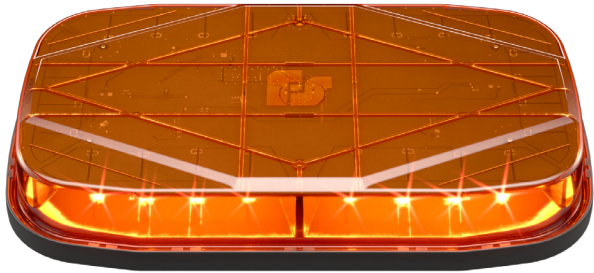




FEDERAL SIGNAL
Safety and Security Systems

HighLighter® LED Micro



Installation, Operation, and Maintenance Instructions

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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. 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 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

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Contents

Safety Message to Installers of Warning Light Equipment	4
Safety Messages to Operators of Warning Light Equipment.....	8
Introduction.....	10
Unpacking the Light Bar	10
Preparing for the Light Bar Installation.....	10
Magnetic or Suction Cup Magnetic Mounting	12
Permanently Mounting the HighLighter® LED Micro	13
Wiring the HighLighter® LED Micro	17
Getting Technical Support.....	19
Ordering Replacement Parts	19
Getting Repair Service	20

Figures

Figure 1 Flat Surface Mount	13
Figure 2 Connecting the Light.....	14
Figure 3 Bar Mount.....	15
Figure 4 Connecting the Light.....	16

Tables

Table 1 Kit Contents	10
Table 2 Flash Patterns.....	18
Table 3 Replacement Parts - Permanent Mount	19
Table 4 Replacement Parts - Magnet Mount	19
Table 5 Replacement Parts - Suction Cup Mount.....	19

Safety Message to Installers of Warning Light Equipment

Safety Message to Installers of Warning Light Equipment

⚠ 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 and the original product. Listed below are some other important safety instructions and precautions you should follow:

Before Installation or Service

Qualifications

- To properly install or service this equipment, you must have a good understanding of automotive mechanical and 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.

Light Hazards

- 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.
- Do not install the light system in an area that would block, impair or blind the driver's vision. Ensure that the light system is mounted in a position that is outside the driver's field of vision, so the driver can maintain safe vehicle operation.
- Federal Signal power supplies and light heads are designed to work together as a system. Combining light heads and a power supply from different manufacturers may reduce the warning effectiveness of the lighting system and may damage the components. Verify or test your combination to make sure the system works together and meets federal, state and local standards or guidelines.

Electrical Hazards

- A light system is a high current system. For the system to function properly, a separate negative (-) connection and positive (+) connection must be made. All negative connections should be connected to the negative battery terminal and a suitable fuse should be installed on the positive battery terminal connection as close to the battery as possible.

Safety Message to Installers of Warning Light Equipment

Ensure that all wires and fuses are rated correctly to handle the device and system amperage requirements.

- 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 or mandated safety functions or circuits. Always check the vehicle for proper operation after installation.
- Do not mount a radio antenna within 18 inches of the lighting system. Placing the antenna too close to the lighting system could cause the lighting system to malfunction or be damaged by strong radio fields. Mounting the antenna too close to the lighting system may also cause the radio noise emitted from the lighting system to interfere with the reception of the radio transmitter and reduce radio reception.
- Do not attempt to wash this or any other electrical device while it is connected to its power source. Exposure to liquid while the product is connected to the power source may result in an electrical shock and personal injury and may short circuit and damage the product.

During Installation and Service

- 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. Inspect the unit after mounting ensure that there are no shavings present in or near the unit.
- 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.
- 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 the wiring is shorted to the vehicle body or frame, high current conductors can cause hazardous sparks, resulting in electrical fires or flying molten metal.
- DO NOT install equipment or route wiring (or the plug in cord) in the deployment path of an airbag.

