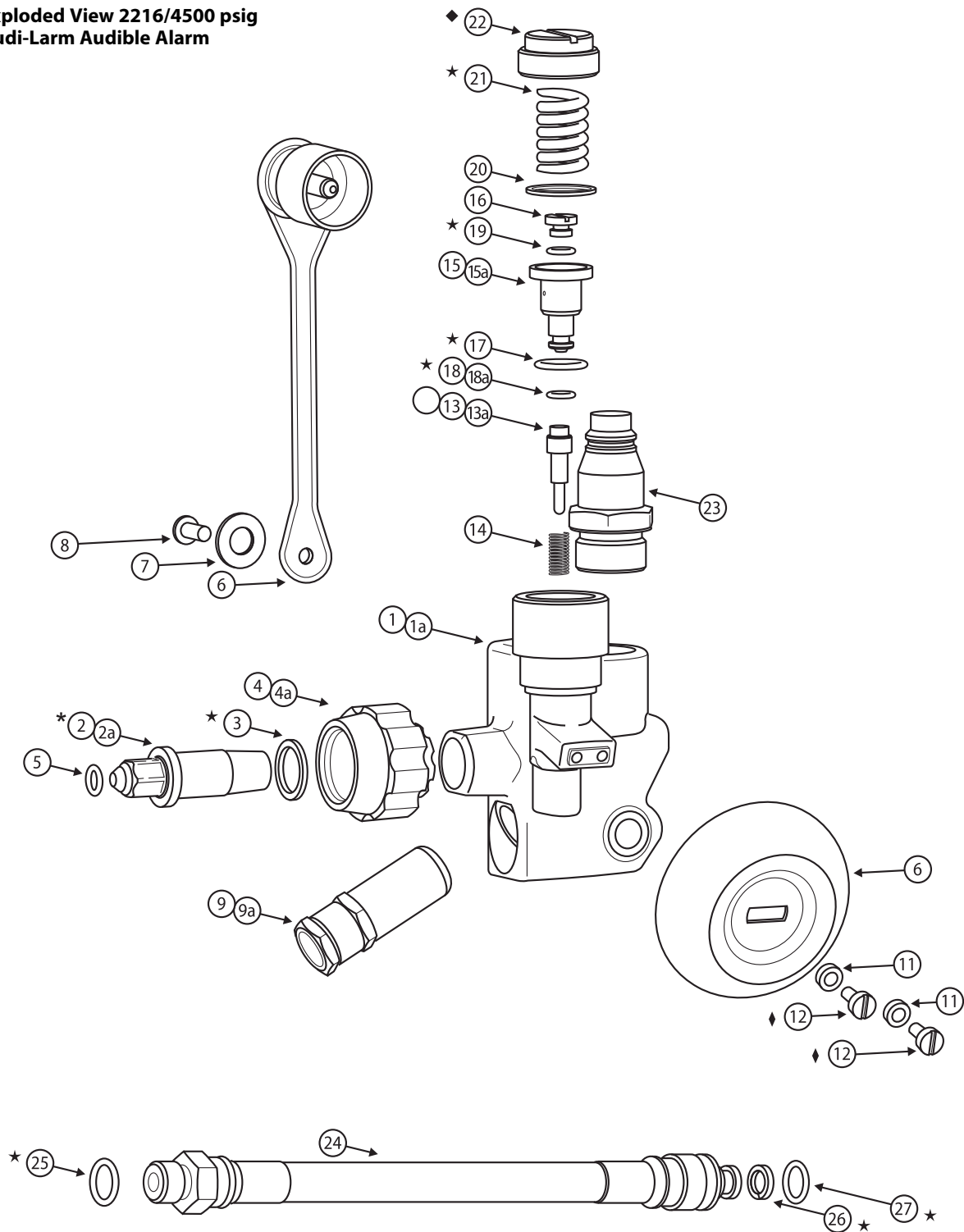
Parts List: 2216/4500 psi

Item	P / N	Description
1	10038417-SP	Audi-Larm Body, 2216 psi
1a	10144916-SP	Audi-Larm Body, 4500 psi
2	10062086	Fitting, Nipple, 2216 psi
2a	10062087	Fitting, Nipple, 4500 psi
3	93031	Washer, CGA Nut
4	10120808	Coupling Nut, 2216 psi
4a	10120809	Coupling Nut, 4500 psi
5	10052355	Nipple O-ring
6	10038031	Dust Cover Assembly
7	10041962	Washer
8	10037952	Screw
9	10036291	Pressure Relief Valve*, 4500 psi
9a	10036292	Pressure Relief Valve*, 2216 psi
10	485829	Bell
11	54197	Lock Washer (2)
12	635245	Screw, #8-32 x 7/16
13	10044574	Striker with Pellet, 2216 psi
13a	10144918	Striker with Pellet, 4500 psi
14	85055	Striker Spring
15	85049-SP	Piston Assembly, 2216 psi
15a	10144917-SP	Piston Assembly, 4500 psi
16	85052	Piston Plug
17	635953	Piston Bore O-ring
18	635954	Piston Nose O-ring, 2216 psi
18a	635553	Piston Nose O-ring, 4500 psi
19	66395	Piston Plug O-ring
20	68523	Retaining Ring
21	474352	Spring, Adjuster
22	10143901	Adjuster Nut, Black
23	485070	URC Adapter with O-ring
24	804382	High Pressure Hose*
25	635037	O-ring
26	635278	Back-up Ring
27	63198	O-ring
	809028	Christo-Lube Lubricant (2cc tube)
	28907	Teflon Tape
	29787	Loctite 222
	26875	Loctite 271
	494992	Liquid Silicone Lubricant

