

## INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR HEAVY-DUTY J LX SERIES LED JET LIGHT BARS

### SAFETY MESSAGE TO INSTALLERS OF FEDERAL SIGNAL LIGHT SYSTEMS

#### WARNING

People's lives depend on your safe installation of our products. It is important to read, understand and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

- To properly install a light assembly: you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and use of safety warning equipment.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.
- A light system is a high current device. In order for it to function properly, a separate ground connection must be made. If practical, it should be connected to the negative battery terminal. At a minimum, it may be attached to a solid metal body or chassis part that will provide an effective ground path as long as the light system is to be used.
- Locate light system controls so the VEHICLE and CONTROLS can be operated safely under all driving conditions.
- This product contains high intensity LED devices. To prevent permanent eye damage, DO NOT stare into the light beam at close range.
- You should frequently inspect the light system to ensure that it is operating properly and that it is securely attached to the vehicle.
- File these instructions in a safe place and refer to them when maintaining and/or re-installing the product.

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

### I. UNPACKING.

After unpacking the light bar, inspect it for damage that may have occurred in transit. If the unit 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.

### II. INSTALLATION.

The basic light bar is completely wired at the factory and does not require any additional internal wiring. All the conductors necessary for control of any and all basic and optional functions are contained in the cable. Installation of options will require additional wiring in the light bar.

The basic light functions of the unit must be controlled by a user supplied control head.

Before proceeding, ensure that the light bar has been installed on the vehicle roof in accordance with the instructions packed with the mounting kit. Route the light bar cable as described below.

#### WARNING

Light system controls must be located so that VEHICLE and CONTROLS can be operated safely under all driving conditions.

#### WARNING

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

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

A. Route the control cable into the vehicle and under the dash, near the eventual location of the user-supplied control head.

B. For proper light operation, the control cable must be properly terminated inside the user-supplied control head. Table 1 shows the recommended control cable wire colors for various light bar functions. Switch current capacities should be at least 15 amps.

#### NOTE

Any of the light bar functions can be activated by applying 12VDC to the appropriate control line. The heavy black lead (-) must be connected to vehicle ground, to perform a function check.

Table 1. Electrical Connections.

Wire Color	Functions
BLK	Common Ground (-)
RED	Primary Flasher Mode #1
RED/WHT	*Secondary Flasher Mode #2
BLU	Primary Flasher Mode #2 (Ptn. Slct.)
GRN	*Secondary Flasher Mode #2 (Ptn. Slct.)
ORG	Primary Flasher Program "Pin" (Prgm.)
YEL	*Secondary Flasher Program "Pin" (Prgm.)
GRAY	*Work Lights
BLK/WHT	Tail Lights
BRN	Drivers Stop/Turn
BRN/WHT	Passenger Stop/Turn
	* If applicable

C. Connect the black lead to chassis ground.

**⚠ WARNING**

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

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

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

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

D. Connect the light bar's red power lead to a fuse or circuit breaker rated at 50 amperes. Connect the other side of the fuse /circuit breaker to the +12VDC supply.

E. Flasher (see figure 1).

1. General.

The flasher has two (2) light circuits with a current capacity of up to 10-amperes (maximum) per side, 20-amperes total. The flasher is designed to operate on any 12-24VDC (negative ground) vehicle electrical system. The flasher operates as a high side switch, switching the +DC supply to the load.

2. Wiring.

**CAUTION**

The device WILL NOT light up or flash if improperly grounded. Be sure that the device ground is attached to a good vehicle ground. A ground termination at the flasher is provided.

Refer to figure 1 when performing the following procedure.

The flasher has two outputs, Out 1 and Out 2. These outputs switch the +DC source from source to the load.

