



FEDERAL SIGNAL
Safety and Security Systems

e-Q2B Electronic Siren System



Installation, Maintenance, and Service Manual

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Safety Messages for Installers and Operators

For your safety, read and understand this manual thoroughly before installing, operating, and servicing the e-Q2B Siren Amplifier. The safety messages presented in this section and throughout the manual are reminders to exercise extreme care at all times. Read and understand the safety instructions to installers (doc. no. 256A692), and keep it close at hand for reference.

To download copies of this manual, go to www.fedsig.com or call the Federal Signal Service Department at 1-800-433-9132, 7 a.m. to 5 p.m., Monday through Friday (CT).

Safety Messages to Installers of Federal Signal Sound/Light Systems

⚠ WARNING

People's lives depend on your proper installation and servicing of Federal Signal products. It is important to read and follow all instructions shipped with this product. 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 ensure that 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.
 - Make 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, 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 that 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 that connects to the vehicle wiring without reviewing a vehicle wiring diagram available from the vehicle manufacturer. Ensure 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 airbag.
 - If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper air bag deployment.
 - Locate the control head so the vehicle, controls, and microphone can be operated safely.
 - When drilling into a vehicle structure, ensure that both sides of the surface are clear of anything that could be damaged.

After Installation

- After installation, test the emergency warning 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 or reinstalling the product.

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

RETAIN AND REFER TO THESE MESSAGES

Safety Messages to Operators of Federal Signal Sound/Light Systems

WARNING

People's lives depend on your safe operation of Federal Signal products. It is important to read and follow all instructions shipped with the products. Listed below are some other important safety instructions and precautions you should follow.

- Do not attempt to activate or deactivate the controls of the emergency warning system while driving in a hazardous situation.
- Although your warning system is operating properly, it may not be completely effective. People may not see, hear, or heed your warning signal. You must recognize this fact and continue to drive cautiously.
- Situations may occur that obstruct your warning signal when natural and man-made objects are between your vehicle and others, such as raising your hood or trunk lid. If these situations occur, be especially careful.
- All effective sirens and horns produce loud sounds that may cause, in certain situations, permanent hearing loss. You and your passengers should consider taking appropriate safety precautions, such as wearing hearing protection.
- The effectiveness of an interior mounted warning light depends on the clarity, the tinting, and the angle of the glass it is being placed behind. Tinting, dirt, defects, and steeply angled glass reduce the light output of the warning light. This may reduce the effectiveness of the light as a warning signal. If your vehicle has dirty, tinted, or steeply angled glass, use extra caution when driving your vehicle or blocking the right of way with your vehicle.
- In order to be an effective warning device, this product produces bright light that can be hazardous to your eyesight when viewed at a close range. Do not stare directly into this lighting product at a close range, or permanent damage to your eyesight may occur.

-
- It is important that you fully understand how to safely operate this warning system before use.
 - Operate your vehicle and its light/sound system in accordance with your department's Standard Operating Procedures.
 - If a selected function does not perform properly or if any of the lamps remain illuminated when the control is off, disconnect the power connector from the control unit and contact the nearest service center.
 - At the start of your shift, ensure that the entire warning light system and the siren system is securely attached and operating properly.
 - Suction cup mounting is for temporary applications only. The unit should be removed from the window and stored securely when not in use. Temperature changes and sunlight can cause suction cups to lose holding power. Periodically check the unit to be sure the suction cups have a firm grip on the mounting surface. An improperly secured light could fall off of the vehicle causing injury and damage.
 - The holding power of magnetic mounting systems is dependent upon surface finish, surface flatness, and thickness of the steel mounting surface. Therefore, to promote proper magnetic mounting:
 - Keep mounting surface and magnets clean, dry, and free of foreign particles that prevent good surface contact.
 - Ensure that mounting surface is flat.
 - Do not use a magnet mounting system on vehicles with vinyl tops.
 - To prevent sliding of light assembly on mounting surface, avoid quick acceleration and hard stops.

Failure to follow these precautions may result in property damage, serious injury, or death.

An Overview of the e-Q2B Siren System

The e-Q2B is a full-featured electronic siren. A state of the art microprocessor and DSP technology create a system with a compact control head and a siren amplifier that can be installed in the trunk, under the seat, or under the dash of any vehicle with a 12-volt, negative-ground electrical system. The siren circuits are protected by a replaceable 30 A fuse that protrudes from the siren housing.

e-Q2B Siren System

The e-Q2B is a modular system that includes either one 200-watt speaker or two 100-watt speakers, an amplifier/DSP (digital signal processor), and a Convergence Network control head. These components work together to generate the characteristic sound of the Federal Signal Q siren. Using DSP circuitry, the e-Q2B amplifier is able to reproduce the true Q sound, rather than relying on a simple digital recording. The DSP enables the product to function either manually or automatically for hands-free operation.

The Model e-Q2B-200 siren amplifier requires two 100-watt neodymium drivers that enable the unit to reproduce the harmonics that are essential for the precise reproduction of the Q sound. To deliver the Q sound effectively, the e-Q2B produces a full 200 watts of output. The e-Q2B produces wail, yelp, priority, and manual siren with brake tones, as well as an air horn sound.

The Model e-Q2B-100 is a 100-watt siren amplifier. It incorporates all the features of the standard 200-watt siren, but is designed to drive a single 100-watt speaker, such as a Federal Signal Model BP100 or a Model ES100.

Siren Speakers

Federal Signal offers speakers for the Model e-Q2B-200 and the Model e-Q2B-100 that meet SAE J1849 and CCR Title 13, Article 22, Class “A” for sound output: the BP200 Series, the BP100 Series, and the ES100.

The Model BP200-Q 200-watt siren speaker mounts flush within the bumper of your vehicle. It has the classic, chrome-plated Q grille. This speaker system enables you to clear traffic with the penetrating sound of the Q and also allows you to maintain the traditional look of the Q siren when using the optional Q grille. Also available is the BP200-EF compact 200-watt speaker with an “Electric F” grille, which also mounts flush within the bumper of your vehicle.

The Model BP100 100-watt siren speaker has a compact size that allows it to be mounted on top of or behind the bumper, or installed beyond the grille of popular emergency vehicles. Available in two finishes, the BP100 has a black matte finish, and the BP100P is highly polished. The Dynamax® ES100 is also an option for increased performance and reliability. The larger diaphragm of the ES100 enables the speaker to capture lower frequency ranges for a more robust sound.

Convergence Network Control Head

The Convergence Network control head digitally transmits and prioritizes end-user commands. The control head/amplifier interface uses solid-state digital decoding, which minimizes interconnection complexity. The control head allows the user to operate several siren functions. The traditional Q Wail can be activated in automatic or manual modes. Additional features include a Q Yelp, Q Brake, digitally recorded Air Horn, PA/radio rebroadcast, and push-to-talk via an integral microphone. PA volume can be adjusted by the user with a volume control potentiometer.

LED Indicators

Green LEDs on the side of the siren amplifier indicate when power is supplied to the amplifier, when output is available and when a load is connected. Red LEDs indicate a speaker short or thermal overload. All buttons on the control head glow amber when the system is on. Pressed buttons glow brighter to indicate that the function they control is active.

Specifications

Table 1 System specifications

Input Voltage	11 Vdc to 16 Vdc
Polarity	Negative ground only
Operating Temperature Range	-40°C to +65°C (-40°F to +149°F)
Standby Current	Less than 0.5 A
Dimensions:	
Siren Amplifier	
Height with cover	3.98 inches (10.11 cm)
Width	7.66 inches (19.44 cm)
Length	10.41 inches (26.44 cm)
Net Weight	6.40 lb (2.91 kg)
Control Head	
Height	3.25 inches (8.25 cm)
Width	1.18 inches (3.00 cm)
Length	6.80 inches (17.27 cm)
Net Weight	0.80 lb (0.36 kg)
Shipping Weight	13.00 lb (6.10 kg)

Table 2 Siren specifications: 200 watts

Operating Current	20 A (nominal) (13.6 V battery, 5.5-ohm load at high power)
Frequency Range	725 to 1600 Hz
Nominal Cycle Rate	Wail: 12 cycles per minute Yelp: 180 cycles per minute Priority: 370 cycles per minute
Nominal Voltage Output	33 V _{RMS} (siren tones)
Audio Response	300 Hz to 3000 Hz ± 3 dB
Audio Power	200 W in PA Mode (typical with 1.4 V peak-to-peak input)
Harmonic Distortion	Less than 10 percent from 5 to 200 W
Input Impedance (PA)	4000 ohms (nominal)
Siren Tone Compliances	SAE J1849 JUL89

Table 3 Siren Specifications: 100 watts

Operating Current	10 A (nominal) (13.6 V battery, 11-ohm load at high power)
Frequency Range	725 to 1600 Hz
Nominal Cycle Rate	Wail: 12 cycles per minute Yelp: 180 cycles per minute Priority: 370 cycles per minute
Nominal Voltage Output	33 V _{rms} (siren tones)
Audio Response	300 Hz to 3000 Hz ± 3 dB
Audio Power	200 W max. in PA Mode (typical with 1.4 V peak-to-peak input)
Harmonic Distortion	Less than 10 percent from 5 to 200 W
Input Impedance (PA)	4000 ohms (nominal)
Siren Tone Compliances	SAE J1849 JUL89

e-Q2B Kit Contents

After unpacking the kit, examine it for damage that may have occurred in transit. If the product 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. Ensure all parts in the packing list are included in the shipment. If any parts are missing, call Federal Signal Customer Support at 1-800-264-3578, 7 a.m. to 5 p.m., Monday through Friday, CT.

Table 4 Kit contents: Models e-Q2B-100 and e-Q2B-200 (standard control head)

Qty.	Description	Part Number
1	Control Head (Standard) OR Control Head (CAL13)	8616026 8616058
1	e-Q2B Siren Amplifier, 200 W OR e-Q2B Siren Amplifier, 100 W	8616033 8616033-02
1	Connector, RS485, 25-foot	1751357-02
1	Connector, 4-Position, Speaker	140417-04
1	Connector, 3-Position, Power	140535
1	Connector, 12-Position	140584-12
2	Bracket, Mounting, Control Head	85361065
2	Screw, Mach. Pan Head, #6-32	7000A404-05
2	Screw, Cap, Hex Head, 1/4-20 x 3/4-inch	7002A000-12
2	Screw, Pan Head, #10, Thread-Forming	7011A047-08
2	Lock Washer, Split, #6	7074A001
2	Lock Washer, Ext, Tooth, 1/4-inch	7075A007
1	Microphone with Modular Plug	256B577-03
1	Card, Safety Instructions	256B691
1	Label, Warning, Siren/Speaker	1612339
1	Inserts, Legends	8572294

Table 5 Kit contents: Models e-Q2B-100 and e-Q2B-200 (flush-mount control head)

Qty.	Description	Part Number
1	Control Head (Flush-Mount) OR Control Head (CAL13)	8616042 8616042-01
1	e-Q2B Siren Amplifier, 200 W OR e-Q2B Siren Amplifier, 100 W	8616033 8616033-02
1	Connector, RS485, 25-foot	1751357-02
1	Connector, 4-Position, Speaker	140417-04
1	Connector, 3-Position, Power	140535
1	Connector, 12-Position	140584-12
4	Screw, Phillips, Thread-Forming, Pan-Head, #6	7011A120
1	Microphone with Modular Plug	256B577-03
1	Card, Safety Instructions	256B691
1	Label, Warning, Siren/Speaker	1612339
1	Inserts, Legends	8572294

Table 6 Kit contents: Model e-Q2B-200-RCFD

Qty.	Description	Part Number
1	Connector, 4-Position, Speaker	140417-04
1	Connector, 3-Position, Power	140535
1	Connector, 12-Position	140584-12
1	Card, Safety Instructions	256B691
1	Label, Warning, Siren/Speaker	1612339

Wiring the e-Q2B Siren System

Before permanently mounting the e-Q2B Siren System, plan all wire routings and select the mounting locations for the siren amplifier and control head. Read and understand all instructions included with related equipment before installing it.

Selecting the Mounting Locations

When fastened to the back of the control head, the mounting bracket covers the wiring connectors and a supplemental control for the gain or volume of the radio rebroadcast feature. To facilitate the installation of the e-Q2B, select mounting locations for the control head and the siren amplifier before permanently mounting them in the vehicle. After completing the wiring described in this section, refer to the instructions for mounting the control head and the siren amplifier on page 37.

⚠ WARNING

AIRBAG DEPLOYMENT: Do not install equipment or route wiring in the deployment path of an airbag. Failure to observe this warning will reduce the effectiveness of the airbag or potentially dislodge the equipment, causing serious injury or death.

⚠ WARNING

SEAT REMOVAL PRECAUTION: If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment. Failure to follow this warning cause serious injury or death.

NOTICE

UNIT REQUIRES AIR FLOW: The siren amplifier is cooled by an internal fan. Do not install it in areas where the air flow is restricted. Do not mount the unit near a heater duct or under the hood.

NOTICE

UNIT IS NOT WATERPROOF: The housing of the e-Q2B siren amplifier is NOT waterproof. The module must be mounted in a location that is sheltered from falling rain, snow, standing water, etc.

For the control head, select a mounting location that allows the vehicle, controls, and microphone to be operated safely under all driving conditions. To identify safe mounting areas for equipment inside the vehicle, consult the vehicle manufacturer's guidelines. To avoid driver distraction and unreliable switch activation, the mounting location must not allow any movement of the control head. Do not select a padded surface for the mounting location of the control head. For the siren amplifier, suggested mounting locations are under the front seat, in a vehicle compartment, or in the trunk under the rear deck near the rear-seat speakers.

Wiring connectors are located on the siren amplifier. Ground, ignition, and power connections are located on the three-position, pluggable, terminal block. To maintain the reliability of the siren amplifier, do not block the air vents or the fan. See Figure 2.

Figure 1 Dimensions of the control head

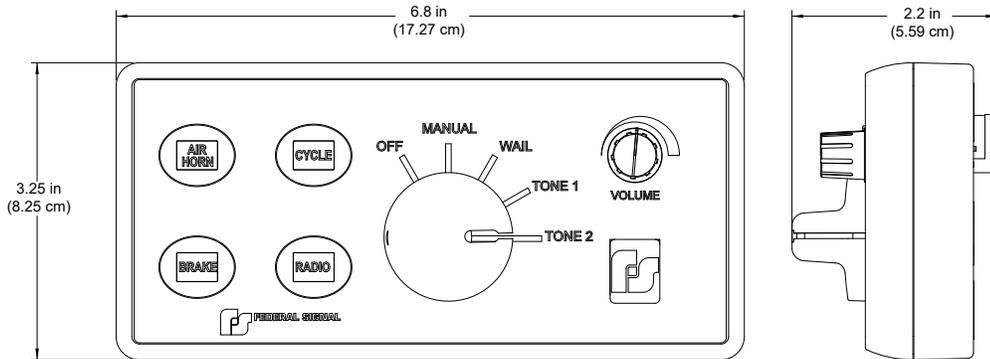
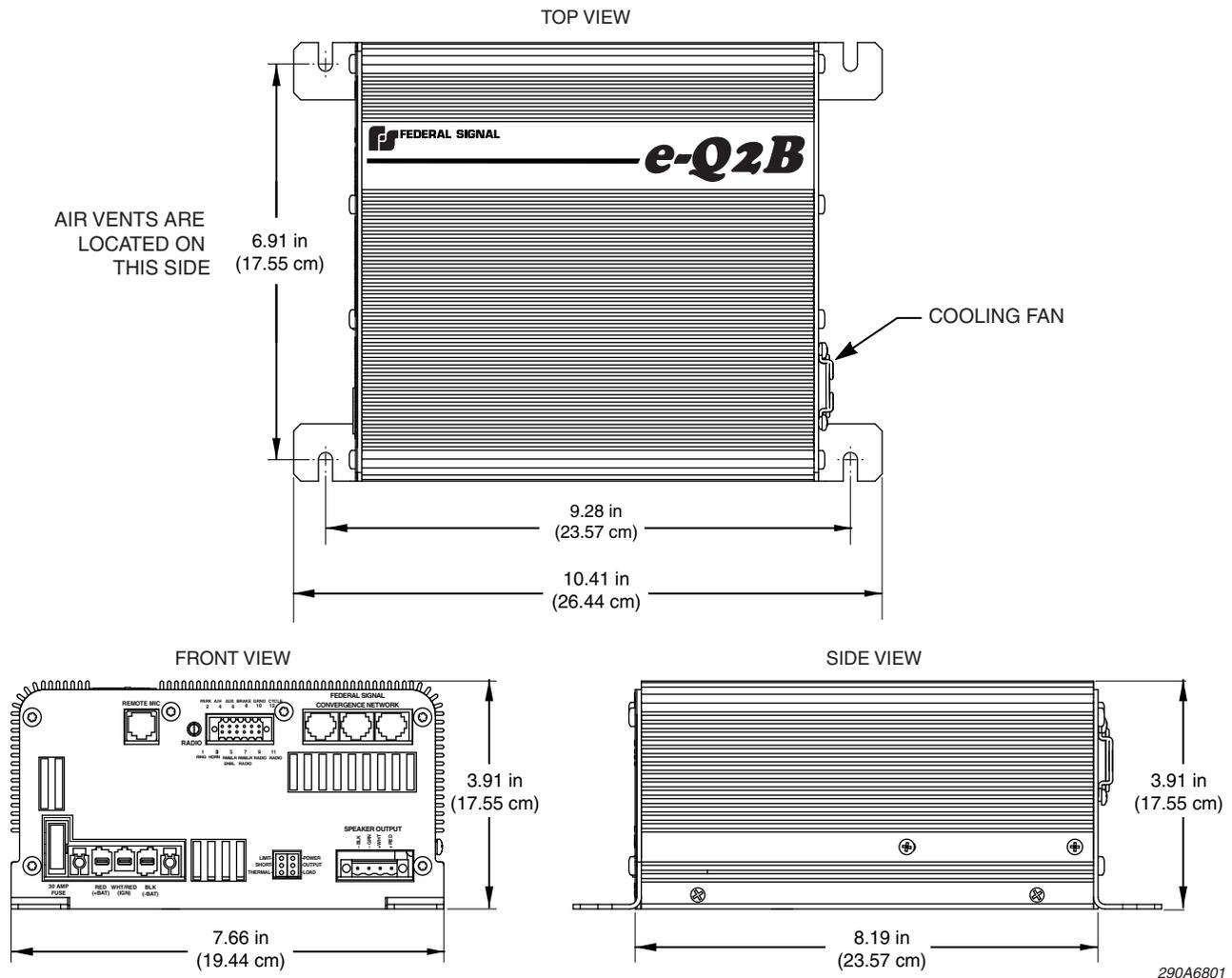