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

FIREHAWK M7XT AUDI-LARM AUDIBLE ALARM

Exploded View 2216/4500 psig
Audi-Larm Audible Alarm



FIREHAWK M7XT 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: The 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 the bell is damaged or loose, replace both the bell and the housing. Refer to the *Installing the Bell* section for additional details.

Removing the Dust Cover

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



Removing the Nipple O-Ring

1. Using a 1/8" hex wrench, loosen the CGATip (P/N 10124808). Set aside.



2. Remove the o-ring and discard.

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

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.

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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.

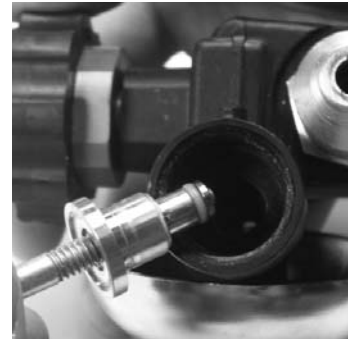
6. Screw the extraction tool (P/N 482426) into the back of the piston.



⚠ CAUTION

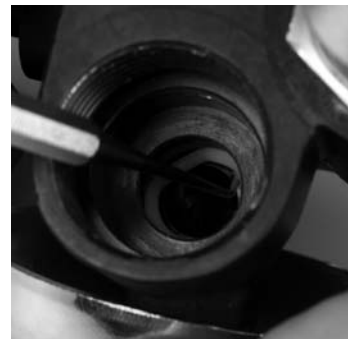
Be careful not to damage the piston valve seat on the opposite end of the piston.

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.

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Removing the Relief Valve

⚠ CAUTION

If label on relief valve is missing or damaged, install a new relief valve.

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



2. Discard the o-ring.

⚠ CAUTION

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

Removing the URC Coupling

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.

REASSEMBLING THE AUDI-LARM AUDIBLE ALARM

Reassembling the Coupling Nut and Nipple

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

1. Reinstall the CGA Nipple and Coupling Nut

- a. Apply Teflon tape to the nipple thread.



- b. Apply a skim coat of Christo-Lube lubricant to the tape.

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 o-ring in the groove.
2. Begin to thread the CGA tip onto the CGA stem.

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2. Using a 1/8" hex wrench, tighten the tip until threads bottom out.



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

Installing the Dust Cover

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 the air mask passes annual and monthly tightness and function tests. See P/N10145950, FireHawk® M7XT Air Mask Maintenance and Repair 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 hand-tighten. Be careful not to cross-thread the relief valve.

4. Using a torque wrench and 1 1/16" socket tighten to 200-250 in. lbs.



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Reassembling the Audi-Larm Audible Alarm

Audi-Larm Audible Alarm Maintenance Kits

2216 psi P/N 10045831

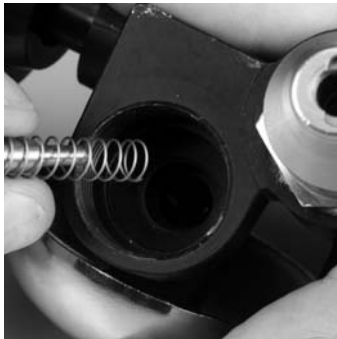
4500 psi P/N 10146003

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.

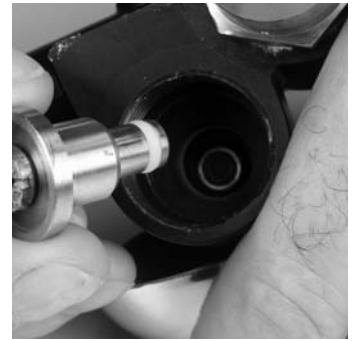
5. Ensure that the striker extends through the hole and can touch the bell.
6. Install new o-rings on the piston and the piston plug.



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.



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

12. Insert the adjusting spring into the alarm housing.



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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).

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.

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 insert 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 start to ring within required range (33-37% cylinder volume)	Adjustment too high. - 2216 psi Cylinder activation pressure above 830 psi - 4500 psi Cylinder activation pressure above 1680 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 740 psi - 4500 psi Cylinder activation pressure below 1520 psi.	To raise alarm activation pressure turn the adjusting screw 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 (225 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 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-Larm 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.