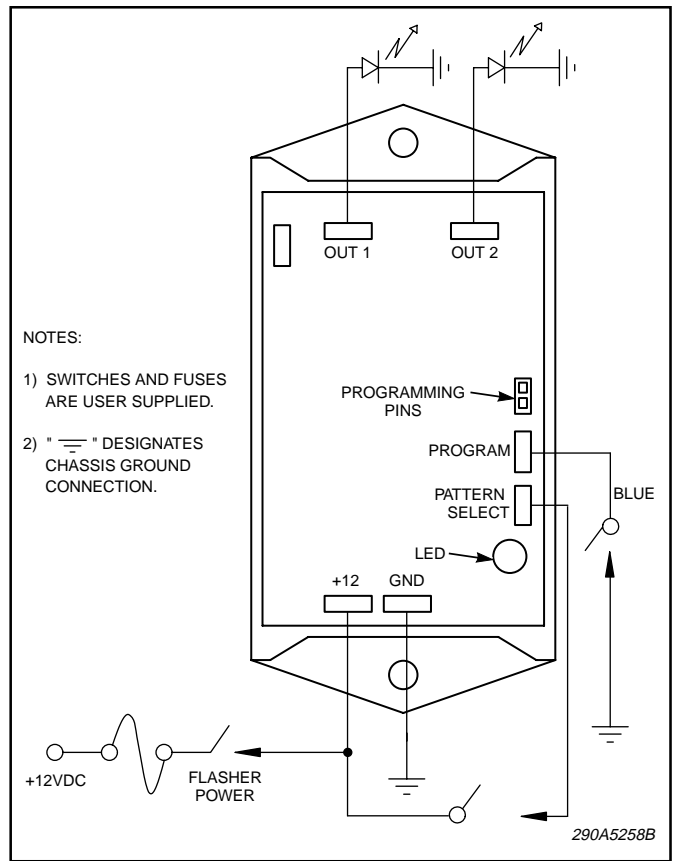


Figure 1.

**⚠ WARNING**

To provide safe operation, the user supplied power control switch and wiring must be capable of handling the rated current of the fuse at the source.

3. Flasher Programming (see table 2).

The flasher will provide the end user with two preselected flash patterns. The preselected flash patterns

Pattern Descriptions	
Pattern 1	Alternating Quad Flash 76 QFPM SAE Compliant
Pattern 2	Alternating Triple Flash 102 TFPM SAE Compliant
Pattern 3	Overlapping Penta Flash 87 PFPM SAE Compliant
Pattern 4	Alternating Single Flash 120 FPM SAE Compliant
Pattern 5	Alternating Single Flash 240 FPM SAE Compliant
Pattern 6	Simultaneous/Overlapping Triple/Nine
Pattern 7	Alternating Single
Pattern 8	Overlapping Alternate 95 Patterns/Min. SAE Compliant
Pattern 9	Steady
Pattern 10	2 @ 60 FPM 4 Pulse Alternating 2 @ 60 FPM 2 Pulse Simultaneous

Table 2.

are to be chosen from the ten factory programmed patterns provided with each flasher. It is recommended that the preselected flash patterns be determined and programmed during installation.

The red/green LED as indicated in figure 1 will be illuminated green when an SAE approved flash pattern is selected. When an unapproved SAE flash pattern is selected, the LED will be illuminated red. The red/green LED may alternate between red and green for several flash patterns.

The following procedures demonstrate the programming and operating features of the flasher:

Turn on the flasher by applying Power (+) and Ground (-). The flasher can be programmed at the flasher by either shorting the programming pins together momentarily or remotely done by connecting the program pin to ground. The flasher will begin to flash in Mode 1 (Primary Pattern). By shorting the PROGRAM pin to GND, the flasher will switch to the next pattern. The flasher will step through the patterns each time the program pin is shorted, returning to the top once after the tenth pattern is displayed. To lock in a chosen pattern, allow the pattern to run for 15-seconds and it is now programmed.

To turn on the flasher in Mode 2 (Secondary Pattern), turn the flasher system on and connect the Pattern Select connection to Power (+). By shorting the PROGRAM pin to GND, the flasher will switch to the next pattern. The flasher will again step through the patterns each time the program pin is shorted, returning to the top once after the tenth pattern is displayed. To lock in a chosen pattern, allow the pattern to run for 15-seconds and it is now programmed.

Channel 1 may be cutoff while the flasher continues to run and channel 2 continues to flash. +12V is applied to cutoff 1 to cutoff the channel.

The flasher is now programmed. When power is applied to the flasher, it will flash in Mode 1 (Primary Pattern). To operate the Mode 2 (Secondary Pattern) switch +DC to the Pattern Select Pin. Releasing the switch returns the flasher to flashing Mode 1 (Primary Pattern).

