

2562577A REV. A 910

Safety Message to Installers of Federal Signal Products

⚠ WARNING

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

- To properly install this equipment, you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and use of safety warning equipment.
- 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 to you or others.
- 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 the lights at a close range or permanent damage to your eyesight may occur.
- If a vehicle seat is removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment.
- When drilling into a vehicle structure, be sure 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 is run.
- Never attempt to install aftermarket equipment that connects to the vehicle wiring without reviewing a vehicle wiring diagram available from the vehicle manufacturer. Insure that your installation will not effect vehicle operation or mandated safety functions or circuits. Always check the vehicle for proper operation after installation.
- Locate the controls so the VEHICLE and CONTROLS can be operated safely under all driving conditions.
- The flasher should be frequently inspected 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 installing and/or reinstalling the product.

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

Overview of the Model FHL-HL

The Model FHL-HL Headlight Flasher is a solid-state flasher designed to operate from +8 Vdc to 30 Vdc with positive-side switched headlight systems. The flasher, which operates a two- or four-headlight system, has built-in shutdown protection against short circuit, loss of ground, over-temperature, and reverse polarity.

With seven installer-selectable flash patterns, the Model FHL-HL features High-Beam Override and Nighttime Cutoff. In addition, when the high-beam switch is activated, the High-Beam Override (HBOR) function of the flasher interrupts the flashing sequence to allow use of the high-beams. The HBOR function is automatically disabled when the high-beam switch is de-activated, allowing the headlight flasher to resume operation.

NOTE: When used in dark conditions, the low-beam headlights must be ON for proper illumination, while the high-beam headlights flash to gain attention and increase the visibility of the vehicle.

Table 1 Product specifications

Operational Voltage:	+8 Vdc to 30 Vdc
Output Current:	9.5 A
Standby Current:	Less than 10 mA
Number of Flash Patterns:	7 (installer-selected)
Dimensions:	4.7 in L x 2.05 in W x 0.7 in H (11.9 cm L x 5.2 cm W x 1.8 cm)
Wire Length:	18 in (45.7 cm)

Installing the Flasher

The Model FHL-HL Headlight Flasher is designed to be water resistant. However, to ensure years of trouble-free operation, it should be mounted in a location that is protected from direct water spray and high temperatures. Before installing the flasher, plan all wire routings.

NOTE: This vehicle will not work on any ground-side switched system. If you have any questions about what type of system your vehicle has, contact the Federal Signal Service Department at 1-800-433-9132.

These installer-supplied items are required:

- ✓ Mounting hardware
- ✓ Activation switch
- ✓ 1 A ATO fuse and fuse holder
- ✓ 15 A ATO fuse and fuse holder
- ✓ 16 AWG wire (minimum) to extend wiring

To mount and wire the flasher:

1. Locate a suitable mounting location for the flasher near the headlight wiring harness. DO NOT mount the flasher directly on the engine or close to the exhaust system.

⚠ WARNING

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

2. Use the flasher as a template to mark the center of the two mounting holes.

NOTICE

DRILLING PRECAUTION—When drilling holes, check the area into which you are drilling to be sure you do not damage vehicle components while drilling. All drilled holes should be de-burred and all holes should be smooth. All wire routing going through drilled holes should be protected by a grommet or convolute/split loom tubing.

3. Drill the two holes and use the installer-supplied mounting hardware to mount the flasher.
4. Connect the GREEN wire from the flasher to reliable ground, preferably close to the ground post of the battery. See Figure 1 below for two lamps or Figure 2 on page 4 for four lamps).
5. Locate the wire that supplies power to either the passenger-side or driver-side high-beam headlight. Cut this wire approximately 10 inches to 12 inches from the headlight.
6. Connect the YELLOW wire to the cut wire that returns to the headlight. Connect the BLUE wire to the other piece of the cut wire that will provide power to the opposite high-beam headlight.

