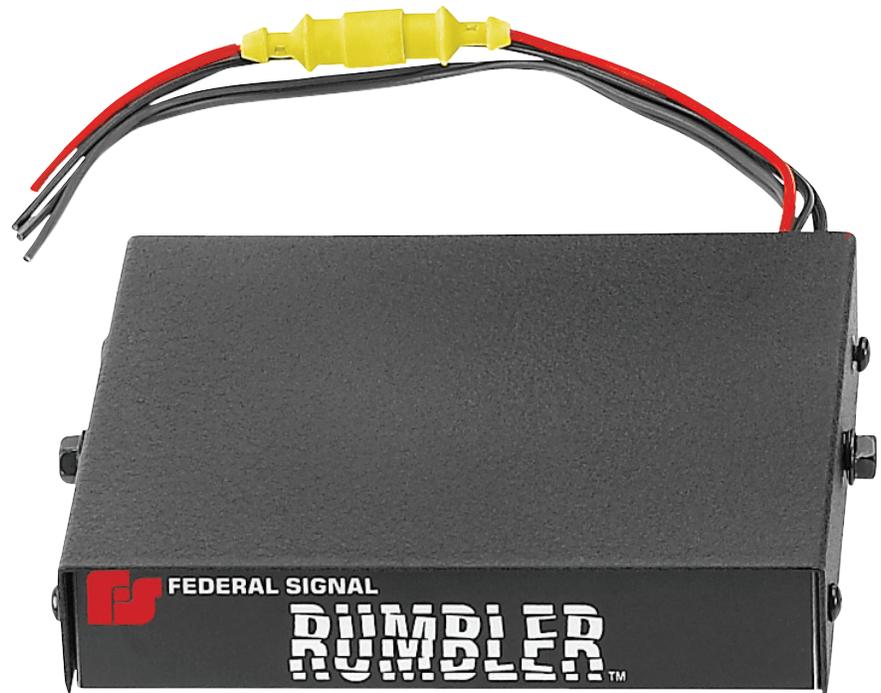


# Model Rumbler® 2 Low Frequency Siren Amplifier



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## *Installation and Operation Instructions*

## Limited Warranty

This product is subject to and covered by a limited warranty, a copy of which can be found at [www.fedsig.com/SSG-Warranty](http://www.fedsig.com/SSG-Warranty). A copy of this limited warranty can also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484, email to [info@fedsig.com](mailto:info@fedsig.com) or call +1 708-534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.



### **FEDERAL SIGNAL** Safety and Security Systems

2645 Federal Signal Drive  
University Park, Illinois 60484-3167

[www.fedsig.com](http://www.fedsig.com)

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

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## **Safety Message to Installers, Operators, and Service Personnel**

For your safety, read and understand this manual thoroughly before installing, operating, or servicing the Rumbler 2 Low Frequency Siren Amplifier. The safety messages presented here are reminders to exercise extreme care at all times.

To download copies of this manual, go to [www.fedsig.com](http://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.
- Electronic circuit repairs must be performed by a qualified and competent electronic technician.

##### *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 and conservation guidance, refer to federal, state, or local recommendations. OSHA Standard 1910.95 offers guidance on "Permissible Noise Exposure."
- All effective sirens and horns produce loud sounds, which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

#### **During Installation**

- DO NOT connect this system to the vehicle battery until ALL other electrical connections are made, mounting of all components is complete, and you have verified that no shorts exist.
- Ensure that the siren amplifier and speaker in your installation have compatible wattage ratings.
- For this electronic siren to function properly, the ground connection must be made to the NEGATIVE battery terminal.

## ***Safety Message to Installers, Operators, and Service Personnel***

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- 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 in a location that provides maximum signaling effectiveness and minimizes the sound reaching the vehicle's occupants.
- Never attempt to install aftermarket equipment that connects to the vehicle wiring without reviewing a vehicle wiring diagram. Such a diagram is available from the manufacturer. Ensure that your installation will not affect vehicle operation or mandated safety functions or circuits.
- 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 airbag deployment.
- Locate the siren so the vehicle controls 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.
- If wiring is shorted to the vehicle frame, high current conductors can cause hazardous sparks, resulting in electrical fires or flying molten metal.

