



UNITROL

A Unit of Federal Signal

INSTALLATION

Omega 90 Amplifier



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LIMITED WARRANTY

FS UNITROL, a unit of Federal Signal Corporation, warrants each new product to be free from defects in material and workmanship under normal use and service for a period of five year on parts replacements and one year labor from the date of purchase.

During this warranty period, the obligation of UNITROL is limited to repairing or replacing, as UNITROL may elect, any part or parts of such products which, after examination by Unitrol, is found to be defective in material and/or workmanship.

UNITROL will warrant any unit that is delivered, prepaid, to the UNITROL factory or designated authorized warranty service center for examination within the warranty period. If such examination reveals a defect in material and/or workmanship, UNITROL will complete the necessary repairs under warranty.

This warranty does not cover travel expenses, the cost of specialized equipment for gaining access to the product, or labor charges for removal and re-installation of the product. Lamps, flash tubes or batteries are not covered under warranty.

Warranty will not be extended to any unit that has been subjected to abuse, misuse, improper installation, or to one that has been inadequately maintained. Warranty does not apply to units that have problems relating to service or modification at any facility other than the UNITROL factory or authorized warranty service centers.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL UNITROL BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIAL OR WORKMANSHIP.

Section I: GENERAL INFORMATION

1: UNIVERSAL USE

The Omega 90 Amplifier can be used fleet-wide wherever a high-powered 12-volt siren or siren/p.a. system is required. The only restriction is that it must be installed in a water-free area. It can be controlled by a simple pushbutton switch, any Omega Controller or any arrangement of separate switches.

2: TRANSISTORS

Output transistors are electronically monitored to prevent damage in the event of short circuit speakers or speaker wiring ... a common problem that causes other electronic sirens to blow out or stop working. Omega protects itself under such conditions and automatically resumes operation when the problem is corrected. No re-setting procedures are required.

3: SOUNDS

MANUAL SOUNDS: The siren can be operated manually by pressing and releasing a momentary switch (pushbutton switch or vehicle horn ring). An additional momentary switch can operate the electronic Air Horn.

PRIMARY SOUNDS: WAIL, YELP and CHC (Choice) are automatic Primary Sounds. CHC is factory set for WAIL but can be changed to another sound as described on Page 3.

SECOND SOUNDS: A second sound occurs when a momentary switch (pushbutton switch or vehicle horn ring) is pressed during any Primary sound. The Second Sound operates for approximately 8 seconds before the siren automatically returns to Primary sound. Combinations are:

WAIL - YELP	Hetro - WAIL
YELP - Futura (fast YELP) or WAIL	Futura - WAIL
Hi-Lo -Hetro (fast Hi-Lo)	

SWEEP: Any Primary sound can be changed to continuous bursts of multiple sounds with a tap of a momentary switch (pushbutton switch or vehicle horn ring). This patented process lets operators keep both hands on the steering wheel while getting maximum effectiveness from their siren. Up to 7 sounds can be produced as described on Page 3.

The SWEEP process is factory set to stop by pressing the same switch a second time. It can be reset to stop automatically after completing one cycle of selected sounds.

NOTE: The quantity and types of sounds your system will actually produce depends on the Controller used with the Amplifier and sound selections made within the Amplifier.

4: ALARM

A special siren loud tone is built into the amplifier to serve as a burglar or high temperature alarm. Activated by existing door and trunk switches, the alarm tone occurs when an unauthorized person opens a door or trunk.

In a K9 carrier, a heat sensing switch can activate the alarm and alert the driver that interior temperature has reached 100 degrees F.

5: PUBLIC ADDRESS

The Amplifier accepts audio from any high output source such as an amplified microphone, two-way radio or tape recorder. Connections are made at the Omega Controller where connectors have been installed for models facilitating P.A. features. Loudness of public address functions is regulated as described in section 5.

6: TROUBLE SHOOTING

If the Amplifier fails to produce sounds over the siren speaker:

- Remove one speaker wire from the power plug
- Operate any primary sound
- Carefully listen for sound coming from the transformer inside the amplifier.

