

PRICE \$4.00



MODEL PA400SS

ELECTRONIC SIREN



INSTALLATION AND OPERATION INSTRUCTIONS

LIMITED WARRANTY

The Signal Division, Federal Signal Corporation (Federal), warrants each new product to be free from defects in material and workmanship, under normal use and service, for a period of two years on parts replacement and one year on labor from the date of delivery to the first user-purchaser.

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

Federal will provide warranty for any unit which is delivered, transported prepaid, to the Federal factory or designated authorized warranty service center for examination and such examination reveals a defect in material and/or workmanship.

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.

This warranty does not extend to any unit which has been subjected to abuse, misuse, improper installation or which has been inadequately maintained, nor to units which have problems relating to service or modification at any facility other than the Federal 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 FEDERAL BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIAL OR WORKMANSHIP.



FEDERAL SIGNAL CORPORATION
Emergency Products

SECTION I

GENERAL DESCRIPTION



Figure 1-1. Model PA400SS.

The Federal Model PA400SS (figure 1-1) is a precision built, efficient and economical full-featured electronic siren and light control system of advanced design. The siren provides wail, yelp, and priority siren tones as well as the Tap II feature, public address (PA), radio rebroadcast and an air horn sound.

On-board relays in the unit allow centralized control and wiring of primary, secondary and alley lights, and auxiliary circuits with lighted, front mounted switches. A convenient four-position Mode slide switch allows simplified and rapid selection of most common siren and lighting functions and changes the horn ring function accordingly to provide the Tap II feature.

The unit may be installed in negative ground vehicles with 12-volt electrical systems. The siren circuits are protected against failure modes by a user-replaceable fuse. Relay outputs are protected by user-supplied fuses. No components protrude from the bottom of the siren to interfere with mounting arrangements.

A noise-cancelling microphone is wired-in to prevent loss or theft. It provides high quality voice reproduction without feedback "squeal". The microphone push-to-talk switch overrides any siren signal for instant PA use. PA volume is adjustable by means of a front panel VOLUME control.

The PA400SS is designed to drive one or two 11-ohm impedance, high power (100W) speakers. When two speakers are used, they must be connected in parallel and in phase.

The Tap II feature allows the driver to change the siren sound from wail to yelp, yelp to priority, and priority to air horn via the vehicle's horn ring. Tap II provides especially effective traffic clearing capability. In addition to Tap II, additional alternate sounds can be activated in two other selector switch positions by depressing and holding the horn ring for as long as the alternate sound is desired. The charts in Section IV of this manual illustrate the operation of these features more fully.

To reduce standby power consumption and instantaneous surge noise, the PA400SS remains powered "on" for approximately 45-seconds after switching to the "OFF" position as follows: paddle switch released, lever switch in the "OFF" position, or the rotary switch in the "MANUAL" position.

Other special features include:

- High degree of reliability is achieved through the use of integrated circuits and silicon output transistors.
- Control panel is illuminated with non-glare backlighting.
- Newly designed printed circuit boards provide improved performance and durability under a wide range of environmental conditions.
- Park-Siren Deactivator can deactivate siren tones when the vehicle is shifted into PARK.

SECTION II

SPECIFICATIONS

Input Voltage	11 Vdc to 16 Vdc
Polarity	Negative ground electrical systems only
Standby Current	7mA
Operating Current (Amplifier)	8A (at 13.6V with 11-ohm load) 14A (at 13.6V with 5.5-ohm load)
Frequency Range	725 to 1600 Hz (nominal).
Cycle Rate	Wail- 14 cycles/min. Yelp- 180 cycles/min.
Voltage Output (approx.)	64V peak-to-peak
Audio Frequency Response	300 to 3000Hz \pm 3dB
Harmonic Audio Distortion	10% max. all power levels from 1/2 to 50 watts (300-3000Hz)
Operating Temperature Range	-30°C to +65°C
Dimensions (HWD)	2.965" x 6.125" x 7.42"
Net Weight	6.0 lbs.
Shipping Weight (approx.)	7.5 lbs.
Current Ratings	
Slide Switch Outputs	50A Combined Total
Mode 1	30A
Mode 2	30A
Mode 3	30A
Pushbutton Switch Outputs	30A Combined Total
A-F	20A Each

SECTION III INSTALLATION

SAFETY MESSAGE TO INSTALLERS OF ELECTRONIC SIRENS

WARNING

The lives of people depend on your proper installation and servicing of Federal 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. Always refer to the vehicle's service manuals when performing equipment installations on a vehicle.

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 (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.
- Federal Signal siren amplifiers and speakers are designed to work together as a system. Combining a siren and speaker from different manufacturers may reduce the warning effectiveness of the siren system and may damage the components. You should verify or test your combination to make sure the system works together properly and meets federal, state and local standards or guidelines.

During Installation

- DO NOT get metal shavings inside the product. Metal shavings in the product can cause the system to fail. If drilling must be done near the unit, place an ESD approved cover over the unit to prevent metal shavings from entering the unit. Inspect the unit after mounting to be sure there are no shavings present in or near the unit.
- 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 exist. If wiring is shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or flying molten metal.
- 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 the NEGATIVE battery terminal.