### **After Installation**

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

## **An Overview of the Rumbler 2**

The Federal Signal Rumbler 2 Low Frequency Siren Amplifier incorporates the latest solid-state designs for superior reliability and sound quality. The Rumbler 2 uses the output of a standard emergency vehicle siren and synthesizes a low-frequency signal. It then amplifies that signal to drive a Federal Signal Low Frequency Siren Speaker.

The amplifier's adjustable 8–60 second timer enables the tone to sound for the selected interval and then automatically turns it off. The result is a highly effective backup emergency tone, especially when crossing hazardous traffic intersections.

The Rumbler 2 is designed for use in negative-grounded vehicles with 12-volt electrical systems. It can be mounted in a variety of positions.

## **Features**

The Rumbler 2 has the following features:

- Economical, small, and compact—mounts virtually anywhere.
- Easy to operate—horn ring activation.
- High reliability—advanced circuitry and FET design.
- Output short-circuit protected—replaceable fuse protection.

## **Applications**

The Rumbler 2 has the following applications:

- Police vehicles
- Fire chief vehicles
- Volunteer emergency vehicles

**Table 1: Rumbler 2 specifications**

Input voltage	9 Vdc to 15 Vdc
Operating input current	12 A maximum
Polarity	Negative-grounded systems only
Standby current	0.025 A nominal
Operating temperature rang	–30°C to +65°C (22°F to 149°F)
Frequency range	182 to 400 Hz
Output voltage	64 V (nominal) peak-to-peak
Output Power	80 W
Height x Length x Width	1.3 x 6.3 x 5.7 inches (3.3 x 16.0 x 14.5 cm)
Shipping Weight	3 lb (1.4 kg)

## Unpacking and Inspecting the Rumbler 2

After unpacking the Rumbler 2, 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, and ensure that the parts listed in Table 2 are contained in the packing carton before removing or destroying them.

**Table 2: Parts list**

Qty.	Description
1	Rumbler 2 Amplifier
2	Mounting Bracket
2	1/4-20 x 1/2-inch Self Tapping Hex Head Screw
2	3/8-inch Star Washer

The installation also requires four installer-supplied 10-32 x 3/4-inch hex head screws, 10-32 split lock washers, and 10-32 hex nuts. An additional installer-supplied 15 A fuse and in-line fuse holder are also required for fusing the Rumbler 2 at the power source. The amplifier is activated through the horn ring circuit or an installer-supplied momentary switch.

## Mounting the Rumbler 2 in the Vehicle

### **⚠ WARNING**

**USE ONLY AS A SUPPLEMENTAL SIREN:** *The Rumbler 2 is intended as a supplemental warning for use at intersections and other areas close to the emergency vehicle. You must continue to use the regular siren in connection with the Rumbler 2. Failure to follow this warning can reduce the effectiveness of the siren system and cause serious injury.*

### **⚠ 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.*

### **NOTICE**

**UNIT REQUIRES VENTILATION:** *The Rumbler 2 radiates heat. Do not install it in an area where it cannot dissipate heat into the air. Do not mount it near a heater duct or under the vehicle's hood.*

The Rumbler 2 has two mounting brackets that mount it in a variety of positions. The amplifier has no user-operated controls, so it can be mounted in the trunk or other concealed area in the vehicle.

## Mounting the Rumbler 2 in the Vehicle

To mount the Rumbler 2 in a vehicle:

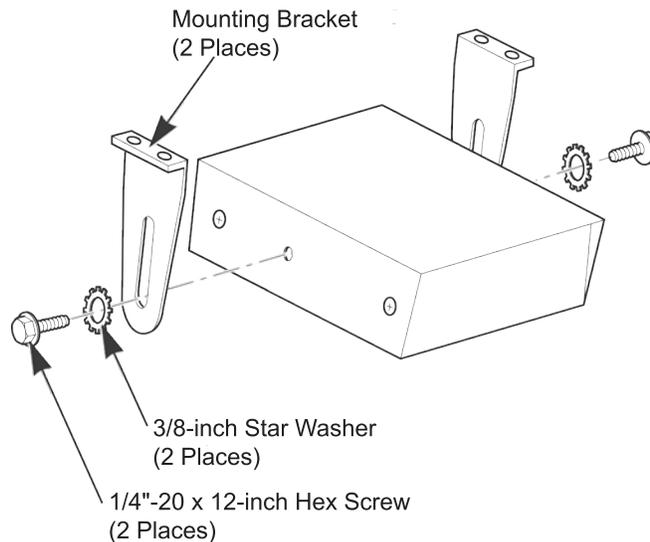
1. Select a mounting location.
2. Use a mounting bracket as a template and scribe two drill-position marks seven inches apart at the selected mounting location.