If sound can be heard from the transformer, a problem exists with the speaker or speaker wiring. If no sound can be heard, a problem exists in the amplifier, controller or cabling.

Except for reverse polarity connection of Primary wires, it is highly unlikely that the internal fuse will blow. However, if no other cause of "no sound" can be determined, check the fuse.

- The fuse is located on back of front circuit board, left side (see illustration on front cover). If necessary, replace with AGA type, 20 ampere rated fuse.

7: ASSISTANCE

Technical help is available by phone 8:00 AM to 4:30 PM *Pacific Standard Time*, Monday through Friday except holidays. 1(800) 854-3375 is toll free within the continental United States and Canada. Phone (714) 871-3336 from other areas.

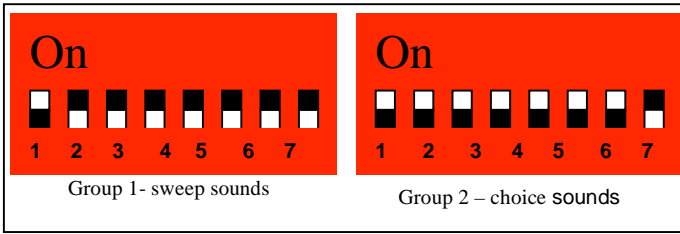
If it is necessary to return an amplifier, please observe this procedure:

- Pack to prevent damage in transit.
- Include brief description of problem.
- Include name and phone numbers of a person who can be contacted in the event bench tests do not reveal problem experienced in vehicle.

Section II: CHANGING PRE-SET SOUNDS

1: SWITCHES

The sounds can be changed by removing the outer cabinet. Selector switches are accessible from the Amplifier's left side, underside the top circuit board.



(Shown in the factory setting positions)

2: YELP SECOND SOUND

In areas where only WAIL and YELP sounds are permitted, the second sound of YELP (Futura) can be changed to WAIL. Locate switch # 1 in group 2 and set it ON.

3: CHOICE

The choice sound is set for WAIL at the factory (switch 8, group 2). If you wish to change it, first put switch 8, group 2 to OFF then choose one of the following and turn it ON:

- | | |
|-------------|-------------------------|
| Hi-Lo | switch 7, group 2 |
| Hetro | switch 6, group 2 |
| Futura | switch 5, group 2 |
| Ultra Hi-Lo | switch 4 and 7, group 2 |

4: SWEEP STYLE

SWEEP is set to start and stop manually by pressing a momentary switch. It may instead stop automatically after completing one cycle of the selected sounds by setting switch 3, group 2 ON.

5: SWEEP SOUNDS

SWEEP sounds are selected with group 1, switches 2 through 8. Factory settings allow all sounds to be swept. Sounds can be deleted by setting switches OFF.

- | | | | |
|--------|----------|----------|----------|
| WAIL | switch 2 | HETRO | switch 5 |
| YELP | switch 3 | AIRHORN | switch 6 |
| Hi-Lo* | switch 4 | ALARM | switch 7 |
| | FUTURA | switch 8 | |

Switch 1, group 1 must remain off unless instructions in an Omega Controller Manual directs you to turn it on.

*For 4- Tone Hi-Lo switch 4 in a group 2 ON.

6: USING 2 AMPLIFIERS

Endless sound possibilities can be achieved when 2 amplifiers are installed. The brute power of up to 400 watts and the effects of 2 sounds beating against each other introduce new and more effective siren penetration.

Unless you prefer both sirens to produce maximum sounds, it is recommended that Amplifier #1 is set for maximum sounds and Amplifier #2 is set for WAIL and YELP only.

Siren #2 will then emit only the standard WAIL and YELP sounds while Siren #1 emits the maximum sounds.