4. Repeat step 3 to program second flasher if applicable.

### III. FRONT AND END LIGHT CUTOFF CONFIGURATION (OPTIONAL).

The end light head assemblies are wired to flash with the rear light head assemblies. If the end user desires, these light heads can be rewired to flash with the front light head assemblies following the instructions below.

A. Remove the two screws located at the Identification Plate of the drivers-side dome assembly. Retain screws and Identification Plate. Slide the dome assembly out of the extrusion.

B. Slide the first bulkhead and the first center dome toward the end of the lightbar until the terminal block is accessible.

C. The end light head assemblies are marked “END” and are connected in the eleventh and twelfth terminal block positions. See figure 2.

D. Disconnect the red wire marked “END” from the eleventh terminal block position and reconnect to the terminal block in the fourteenth position.

E. Disconnect the red wire marked “END” from the twelfth terminal block position and reconnect to the terminal block in the thirteenth position.

F. The end light head assemblies are now wired to work with the front light cutoff option. Slide the center dome and the bulkhead back into place.

G. Reinstall the dome assembly and the Identification Plate removed in step A. Secure with previously removed screws.

H. Check for proper operation of all functions.

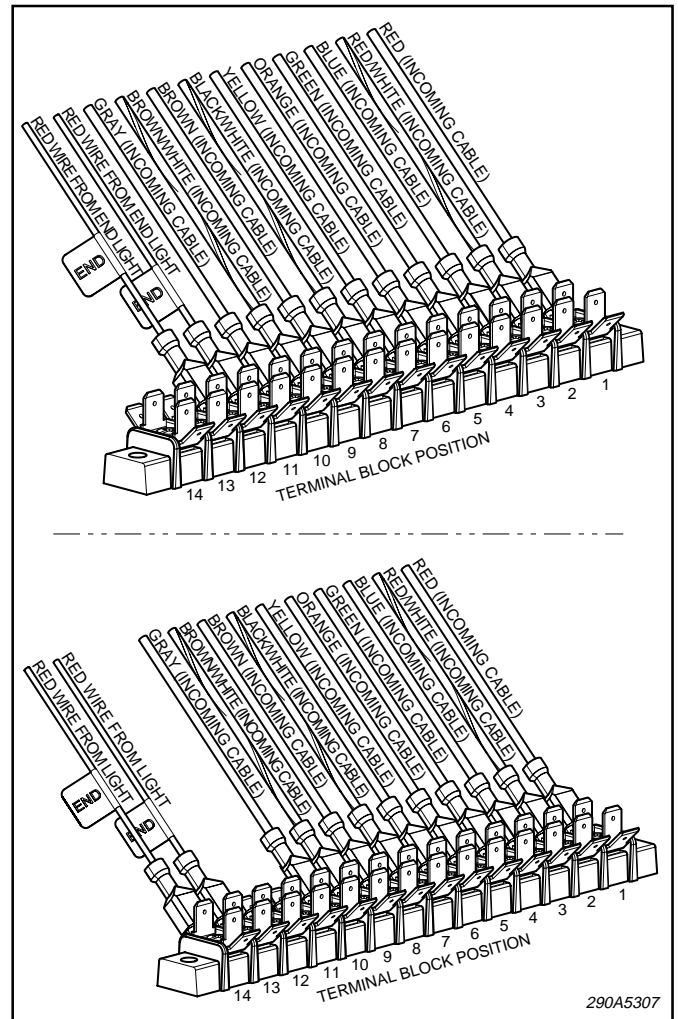


Figure 2.

#### IV. SIGNALMASTER™ OPTION WIRING (IF APPLICABLE).

##### A. Control Head.

### ⚠ WARNING

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

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

Assemble the control head as shown in figure 3. For proper operation of the unit, the switches must be installed as shown. To install the control head, proceed as follows:

### NOTE

When selecting a mounting location for the control head, it is necessary to keep in mind the SignalMaster's cable length. Plan wiring and cable routing before installation.

1. Select a mounting location for the control head that allows the vehicle and controls to be operated safely at all times.
2. Use the control head as a template and scribe two drill position marks at the selected mounting location.