### **NOTICE**

**DRILLING PRECAUTIONS:** When drilling holes, check the area you are drilling into to ensure that you do not damage vehicle components while drilling. All drilled holes should be de-burred, and all sharp edges should be smoothed. All wire routings going through drilled holes should be protected by a grommet or convolute/split loom tubing.

3. Drill four mounting holes at the position marks.
4. Secure the mounting brackets to the surface with installer-supplied 10-32 by 3/4-inch hex head screws, 10-32 split lock washers, and 10-32 hex nuts (four of each).
5. Secure the amplifier to the mounting brackets with the 1/4"-20 by 1/2-inch hex head screws and 3/8-inch star washers just enough that you can adjust its position (Figure 1).
6. Adjust the amplifier to the position you want and tighten the screws.

**Figure 1: Front view of Rumbler 2 with mounting hardware**



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## Wiring the Rumbler 2 in the Vehicle

### **⚠ WARNING**

**FIRE HAZARD:** *If shorted to the vehicle frame, high current conductors can cause hazardous sparks, resulting in electrical fires or molten metal. DO NOT connect this system to the vehicle battery until ALL other electrical connections are made and mounting of all components is complete. Verify that no short circuits exist before connecting to the positive (+) battery terminal. Failure to follow this warning can cause a fire and may result in serious injury or death to you or others.*

### **NOTICE**

**DRILLING PRECAUTIONS:** *When drilling holes, check the area you are drilling into to ensure that you do not damage vehicle components while drilling. All drilled holes should be de-burred, and all sharp edges should be smoothed. All wire routings going through drilled holes should be protected by a grommet or convolute/split loom tubing.*

## Connecting a Speaker

### **NOTICE**

**USE ONLY WITH MODEL 751000 SPEAKER:** *The Rumbler 2 siren amplifier is designed to operate only with the Model 751000 Rumbler speaker. Connecting the Rumbler 2 to a standard siren speaker will damage the speaker.*

A speaker is not included as part of the electronic siren amplifier. Mounting instructions for the Model 751000 Low Frequency Speaker are included with the speaker.

The power and speaker cables are included on the siren. All wires must be connected as shown in Figures 2 and 3 on page 11.

Use 18 AWG wire to connect the amplifier's speaker leads (clear zip cord) to the speaker. Ensure that exposed connections are properly insulated.

## Connecting the Input Leads

### **NOTICE**

**CONNECT INPUT LEADS PROPERLY:** *Failure to connect the input leads as shown in Figure 3 on page 11 could result in damage to the vehicle's main emergency siren.*

Use 18 AWG wire to connect the input leads (black zip cord) in series with one of the speaker leads of the emergency vehicle's main siren. See Figure 3 for the wiring diagram.

Use 18 AWG wire to connect the brown input lead to the other speaker lead of the emergency vehicle's main siren. See Figure 3 for the wiring diagram.

### Connecting the Activation Input

Use 22 AWG wire to connect the white activation lead to the vehicle's horn ring circuit or user-supplied momentary switch.

**NOTE:** The Rumbler 2 activates only by placing the white activation lead to ground. If activation is required from a 12-volt signal, an installer-supplied relay or a Federal Signal UPKM-3 Module must be used. The 12-volt signal will energize the relay, and the relay contact will place the white activation lead to ground.

### Connecting Power

The Rumbler 2 operates only from 12-volt NEGATIVE-grounded vehicle electrical system. Therefore, before making any electrical connections, determine the polarity of the vehicle's electrical system ground.