Figure 2 Dimensions of the siren amplifier



Wiring the Siren Amplifier

The siren amplifier has the following types of Convergence Network connections via cables and locking connectors included with the e-Q2B kit:

- Three “plug and play” serial ports that communicate on the Federal Signal Convergence network with the control head, compatible light bars and the Federal Signal Model 660100 Relay Module/Two-Channel Flasher.
- Speakers
- Radio rebroadcast
- Park disable circuit
- Horn ring circuit
- Foot switch inputs for CYCLE, BRAKE, and AIR HORN

⚠ CAUTION

HIGH CURRENT ARCING: Do not connect this system to the vehicle battery until ALL other electrical connections are made and you have verified that no shorts exist. High current conductors can cause hazardous sparks or burning wire, resulting in electrical fires.

⚠ WARNING

DRILLING PRECAUTIONS: Before drilling holes, check the area into which you plan to drill to ensure that you do not damage vehicle components. All drilled holes should be deburred and all sharp edges should be smoothed. Additionally, all exterior drilled holes must be sealed with Motorcraft seam sealer T-A-2-B or equivalent to prevent the potential exposure to carbon monoxide or other potentially harmful fumes. Failure to observe this warning could cause serious injury or death.

To prepare the vehicle for the electrical installation of the e-Q2B Siren System:

1. After planning where to route the wires and cables for the e-Q2B Siren System components, such as Federal Signal warning lights, directional lights, and speakers, drill the holes for the wiring. Smooth, deburr, and insert a grommet in each hole. Use a silicone sealant where needed.
2. Route wires from the system components through the vehicle to their connection points.

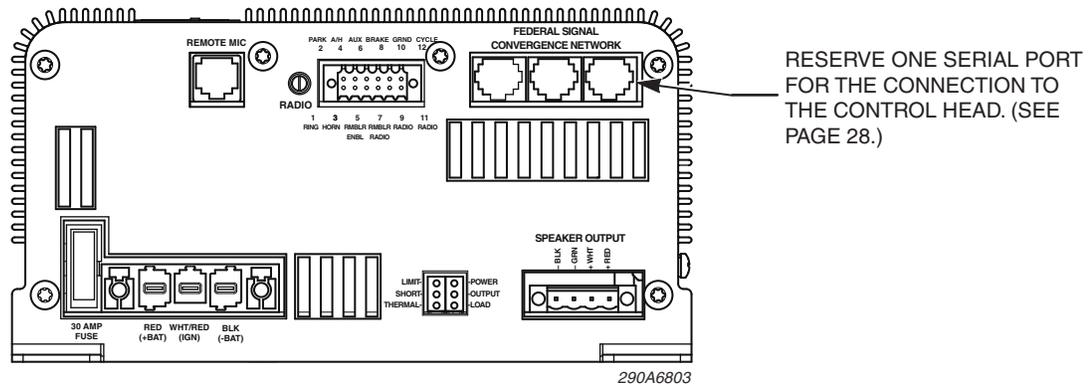
The next sections describe how to connect and wire each system component to the siren amplifier:

Connecting to the Serial Ports

There are three network ports on the upper right corner of the front of the siren amplifier. The ports connect Federal Signal network devices through RS-485 communication cables. To connect the control head, use the 25-foot FS Convergence Network cable (P/N 1751357-02).

Figure 3 shows the network connections on the siren amplifier. Refer to the mounting instructions included with the products after you connect all system devices.

Figure 3 Serial port locations



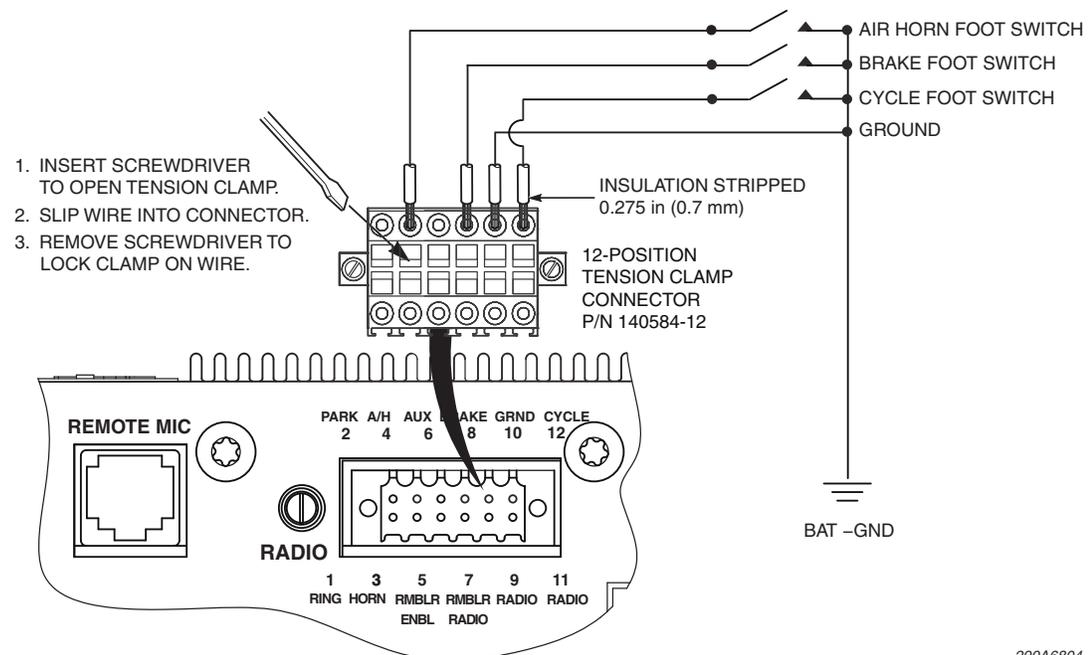
To connect the serial devices:

1. Carefully route the cables from the network devices through the vehicle to the connectors on the siren amplifier.
2. To provide strain relief, secure the cables with installer-supplied clamps and hold-downs.
3. Insert the modular connector at the end of each cable into one of the three serial ports.

Connecting the Foot Switches for Cycle, Brake, and Air Horn

For input connections for the Model EQ2B-200-RCFD, see Figure 4.

Figure 4 Foot switch connections



The CYCLE, BRAKE, and AIR HORN functions are activated either by control head buttons or by remotely located foot switches. The foot switches connect to the front of the siren amplifier.

The siren can be controlled by the position of the five-position rotary switch located on the control head. The five rotary switch positions are OFF, MANUAL, WAIL, YELP, and PRIORITY. In addition, the radio rebroadcast function is available while the MANUAL mode of operation is selected and the RADIO button is activated.

If the MANUAL position is selected, the siren can be manually activated by pressing the CYCLE or BRAKE push buttons or foot switches (if installed). By activating the CYCLE button, the siren tone increases in frequency. By releasing the CYCLE button, the siren tone gradually decreases in frequency. The activation of the CYCLE switch simulates the application of voltage to the original electromechanical Q siren. Releasing the CYCLE button simulates the coasting down of the original electromechanical Q siren.

The activation of the BRAKE button simulates the accelerated braking, or slowing down, of the siren output. This braking action is similar to the original electromechanical Q siren when the brake solenoid is activated.

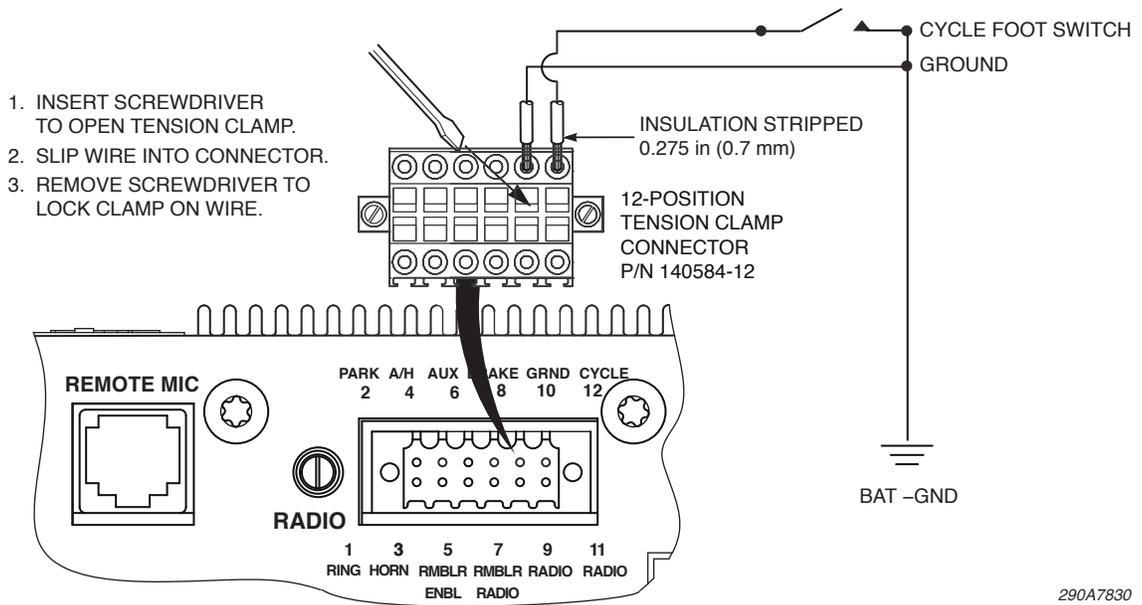
The AIR HORN function is selectable anytime the rotary switch is not in the off position. The AIR HORN tone sounds with all other siren tones: MANUAL, CYCLE, BRAKE, WAIL, YELP, and PRIORITY. The microphone via its push-to-talk switch or the PA/radio rebroadcast function overrides the AIR HORN function.

Connecting the Switch Input for the Model e-Q2B-200-RCFD

The Model e-Q2B-200-RCFD siren is designed to operate without a control head. The siren produces a continuous e-Q wail tone while the CYCLE input is activated. The foot switch input is connected to the front of the siren amplifier through the 2 by 6 plug-in terminal block. The CYCLE input is the only active input on this model. No other features are available.

The power connections are the same as those for the standard e-Q siren. Connecting the CYCLE input to ground through a switch generates a siren tone. Immediately disconnecting the switch turns off the siren.

Figure 5 Foot switch connections for the e-Q2B-200-RCFD



Connecting Speakers to the e-Q2B

⚠ WARNING

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

⚠ WARNING

SOUND REDUCTION HAZARD: Connecting driver wires out of phase may cause severe reduction in sound output, which may result in serious injury or death.

The Model e-Q2B-200 operates one 200-watt speaker or two 100-watt speakers with an impedance of 11 ohms. The Model e-Q2B-100 operates one 100-watt speaker with an impedance of 11 ohms.

The e-Q2B-200 siren amplifier is designed to operate optimally with a Federal Signal BP200-Q or BP200-EF 200-watt speaker system, which is not included as part of the electronic siren. This speaker system incorporates two 11-ohm, 100-watt neodymium drivers to produce a full 200 watts of output. If you are using a speaker system comprising two 11-ohm, 100 W speakers, connect the speakers as shown in Figure 6 on page 23.

Federal Signal speakers are weatherproof and may be installed in any unobstructed convenient location: on the fender, behind the grill, etc. Any special mounting instructions applicable to the type of speaker you have chosen will be found in the speaker carton.

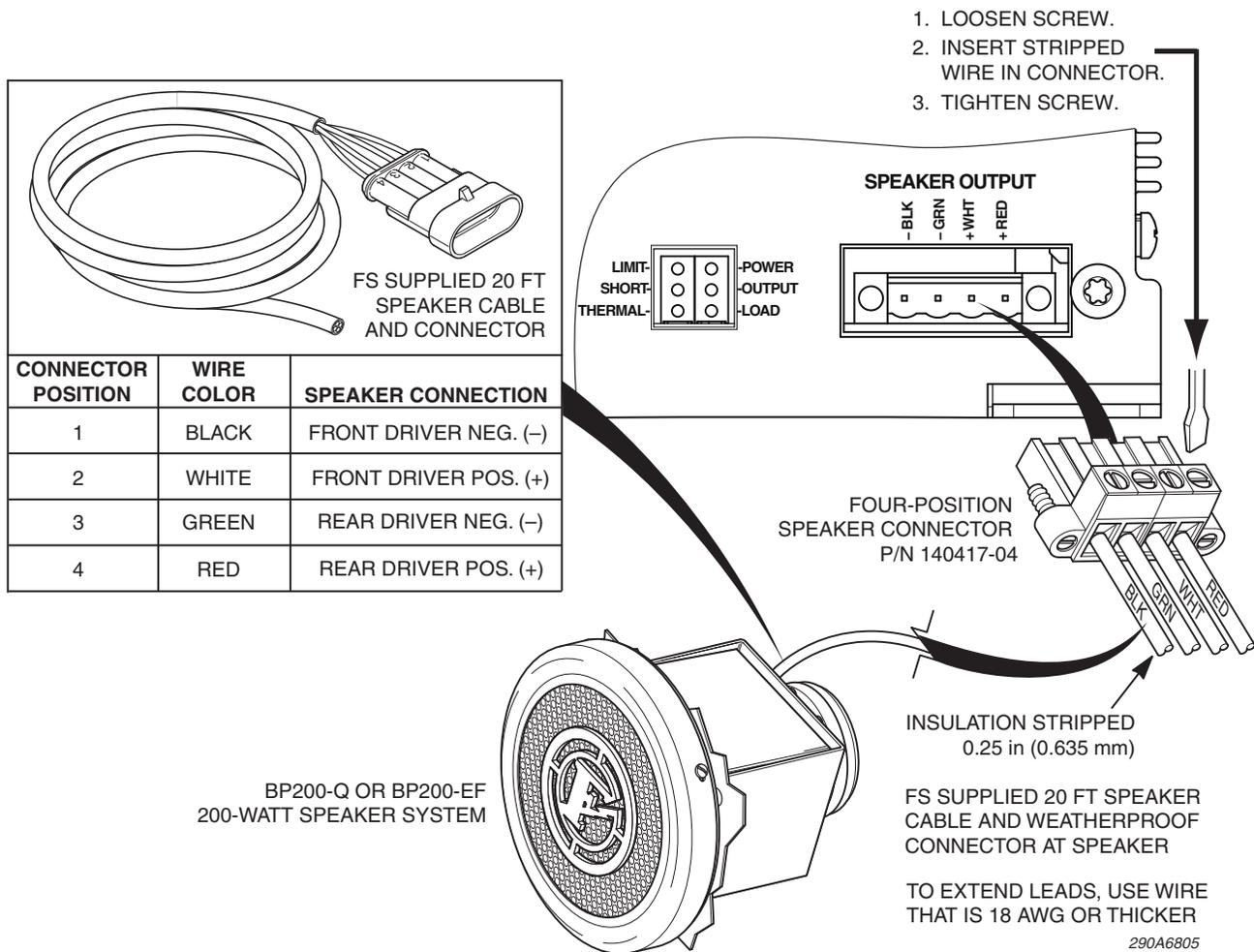
A 20-foot speaker cable is included with Federal Signal BP200 Series speakers. The cable has a waterproof connector on one end that connects to the speaker. The other end of the cable is supplied un-terminated.