- Sound output will be severely reduced if any objects are in front of the speaker. If maximum sound output is required for your application, you should ensure that the front of the speaker is clear of any obstructions.
- Install the speaker(s) as far forward on the vehicle as possible, in a location which provides maximum signaling effectiveness and minimizes the sound reaching the vehicle's occupants. Refer to the National Institute of Justice guide 500-00 for further information.
- Mounting the speakers behind the grille will reduce the sound output and warning effectiveness of the siren system. Before mounting speakers behind the grille, make sure the vehicle operators are trained and understand that this type of installation is less effective for warning others.
- Sound propagation and warning effectiveness will be severely reduced if the speaker is not facing forward. Carefully follow the installation instructions and always install the speaker with the projector facing forward.
- DO NOT install the speaker(s) or route the speaker wires where they may interfere with the operation of air bag sensors.
- Installation of two speakers requires wiring speakers in phase.
- Never attempt to install aftermarket equipment, which connects to the vehicle wiring, without reviewing a vehicle wiring diagram - available from the vehicle manufacturer. Insure that your installation will not affect vehicle operation and safety functions or circuits. Always check vehicle for proper operation after installation.
- 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.

After Installation

- After installation, test the siren system and light system to ensure that it is operating properly.
- Test all vehicle functions, including horn operation, vehicle safety functions and vehicle light systems, to ensure proper operation. Ensure that installation has not affected vehicle operation or changed any vehicle safety function or circuit.
- 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.

3-1. UNPACKING.

After unpacking the Model PA400SS, examine it for damage that may have occurred in transit. If the equipment has been damaged, file a claim immediately with the carrier stating the extent of damage. Carefully check all envelopes shipping labels and tags before removing or destroying them.

3-2. MOUNTING BRACKET.

WARNING

When installing equipment inside air bag equipped vehicles, the installer **MUST** ensure that the equipment is installed **ONLY** in areas recommended by the vehicle manufacturer.

Failure to observe this warning will reduce the effectiveness of the air bag, damage the air bag, or potentially damage or dislodge the equipment, causing serious injury or death to you or others.

The unit comes equipped with a swinging bracket which enables it to be mounted in variety of positions. Positioning the bracket above the unit allows mounting to the underside of a surface. Positioning the bracket below the unit will permit mounting on any horizontal surface.

The unit should be mounted in a position that is both comfortable and convenient to the operator. The mounting position must allow the vehicle, controls, and microphone to be operated safely at all times. Keep visibility and accessibility of controls in mind. To install the unit using the bracket, determine the mounting location and proceed as follows (see figure 3-1).

CAUTION

The unit must be installed in an adequately ventilated area. Never install near heater ducts.

A. Use the mounting bracket as a template and scribe two drill positioning marks at the selected mounting location.

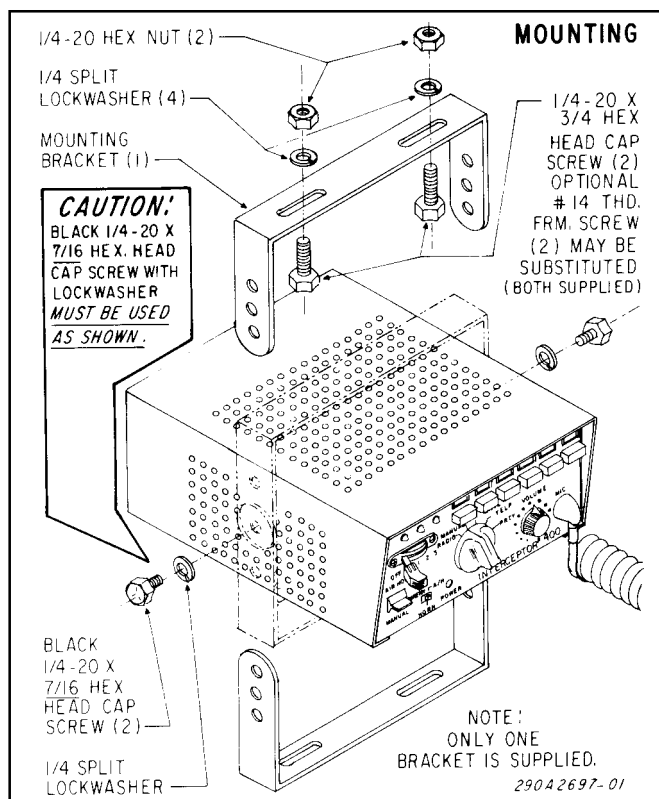


Figure 3-1. Mounting Bracket Installation.

CAUTION

Before drilling holes in ANY part of a vehicle, be sure that both sides of the mounting surface are clear of parts that could be damaged; such as brake lines, electrical wiring or other vital parts.

B. Drill two 1/4-inch diameter holes at the position marks.

C. Secure the mounting bracket to the surface with (2 each) 1/4-20 x 3/4 hex head screws, 1/4 split lockwashers and 1/4-20 hex nuts as shown in figure 3-1. The unit will be secured to the mounting bracket after wiring is completed.