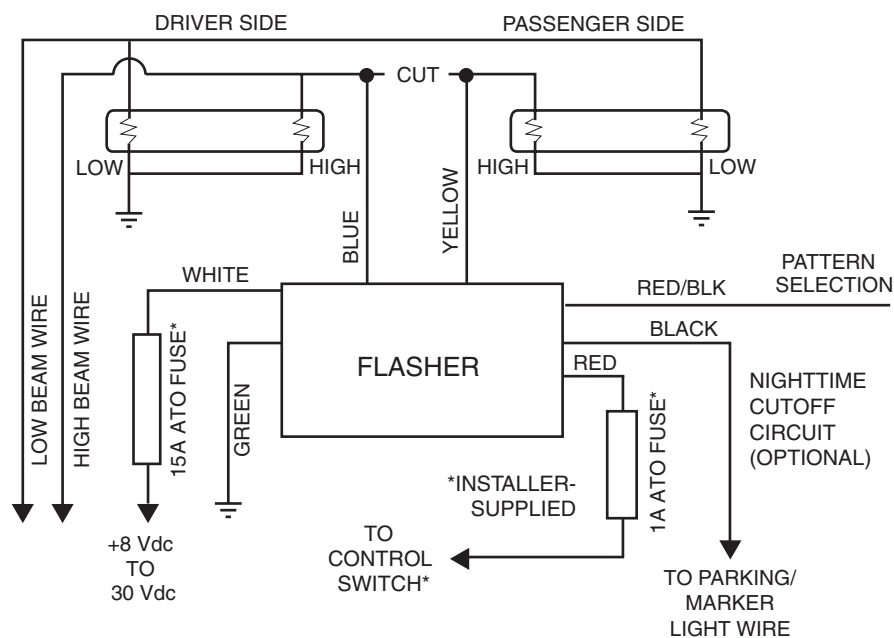
NOTICE

FUSE PRECAUTION—Do not use a circuit breaker, fusible link, or slow-blow fuse. Improper fusing can cause equipment failure and damage.

7. Connect the WHITE wire through an installer-supplied 15A ATO fuse and fuse holder to an +8 Vdc to 30 Vdc power source capable of providing 15 A.
8. Connect the RED wire to an installer-supplied powered switch through an installer-supplied 1A fuse.

Optional: If “Nighttime Cutoff” (NTCO) of the flasher is required by law, “T” or tap the BLACK wire into the parking/marker light wire. This feature disables the flashers whenever the parking/marker lights are turned ON. If the feature will not be used, fold and seal the BLACK wire.

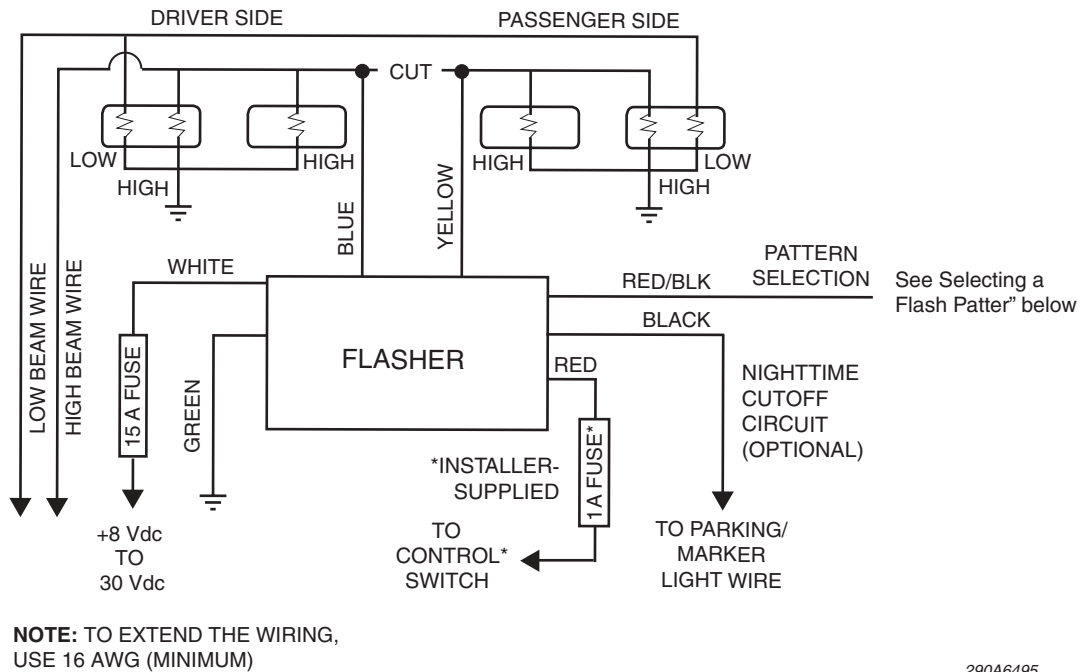
Figure 1 Wiring Diagram for two-lamp installation



NOTE: TO EXTEND THE WIRING, USE 16 AWG WIRE (MINIMUM)

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Figure 2 Wiring Diagram for four-lamp installation