### CAUTION

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

3. Drill two holes at the previously scribed position marks.

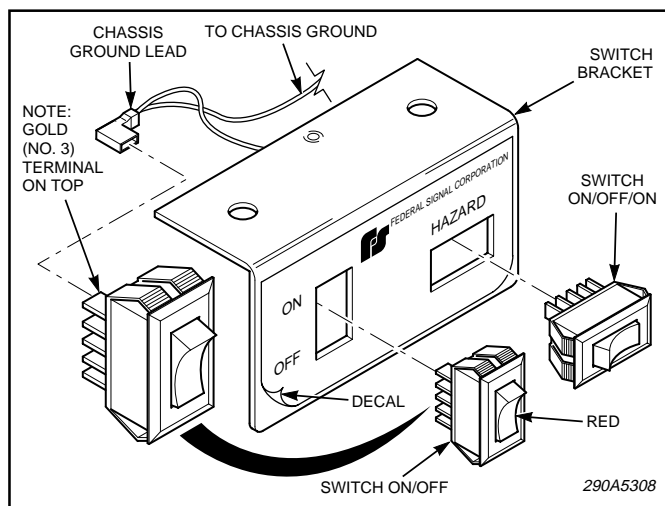


Figure 3.

4. Secure the control head to the mounting surface with two user-supplied sheet metal screws.

##### B. Electrical Connections.

### ⚠ WARNING

Failure to observe this **WARNING** may result in fire, burns or blindness.

If shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or molten metal.

If additional cable length is required, splice the same gauge (or heavier) wire to the leads.

**DO NOT** connect this system to 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.

#### 1. Power Connections.

- a. Route the red and black 14-gauge wires to the power source. Ensure that the power source is capable of supplying an additional 25-amperes.
- b. Connect the black wire to a known good chassis ground. This connection must be capable of supplying 25-amperes.
- c. Do not connect the red wire to the positive (+) power source terminal at this time.

#### 2. Control Head Connections.

- a. Wrap the control cable's stripped wire ends with tape and route the cable to the control head mounting location.
- b. See figure 4. Crimp five 1/4" straight terminals on the cable wire ends and jumper wire combination.

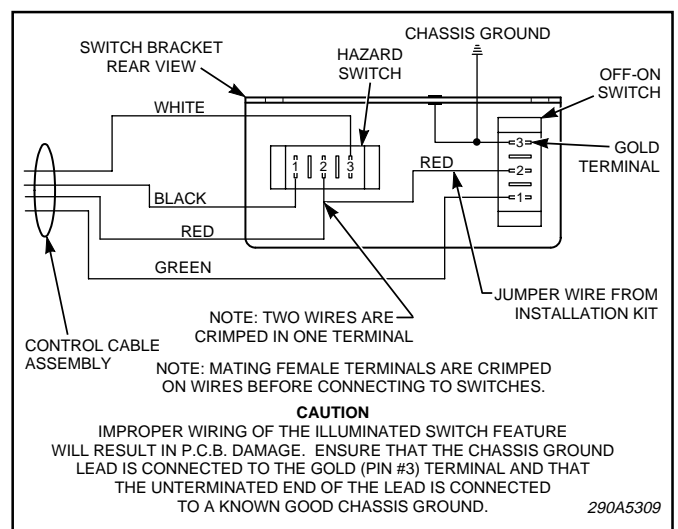


Figure 4.

c. Connect the terminals on the switch as shown in figure 4.

3. Illuminated Power Switch.

**CAUTION**

Improper wiring of the illuminated switch feature will result in printed circuit board damage. Ensure that the chassis ground lead is connected to the gold (pin #3) terminal and that the unterminated end of the lead is connected to a known good chassis ground.

a. See figure 4. Connect the right angle terminal on the switch bracket ground lead to the gold (pin #3) terminal of the on-off switch.

b. Route the unterminated end of the ground lead to a known good chassis ground. Cut the lead to length and crimp the supplied ring terminal on the lead.

**NOTE**

If necessary, additional 18-gauge wire may be spliced to the ground lead.

c. Secure the lead to the chassis ground with a user-supplied screw.

*C. Inspection and Final Installation.*

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

2. Connect the 14-gauge red wire to the (+) positive terminal of the battery using an in-line, user-supplied fuseholder and 25A fuse. Locate the fuse as near the battery as possible to protect the entire length of wire.