Mark one amplifier "#2" on the faceplate and make these changes:

Set only these switches ON:

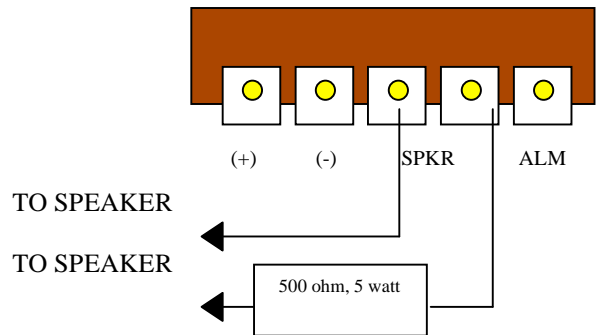
- Switch 2, group 1
- Switch 3, group 1
- Switch 1, group 2
- Switch 2, group 2
- Switch 8, group 2

Set all other switches to the OFF position.

7: SIREN QUIETING

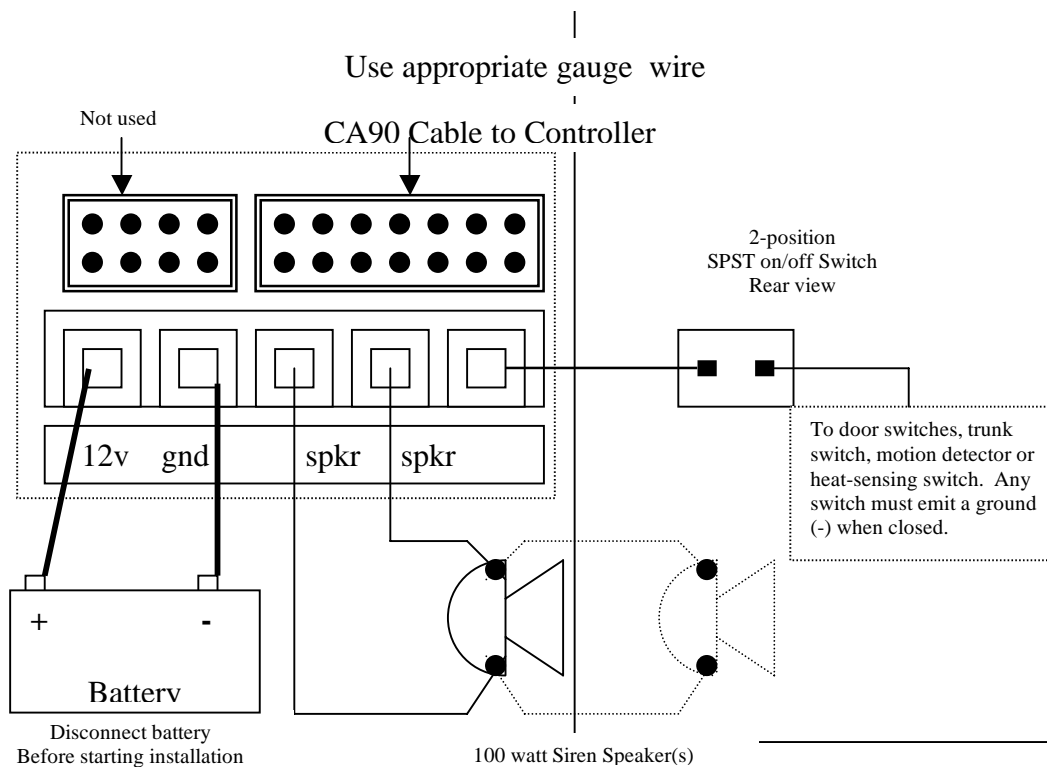
To protect your hearing as well as the hearing of those around you, reduce the siren loudness while testing. For in-vehicle testing, place a 500 ohm, 5watt resistor in-line with one speaker wire as shown in the diagram below. The resistor is available in most electronic parts stores.

For bench testing, install the 500 ohm, 5 watt resistor in-line with one wire of a small cone speaker. Speaker power rating can be 2 to 5 watts. Speaker impedance is relatively unimportant: 4 to 100 ohms.



Section III: INSTALLATION ONE (1) AMPLIFIER

Use with Any Switch or Omega Controller



1: MOUNTING

Mount amplifier in any water-free location using 1/4-20 bolts supplied. If other bolts are used, they must not enter cabinet beyond 1".