#### **NOTICE**

**BATTERY DRAIN:** *The Rumbler 2 system does not have an on-off switch. If power for the Rumbler 2 is obtained directly from the vehicle battery, it draws approximately 0.20 Ah per day in standby mode. If you are connecting the Rumbler 2 to the switched side of the ignition circuit, make sure the circuit has enough current capacity to handle the additional 10 A (approx.) load.*

#### **NOTICE**

**FUSE AMPLIFIER AT 12 V SOURCE:** *Damage to the Rumbler 2 will occur if it is not properly fused. Ensure that the supplied in-line fuse holder and 15 A fuse are installed in the red power lead. The Rumbler 2 should also be fused with a user supplied 15 A fuse at the 12-volt source.*

1. Use a 14 AWG or heavier wire to connect the amplifier's black ground lead to the vehicle battery's negative terminal (–NEG) or ground lug. See Figure 2.
2. Use a 14 AWG or heavier wire to connect the amplifier's red lead to the selected 12-volt source.

Figure 2: Rear view of Rumbler 2 with leads

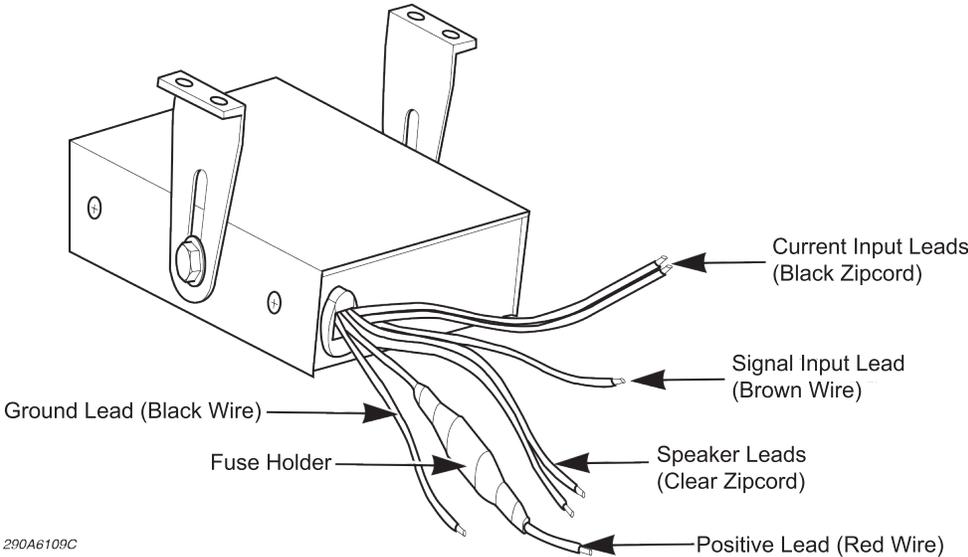
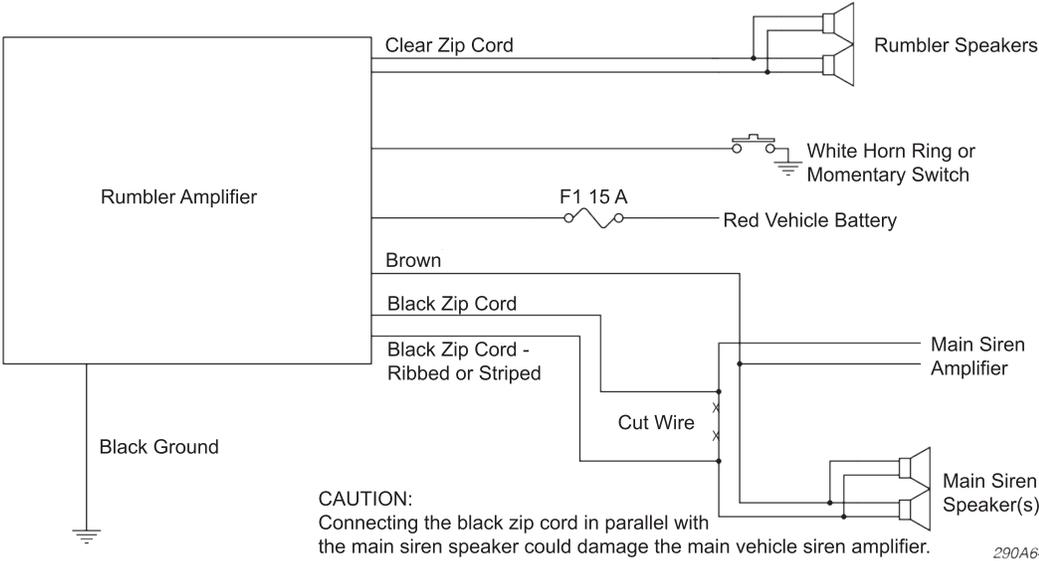