Connecting the BP200 Speaker to the e-Q2B-200

To connect the 200-watt speaker system to the Model e-Q2B-200 siren amplifier:

- 1.** Mount the e-Q2B Siren System components according to the instructions included with each product.
- 2.** Connect the waterproof connector to the speaker and route the speaker cable through the vehicle compartment to the amplifier.
- 3.** Carefully strip back the outer jacket on the speaker cable to expose the four colored conductors.
- 4.** Use 18 AWG or thicker wire to extend and connect the speaker leads.
- 5.** Terminate the conductors in the supplied four-position connector that mates with the SPEAKER OUTPUT terminal block of the amplifier as shown in Figure 6.
- 6.** To prevent fretting or disconnection, tighten the two screws on the four-position speaker connector.

Figure 6 e-Q2B 200-watt speaker connections (BP200-Q or BP200-EF)



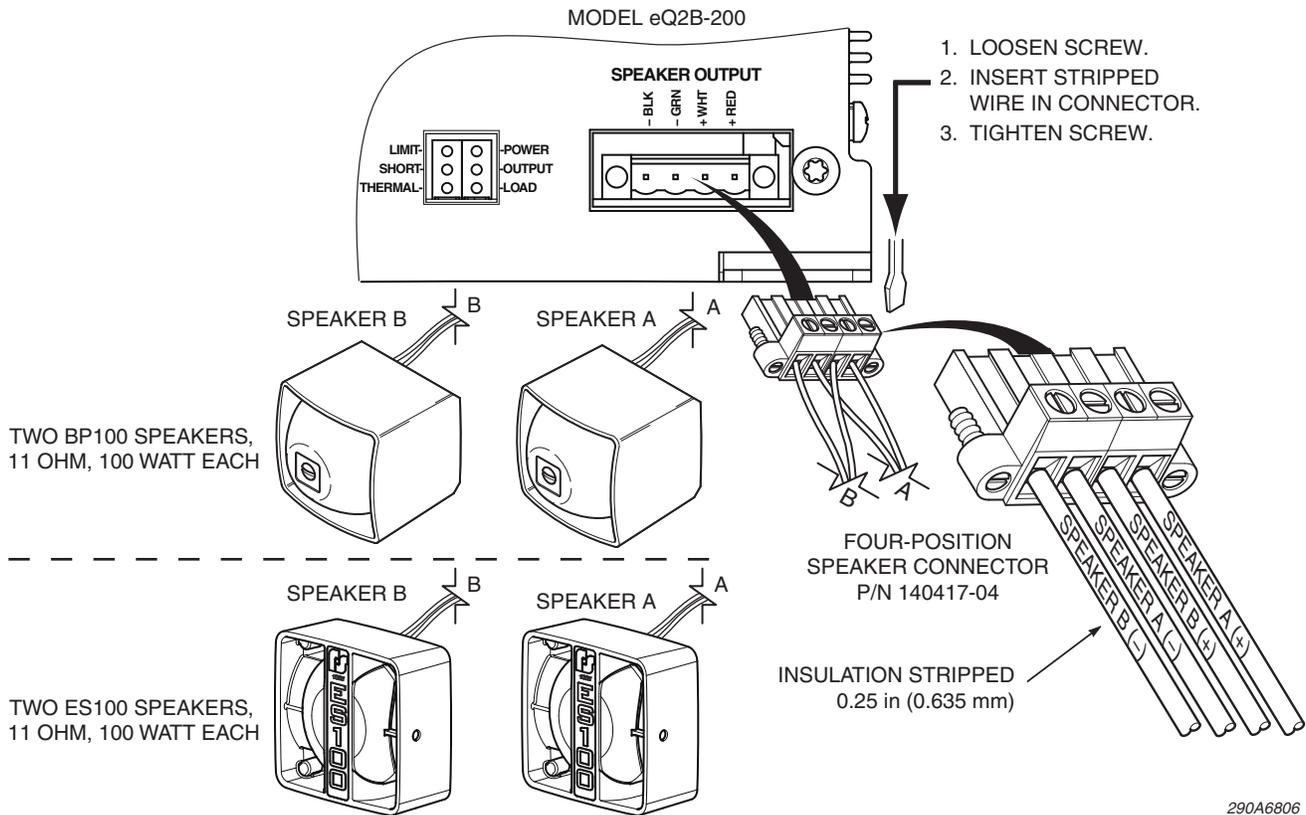
Connecting Two BP100 or ES100 Speakers to the e-Q2B-200

To connect the two 11-ohm, 100-watt speakers to the Model e-Q2B-200 siren amplifier:

1. Mount the e-Q2B Siren System components according to the instructions included with each product.
2. Grommet holes through which the speakers wires will pass. Route the speaker wires through the vehicle compartment to the amplifier.
3. Carefully strip 1/4 inch of insulation from the speaker wires.
4. Use 18 AWG or thicker wire to extend and connect the speaker leads.
5. Terminate the conductors in the supplied connector that mates with the SPEAKER OUTPUT terminal block of the amplifier as shown in Figure 7:
 - The positive (+) wire from Speaker B is terminated in the +WHT position. The negative (-) wire from Speaker B is terminated in the -BLK position.
 - The positive (+) wire from Speaker A is terminated in the +RED position. The negative (-) wire from Speaker A is terminated in the -GRN position.

- To prevent fretting or disconnection, tighten the two screws on the four-position speaker connector.

Figure 7 e-Q2B 200-watt speaker connections with two 100-watt speakers



Connecting One BP100 Speaker to the e-Q2B-100

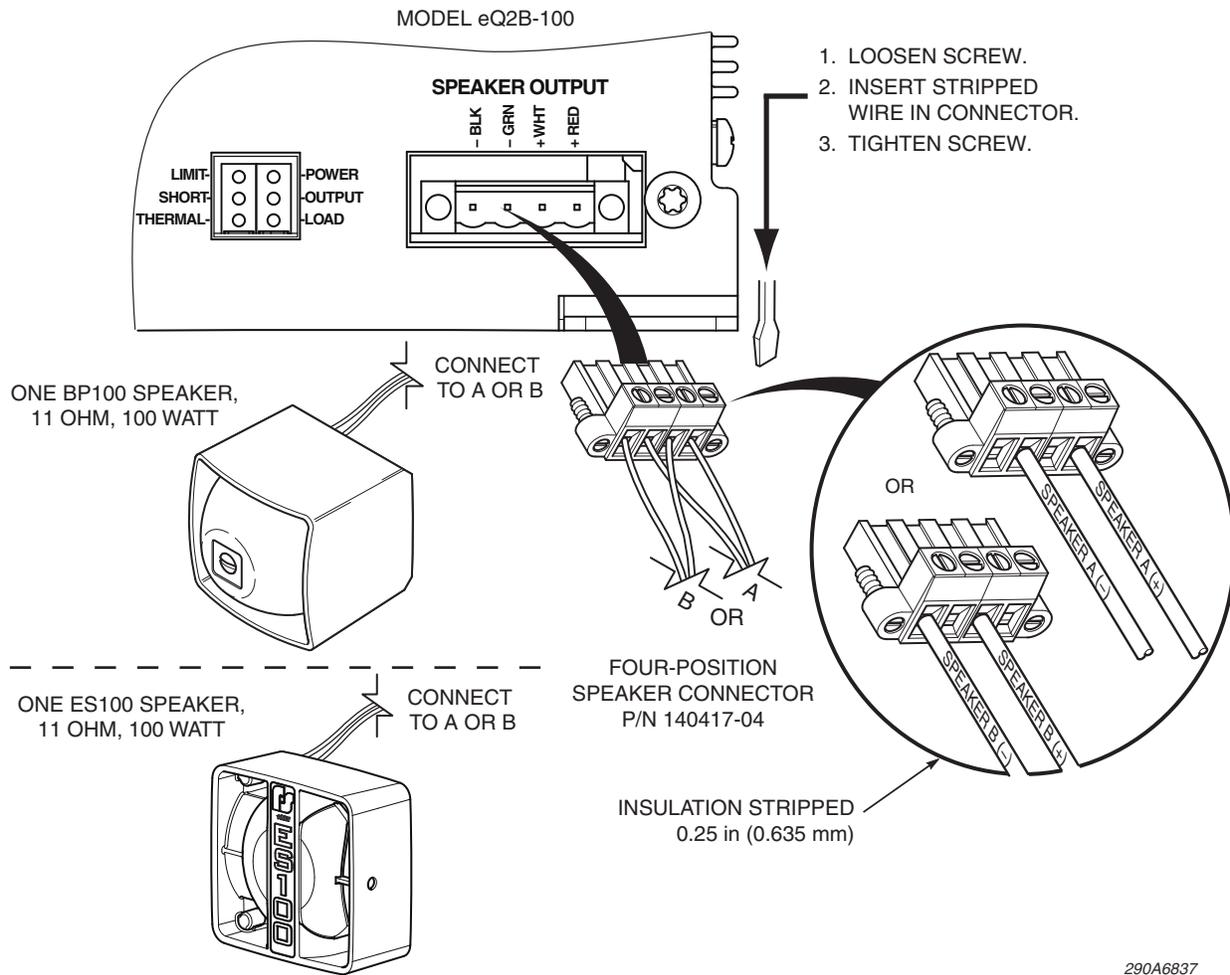
To connect one 11-ohm, 100-watt speaker to the Model e-Q2B-100 siren amplifier:

- Mount the e-Q2B Siren System components according to the instructions included with each product.
- Route the speaker wires through the vehicle compartment to the amplifier.
- Carefully strip 1/4 inch of insulation from the speaker wires.
- Use 18 AWG (minimum) wire to extend and connect the speaker leads.
- Terminate the conductors in the supplied connector that mates with the SPEAKER OUTPUT terminal block of the amplifier as shown in Figure 8.

NOTE: Connect the 11-ohm, 100-watt speaker as either Speaker A or Speaker B.

- To prevent fretting or disconnection, tighten the two screws on the four-position speaker connector.

Figure 8 BP100 100-watt speaker connections



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Connecting the e-Q2B to the Rumbler® 2 Low Frequency Amplifier

The e-Q2B has a Rumbler audio output that enables it to interface to a Federal Signal Rumbler 2 siren amplifier. The Rumbler 2 intersection-clearing system uses the output of the e-Q2B siren amplifier to synthesize a low frequency signal. It then amplifies the signal to drive a Federal Signal low-frequency siren speaker. Low frequency tones have the distinct advantage of penetrating solid materials, enabling vehicle operators and nearby pedestrians to feel the sound waves.

Figure 9 on page 26 shows the connections between the Rumbler 2 and the e-Q2B siren amplifier. For more details, see

See also:

Connecting the BP200 Speaker to the e-Q2B-200 on page 22.

Connecting Two BP100 or ES100 Speakers to the e-Q2B-200 on page 23.

Connecting One BP100 Speaker to the e-Q2B-100 on page 24.

For more information, refer to Federal Signal document “Model Rumbler 2 Low Frequency Siren Amplifier,” document number 2562420, Rev. B or later.

Enabling the Horn-Ring Transfer of Siren Tones

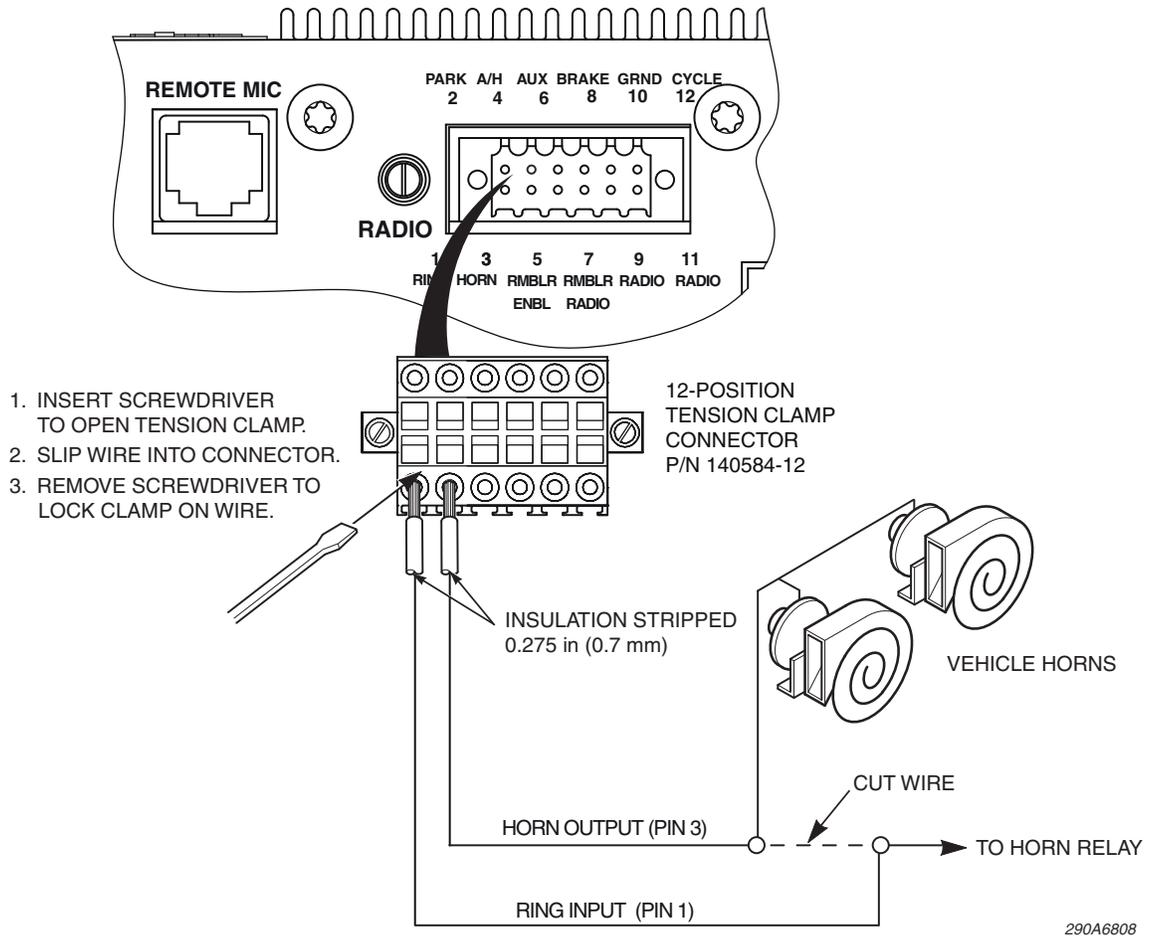
The e-Q2B horn-ring transfer function uses the vehicle horn switch to toggle between siren tones. For more information on how this function operates, see “Horn Ring” on page 46 for the standard e-Q2B Siren System. For the e-Q2B-CAL Siren system, see “Horn Ring” on page 51.

NOTE: The 12-position tension-clamp connector accepts 18 AWG to 22 AWG wire. The recommended length of insulation to strip from the wires for insertion into the connector is 0.275 in (0.7 mm).

To enable the horn-ring control of siren tones:

1. Locate the vehicle horn relay.
2. Route wire from the RING and HORN connectors on the front of the siren amplifier to the relay. See Figure 10 on page 28. If possible, follow the factory wire harness to the relay.
3. Locate and cut the wire that connects the vehicle horn to the horn relay.
4. Terminate the lead from the horn relay in the RING connector on the siren amplifier.
5. Terminate the lead from the vehicle horn in the HORN connector on the siren amplifier.
6. Insulate the spliced leads with twist-on wire connectors. Fold and seal unused leads.
7. To prevent fretting or disconnection, tighten the two screws on the 12-position connector.