3-3. ELECTRICAL INSTALLATION.

A. Siren Connections.

The unit is supplied with an eleven-position connector to perform the electrical installation. User-supplied 12-gauge red and black wires are required

for the positive (+) and ground (-) connections. User supplied 18-gauge wires are required for the speaker, radio, horn switch, park switch, backlighting, and case ground connections.

To install a wire in the eleven-position connector, strip 1/4" of insulation from the end of the wire. Then insert the wire into the connector and tighten the screw at the appropriate connector position.

1. Speaker.

The unit is designed to operate with one 11-ohm impedance speaker (100W) or two 11-ohm impedance speakers (100W) connected in parallel and in phase. On FEDERAL speakers, this can be accomplished by connecting the two speaker leads marked "1" to the SPEAKER COMMON connector position and the two speaker leads marked "2" to the SPEAKER OUTPUT connector position. See figures 3-2 and 3-3.

NOTE

If desired, the PA400SS can be modified at the factory to operate with 58W speakers.

Using 18 gauge wire, connect the speaker leads to positions 1 and 2 of the eleven-position connector as shown in figures 3-2 and 3-3.

2. Radio.

See figures 3-2 and 3-3. To allow incoming radio messages to be rebroadcast over the outside speakers, connect user-supplied 18 gauge wires to positions 3 and 4 of the eleven-position connector. Connect the other end of the 18 gauge wires across the two-way radio's speaker.

3. Horn Ring.

CAUTION

The horn ring transfer circuit of the siren is capable of switching a maximum of 10-amperes.

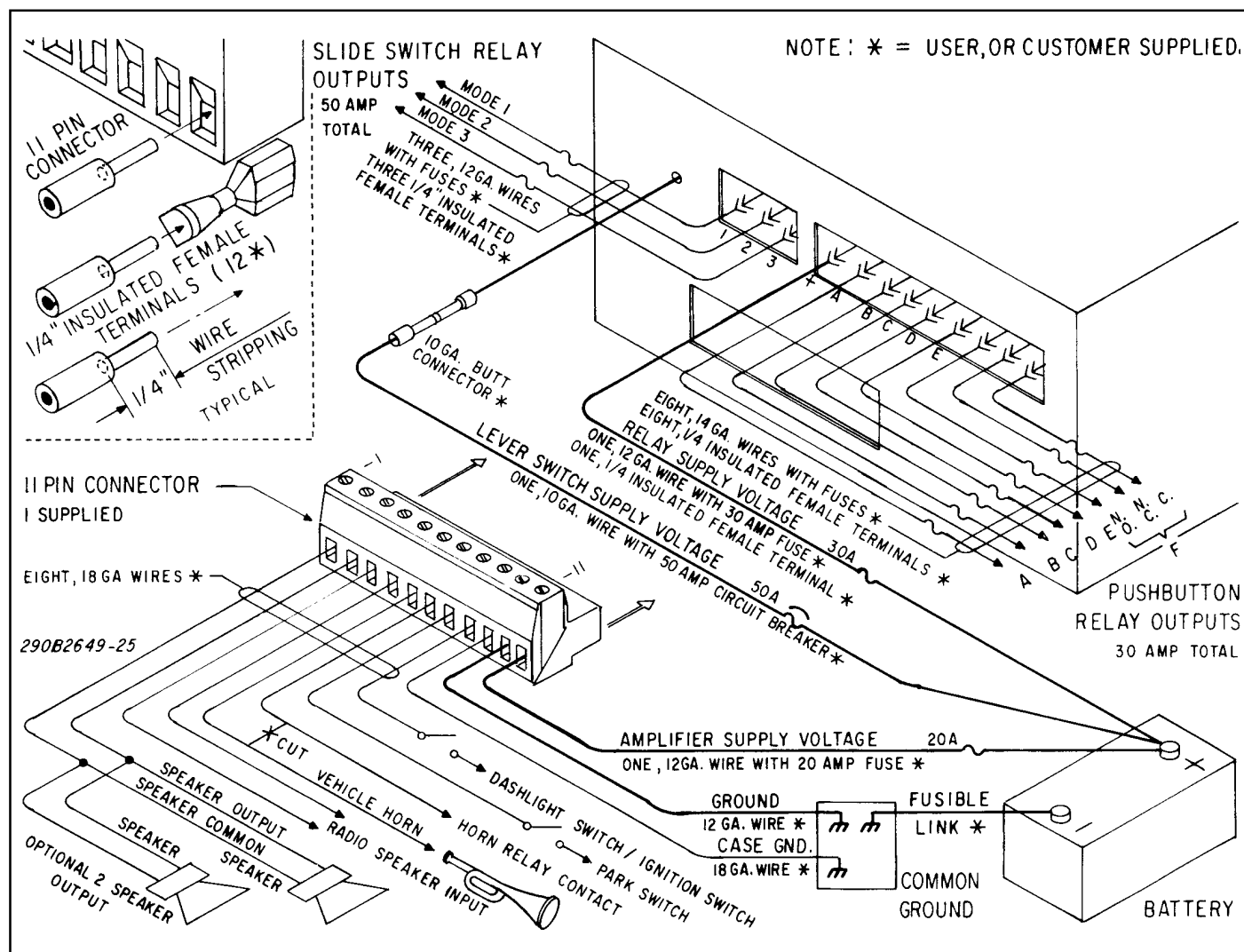


Figure 3-2. PA400SS Wiring.