2: POWER PLUG

Follow diagram. Secure wires in power plug with set screws above each wire opening.

- a) If battery is not disconnected, a brief electrical flash can occur when the second primary wire is connected. The flash indicates Normal charge surge of components.
- b) Reverse polarity connections. Fuse inside cabinet on left front circuit board may have blown. Inspect and replace if necessary.

Connect speaker(s) as shown.

3: ALARM

A special siren-loud tone is produced 8-seconds after the ALM terminal is grounded. It can warn that: a door or trunk has been opened, or (when used in conjunction with the "UTAS") that the interior of a K-9 unit has reached 100 degrees.

Closing the door or trunk within 8 seconds prevents operation of the alarm. This allows for normal vehicle exit and entry when system is armed.

Existing door switches, trunk switch or motion-detector and/or heat sensing switch (Unitrol part number "UTAS") can be used for triggering the alarm. Any switch must emit a ground (-) when activated.

CAUTION: Interconnection of a heat-sensing switch or motion-detector with door and trunk switches will cause unwanted operation of interior lights. Contact factory for diode placement instructions.

4: ALARM CONNECTIONS

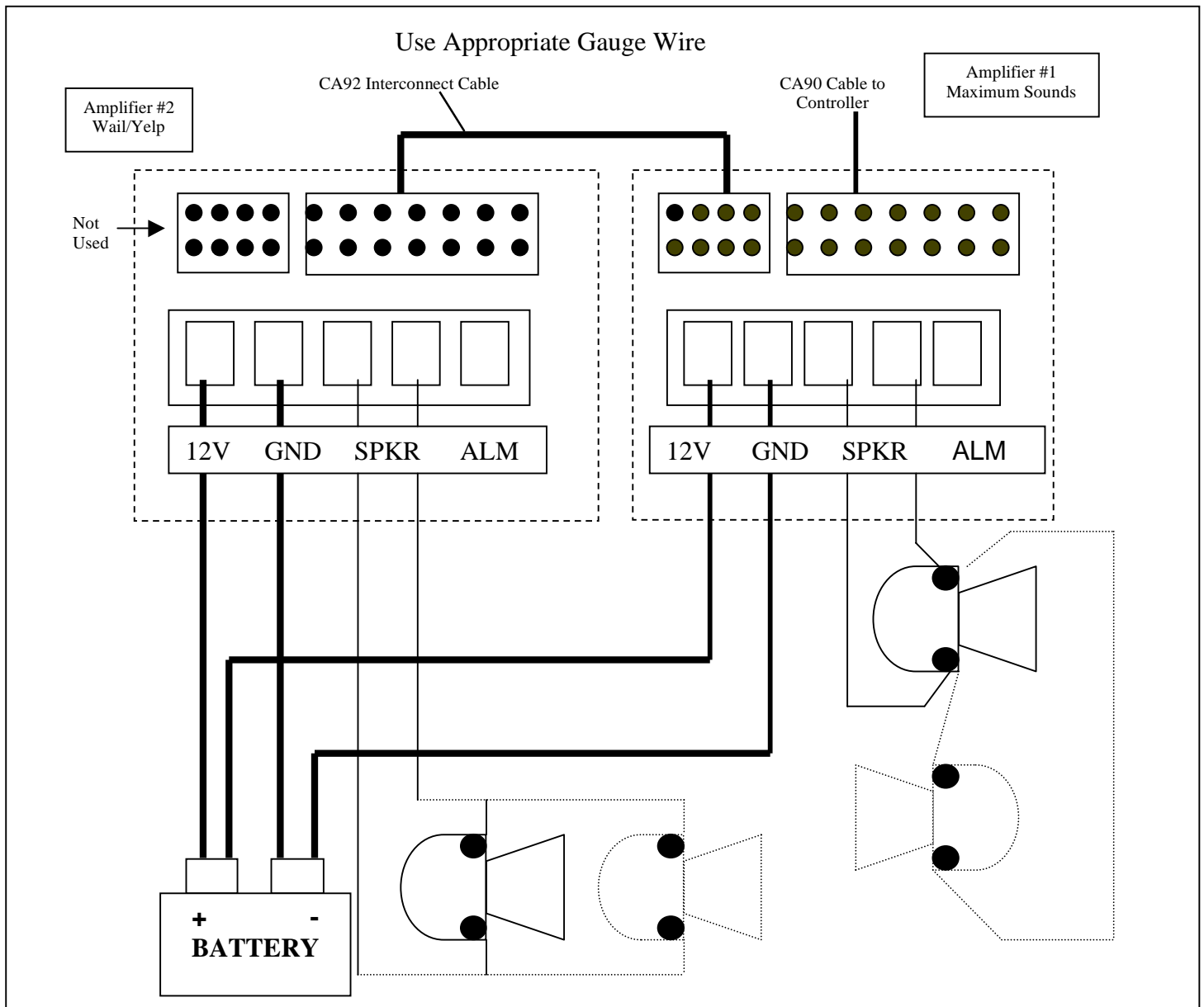
- a) Install a single-pole/single throw system-arming switch. See note below.
- b) Connect one switch terminal (either one) to ALM terminal on the amplifier
- c) Connect remaining switch terminal to door switches, trunk switch and/or a motion detector.
- d) Install Unitrol "UTAS" heat sensing switch in any a/c duct closely behind duct opening. Connect one wire to vehicle chassis (-). Connect the other to the terminal arming switch.