Figure 10 Connections for horn-ring transfer



Enabling Radio Rebroadcast Over the Siren Speakers

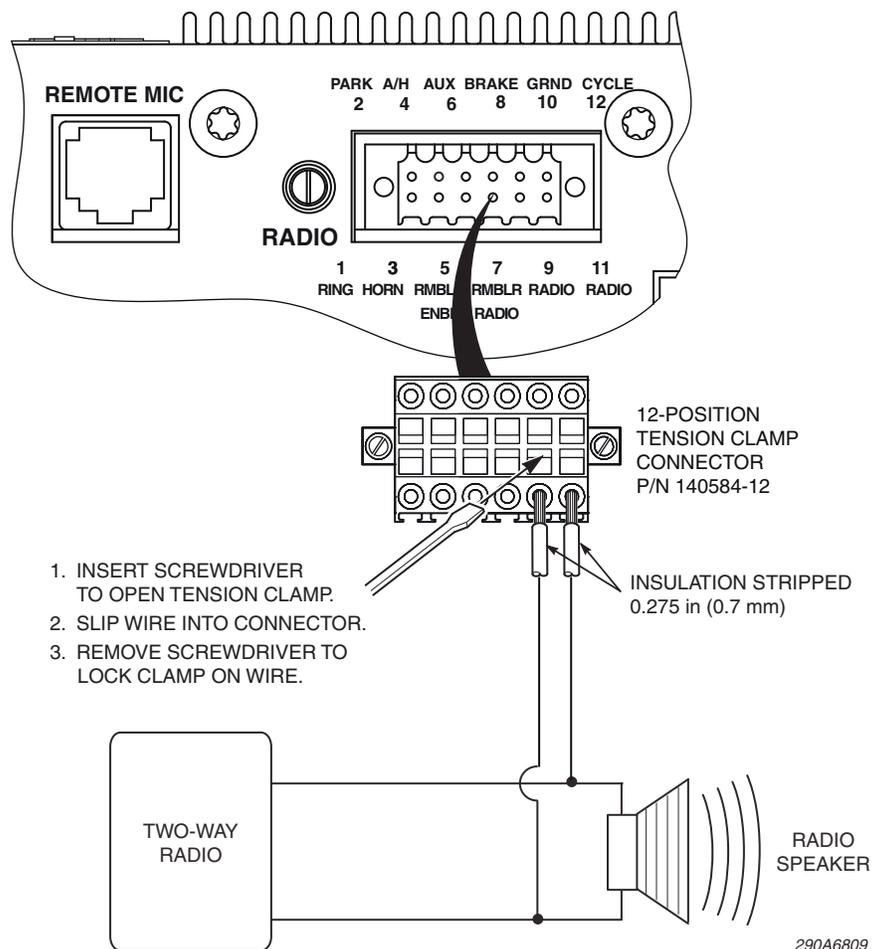
To enable incoming two-way radio messages to be amplified by the siren amplifier and rebroadcast over the siren speakers:

NOTE: The 12-position tension clamp connector accepts 18 AWG to 22 AWG wire. The recommended length of insulation to strip from the wires for insertion into the connector is 0.275 in (0.7 mm).

1. Connect 18 AWG to 22 AWG leads from Positions 9 and 10 (RADIO) across the speaker of the two-way radio. See Figure 11.
2. Extend wiring with 18 AWG to 22 AWG leads.
3. Insulate spliced leads with twist-on wire connectors. Fold and seal unused leads.
4. To prevent fretting or disconnection, tighten the two screws on the 12-position connector.

For instructions on adjusting the gain, see “Setting the Gain for Radio Rebroadcast” on page 35.

Figure 11 Connections for radio rebroadcast



Connecting the PARK Detection Circuit

The PARK detection circuit sends a signal to the siren amplifier to mute all siren functions when the vehicle transmission is shifted into park or neutral. The circuit can detect a +12 V signal or a –BAT signal.

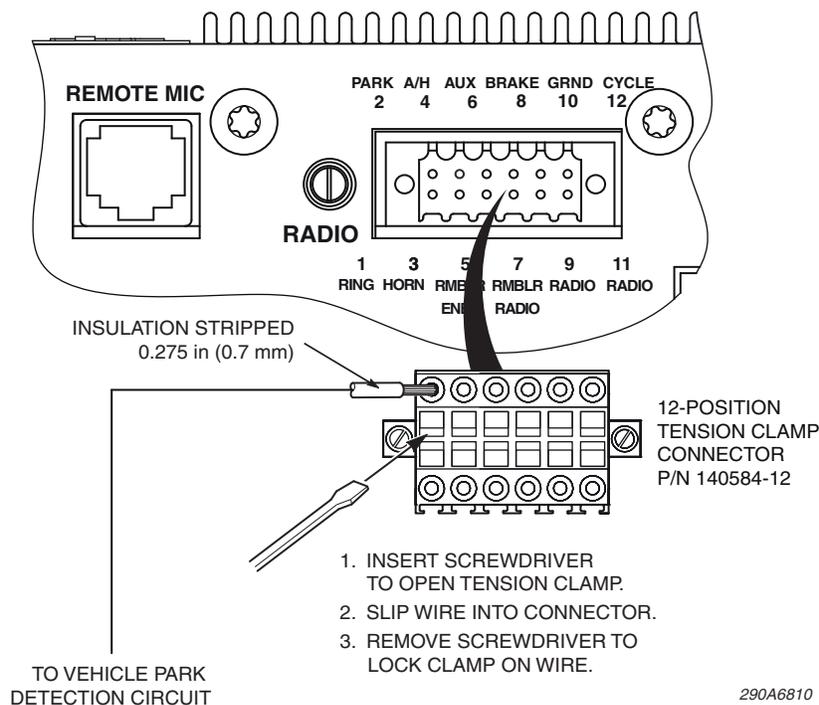
NOTE: The 12-position tension clamp connector accepts 18 AWG to 22 AWG wire. The recommended length of insulation to strip from the wires for insertion into the connector is 0.275 in (0.7 mm).

To wire the PARK detection circuit:

1. Connect an 18 AWG to 22 AWG lead from Position 2 (PARK) on the 12-position connector to the electrical circuit that provides +12 V or –BAT when the vehicle transmission is in park. See Figure 12.
2. Insulate spliced leads with twist-on wire connectors. Fold and seal unused leads. Use wire ties and hold-downs for strain relief.
3. To prevent fretting or disconnection, tighten the two screws on the 12-position speaker connector.

NOTE: The PARK detection circuit must be OPEN when the vehicle is NOT in PARK. If power or ground is detected on the circuit that is CLOSED when the vehicle is not in PARK, the vehicle operator will not be able to activate any siren tones.

Figure 12 Connections for the park detection circuit

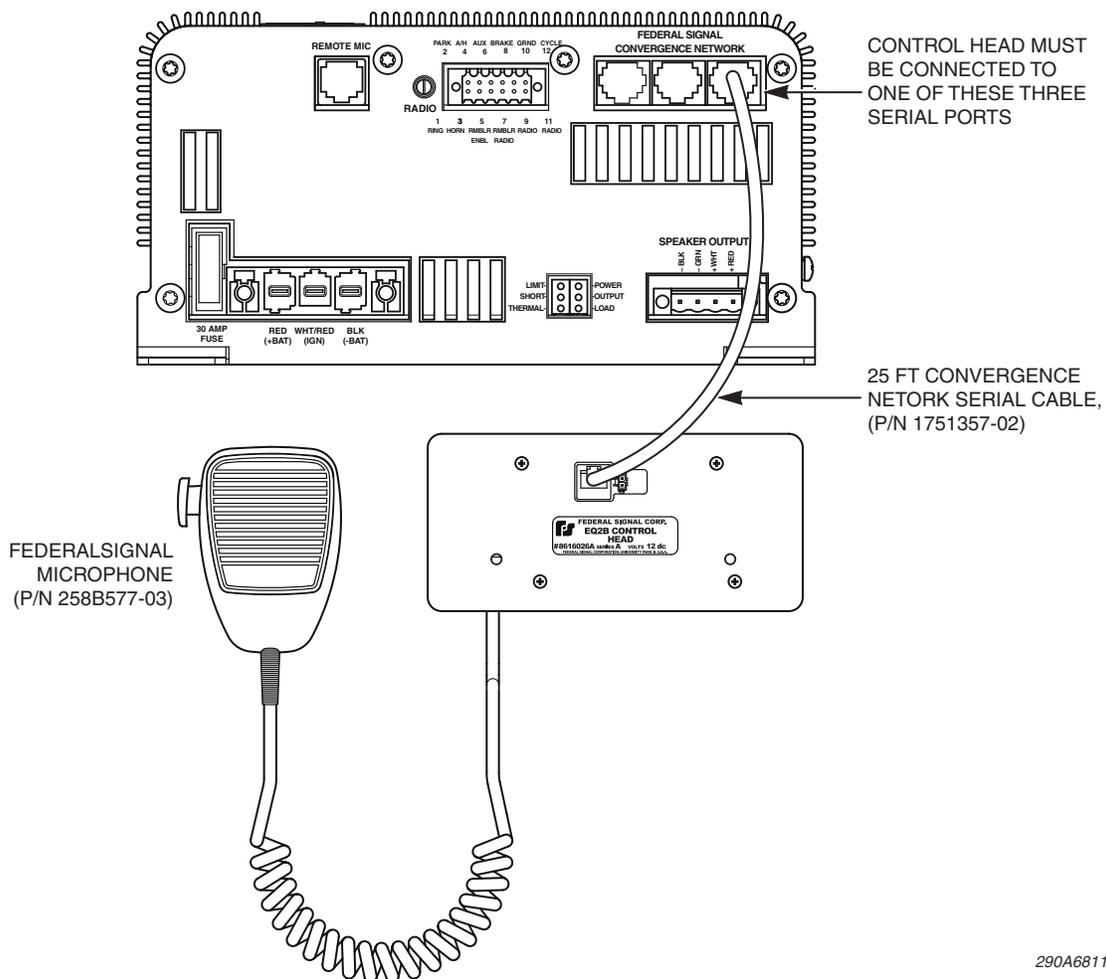


Connecting the Control Head

To connect the control head to the siren amplifier:

1. Plug the 25-foot Convergence Network serial cable into one of the three serial ports in the upper right corner on the front of the siren amplifier. See Figure 12.
2. Plug the other end of the cable into the connector on the back of the control head.
3. To provide strain relief, secure the cables with installer-supplied clamps and hold-downs.

Figure 13 Convergence Network connection between e-Q2B and control head



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Connecting the Federal Signal Microphone (P/N 258B8577-03)

The Federal Signal microphone provides high quality voice reproduction in for public address over the siren speakers. The microphone push-to-talk switch overrides all siren functions, except radio rebroadcast, for instant PA use. The microphone connection is not required for the siren to operate properly.

There are two options for connecting the microphone through the FS Convergence Network: to the control head or to siren amplifier. The options provide greater

Wiring the e-Q2B Siren System

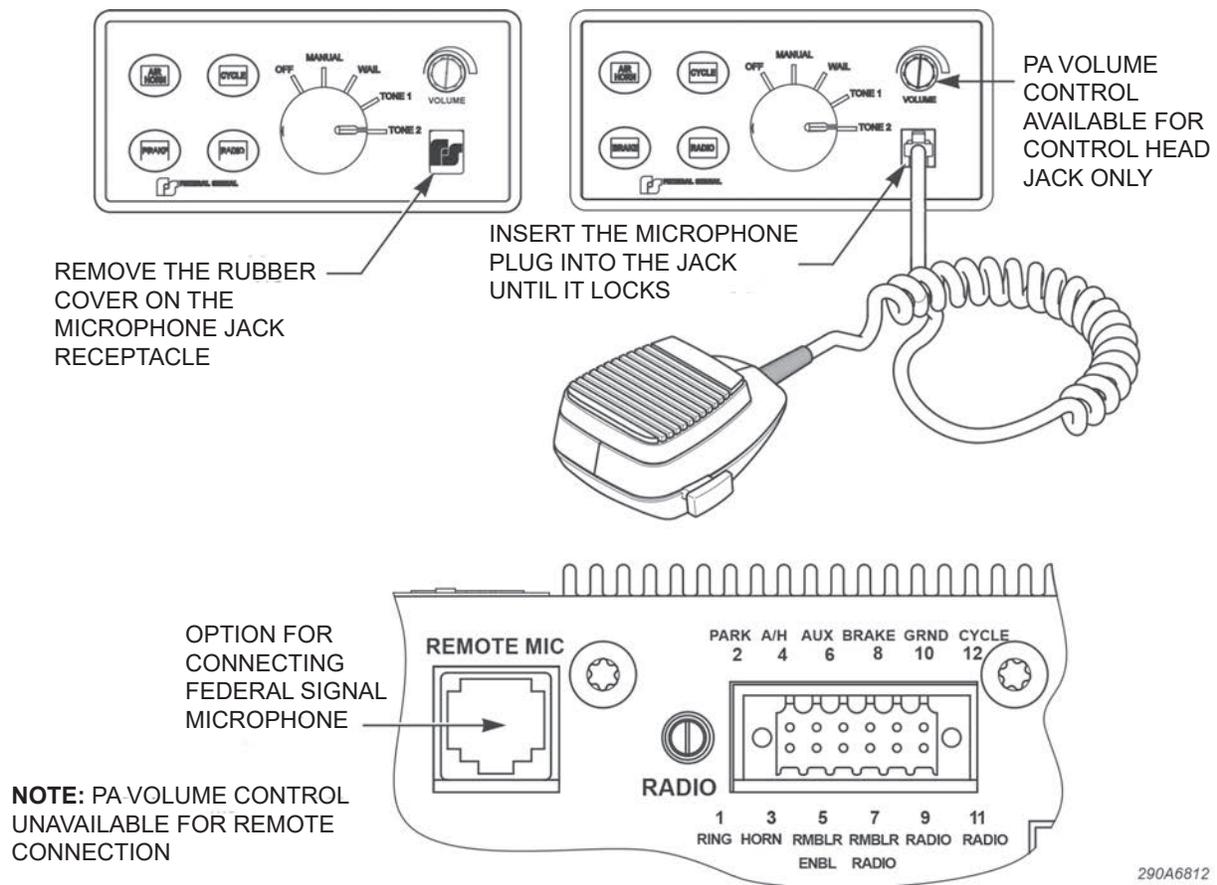
flexibility in selecting mounting locations for the microphone. For instructions on adjusting the PA volume, which is available only when the microphone is connected to the control head, see “Setting the Gain for Public Address (PA)” on page 36.

To connect the microphone to the control head:

1. Remove the rubber cover from the telephone jack on the front of the control head. See Figure 14.
2. Insert the plug of the microphone cable into the microphone jack until it locks.

To connect the microphone to the front of siren amplifier, insert the plug of the microphone cable into the microphone jack labeled REMOTE MIC until it locks.

Figure 14 Microphone connections



Connecting the e-Q2B System to the Battery

The e-Q2B is supplied with a three-conductor, 20-foot power cable. The cable uses a three-position male connector. The installer-supplied red (positive) and black (negative ground) power leads from the siren amplifier to the vehicle battery should be as short and direct as possible. An installer-supplied in-line fuse and wiring of an amperage capacity sufficient to handle the total vehicle electrical loads are required.

⚠ WARNING

BATTERY EXPLOSION: *To avoid a battery explosion, always disconnect the negative battery cable first and reconnect it last. Avoid causing a spark when connecting near or to the battery. The gases produced by a battery can cause a battery explosion that could result in vehicle damage and serious injury.*

⚠ CAUTION

HIGH CURRENT ARCING: *Do not connect this system to the vehicle battery until ALL other electrical connections are made and you have verified that no shorts exist. High current conductors can cause hazardous sparks or burning wire, resulting in electrical fires.*

Preparing to Connect the Power Leads

Before connecting the amplifier/relay module to the battery, ensure that your final installation goes smoothly by taking these preparatory steps:

1. Visually check all connections and wiring to ensure that all connections are correct and secure.
2. Ensure that there are no loose strands or other bare wires that may cause a short circuit. All wires must be protected from any sharp edges that could eventually cut through the insulation.
3. Verify that all other electrical connections are completed and that no shorts exist.
4. Use an ohmmeter to verify that a short circuit does not exist between the positive (+) and negative (–) battery cable leads. There must be no short circuits between the positive wires and the vehicle chassis.
5. Insulate spliced leads with twist-on wire connectors. Fold and seal unused leads. Use wire ties and hold-downs for strain relief.