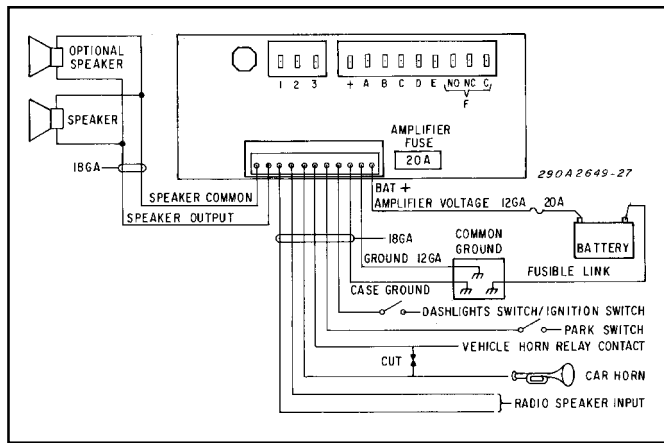


Figure 3-3. PA400SS Siren Connections.

In order to utilize the Tap II and Press-and-Hold features of the siren, the following procedure must be performed.

- Locate the wire that connects the vehicle horn relay to the horn. Cut this wire.
- See figures 3-2 and 3-3. Connect a user-supplied 18 gauge wire to position 5 of the eleven-position connector. Connect the other end of the wire to the horn side of the cut wire. Insulate the connection with a wire nut.
- See figures 3-2 and 3-3. Connect a user-supplied 18 gauge wire to position 6 of the eleven-position connector. Connect the other end of the wire to the horn relay side of the cut wire. Insulate the connection with a wire nut.

4. Park-Siren Deactivator.

IMPORTANT

It is the installer's responsibility to determine an appropriate location in the vehicle circuitry to connect this wire.

This feature automatically deactivates siren tones when the vehicle is shifted into PARK.

See figures 3-2 and 3-3. To use this feature, connect a user-supplied 18 gauge wire to position 7 of the eleven-position connector. Connect the other end of the wire to a vehicle circuit that is GROUNDED when the vehicle is shifted into PARK.

5. Backlighting.

- Connect a user-supplied 18 gauge wire to position 8 of the eleven-position connector.

- Connect the other end of the wire to a vehicle circuit that is powered when the ignition switch is "on". If backlighting dimming is desired, connect the other end of the wire to the dash lights' circuit.

6. Power Source Connections.

The PA400SS can operate from any 12-volt negative ground vehicle electrical system. Power for the unit can be obtained from the vehicle's power distribution center or directly from the vehicle battery. If power is going to be obtained directly from the vehicle battery, drill a hole in the vehicle firewall for the power lead to enter the engine compartment. Place a grommet or similar device in the hole to protect the wire against damage from rough edges.

Using figures 3-2 and 3-3 as a guide, proceed as follows:

CAUTION

Before drilling holes in ANY part of the vehicle, ensure that both sides of the surface are clear of parts that could be damaged; such as brake lines, fuel lines, electrical wiring or other vital parts.

- Connect a user-supplied 18 gauge green wire to position 9 (case ground) of the eleven-position connector. Connect the other end of the wire to the vehicle chassis as close as practical to the unit. Scrape paint away from the selected bolt hole to ensure a good electrical connection to the chassis.
- Connect a user-supplied 12 gauge black wire to position 10 of the eleven-position connector. Connect the other end of the wire to a common ground, located near the vehicle battery, that is connected directly to the negative battery terminal.

CAUTION

Damage to unit will occur if not properly fused. Ensure that an in-line fuse (20A) and fuseholder are installed in the red wire connected to position 11 of the eleven-position connector.

- Connect a user-supplied 12 gauge red wire to position 11 of the eleven-position connector. Route the wire toward the power source. To protect the wire, use an in-line fuseholder and 20-ampere fuse (not supplied). The fuseholder should be installed as close as practical to the power source. Do not connect to the power source at this time.

B. *Light Bar and Auxiliary Light Connections*
(see figures 3-2 and 3-4).

IMPORTANT

The total combined current requirement for outputs 1 through 3 must not exceed 50-amperes. Also, the total combined current requirement for outputs A through F must not exceed 30-amperes.

The PA400SS provides connections for control of light bars, auxiliary lights and accessories. A total of nine relay-controlled outputs are available.

Each output switches a nominal +12-volts to the controlled device. DO NOT use the PA400SS ground circuit to ground the switched device(s). Ground each switched device SEPARATELY.

Refer to the installation instructions provided with the light bar or auxiliary light for additional precautions and details.