Figure 3: Rumbler 2 wiring diagram



## Setting the 8–60 Second Timer

**⚠ WARNING**

**SOUND HAZARD:** *The Rumbler 2 increases close-proximity warning effectiveness by generating siren signals that better penetrate a vehicle's interior. These signals may also increase sound levels in the operator's vehicle, and may increase noise exposure to the operator. The amount of this increase will vary based on the length of time operators are exposed to noise from emergency operation, the vehicle in which the Rumbler 2 is installed, and other factors.*

*To protect the operator from sound exposure hearing loss, you should measure the sound levels in the vehicle and calculate permissible exposure times. One source of permissible exposure times is the federal OSHA regulations in section 1910.95.*

*The amplifier's 8-60 second timer is factory-set for a default time of 8 seconds. After assessing sound levels in the operators' compartment, you must adjust the timer on the interface board inside the amplifier to limit the operating time of the amplifier based upon the expected usage through a work shift. You should also ensure that your operators heed all other warnings associated with the use of sirens, and provide and require the use of hearing protection if appropriate, based on your particular exposure levels and conditions of use. If you operate the Rumbler 2 before you can make an assessment of operator noise exposures, set it for the shortest amount of time possible and require the use of hearing protection devices.*

*For more information on sound exposure, refer to the warnings in "Safety Messages to Operators of Federal Signal Light and Sound Systems" on page 16 and in "Operating the Rumbler 2" on page 18.*

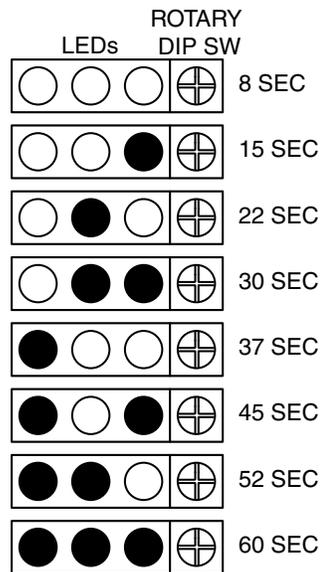
**Failure to follow this warning may result in hearing damage to operators and passengers.**

To set the timer:

1. Remove the Rumbler 2 from the mounting brackets.
2. Locate the slot on the left side of the top cover.
3. Rotate the rotary dip switch until the LED indicator displays the desired time interval. See Figure 4.

**NOTE:** The Rumbler 2 system will not operate if the vehicle's main siren speaker is not functioning properly.

**Figure 4: Timer dip switch**



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4. Activate the vehicle's main siren and the Rumbler 2.
5. Check the sound exposure time and make further adjustments if necessary.
6. When finished, place the cover on the Rumbler 2 and tighten the screws.
7. Reinstall the Rumbler 2 in the brackets.