Connecting the Power Leads to the Vehicle Battery

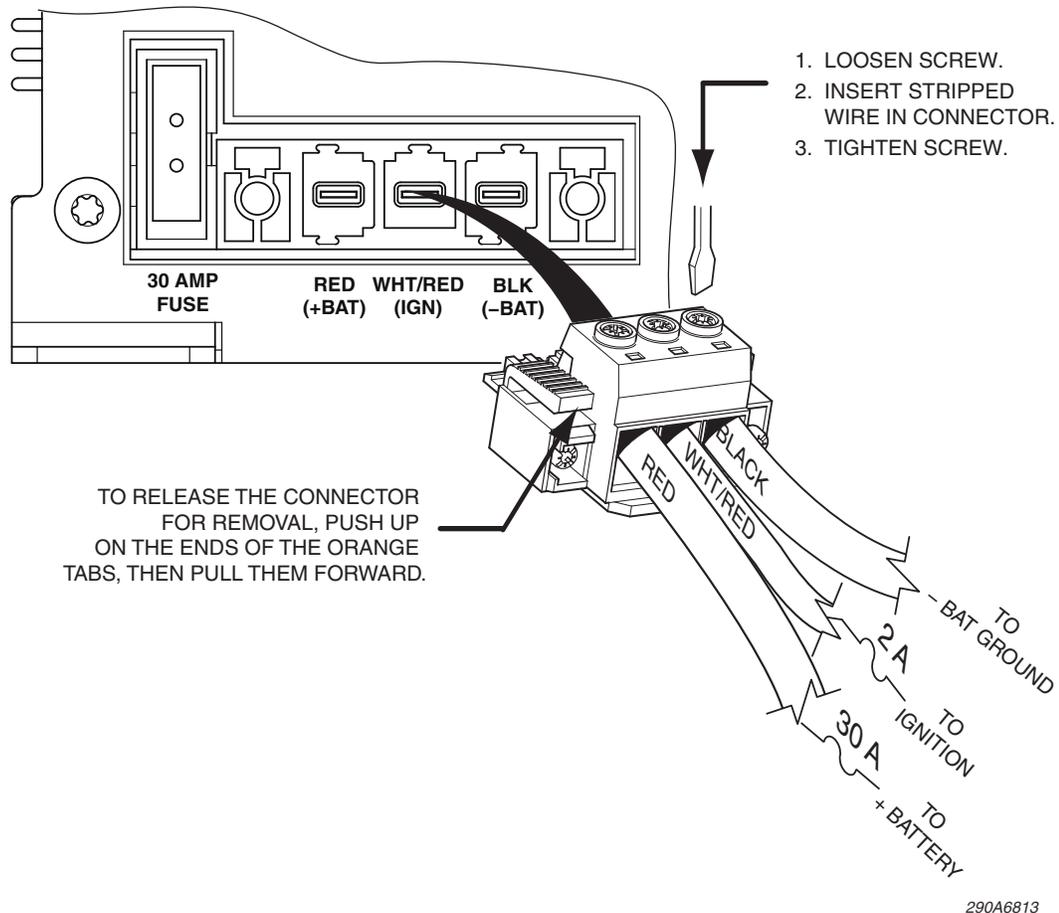
The installer-supplied red (positive) and black (negative ground) power leads from the siren amplifier to the vehicle battery should be as short and direct as possible.

1. Connect the 10 AWG red positive lead (+) to a positive power source capable of supplying 40 amperes. Install a user-supplied 30-ampere fuse (minimum) at the source. The e-Q2B is internally fused at 30 amperes. See Figure 15 on page 34.

Wiring the e-Q2B Siren System

2. Connect the 10 AWG negative (-) black lead directly to the negative battery terminal.
3. Connect the 12 AWG white lead with the red stripe to a switched circuit that is hot, or active, in the ON and START position of the vehicle ignition system. Install a user-supplied 2-ampere fuse at the source.
4. To prevent fretting or disconnection, tighten the screws on the connector.

Figure 15 Connections for power, ground, and ignition



Setting the Gain for Radio Rebroadcast and PA

The radio rebroadcast feature allows incoming two-way radio messages to be amplified by the siren amplifier and rebroadcast over the siren speakers of the e-Q2B System. The Radio Rebroadcast function is available only when the siren is in MANUAL Mode. The gain control for radio rebroadcast is a potentiometer with a screw head on the front of the siren amplifier. See Figure 17 on page 36.

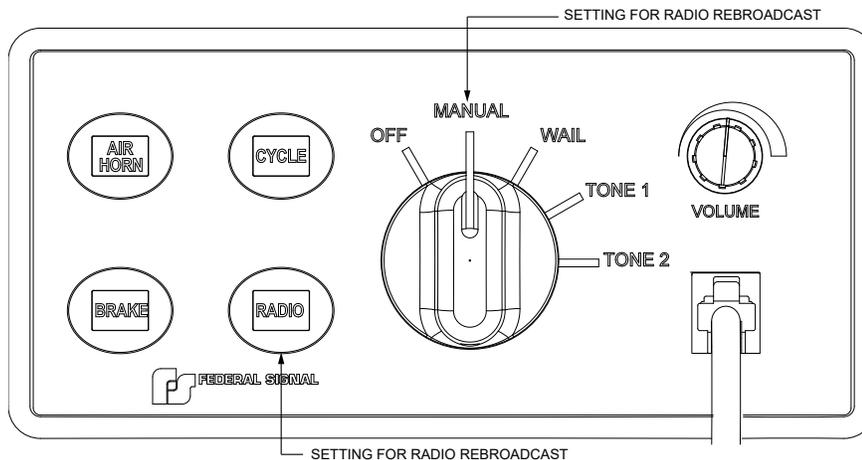
For public address, the e-Q2B Siren System includes a microphone that connects to a serial port on the front of the control head. When the operator presses the microphone push-to-talk button and speaks into the microphone, the operator's voice is amplified and broadcast over the siren speakers. The control for adjusting the PA gain is a volume knob on the front of the control head. See Figure 18 on page 36.

Setting the Gain for Radio Rebroadcast

To adjust the radio rebroadcast volume:

1. Stand outside the vehicle in an enclosed area and turn on the two-way radio.
2. Adjust the volume level of the radio to its normal operating volume.
3. Set the dial on the control head to MANUAL. See Figure 16.
4. Press the RADIO button on the control head. The button glows brighter to indicate that it is ON.

Figure 16 Control head selections for radio rebroadcast



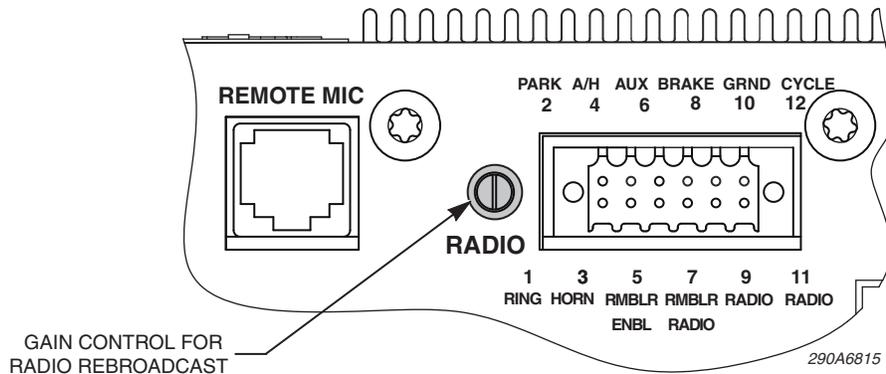
5. Stand outside the vehicle and note the volume level of the radio rebroadcast. If the volume is too loud or too soft, insert a flat head screwdriver into the slot on the RADIO potentiometer on the front of the Q2B. See Figure 17 on page 36. Turn it clockwise to increase the volume until audio feedback (squeal) occurs or counterclockwise to decrease the volume.

NOTE: Audio feedback depends upon the microphone gain, open windows, speaker placement, and proximity of reflecting surfaces such as walls, buildings, or other vehicles.

Setting the Gain for Radio Rebroadcast and PA

- To turn off radio rebroadcast, press the RADIO button. The button dims to indicate it is OFF.

Figure 17 Gain control for radio rebroadcast

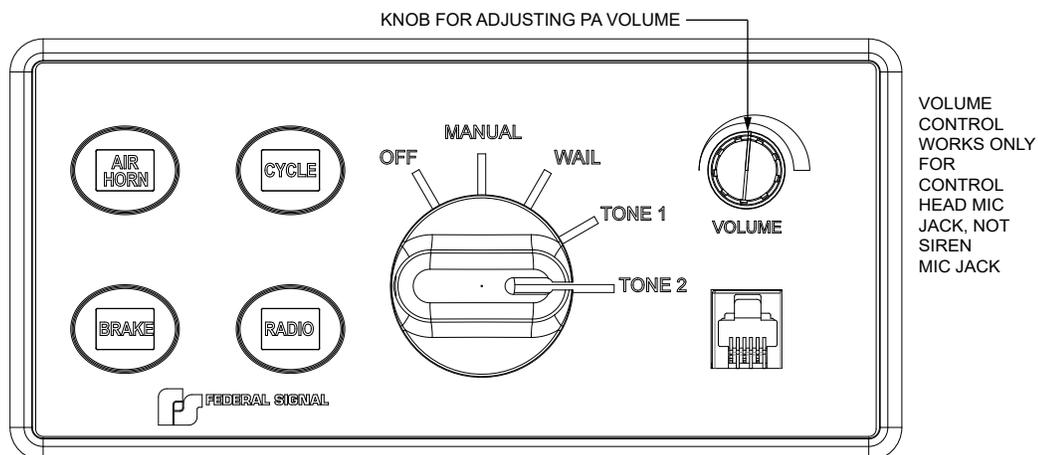


Setting the Gain for Public Address (PA)

NOTE: You can adjust the PA gain only if the microphone is connected through the jack on the control head. It is not available through the REMOTE connection on the back of the siren amplifier.

To adjust the PA gain, turn the VOLUME knob clockwise to increase the volume or counterclockwise to decrease the volume. See Figure 18.

Figure 18 Gain control for public address



NOTE: Audio feedback depends upon the microphone gain, open windows, speaker placement, and the proximity of reflecting surfaces such as walls, buildings, or other vehicles.

Mounting the Siren Amplifier and Control Head

The next step in the installation after wiring and connecting the e-Q2B Siren System is to permanently mount the siren amplifier and control head in the vehicle. Verify that the mounting locations you selected earlier are safe for installing these components. Before installing the siren amplifier and control head, note the following precautions.

⚠ WARNING

AIRBAG DEPLOYMENT: Do not install equipment or route wiring in the deployment path of an airbag. Failure to observe this warning will reduce the effectiveness of the airbag or potentially dislodge the equipment, causing serious injury or death.

⚠ WARNING

SEAT REMOVAL PRECAUTION: If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment. Failure to follow this warning cause serious injury or death.

NOTICE

UNIT REQUIRES AIR FLOW: The siren amplifier is cooled by an internal fan. Do not install it in areas where the air flow is restricted. Do not mount the unit near a heater duct or under the hood.

NOTICE

UNIT IS NOT WATERPROOF: The housing of the e-Q2B siren amplifier is NOT waterproof. The module must be mounted in a location that is sheltered from falling rain, snow, standing water, etc.

⚠ WARNING

DRILLING PRECAUTIONS: Before drilling holes, check the area into which you plan to drill to ensure that you do not damage vehicle components. All drilled holes should be deburred and all sharp edges should be smoothed. Additionally, all exterior drilled holes must be sealed with Motorcraft seam sealer T-A-2-B or equivalent to prevent the potential exposure to carbon monoxide or other potentially harmful fumes. Failure to observe this warning could cause serious injury or death.

Mounting the Siren Amplifier

Installer-supplied #10-32 mounting hardware is required to mount the siren amplifier.

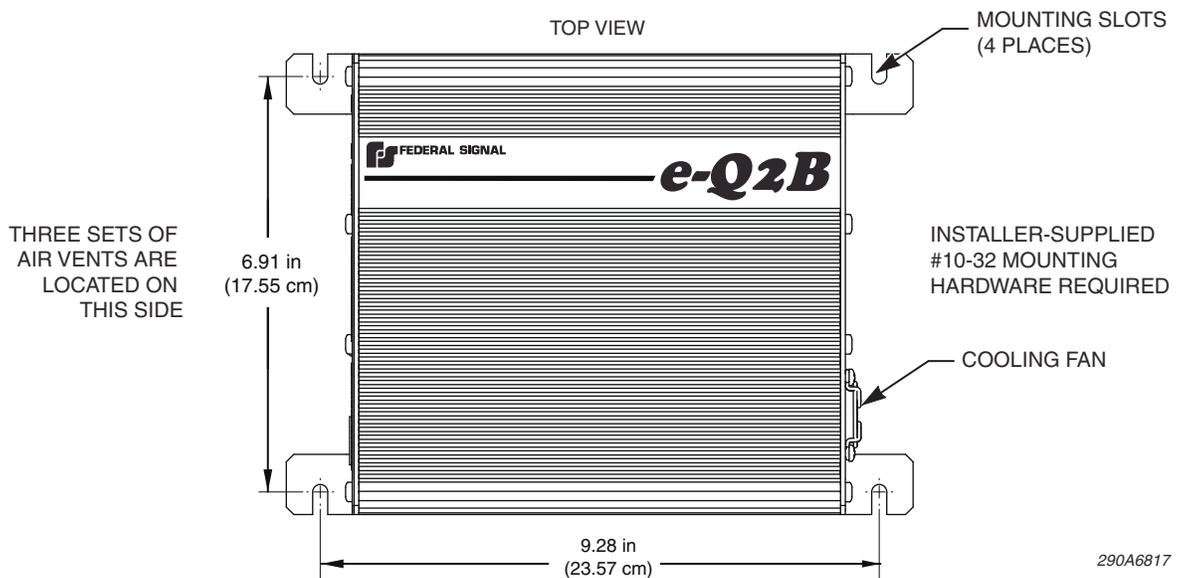
Tools needed:

- #18 tap drill for steel and iron
- Phillips screwdriver
- Pencil or felt tip pen for marking drill locations

To mount the siren amplifier in the vehicle:

1. Use the base of the siren amplifier as a template to mark the centers of the four mounting holes. See Figure 19.

Figure 19 Mounting information for the siren amplifier



2. Tap and drill the center of the four mounting holes.
3. Center the slots in the base of the siren amplifier over the drilled holes and secure it with the installer-supplied #10-32 mounting hardware.

Mounting the Standard Control Head

⚠ WARNING

LOCATING OPERATOR CONTROLS: *The controls for the light system must be located so that the VEHICLE and CONTROLS can be operated safely under all driving conditions.*

For directions on mounting the flush-mount control head, see “Mounting the Flush-Mount Control Head” on page 40. The standard control head comes with two mounting brackets and mounting hardware.

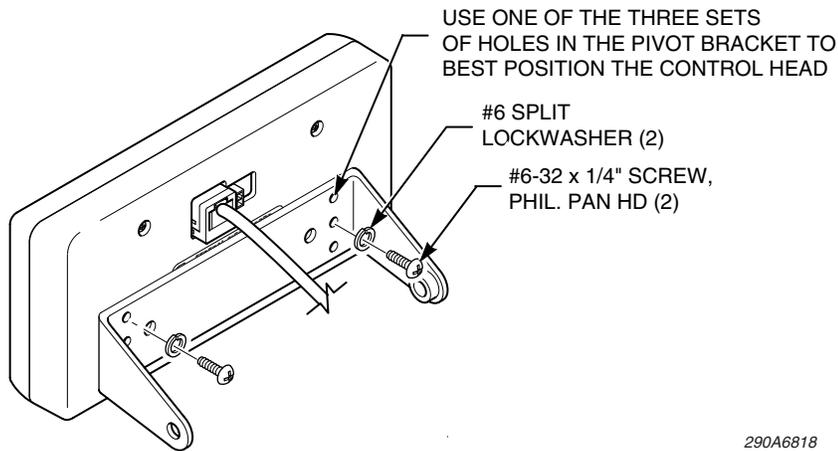
Tools needed:

- Drill with #9 drill bit
- Phillips screwdriver
- 7/16-inch nut driver
- Pencil or felt tip pen for marking drill position locations

To mount the control head:

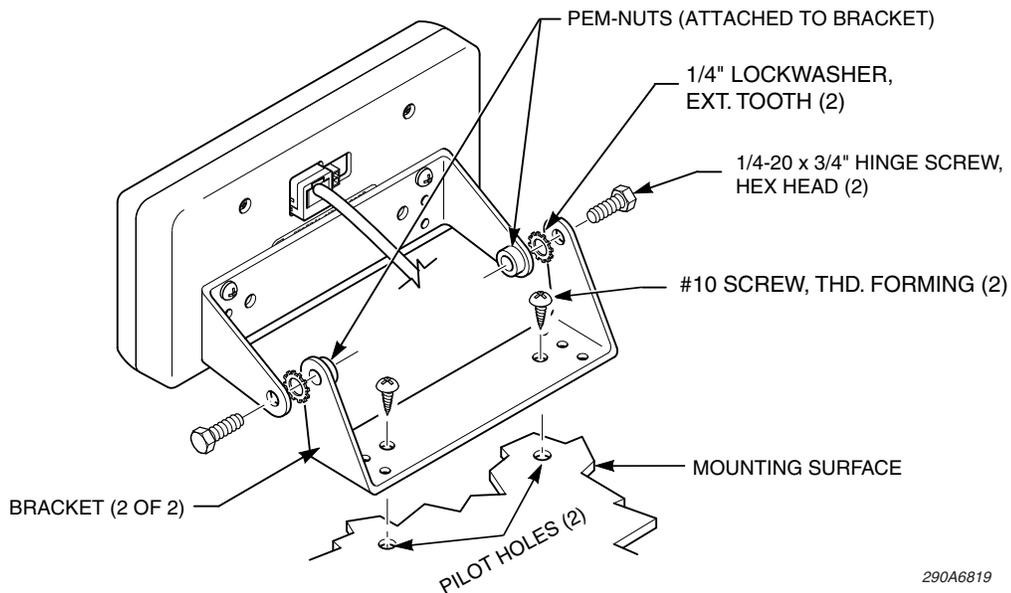
1. Secure a bracket to the control head with the 6-32 by 1/4-inch Phillips screws and #6 lock washers. See Figure 20.