When connecting light bar or auxiliary light wires to the PA400SS, each wire must be terminated with an appropriate 1/4" female, insulated, quick-connect terminal. Complete the wiring to the light bar or accessories as follows:

1. Using a user-supplied butt connector, connect a 10 gauge red wire to the 10 gauge red wire that exits the unit. Since this wire provides the power source for all switched lighting functions, good mechanical and electrical connections are important.
2. Route the 10 gauge red wire to the power source. DO NOT make any connections to the power source until all wiring is complete.
3. To protect the 10 gauge red wire, install a user-supplied 50-ampere circuit breaker as close as practical to the positive (+) power source terminal.
4. Connect a 12 gauge red wire to the "+" terminal (first position of the 9-pin terminal strip,

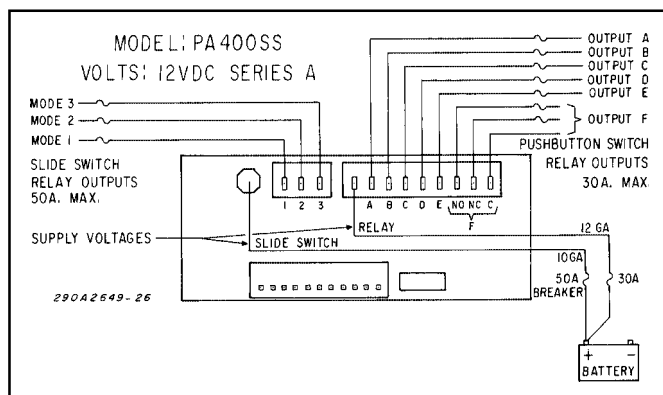


Figure 3-4. PA400SS Light Bar and Auxiliary Connections.

next to the "A" terminal). Route the wire to the power source. To protect the wire, install a user-supplied in-line fuseholder and 30-ampere fuse. The fuseholder should be installed as close as practical to the power source. Do not connect to the power source at this time.

5. Connect wires from the light bar or accessories to terminals 1 through 3. Refer to the instructions supplied with the light bar or accessory for current requirement, proper wire gauge, and any additional instructions. Remember, each output can supply 30 amperes and the total combined current available is 50-amperes. Install appropriate user-supplied in-line fuses in each wire as close to the PA400SS as possible.

NOTE

Output F can be isolated from the +12-volt battery supply for switching other POSITIVE voltages. To use output F for switching other POSITIVE voltages, remove jumper JP1 on the relay board. See figure 3-5.

6. Connect wires from the accessories to terminals A through F. Refer to the instructions supplied with the accessories for current requirement, proper wire gauge, and any additional instructions. Remember, each output can supply 20 amperes and the total combined current available is 30-amperes. Install appropriate user-supplied in-line fuses in each wire as close to the PA400SS as possible.

3-4. PUSHBUTTON SWITCH OPTION.

As supplied, the pushbutton switches operate in a push-on/push-off mode. If desired, the pushbutton switches can operate in a momentary mode. To change to momentary operation, proceed as follows (see figure 3-6):

- A. Remove the unit's cover for access to the pushbutton switches.
- B. Pull the spring forward to release the clip.
- C. Using a small longnose pliers, carefully remove the clip.

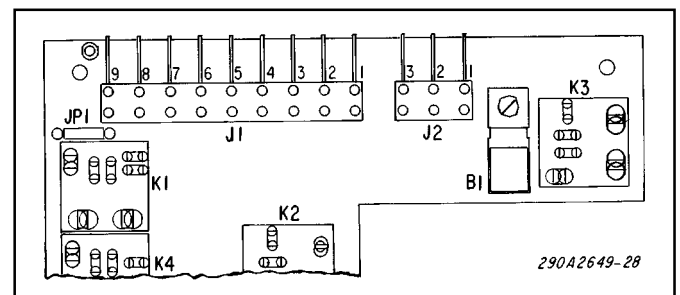


Figure 3-5. Jumper JP1.

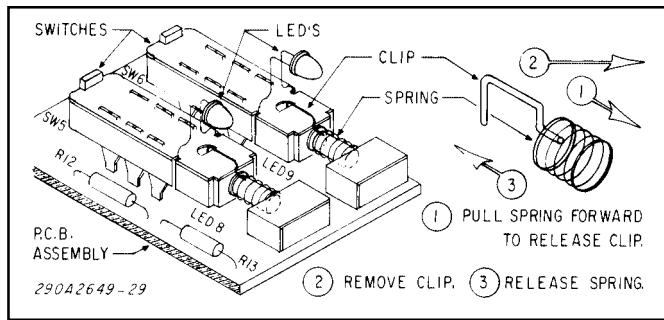


Figure 3-6. Pushbutton Switch Option.

D. Release the spring.

3-5. FUNCTION LABEL INSTALLATION.

See figure 3-7. Replaceable function labels identify the auxiliary switches. A sheet of applicable function legends is supplied.

To install the function legends, proceed as follows:

Select the appropriate labels from the supplied sheet of function legends. Peel the labels from the sheet and apply to the unit above the switches in the area provided.