**NOTE**

All directional lamps will illuminate simultaneously if the power supply leads are reversed. Correct the wiring before proceeding.

3. Read and understand paragraph V OPERATION, and test for proper operation of all functions.

**V. OPERATION.**

**SAFETY MESSAGE TO OPERATORS**



**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 or man-made objects are between your vehicle and others, such as: raising your hood or trunk lid. If these situations occur, be especially careful.**
- **At the start of your shift, you should ensure that the light is securely attached and all lamps are operating properly.**
- **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.**

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

**RETAIN AND REFER TO THIS MESSAGE**

A. *On/Off Switch.*

1. OFF Position.

The SignalMaster is not powered.

2. ON Position.

a. The switch will illuminate. If the switch does not illuminate, check the switch bracket ground lead for proper chassis ground connection.

b. The directional/hazard patterns will operate as selected by the Hazard Rocker Switch.

B. *Hazard Rocker Switch.*

**NOTE**

These patterns will override the turn signal/brake feature (if installed).

1. LEFT Position.

In this position, the light produces a left arrow flashing pattern, instructing traffic to move left.

2. CENTER Position.

In this position, an alternating pattern is produced. The four middle lights activate alternately with the two outside lights on each side.

3. RIGHT Position.

In this position, the light produces a right arrow flashing pattern, instructing traffic to move right.

VI. **BASIC MAINTENANCE.**

**⚠ WARNING**

**High voltages are present inside the light bar, when the strobe light option is installed. Wait at least ten (10) minutes, after shutting off power, before servicing this unit. Failure to do so may result in property damage, serious injury, or death to you or others.**

A. *Cleaning the Plastic Domes.*

Ordinary cleaning of the plastic domes can be accomplished by using mild soap and a soft rag. Should fine scratches or a haze appear on the domes, they can ordinarily be removed with a non-abrasive, high quality, automotive paste wax.

**CAUTION**

The use of other materials such as strong detergents, solvents, petroleum products, etc. can cause crazing (cracking) of the plastic domes.

B. *Lamp Replacement.*

**⚠ WARNING**

**A serious injury may result if lamp is touched when hot. Always allow lamp to cool before removing. Halogen lamps are pressurized and if broken can result in flying glass. Always wear gloves and eye protection when handling the lamps.**

**CAUTION**

Service life of lamp will be shortened if glass portion is touched. If glass has been handled, clean carefully with a grease solvent.

See figure 5. Replace 50-watt halogen lamps with Federal Part Number 8107A119 and 35-watt with 8548A028.

C. *Cleaning Reflector Assemblies.*

Use a soft tissue to clean the reflector and mirrors. Avoid heavy pressure and the use of caustic or petroleum base solvents which will scratch or dull the surface.

D. *Service.*

The Federal factory will service your equipment or provide 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 Return Material Authorization. This R.M.A. can be obtained from a local Distributor or Manufacturer's Representative.

At this time a brief explanation of the service requested, or the nature of the malfunction, should be provided.

Address all communications and shipments to:

Federal Signal Corporation  
Emergency Products Division  
Service Department  
2645 Federal Signal Drive.  
University Park, IL 60466-3195

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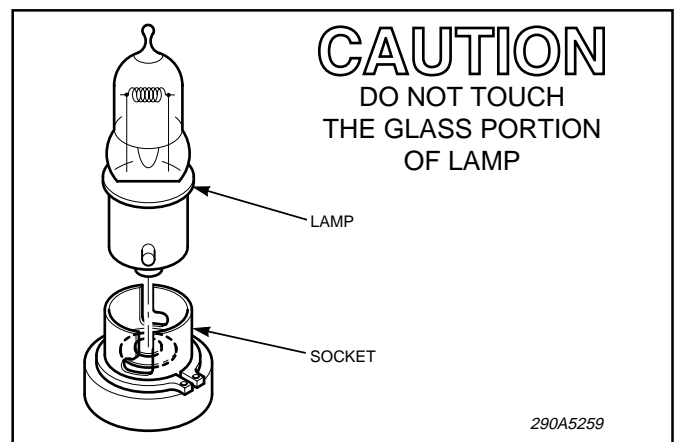


Figure 5.