Figure 20 Bracket attached to back of control head



2. Using a 7/16-inch nut driver, secure the other bracket to the control head/bracket assembly with the 1/4-20 by 3/4-inch hex head screws and 1/4-inch lock washers. See Figure 21.

Figure 21 Brackets attached to control head and mounting surface



Mounting the Siren Amplifier and Control Head

3. Use the mounting bracket as a template and scribe two drill position marks at the selected mounting location.
4. Drill two pilot mounting holes at the drill position marks.
5. Secure the mounting bracket to the mounting surface with the #10 thread-forming screws. See Figure 21.
6. To adjust the angle of the control head, loosen the hinge screws, tilt the control head forward or backward, then securely tighten the screws.

Mounting the Flush-Mount Control Head

For directions on mounting the standard control head, see page 38. The flush-mount control head comes with mounting hardware.

Tools needed:

- Drill with #37 drill bit
- Template on page 59
- Phillips screwdriver
- Pencil
- Sabre saw

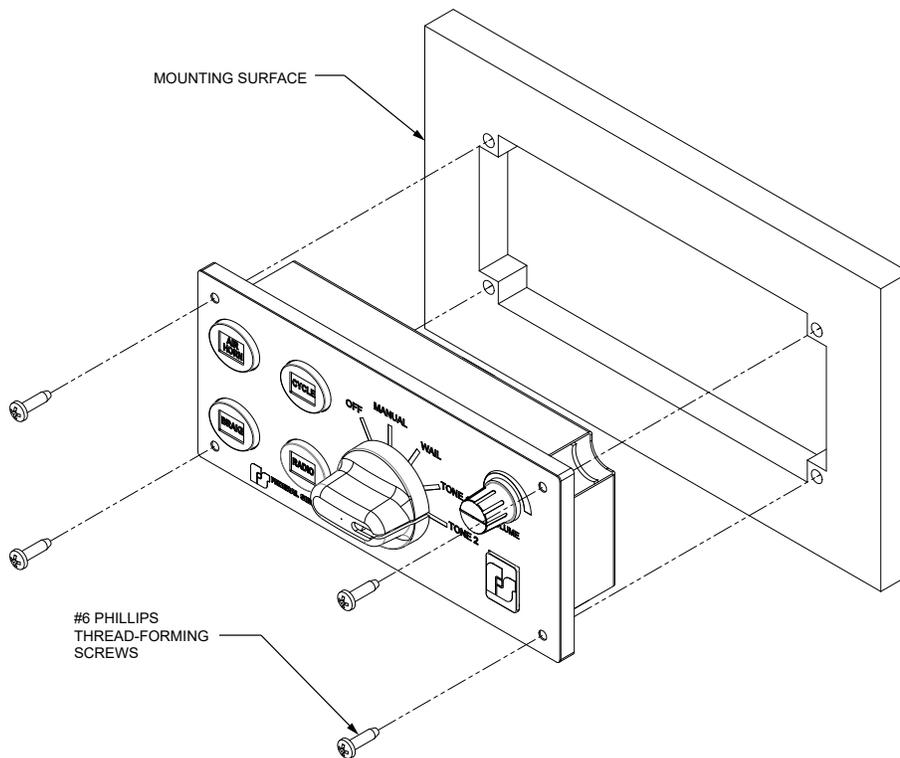
To mount the control head:

⚠ WARNING

LOCATING OPERATOR CONTROLS: The controls for the light system must be located so that the VEHICLE and CONTROLS can be operated safely under all driving conditions.

1. Select a mounting location for the control head. See Figure 22. The control head must be mounted within convenient reach of the operator, typically in the vehicle console.

Figure 22 Flush-mount control head



NOTICE

VERIFY TEMPLATE DIMENSIONS: Before using the mounting template, verify that the template is to size and all dimensions are correct.

2. Use the template on page 59 as a guide to scribe the four mounting holes and the cutout on the mounting surface.
3. Drill a mounting hole 0.104-inch in diameter at each of the four scribed marks.
4. Use a sabre saw to cutout the scribed opening for the light.
5. After completing the wiring of the e-Q2B system, insert the control head into the cutout and secure it with the four supplied #6B screws.

Final Preparations of the e-Q2B Siren System

The final step in the installation of the e-Q2B Siren System is to ensure that the system is installed correctly, that all vehicle functions operate properly, and that safety stickers and messages are available to vehicle operators. Before proceeding, note the following precautions.

⚠ WARNING

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

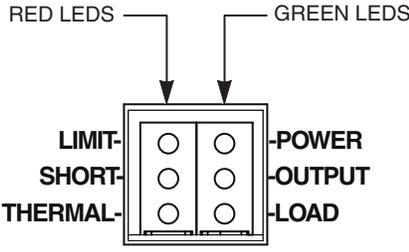
⚠ WARNING

LIGHT HAZARD: To be an effective warning device, an emergency warning system produces bright light that can be hazardous to your eyesight when viewed at a close range. Do not stare directly into this lighting product at a close range, or permanent damage to your eyesight may occur.

Testing the Installation

Test the e-Q2B Siren System to verify that it is operating properly. Be sure to note the status of the LED indicators on the front of the siren amplifier. See Figure 23.

Figure 23 e-Q2B system diagnostic LEDs

	System Activity	LED Activity
	Power on	No LEDs light
	Power and ignition on	POWER lights
	Siren active	OUTPUT lights
	Short circuit	SHORT lights
	Siren speakers are receiving current	LOAD lights
	Siren amplifier overheats	THERMAL lights
	30-ampere fuse is intact	LIMIT lights

Test all vehicle functions, including horn operation, vehicle safety functions, and vehicle lighting systems for proper operation. Ensure that the installation has not affected the vehicle operation or changed any vehicle safety functions or circuits. Do not test the sound and light system of the vehicle while driving. Operating the vehicle warning system may pose a hazard to the operator and other drivers if the system does not function as expected. Test the vehicle only in a controlled environment. After testing is complete, provide a copy of this manual to the instructional staff and all operating personnel.

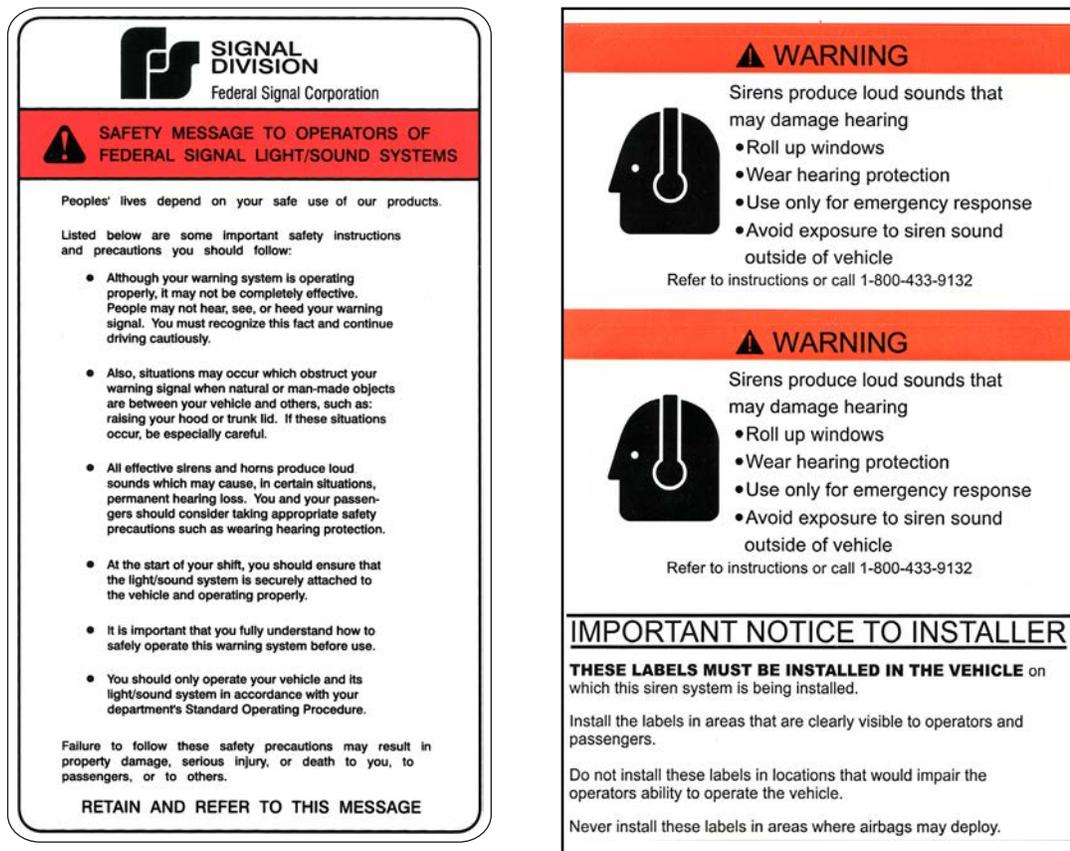
Distributing the Safety Message Card

Give the operator of the e-Q2B System the card entitled “Safety Message to Operators of Federal Signal Light/Sound Systems” (part no. 256B691). See Figure 24. The operator must read and understand the safety instructions and keep the card in the vehicle for reference.

Applying the Siren Safety Labels in the Vehicle

The e-Q2B Siren System kit includes a sheet of two labels with siren safety messages (part no. 1612339). See Figure 24. These labels must be installed in the vehicle in which the system is installed. Place these labels in areas that are clearly visible to operators and passengers. Do not adhere the labels to locations that would impair the driver’s ability to operate the vehicle. Never install the labels in areas where air bags may deploy.

Figure 24 Safety message card (left) and siren safety labels (right)



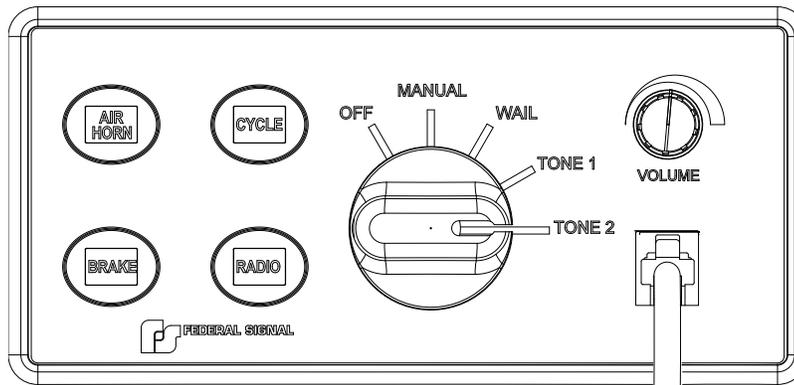
Operating the Standard e-Q2B Siren System

This section describes the standard siren controls (control head 8616058) and how to operate them. (For instructions on operating the eQ2B-CAL siren system, see page 48.) The e-Q2B Siren System is controlled through the control head, which has a rotary switch, four buttons, and one volume control for public address. Some siren functions can be controlled by either the control head or foot switches. The foot switches, which are purchased separately, connect to the front of the siren amplifier. For information on wiring foot switches, see “Connecting the Foot Switches for Cycle, Brake, and Air Horn” on page 19.

⚠ WARNING

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

Figure 25 Control head push buttons, rotary switch, and PA volume control



Siren Tones

The selector switch positions are OFF, MANUAL, WAIL, TONE 1 (YELP), and TONE 2 (PRIORITY). WAIL produces a continuous wailing up-and-down tone with the distinctive “Q” sound. YELP produces a continuous, rapid warbled tone. PRIORITY produces continuous extremely rapid warbled tone. For a loud burst of traffic-clearing sound, push and release the AIR HORN button or foot switch.

Siren Priorities

A priority level is assigned to each siren function. The functions are PA, Radio Rebroadcast, Air Horn, Cycle, Wail, Yelp, Brake, and Manual. If two siren functions are simultaneously requested, the one with higher priority is activated. Lower priority siren functions are overridden by higher priority siren functions. For example, when WAIL is selected and the AIR HORN button or foot switch is activated, the AIR HORN tone sounds over the WAIL tone. When the AIR HORN button or switch is released, the WAIL tone continues. Public Address, Radio Rebroadcast, and AIR HORN override siren tones.

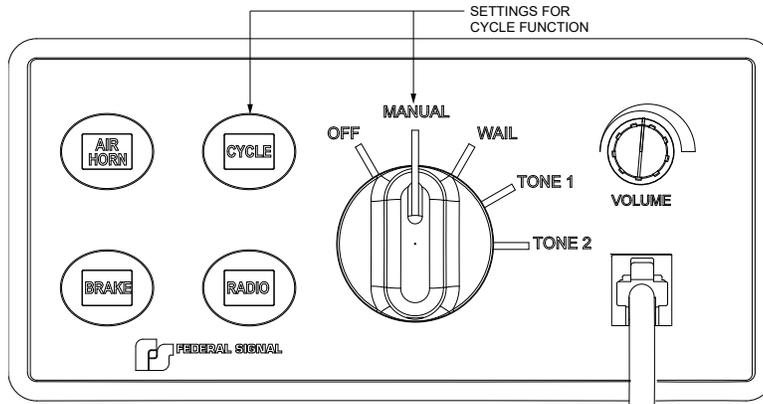
Manual Mode

If you select the MANUAL position, the following siren functions are available.

Cycle Foot Switch/Push Button

Press the CYCLE push button or foot switch to simulate the application of voltage to the original electromechanical “Q” siren with a rising tone. Release the CYCLE switch to simulate the coasting down tone of the original electromechanical “Q” siren.

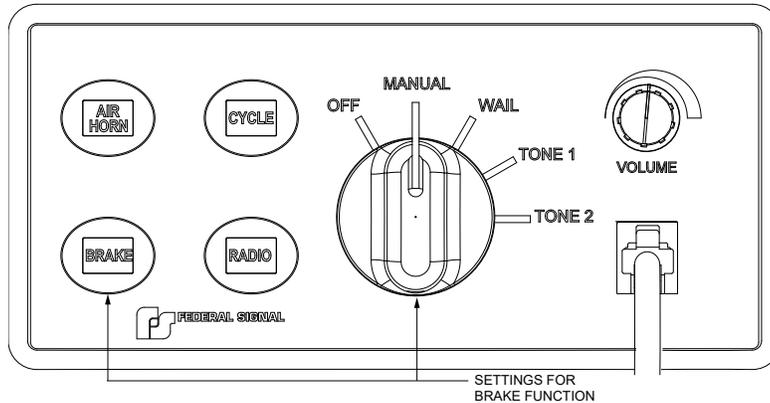
Figure 26 Settings for CYCLE function



Brake Foot Switch/Button

Press the BRAKE button or foot switch to simulate the accelerated braking or slowing down of the siren output. The braking action is similar to the original electromechanical “Q” when the brake solenoid is activated.