3-6. SIREN FUNCTION SELECT.

As received from the factory, the unit produces wail, yelp, or priority tones *ONLY* if the slide switch is set to position 3. The siren tone/activation is *dependent* on the slide switch position.

If desired, the siren tones can sound immediately when the desired tone is selected with the selector switch. The siren tones can be *independent* of the slide switch position.

To change the siren tones to independent operation, set the siren operation select switch to the rear position as shown in figure 3-8.

NOTE

Inform the operator that the siren operates independently of the slide switch.

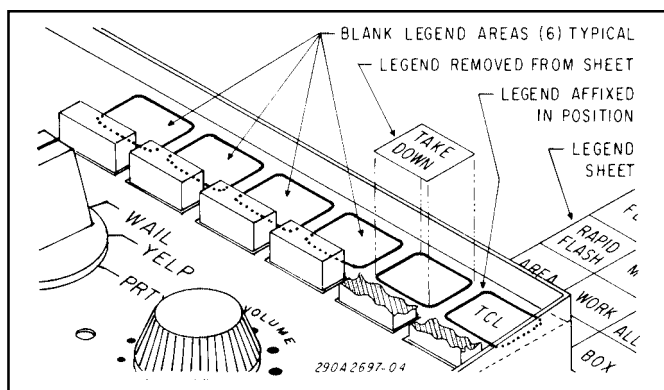


Figure 3-7. Function Label Installation.

3-7. RADIO REBROADCAST VOLUME ADJUSTMENT.

After the unit is completely installed in the vehicle, set the siren function selector switch to **RADIO**. First, adjust the radio receiver volume for a comfortable listening level inside the vehicle. Next, stand outside of the vehicle and note the radio rebroadcast loudness. If the sound volume is too loud or too soft, adjust the radio rebroadcast level control through the hole in the front of the siren (see figure 3-9) to the desired sound level.

3-8. INSPECTION AND FINAL INSTALLATION.

A. Plug the eleven-position connector into the mating connector on the unit, and apply pressure until it locks into place.

CAUTION

To avoid damage to the unit, the **BLACK** 1/4-20 x 7/16 hex head cap screws and the 1/4 split lockwashers **MUST** be used as shown in figure 3-1.

B. Secure the unit to the mounting bracket with the black 1/4-20 x 7/16 hex head screws and 1/4 split lockwashers.

C. Tilt the unit to the desired position. Tighten the 1/4-20 x 7/16 hex head screws.

D. Before connection to the power source, perform a visual check of all connections and wiring.

E. Ensure that there are no loose wire strands or other bare wire which may cause a short circuit. Also, all wires must be protected from any sharp edges which could eventually cut through the insulation.

F. Use an ohmmeter to verify that a short circuit does **NOT** exist between the positive (+) leads and the vehicle chassis.

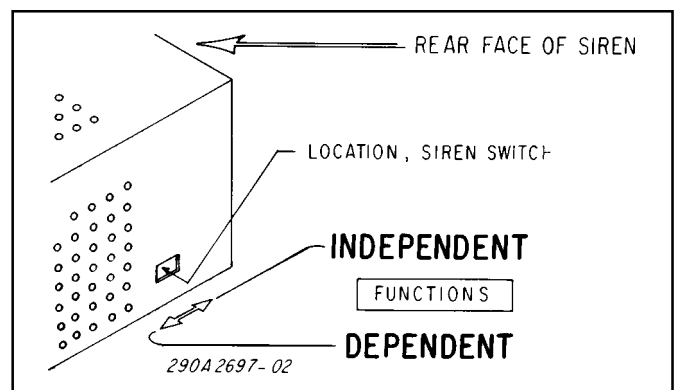


Figure 3-8. Siren Function Select.

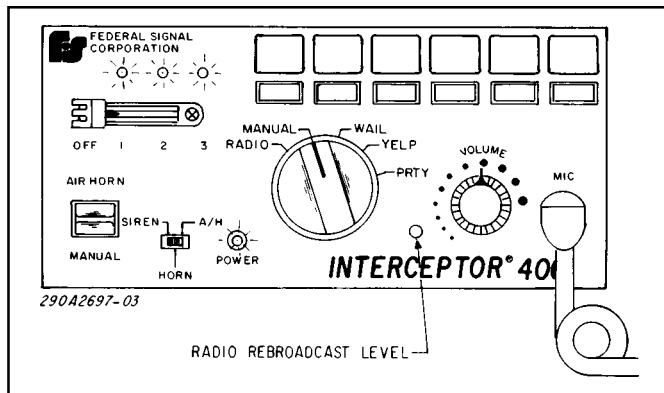


Figure 3-9. Radio Rebroadcast Level.

⚠ WARNING

If wires are shorted to the vehicle frame or each other, high current conductors can cause hazardous sparks resulting in electrical fires and molten metal.

Verify that no short circuits exist before connecting to the Positive (+) battery terminal.

DO NOT connect this system to the vehicle battery until ALL other electrical connections are made and mounting of all components is complete.

Failure to observe this WARNING will result in fire, burns and blindness.