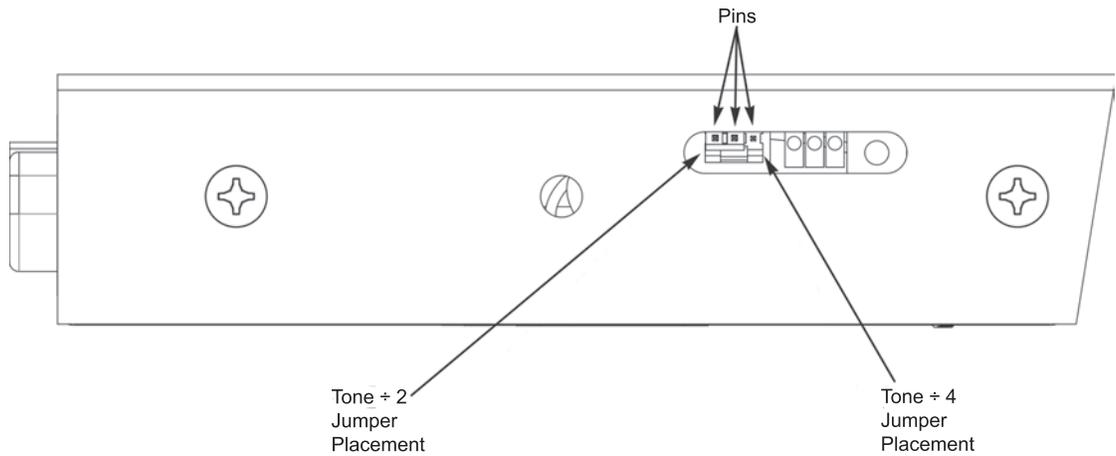
## Changing the Frequency of the Rumbler Tone

The Rumbler tone is developed by bringing the siren tone into the Amplifier, sensing the fundamental frequency of the siren tone, and dividing it into a lower frequency tone. The Rumbler tone tracks the siren tone in real time. Traditionally, the tone has always been divided by four. In applications where an eQ siren is being used, you might want to divide the tone by two instead.

The amplifier is factory-set to divide the tone by four. If you want to divide the tone by two, you must move the mini jumper on the slot on the left side of the cover.

The position of the jumper from the factory should be set to the right. To change for the tone to be divided by two, pull out the jumper covering the center and left pins and place it on the center and left pins. See Figure 5.

Figure 5 Jumper placement



## Actuation Switch

Federal Signal offers an optional RB-SW Rumbler Actuation Switch. This panel- or dash-mounted momentary switch activates and cancels the Rumbler Low Frequency Siren.

Table 3 Actuation Switch Parts

Qty.	Description	Part Number
1	RB-SW Rumbler Actuation Switch	109901972A

## Testing the Rumbler 2 After Installation

**⚠ 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 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, test the electronic siren to ensure that it is operating properly. The siren is designed to blow the fuse under reverse polarity conditions. If the fuse fails when power is supplied, check and correct the power lead wiring. Install a 15-ampere in-line fuse and reapply power.

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

## **Safety Message to Operators of Federal Signal Light and Sound 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. 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 which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

#### *Sound Limitations*

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

#### *Signaling Limitations*

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

#### *Driving Limitations*

- At the start of your shift, 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 light/siren controls being installed in a position that

## ***Safety Message to Operators of Federal Signal Light and Sound Systems***

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does not allow you to operate them by touch only, OPERATE CONTROLS ONLY WHILE YOUR VEHICLE IS STOPPED.

- If driving conditions require your full attention, you should avoid operating the light/siren controls while the vehicle is in motion.

### ***Continuing Education***

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

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

## **Operating the Rumbler 2**

The Rumbler 2 has no user switches on the amplifier unit. Refer to your standard siren system manual for instructions on using your system.

Your Rumbler 2 system operates in conjunction with your standard vehicle siren. You activate the Rumbler 2 sound by pressing the horn switch on your steering wheel. The Rumbler 2 turns off automatically based on a preset time.

**⚠ WARNING**

***SOUND HAZARD: If the Rumbler 2 system does not shut off automatically, you should have your system checked. Overexposure to Rumbler 2 sound may cause hearing loss. This overexposure can occur if your system is not shutting off automatically.***

**⚠ WARNING**

***SOUND HAZARD: The sound generated by the Rumbler 2 penetrates your vehicle as well as other vehicles. To protect yourself from hearing loss due to the sound produced by Rumbler 2, you should use it only for intersection applications where you need extra-close proximity penetration.***

## **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](mailto:empserviceinfo@fedsig.com)  
[www.fedsig.com](http://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



**FEDERAL SIGNAL**  
Safety and Security Systems

2645 Federal Signal Drive  
University Park, Illinois 60484-3167

[www.fedsig.com](http://www.fedsig.com)

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Work Truck:

800-824-0254 • +1 708 534-3400

Technical Support

800-433-9132 • +1 708 534-3400