Safety Message to Installers of Warning Light Equipment

- If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment.
- Before mounting any components, check the manual to ensure that the component you are installing is suitable for use in that area of the vehicle. Many components are not suitable for use in the engine compartment or other extreme environmental exposure areas.
- When drilling into a vehicle structure, ensure that both sides of the surface are clear of anything that could be damaged. Remove all burrs from drilled holes. To prevent electrical shorts, grommet all drilled holes through which wiring passes. Ensure that the mounting screws do not cause electrical or mechanical damage to the vehicle.
- Refer to the instruction sheet packed with the lighting system for proper electrical connections, additional precautions, and information.
- Because vehicle roof construction and driving conditions vary, do not drive a vehicle with a magnetically mounted warning light installed. The light could fly off the vehicle, causing injury or damage. Repair of damage incurred because of ignoring this warning shall be the sole responsibility of the user.
- Locate the light system controls so the VEHICLE and CONTROLS can be operated safely under all driving conditions.

After Installation or Service

- After installation, test the light system to ensure that it is operating properly.
- If a seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment.
- Test all vehicle functions, including horn operation, vehicle safety functions, and vehicle light systems, to ensure proper operation. Ensure that the installation has not affected the vehicle operation or changed any vehicle safety function or circuit.
- Scratched or dull reflectors, mirrors or lenses will reduce the effectiveness of the lighting system. Avoid heavy pressure and use of caustic or petroleum based products when cleaning the lighting system. Replace any optical components that may have been scratched or crazed during system installation.

Safety Message to Installers of Warning Light Equipment

- Do not attempt to activate or deactivate the light system control while driving in a hazardous situation.
- Frequently inspect the light system to ensure that it is operating properly and is securely attached to the vehicle.
- After installation and testing are complete, provide a copy of these instructions to 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.

RETAIN AND REFER TO THESE MESSAGES

Safety Messages to Operators of Warning Light Equipment

⚠ WARNING

Peoples' lives depend on your safe use of our products. Listed below are some important safety instructions and precautions you should follow:

- Although your warning system is operating properly, it may not be completely effective. People may not see or heed your warning signal. You must recognize this fact and continue driving cautiously.
- Also, situations may occur which 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.
- 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 Procedure.
- 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, you should 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.

Safety Messages to Operators of Warning Light Equipment

- 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 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.
 - Avoid quick acceleration and hard stops to prevent sliding of the light assembly on the mounting surface.

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

RETAIN AND REFER TO THESE MESSAGES

Introduction

The HighLighter® LED Micro is a LED-based warning light with a small footprint and low current draw. The light is available in one of three mounting types: Permanent, Suction Cup Magnetic, or Magnet. The light has one mode of operation and 25 selectable patterns.

Unpacking the Light Bar

After unpacking the light, inspect it for damage that may have occurred in transit. If it has been damaged, do not attempt to install or operate it. 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 that the parts listed in Table 1 are included in the package. If you are missing any parts, contact Customer Support at 1-800-264-3578, 7 a.m. to 5 p.m., Monday through Friday (CT).

Table 1 Kit Contents

Permanent		Suction Cup Magnetic		Magnet	
Qty	Description	Qty	Description	Qty	Description
1	Mini Light Bar	1	Mini Light Bar	1	Mini Light Bar
1	Mounting Bracket				
1	Wire Harness				
4	#8 Hi-Low Screws				

Preparing for the Light Bar Installation

Determining the Mounting Location and Wire Routing

To prepare for the installation:

- Ensure that the battery voltage is the same as the voltage rating of the light bar.
- Verify that the light bar and mounting hardware fit the vehicle.
- Determine where to mount the light bar on the vehicle.

⚠ 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.*

⚠ 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.

- Decide where to route wiring around airbag areas.
- Decide where to route the power and ground wires from the light bar.

⚠ 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.

- To make wiring easier, remove the seats and spare tire, and pull down the headliner where needed.
- Separate all electronic equipment wiring from two-way radio equipment wiring.

NOTICE

INSTALLATION PRECAUTIONS: The warning system and/or two-way radio system may operate improperly if a two-way radio antenna is installed on or within 18 inches of the light bar. Before permanently installing the light bar or a two-way radio antenna, test the warning system and two-way radio system. Some installations may require the relocation of the two-way radio antenna to the trunk or fender. **DO NOT drill holes in the light bar or install auxiliary devices on the light bar, or the warning system may fail.**

- To avoid interference, keep two-way radio antennas a minimum of 18 inches (45.7 cm) away from warning equipment.
- Whenever possible, run full wire lengths. DO NOT splice the wires.
- Do not coil excess wire. Leave a drain loop for servicing the light bar.
- After drilling holes for wires, deburr them, smooth sharp edges, and insert grommets to protect the wires from chafing.