NOTE: A separate switch is not necessarily needed if installing an Omega 8000 Controller. Any numbered switch can be used as an arming switch when connected as follows:

- a) Connect "N.O." of numbered switch to ALM terminal.
- b) Connect "ARM" of same switch to common wire of your activation switch.

Section IV: INSTALLATION TWO (2) AMPLIFIERS

No Changes required in Controller



1: PRELIMINARY RE-SETTING

See Page 3, Item 6 for recommended re-setting procedures of amplifier #2.

2: MOUNTING

Install in water-free area up to 2 ½ feet apart.
Do not use side bolts that enter the cabinet beyond 1"

3: CONNECTIONS

Secure wires in Power Plug with set screws above wire openings. Use Minimum wire sizes indicated.

CAUTION – The sources of Primary wires Must connect exactly to the same point.

Example: The source for Bat (+) terminals of amplifier # 1 and # 2 must be connected to the same point.

Failure to observe this precaution will result in erratic siren performance of either or both amplifiers and/ or noise over the siren speaker during public address functions.

4: SPEAKER WIRES

Only 2 wires (such as the 2 speaker wires coming from the lightbar) are necessary for connecting up to 4 speakers. Connect the speakers to the amplifiers as shown in the above diagram.

5: BURGLAR/HEAT ALARM

If the ALARM feature is to be used, connect ALM terminal as described on page 4, section 4.

Section V: ADJUSTING P.A. LOUDNESS

1: GENERAL

The primary purpose of the Gain Control is to set proper microphone loudness after the system is installed and battery connected.

- a) Loudness of the other audio source is established with the source volume control or Radio Gain control built into the series 5000 through 9000 Omega Controllers.

2: MICROPHONE LOUDNESS

With a louder than average voice, make a mic test count while increasing Amplifier gain (rotate clockwise). Rotate until squeal occurs then rotate slightly counter clockwise until squeal stops.

- a) Repeat test while standing outside the vehicle (not necessary when installing Series 8000 or 9000 Omega Controllers).

3: RADIO/TAPE LOUDNESS

Loudness of amplified calls or recorded tape must always be established with the radio or recorder volume control.

Additional gain control in Series 5000 through 9000 Omega Controllers enables you to balance loudness of the audio source with the loudness of the microphone.

Omega sirens are made under U.S. Patents 4,040,050 (Second-Sounds), 4,980,837 (Sweep) and other Patents Pending.

Unitrol, Ultra-Hi-LO, Hetro, and Sweep are Federal Signal Corporation registered trademarks.