G. Connect all red (+) wires to the positive (+) terminal of the power source. Secure mechanical and electrical connections are required.

3-9. TESTING AFTER INSTALLATION.

⚠ WARNING

All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.

After installation is complete, test all siren and light functions to ensure that all functions and controlled devices operate as intended. Test all vehicle functions, including horn operation and vehicle light systems, to ensure proper operation.

After testing is complete, provide a copy of this manual to all operating personnel.

SECTION IV OPERATION

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

WARNING

The lives of people depend on your safe operation of Federal 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 an electronic siren and speaker(s): 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 (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound, roll up your windows and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound. Only use the siren for emergency response situations.

Sound Limitations

- Before using the vehicle, check to see if the siren speakers are concealed from view. If the siren speaker is not in clear view on the front of the vehicle, use extra caution when operating the vehicle. A concealed siren speaker installation is less effective at warning others.
- 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 does 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. This can also occur 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 light/sound 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 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 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, or death to you, to passengers, or to others.

4-1. GENERAL.

All controls utilized during operation of the Model PA400SS are located on the front panel of the unit (see figure 4-1). They comprise:

1. A five-position rotary type siren function Selector switch.
2. A four-position mode selector slide switch.
3. Six lighted (A,B,C, D, E, F) push-on/push-off pushbuttons.
4. A horn ring function switch.
5. A public address volume control.
6. A momentary AIR HORN/MANUAL paddle switch.

The five-position rotary siren Function selector switch determines what siren sound is generated when the siren is enabled in mode 3. Each position will be described in detail, however Table 4-1 will be useful as a quick reference.

NOTE

As received from the factory, the siren tones are dependent on the slide switch position.

If desired, the siren tones can sound immediately when the desired tone is selected with the selector switch. The siren tones can be independent of the slide switch position.

To change the siren tones to independent operation, set the siren operation select switch to the rear position as shown in figure 3-8.

The four-position Mode selector switch controls the operation of the warning lights and enables the siren in Mode 3. In modes OFF, 1, and 2; only the peak-and-hold siren or air horn sound is available.

4-2. SIREN FUNCTION SELECTOR SWITCH.

This five-position rotary switch determines what siren sound is generated when the siren is enabled in Mode 3. This switch does not effect any light operation. The five switch positions are described below and in Table 4-1.

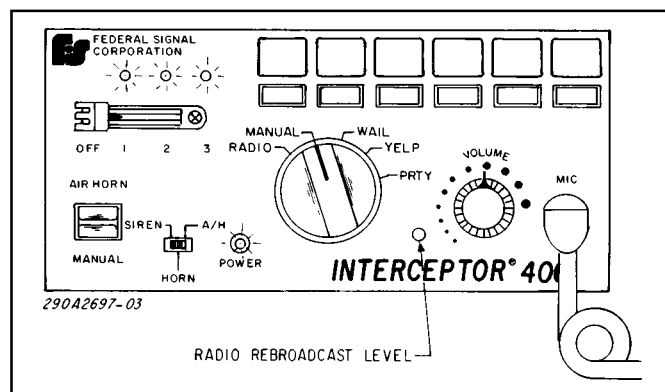


Figure 4-1. Front View.

A. RADIO.

In this position, incoming radio messages are amplified by the siren and rebroadcast over the outside speaker.

B. MAN.

In this position, it is possible to operate the siren by activating the AIR HORN/MANUAL paddle switch. The siren can also be activated by means of an auxiliary switch, such as the vehicle horn ring.

C. WAIL.

In this position, the siren produces a continuous "wailing" sound, up and down in frequency.

D. YELP.

In this position, a continuous rapid "warbled" tone is generated.

E. PRIORITY.

In this position, a continuous extremely rapid "warbled" tone is generated.

NOTE

Pressing the microphone push-to-talk switch will override any function and provide instant public address operation.

4-3. HORN RING SWITCH.

The horn ring switch determines the function of the vehicle horn ring.

1. In the center position, the vehicle's horn will sound.

2. In the left (SIREN) position, pressing the vehicle's horn ring activates the Tap II function and changes the audible siren sound. The vehicle horn will not sound if Mode 2 or 3 is selected.

3. In the right (A/H) position, pressing the vehicle's horn ring will sound the air horn tone. The vehicle horn will not sound if Mode 2 or 3 is selected.

4-4. AIR HORN/MANUAL SIREN SWITCH.

The AIR HORN/MANUAL switch activates the electronic air horn sound (up) in any selected position, except RADIO, and the peak-and-hold sound (down) in the MAN position.

Table 4-1. Functional Description of Selector and Mode Switches.