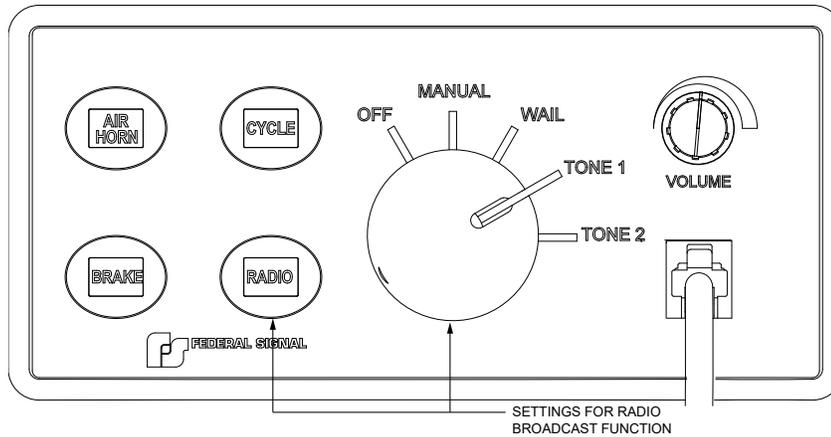
Figure 27 Settings for BRAKE function



Radio Rebroadcast

To rebroadcast incoming radio transmissions through the siren speakers, turn the rotary switch to the MANUAL function and press the radio switch to the ON position. The volume is factory set but can be adjusted by a potentiometer on the front of the siren amplifier. Volume level increases when turning the potentiometer clockwise. For more information, see “Setting the Gain for Radio Rebroadcast” on page 35.

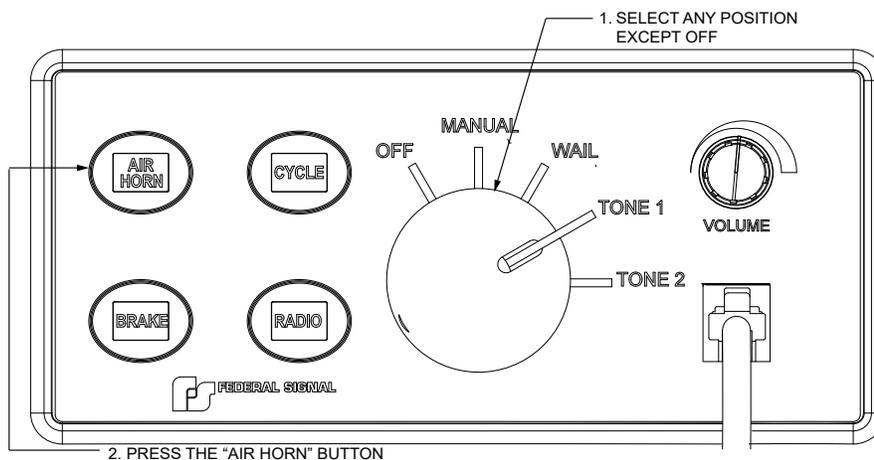
Figure 28 Settings for RADIO rebroadcast function



Air Horn

To sound the air horn, turn the rotary switch to any position except OFF. Press the AIR HORN button as you would the horn button on the steering wheel. The air horn overlaps any siren tone.

Figure 29 Settings for AIR HORN

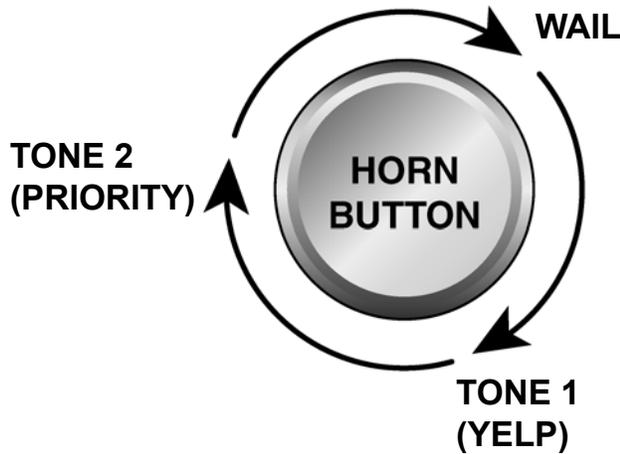


Horn Ring

The e-Q2B horn-ring transfer function uses the vehicle horn switch to toggle between siren tones. The first tap of the vehicle horn button transfers the siren to the next tone. A second tap transfers to the next tone in the sequence. A third tap returns the tone to the tone shown on the control head.

When the tone is in MANUAL Mode, pressing the horn ring activates the cycle command as long as the hold ring is held.

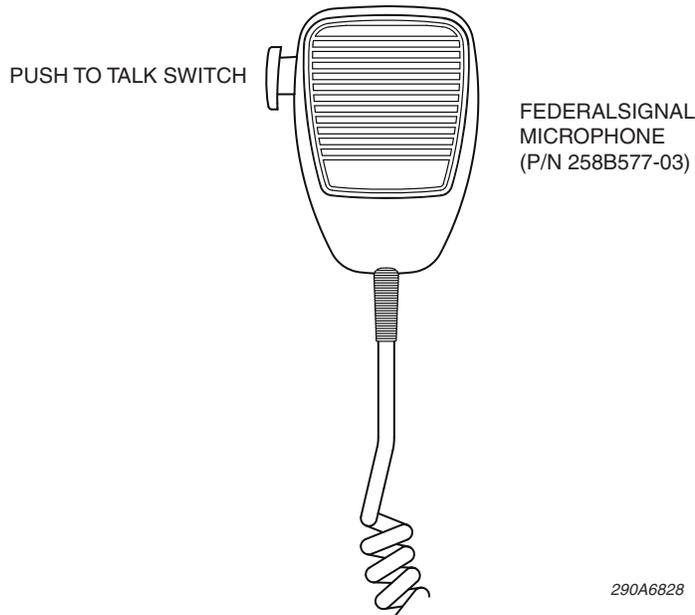
Figure 30 Horn button control of siren tone sequence



Public Address (PA)

The push-to-talk switch on the Federal Signal microphone overrides all siren functions except radio rebroadcast. The microphone connection is not required for the siren to operate properly. For more information, see “Setting the Gain for Public Address (PA)” on page 36.

Figure 31 Push-to-Talk button for PA



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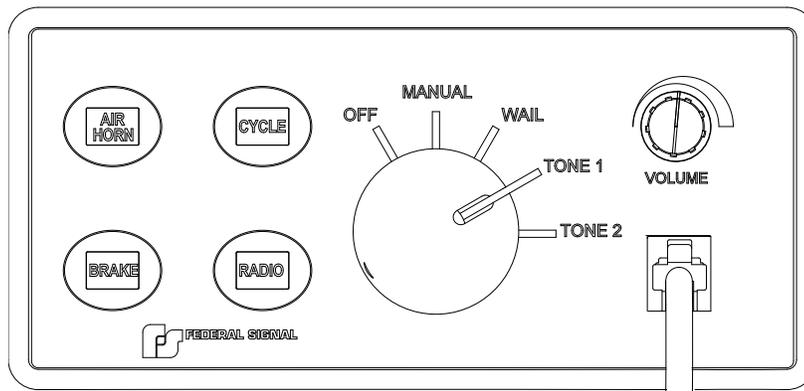
Operating the e-Q2B-CAL Siren System

This section describes the CAL model siren controls and how to operate them. For instructions on operating the standard eQ2B siren system, see page 44. The e-Q2B-CAL Siren System is controlled through the control head, which has a rotary switch, four buttons, and one volume control for public address. Some siren functions can be controlled by either the control head or foot switches. The foot switches, which are purchased separately, connect to the front of the siren amplifier. For information on wiring foot switches, see “Connecting the Foot Switches for Cycle, Brake, and Air Horn” on page 19.

⚠ WARNING

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

Figure 32 Control head push buttons, rotary switch, and PA volume control



Siren Tones

The selector switch positions are OFF, MANUAL, WAIL, TONE 1 (YELP), and TONE 2 (YELP). WAIL produces a continuous wailing up-and-down tone with the distinctive “Q” sound. YELP produces a continuous, rapid warbled tone. For a loud burst of traffic-clearing sound, push and release the AIR HORN push button or foot switch.

Siren Priorities

A priority level is assigned to each siren function. The functions are PA, Radio Rebroadcast, Air Horn, Cycle, Wail, Yelp, Brake, and Manual. If two siren functions are simultaneously requested, the one with higher priority is activated. Lower priority siren functions are overridden by higher priority siren functions. For example, when WAIL is selected and the AIR HORN button or foot switch is activated, the AIR HORN tone sounds over the WAIL tone. When the AIR HORN button or switch is released, the WAIL tone continues. Public Address, Radio Rebroadcast, and AIR HORN override siren tones.

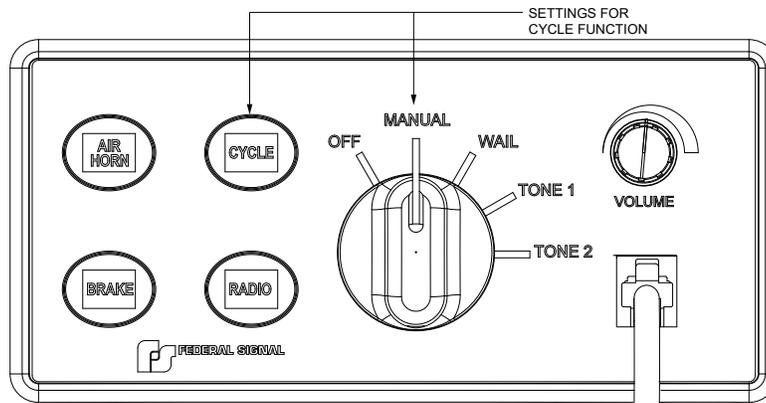
Manual Mode

If you select the MANUAL position, the following siren functions are available.

Cycle Foot Switch/Push Button

Press the CYCLE button or foot switch to simulate the application of voltage to the original electromechanical “Q” siren with a rising tone. Release the CYCLE switch to simulate the coasting down tone of the original electromechanical “Q” siren.

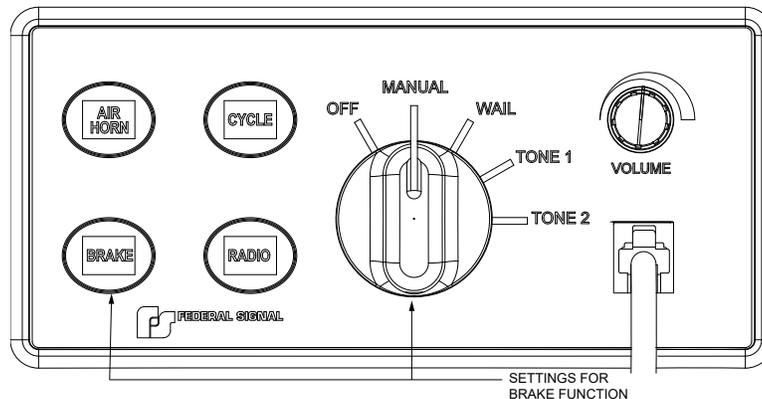
Figure 33 Settings for CYCLE function



Brake Foot Switch/Button

Press the BRAKE push button or foot switch to simulate the accelerated braking or slowing down of the siren output. The braking action is similar to the original electromechanical “Q” when the brake solenoid is activated.

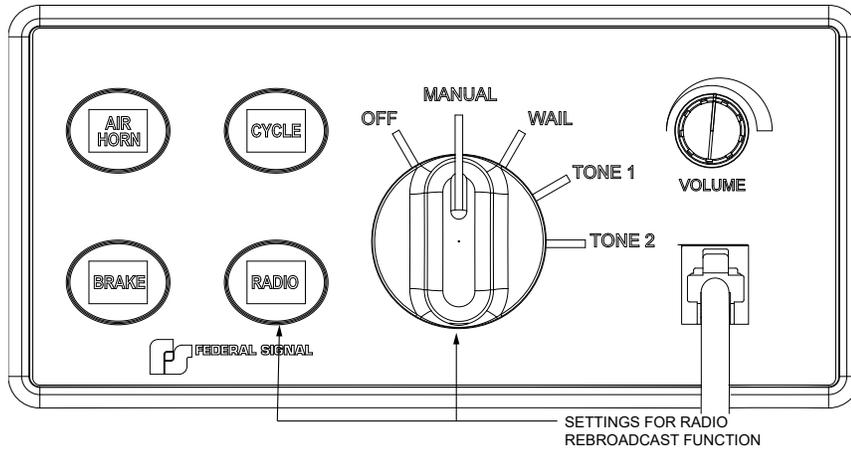
Figure 34 Settings for BRAKE function



Radio Rebroadcast

To rebroadcast incoming radio transmissions through the siren speakers, turn the rotary switch to the MANUAL function and press the radio switch to the ON position. The volume is factory set but can be adjusted by a potentiometer on the front of the siren amplifier. Volume level increases when turning the potentiometer clockwise. For more information, see “Setting the Gain for Radio Rebroadcast” on page 35.

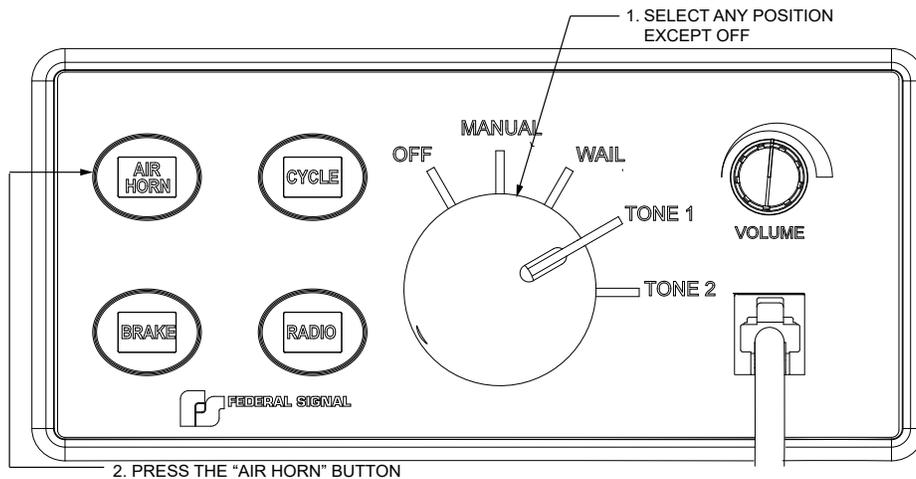
Figure 35 Settings for RADIO rebroadcast function



Air Horn

To sound the air horn, turn the rotary switch to any position except OFF. Press the AIR HORN button as you would the horn button on the steering wheel. The air horn overlaps any siren tone.

Figure 36 Settings for AIR HORN

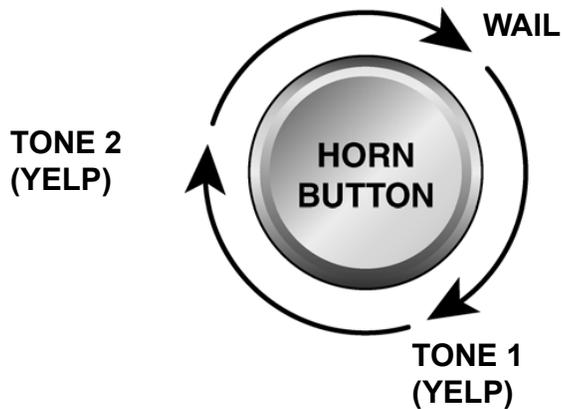


Horn Ring

The e-Q2B-CAL horn-ring transfer function uses the vehicle horn switch to toggle between siren tones. The first tap of the vehicle horn button transfers the siren to the next tone. A second tap returns the tone to the tone shown on the control head.

When the tone is in MANUAL mode, pressing the horn ring activates the cycle command as long as the hold ring is held.

Figure 37 Horn button control of siren tone sequence



Public Address (PA)

The push-to-talk switch on the Federal Signal microphone overrides all siren functions except radio rebroadcast. The microphone connection is not required for the siren to operate properly. For more information, see “Setting the Gain for Public Address (PA)” on page 36.

Figure 38 Push-to-Talk button for PA



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Safety Messages to Personnel Servicing Electronic Sirens

⚠ WARNING

People's lives depend on your proper servicing of Federal Signal products. It is important to read and follow all instructions shipped with the products. 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 control head.
- To properly service an electronic siren or control head, 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 service manuals when performing service on a vehicle.
- Electronic repairs must be performed by a qualified and competent electronics 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.
- 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.

Servicing the e-Q2B Siren System

Federal Signal recommends that the e-Q2B siren amplifier and control head be returned to your local distributor or to Federal Signal for service. External components, such as cabling and the 30-ampere fuse, are available as replacement parts. See Table 7 on page 58. With the exception of the selector knob and the PA volume knob on the control head, there are no other user-serviceable parts within the control head or the siren amplifier. After servicing the e-Q2B Siren System, test it to ensure that it is operating properly. See “Final Preparations of the e-Q2B Siren System” on page 42 for more information.

Servicing the Control Head

Servicing the control head includes replacing the selector knob and PA volume knob. It also includes removing and reinstalling the control head when necessary.