Magnetic or Suction Cup Magnetic Mounting

- When you frame-ground the equipment, use the manufacturer-supplied ground locations in the vehicle.

IMPORTANT: After the installation, frequently inspect the light bar and mounting feet to ensure that all fasteners and brackets are tight.

Magnetic or Suction Cup Magnetic Mounting

⚠ WARNING

DO NOT DRIVE WITH MAGNETICALLY-MOUNTED WARNING LIGHT INSTALLED: *Because vehicle roof construction and driving conditions vary, do not drive a vehicle with a magnetically mounted warning light installed. The light could fly off the vehicle, causing injury or damage. Repair of damage incurred because of ignoring this warning shall be the sole responsibility of the user.*

⚠ WARNING

PROPER MAGNETIC MOUNTING: *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 the mounting surface and magnets clean, dry, and free of foreign particles that prevent good surface contact.*
- *Ensure that the mounting surface is flat.*
- *Do not use a magnet mounting system on vehicles with vinyl tops.*
- *Avoid quick acceleration and hard stops to prevent sliding of the light bar on the mounting surface.*

To mount the HighLighter LED Micro:

1. Place the light bar assembly on the vehicle roof at a location that provides maximum signaling effectiveness for your application.
2. For models with suction cups, release trapped air by applying downward pressure to the top of the dome while pulling up on the release tabs.
3. To operate the magnet-mounted light bar assembly, insert the plug at the end of the cable assembly in the cigarette lighter socket. Turn the plug on and off using the power switch on the plug. To show that the power is on, a pilot light turns on.

Permanently Mounting the HighLighter® LED Micro

4. To remove models with suction cups, pull up on the release tabs while picking up the light bar.

Permanently Mounting the HighLighter® LED Micro

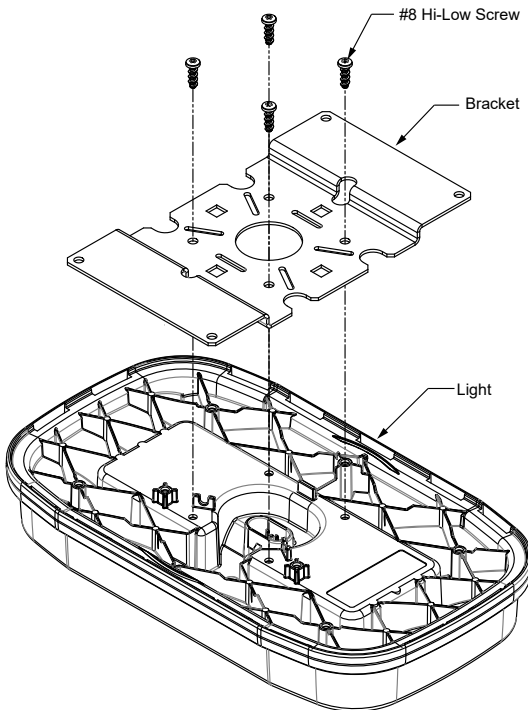
Use the supplied permanent mounting bracket to mount the light to a flat surface or a flat bar using installer-supplied hardware.

Attaching the Light to a Flat Surface

To permanently mount the HighLighter LED Micro to a flat surface:

1. Attach the bracket to the bottom of the light using supplied hi-low screws. See Figure 1.

Figure 1 Flat Surface Mount



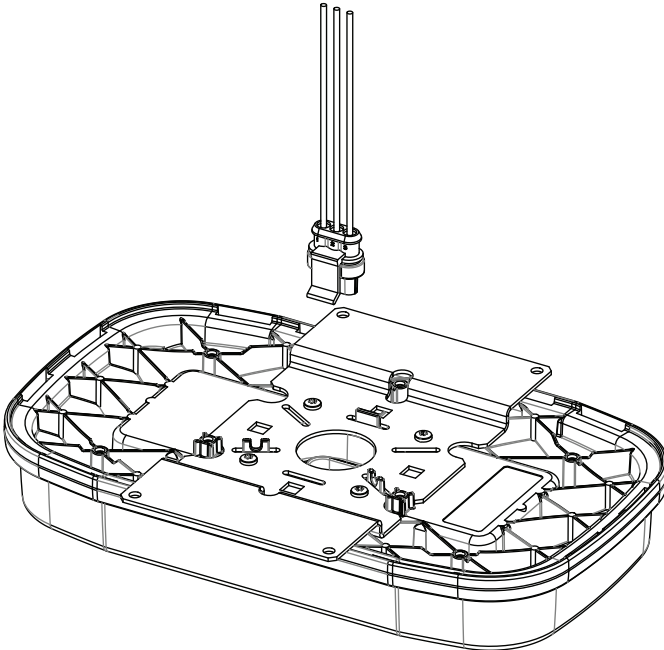
2. Using the bracket as a template, scribe the four (4) mounting hole locations.

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 deburred, 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 an appropriately sized hole for the installer-supplied #8 hardware.
4. Refer to the “Wiring the HighLighter® LED Micro” section for wire connections.
5. Plug the supplied connector into the bottom of the light. See Figure 2.

Figure 2 Connecting the Light



6. Attach the light to the mounting surface using installer-supplied #8 hardware.

Attaching the Light to a Flat Bar

To permanently mount the HighLighter LED Micro to a flat bar:

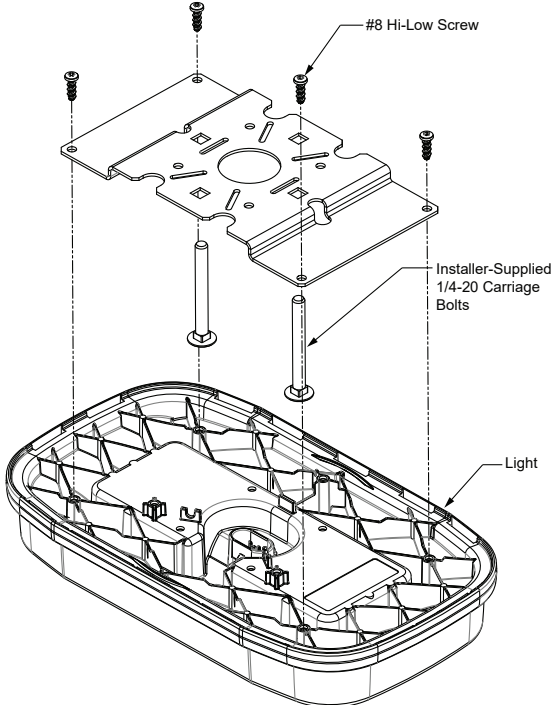
1. Using the bracket as a template, scribe two (2) mounting hole locations for the installer-supplied 1/4-20 carriage bolts.

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 deburred, 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.

2. Drill two (2) 17/64-inch holes at the scribed marks.
3. Load carriage bolts into the bracket and attach it to the bottom of the light using the supplied hi-low screws. See Figure 3.

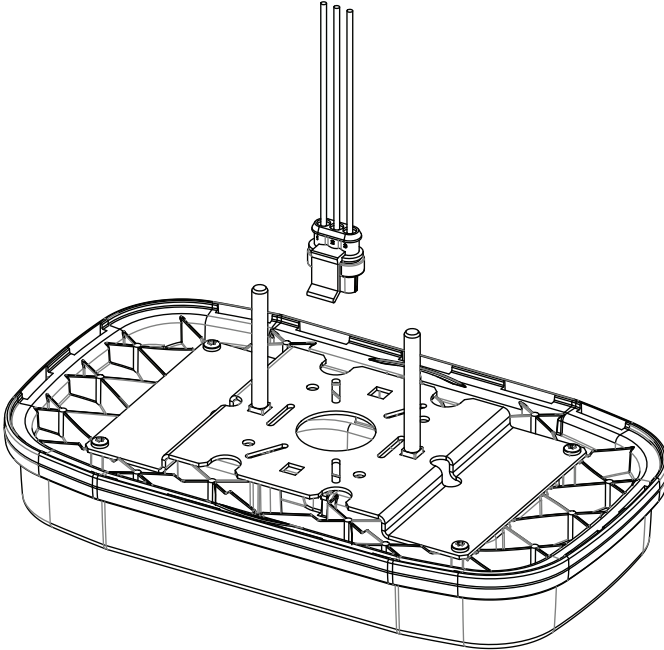
Figure 3 Bar Mount



Permanently Mounting the HighLighter® LED Micro

4. Refer to the “Wiring the Highlighter LED Micro” section for wire connections.
5. Plug the supplied connector into the bottom of the light. See Figure 4.