Selector	OFF	POSITION 1	POSITION 2	POSITION 3
RADIO	Radio Only Normal Horn No Lights PTT=PA No MAN. Siren No Air Horn	Radio Only Normal Horn Mode 1 Lights PTT=PA No MAN. Siren No Air Horn	Radio Only No Horn ¹ Mode 1 & 2 Lights PTT=PA No MAN. Siren No Air Horn	Radio Only No Horn ¹ Mode 1, 2, & 3 Lights PTT=PA No MAN. Siren No Air Horn
MANUAL	Normal Horn No Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren	Normal Horn Mode 1 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren	Horn ¹ =PK. & Hold Mode 1 & 2 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren	Horn ¹ =PK. & Hold Mode 1, 2, & 3 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren
WAIL	Normal Horn No Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Normal Horn Mode 1 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Horn ¹ =PK. & Hold Mode 1 & 2 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Horn ¹ =Wail>Yelp Mode 1, 2, & 3 Lights MAN.=Wail>Yelp Air Horn PTT=PA Wail Siren
YELP	Normal Horn No Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Normal Horn Mode 1 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Horn ¹ =PK. & Hold Mode 1 & 2 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Horn ¹ =Yelp>Priority Mode 1, 2, & 3 Lights MAN.=Yelp>Priority Air Horn PTT=PA Yelp Siren
PRIORITY	Normal Horn No Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Normal Horn Mode 1 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Horn ¹ =PK. & Hold Mode 1 & 2 Lights MAN.=PK. & Hold Air Horn PTT=PA No Siren ²	Horn ¹ =Priority>Air Horn Mode 1, 2, & 3 Lights MAN.=Priority>Air Horn Air Horn PTT=PA Priority Siren

NOTES: 1. The horn ring switch is set to the SIREN position.
2. The siren operation select switch is set to the factory setting (dependent position).

4-5. VOLUME CONTROL.

The VOLUME control is used to control the volume when the siren is used for public address. Clockwise rotation of the knob increases voice volume in the public address mode. The VOLUME control does not control the volume of the siren signals or radio.

4-6. AUXILIARY PUSHBUTTONS A, B, C, D, E, AND F.

These switches are active in all modes and are illuminated when pushed "on". Battery power is switched "on" to activate auxiliary devices A, B, C, D, E, and F, respectively.

4-7. PARK-SIREN DEACTIVATOR.

If installed, shifting the vehicle into PARK will silence the siren tones. Move the shift lever to another position to sound the siren tone.

4-8. RADIO REBROADCAST VOLUME ADJUSTMENT.

If the radio rebroadcast sound volume is too loud or too soft, it can be readjusted by the operator. First, adjust the radio receiver volume for a comfortable listening level inside the vehicle. Next, use a small screwdriver and adjust the radio rebroadcast level control in the front of the unit (see figure 4-1) to the desired sound level.

SECTION V

SERVICE AND MAINTENANCE

SAFETY MESSAGE TO PERSONNEL SERVICING FEDERAL SIGNAL ELECTRONIC SIRENS

WARNING

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

- Read and understand all instructions in this manual before servicing the electronic siren or speaker.
- To properly service an electronic siren or speaker: you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and service of safety warning equipment. Always refer to the vehicle's service manuals when performing service on a vehicle.
- Electronic circuit and speaker repairs must be performed by a qualified and competent electronic technician.
- 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 (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.
- DO NOT connect this system to the positive terminal of the battery until servicing is complete, and you have verified that there are no short circuits to ground.
- In order for the electronic siren to function properly, the ground connection must be made to the NEGATIVE battery terminal.
- After repair, test the electronic siren and speaker system to ensure that it is operating properly.
- Federal Signal siren amplifiers and speakers are designed to work together as a system. Combining a siren and speaker from different manufacturers may reduce the warning effectiveness of the siren system and may damage the components. You should verify or test your combination to make sure the system works together properly and meets both federal, state and local standards or guidelines.

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

5-1. GENERAL.

For warranty service, contact your local Distributor.

The factory can and will service your equipment or assist you with technical problems that cannot be handled satisfactorily and promptly locally.

Communications and shipments should be addressed to:

Service Department
Federal Signal Corporation
2645 Federal Signal Drive
University Park, IL 60466

1-800-433-9132

5-2. REPLACEMENT PARTS LIST.

Description	Part Number
Chassis	85361113
Faceplate	85361110
Cover	85361114
Screw, Hex Head, Chassis	7011A103-06
Nameplate (front panel label)	81461264
Instruction Label (back panel)	1611183
Model/Instruction Label (bottom)	1611159
Slide Switch Assy.	122290A-01
Slide Switch Knob	8536C1041
Slide Switch Bezel	8573060
Screw, Slide Switch, Flat Hd.	7000A259-06
Knob, Pushbutton Switch	141130
Knob, Rotary Switch	141A111
Knob, Volume Control	141A102
Mounting Kit	85361117
Bracket, Mounting	8536B022
Screw, Mounting	7000A323-07
Lockwasher, Ext. Tooth	7075078
Plug, Right Angle	140338A-11
Legend Inserts	8572294
Amplifier PCB Assy.	2001183
Microprocessor	PA4CB110
Output Transistor	125B437
Bracket, Transistor	8552368A-01
Nut, Hex, KEP, Transistor	7058A022
Insulator	235150
Lamp	149A120A
Fuse, 20A	148A142
Relay PCB Assy.	2001184
Microphone	258B577A-01
Bushing, Right Angle, Microphone	231A148