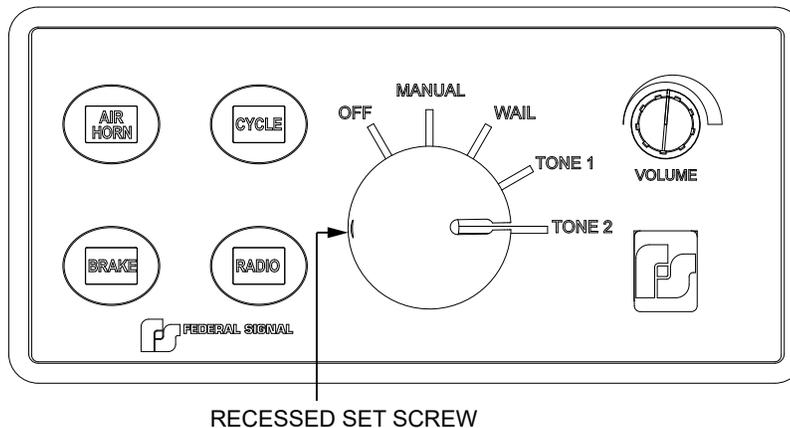
Replacing the Selector Knob

The selector knob is retained by a set screw. The knob can be removed from the control head for replacement or service without disassembling or dismounting the control head.

Tools needed:

- 1/16-inch Allen wrench

Figure 39 Location of set screw in selector knob



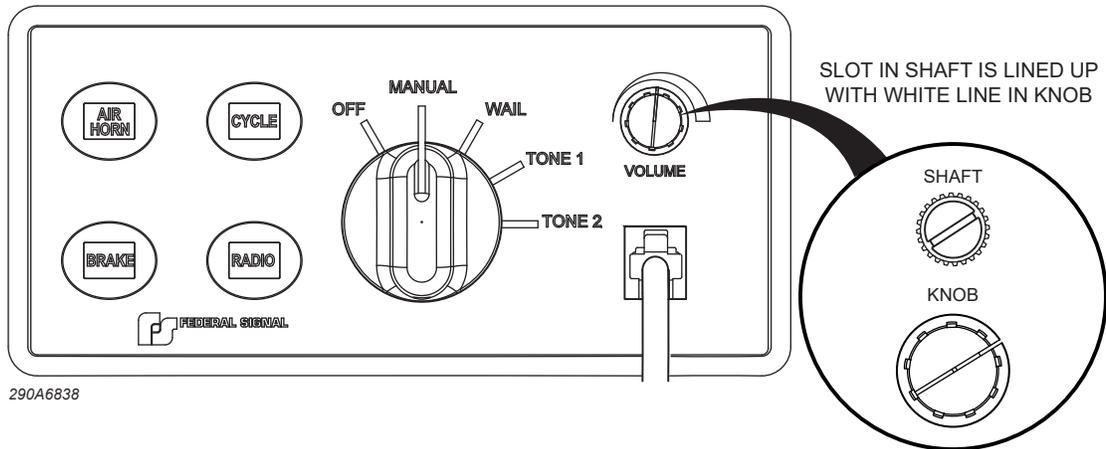
Replacing the PA Volume Knob

The PA volume knob is a press-on knob that is not secured with any mechanical fasteners.

To remove the knob:

1. Pull the plastic knob off the shaft of the volume control potentiometer.
2. Turn the metal shaft counterclockwise until it stops.
3. Orient the new knob above the shaft so that the white line is lined up with the slot in the metal shaft. See Figure 40.

Figure 40 PA volume knob replacement



4. Press the knob down on the shaft until it is fully seated.
5. Disconnect the Convergence Network cable from the back of the control head.
6. Remove the two #6-32 by 1/4-inch Phillips screws securing the bracket to the rear of the control head. See Figure 41 on page 55. Retain the screws and the two #6 lock washers.

Removing the Standard Control Head

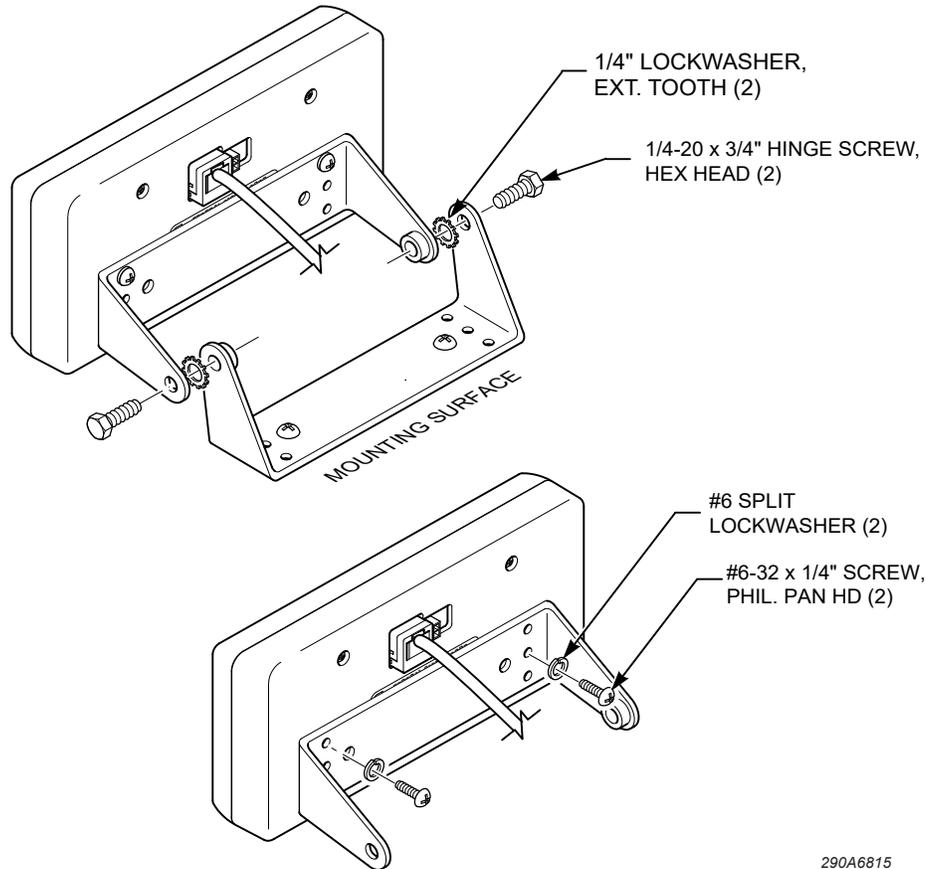
The standard control head is easily removed from the mounting brackets.

Tools needed:

- 7/16-inch nut driver
- Small Phillips screwdriver
- Small needle nose pliers
- 1/64-inch hex key wrench

To remove the control head for service or replacement, use a 7/16-inch nut driver to remove the two 1/4-20 by 3/4-inch hinge screws securing the two mounting brackets together. Retain the screws and the two 1/4-inch external-tooth lock washers. See Figure 41.

Figure 41 Control head removed from mounting surface



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To remove the selector knob:

1. Use the Allen wrench to remove the set screw securing the knob to the shaft of the selector switch.
2. Pull the knob off the shaft.
3. Place the new knob on the shaft, and use the Allen wrench to tighten the set screw.

Reinstalling the Standard Control Head

To reinstall the control head in the vehicle:

1. Secure the rear mounting bracket to the control head base with the two Phillips #6-32 by 1/4-inch screws. See Figure 40 on page 55.
2. Reconnect the Convergence Network cable to the control head.
3. Test the siren system to ensure that it is operating properly.
4. Secure the rear mounting bracket to the mounting surface bracket with the two 1/4-inch external-tooth lock washers and 1/4-20 by 3/4-inch hinge screws.

Removing and Reinstalling the Flush-Mount Control Head

The standard control head is secured in place by four #6B Phillips thread forming screws. Use a small Phillips screwdriver to remove the screws and pull the control head from the mounting location. See Figure 22 on page 41. Disconnect the Convergence Network cable from the back of the control head. Before reinstalling the control head with the four #6B screws, reconnect the Convergence Network cable to the control head, and test the siren system to ensure that it is operating properly.

Servicing the Siren Amplifier

Servicing the siren amplifier includes replacing damaged cables or external wiring and the 30-ampere fuse. It also includes removing and reinstalling the siren amplifier when necessary. For information on ordering replacement parts from Federal Signal, see page 58.

Tools needed:

- 16-inch nut driver
- Flat head screwdriver
- Small needle nose pliers (for fuse replacement)

Removing the Siren Amplifier

To remove the siren amplifier for service or replacement:

1. Remove and retain the installer-supplied #10-32 hardware.
2. Disconnect the Convergence Network cable, serial cables, and speaker leads from the siren amplifier.
3. Loosen the two strain-relief screws securing the power connector and unplug the three-position power and ignition connector.

Reinstalling the Siren Amplifier

To reinstall the siren amplifier in the vehicle:

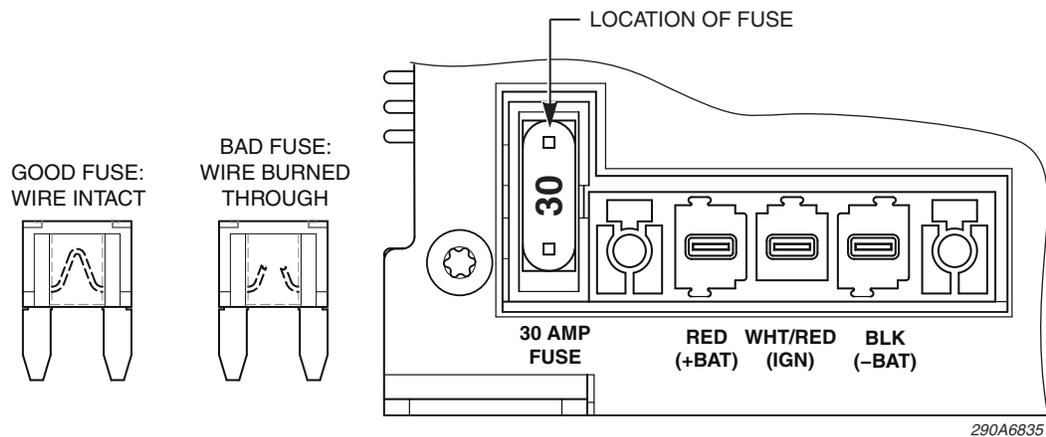
1. Test the siren system to ensure that it is operating properly.
2. Reinstall the siren amplifier with the installer-supplied #10-32 hardware.
3. Reconnect the Convergence Network cable, serial cables, and speaker leads from the siren amplifier.
4. Reconnect the three-position power and ignition connector.

Replacing the 30 A Fuse in the Siren Amplifier

To replace the fuse:

1. Investigate and correct the cause of the fuse failure.
2. Remove the 30-ampere fuse by pulling it out with a pair of needle nose pliers. See Figure 42. Be careful not to bend the blades.
3. Insert the blades of the new 30-ampere fuse into the fuse holder. Make sure that it is properly seated.

Figure 42 Fuse replacement in the siren amplifier



Getting Technical Support and Service

For technical support and service, please contact:

Service Department
 Federal Signal Corporation
 Phone: 1-800-433-9132
 Email: empserviceinfo@fedsig.com
www.fedsig.com

Getting Repair Service

The Federal Signal factory provides technical assistance with any problems that cannot be handled locally.

Any units returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization (RMA). Obtain a RMA from a local Distributor or Manufacturer's Representative.

Provide a brief explanation of the service requested, or the nature of the malfunction.

Address all communications and shipments to the following:

Federal Signal Corporation
 Service Department
 2645 Federal Signal Drive
 University Park, IL 60484-3167

Ordering Replacement Parts

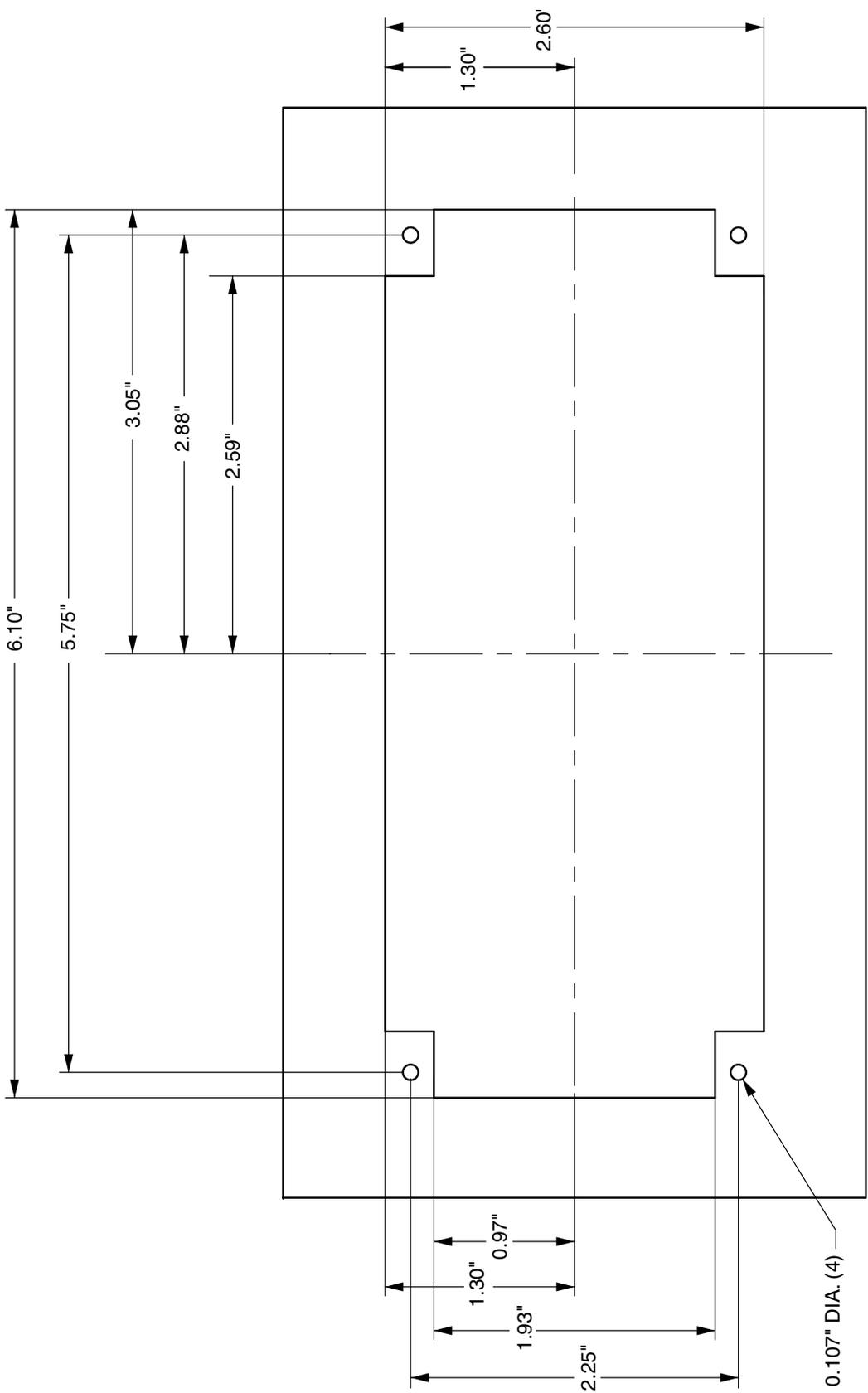
To order replacement parts, please contact:

Customer Support
Federal Signal Corporation
Phone: 1-800-264-3578

Table 7 Replacement parts

Description	Part Number
Amplifier, e-Q2B, 200 W	8616033
Amplifier, e-Q2B, 100 W	8616033-100
Control Head, e-Q2B	8616026
Cable, 25 ft Convergence Network	1751357-02
Microphone	258B577-03
Fuse, 30 A	148A142-08
Knob, Selector	141143
Knob, PA Volume	141134
Connector, Power	140535
Connector, Speaker	140417-04
Connector, Aux. Input, 12-Position	140584-12

Figure 43 Mounting Template for Flush-Mount Control Head



0.107" DIA. (4)

NOTE: VERIFY THAT THE TEMPLATE IS TO SIZE AND THAT ALL DIMENSIONS ARE CORRECT.



FEDERAL SIGNAL
Safety and Security Systems

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Customer Support

Police/Fire-EMS: 800-264-3578 • +1 708 534-3400

Work Truck: 800-824-0254 • +1 708 534-3400

Technical Support 800-433-9132 • +1 708 534-3400