SECTION VI

SAFETY MESSAGE TO OPERATORS OF UNITROL ELECTRONIC SIRENS AND LIGHT/SOUND SYSTEMS

WARNING

The lives of people depend on your operation of UNITROL products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

Qualifications

- To properly use a light system you must have a good understanding of general vehicle operation, a high proficiency in the use of safety warning equipment and thorough knowledge of State and Federal *UNIFORM TRAFFIC CODES*.

Sound Hazards

- Your hearing, and the hearing of others in or close to your emergency vehicle could be damaged by loud sounds. This can occur from short exposures to very loud sounds or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to Federal, State or local recommendations. **OSHA Standard 1910.95** offers guidance on *“Permissible Noise Exposure.”*
- All effective sirens and horns produce loud sounds which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

Sound Limitations

- Maximum sound output will be severely reduced if any objects are in front of the speaker. If your installation has obstructions in front of the speaker, drive even more cautiously.
- Frequently inspect the speaker to ensure that it is clear of any obstruction such as mud or snow, which will reduce maximum sound output.

Signaling Limitations

- Be aware that the use of your visual and audible signaling devices do not give you the right to force your way through traffic. Your emergency lights, siren and actions are **REQUESTING** the right-of-way.
- Although your warning system is operating properly, it may not alert everyone. People may not hear, see or heed your warning signal. You must recognize this fact and continue driving cautiously.
- Situations may occur which obstruct your warning signal when natural or man-made objects are between your vehicle and others, such as when you raise your hood or trunk lid. If these situations occur, be especially careful.

Driving Limitations

- At the start of your shift, you should ensure that the warning system is securely attached to the vehicle and operating properly.
- If the unique combination of emergency vehicle equipment installed in your vehicle has resulted in the light/siren controls being installed in a position that does not allow you to operate them by touch only, **OPERATE CONTROLS ONLY WHILE YOUR VEHICLE IS STOPPED.**
- If driving conditions require your full attention, you should avoid operating the light/siren controls while the vehicle is in motion.

Continuing Education

- File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees.

Failure to follow these safety precautions may result in property damage, serious injury, death to you, your passengers or to others.

SECTION VII SAFETY MESSAGE TO INSTALLERS OF ELECTRONIC SIRENS

WARNING

- The lives of people depend on your safe installation and servicing of UNITROL products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

Before Installation:

Qualifications

- To properly install an electronic siren you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and service of safety warning equipment.

Sound Hazards

- Your hearing and the hearing of others, in or close to your emergency vehicle, could be damaged by loud sounds. This can occur from short exposures to moderately loud sounds. For hearing conservation guidance, refer to federal, state, or local recommendations. **OSHA Standard 1910.95** offers guidance on “Permissible Noise Exposure.”
- All effective sirens and horns produce loud sounds, which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

During Installation

- **DO NOT** connect this system to the vehicle battery until **ALL** other electrical connections are made, mounting of all components is complete, and you have verified that no shorts exists.
- Be sure the siren amplifier and speaker(s) in your installation have compatible wattage ratings.

In order for the electronic siren to function properly, the ground connection must be made to a solid chassis component and not to an insulated point.

- Sound output will be severely reduced if any objects are in front of this speaker. If maximum sound output is required for your application, you should ensure that the front of the speaker is clear of any obstruction.
- Install the speaker(s) in a location, which provides maximum signaling effectiveness and minimizes the sound reaching the vehicle’s occupants.
- Installation of two speakers requires wiring speakers in phase.
- **DO NOT** install equipment or route wiring or cord in the deployment path of an air bag.
- Locate the control head so the vehicle, controls, and microphone can be operated safely.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.
- If wiring is shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or flying molten metal.

After Installation

- After installation, test the electronic siren, speaker system, and light system to ensure that it is operating properly.
- Test all vehicle functions, including horn operation and vehicle light systems, to ensure proper operation.
- After testing is complete, provide a copy of these instructions to the instructional staff and all operating personnel.
- File these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.