Figure 4 Connecting the Light



6. Attach the light to the mounting surface using installer-supplied 1/4-20 carriage bolts and related hardware. See Figure 3.

Wiring the HighLighter® LED Micro

NOTICE

HIGH CURRENT DEVICE: A light system is a high current system. In order for the system to function properly, a separate negative (-) connection and positive (+) connection must be made. All negative connections should be connected to the negative battery terminal, and a 3 A fuse should be installed on the positive battery terminal connection as close to the battery as possible. Ensure that all wires and fuses are rated correctly to handle the system amperage requirements.

The permanent mount HighLighter LED Micro is supplied with a 12-inch wire harness. The wires must be extended using installer-supplied 18 AWG wire minimum and terminals.

To wire the HighLighter LED Micro:

1. Connect the red wire from the harness through a 3 A fuse to the positive battery (+BAT) terminal. If you are installing an on/off switch, ensure that the switch has a current handling capacity of at least 3 A. Install the switch between the fuse and the product.
2. If desired, attach the green wire (pattern select) to the positive battery terminal (+BAT) using a momentary switch.
3. Connect the black wire to the negative battery (-GND) terminal.

Selecting a Flash Pattern

To select a flash pattern:

1. With power applied to the light, tap the green wire to +BAT to advance the pattern.
2. Holding the green wire to +BAT for 3-5 seconds places the light in flash pattern 1. See Table 2 for flash patterns.

Table 2 Flash Patterns

Pattern No.	Description	Flash Rate (FPM)
1*	Single/Double/Quad	91
2	Split Quad	60
3	Split Triple	85
4	Double Flash Left/ Right-Front/Back	84
5	Quad Flash Left/Right -Front/Back	74
6	Rotate Counter Clockwise	180
7	Rotate Clockwise	180
8	Random, Patterns #1-7	Various
9	Random, Select Patterns #11-25	Various
10	6x Flash	78
11	Single Flash	75
12	Single Flash	120
13	Double Flash	80
14	Double Flash, Fast	120
15	Triple Flash, Fast	80
16	Triple Flash, Fast	120
17	Quad Flash, Slow	60
18	Quad Flash	75
19	Quad Flash, Fast	95
20	Quad FedPulse	75
21	5x Flash	75
22	7x Flash	80
23	Single Flash 120 FPM/Quad 60 FPM	120/60
24	Decelerating	60
25	Accelerating	60

* Pattern 1 is the default.

Getting Technical Support

For technical support, please contact:

Federal Signal Corporation
Phone: 1-800-443-9132
Fax: 1-800-343-9706
Email: empSERVICEinfo@fedsig.com

Ordering Replacement Parts

To order replacement parts, call Customer Support at 1-800-264-3578, 7 a.m. to 5 p.m., Monday through Friday (CT) or contact your nearest distributor.

Table 3 Replacement Parts - Permanent Mount

Description	Part No
Bracket	856003447
Power Plug/Screw Kit	77701318

Table 4 Replacement Parts - Magnet Mount

Description	Part No
Magnet	8550300
Mylar Magnet Cover	1611464
0.5-inch #8 Hi-Low Screw	70000900-08
Power Plug	17502345

Table 5 Replacement Parts - Suction Cup Mount

Description	Part No
1.5-inch Diameter Suction Cup	856003745
8-32 El-Stop Nut	7058056
Power Plug	17502345
0.188-inch Cable Clamp	8542A028-04
0.5-inch #8 Hi-Low Screw	70000900-08
Bracket	856003447

Getting Repair Service

Getting Repair Service

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

Any units returned to returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization (RMA). Obtain an RMA from a Local Distributor or Manufacturer's Representative. Provided a brief explanation of the service requested or the nature of the malfunction.

Address all communications to the following address.

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



FEDERAL SIGNAL

Safety and Security Systems

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