Selecting a Flash Pattern

⚠ WARNING

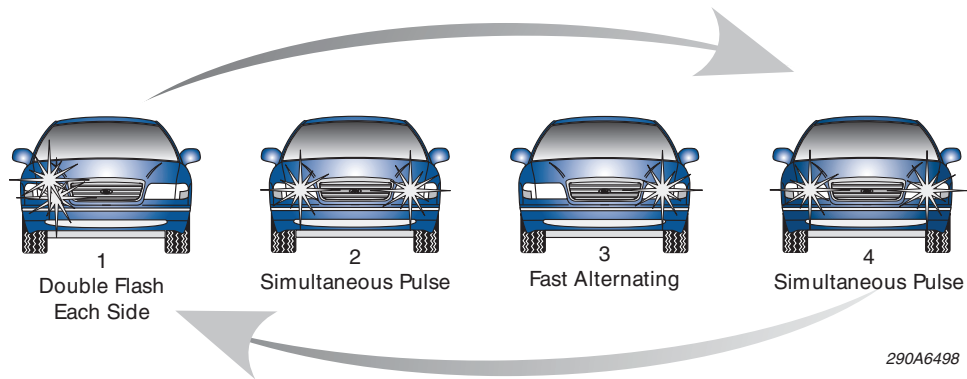
LIGHT HAZARD—To be an effective warning device, an emergency warning system produces bright light that can be hazardous to your eyesight when viewed at a close range. Do not stare directly into the lights at a close range or permanent damage to your eyesight may occur.

Each time you touch the RED/BLACK wire to ground, the flasher displays the next flash pattern in the sequence (Table 2). When the flasher displays the flash pattern you want, remove the wire from ground before the next flash pattern appears. When finished, fold and seal the RED/BLACK wire.

Table 2 Flash patterns

Flash Pattern Sequence	Description	Cycles per Minute
1. RoadRunner™	Slow alternation pattern at 1.9 FPS	115 cycles/minute
2. PowerPulse™	Fast double flash alternating at 3.0 FPS	180 cycles/minute
3. ETM (Emergency Traffic Mover)	Fast simultaneous flash alternating at 3.6 FPS	215 cycles/minute
4. Double Flash Alternating	Flash double flash alternating at 3.0 FPS	50 cycles/minute
5. Q-Switch™	Cycles high-beams through multiple flash patterns from 1.9 FPS to 3.0 FPS, repeating every 5.4 seconds using three constantly changing patterns: Double Flash Alternating, Fast Simultaneous Pulse, and Fast Alternating. See Figure 3 on page 5.	Multi-Pattern
6. Cycle Flash	Multi-pattern cycles through three double alternating and two simultaneous patterns	Multi-Pattern
7. Single Flash Alternating	Slow alternating flash pattern at 55 FPM	56 cycles/minute

Figure 3 Q-Switch flash pattern



Testing the Flasher

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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 the lights at a close range or permanent damage to your eyesight may occur.

To test the operation of the flasher:

1. Verify that the flasher properly flashes the headlights when the control switch is turned ON.
2. With flasher control switch ON, turn ON the high-beam switch and verify that both high-beam lights turn on steady.
3. If NTCO is required, turn ON the flasher control switch and turn ON the parking/marker lights. Verify that the flasher does not function.

Table 3 Troubleshooting guide

Problem	Corrective Action
No operation	Verify that the fuse is not open. Verify that a voltage of +8 Vdc to 30 Vdc is present on the RED wire and the WHITE wire.
Interference with radio equipment	Verify that the power (WHITE) and ground (GREEN) wires of the flasher are not connected to the same circuit as the radio equipment. Connect the ground wire as close to the ground terminal of the battery as practical.
Flasher stops functioning when the marker lights are turned ON	The NTCO (Night Time Cut Off) wire (BLACK) is connected to the parking/marker lights. If the flashing of the headlights is allowed at night, remove the NTCO wire from the marker light wiring.
Headlights turn ON for a short time then OFF for a couple of seconds and repeats	The over-current shutdown of the flasher has detected too much load on the flasher. Verify that a maximum of two 55 watt lamps are connected to each output.

Testing the 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.

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After testing the flasher, test the emergency warning system to ensure that it is operating properly. Also test all vehicle functions, including horn operation, vehicle safety functions, and vehicle lighting systems to ensure proper operation. Ensure that the installation has not affected the vehicle operation or changed any vehicle safety functions or circuits. After testing is complete, provide a copy of these instructions to the instructional staff and all operating personnel.

Do not test the sound and light system of the vehicle while driving. Operating the vehicle warning systems may pose a hazard to the operator and other drivers if the systems do not function as expected. Test the vehicle only in a controlled environment.

Limited Warranty

Federal Signal warrants the Model FHL-HL Headlight Flasher for five years from the date of purchase to the original purchaser against any manufacturer defects or workmanship. This warranty applies only to the units installed according to the manufacturer's installation instructions and operated within the specifications of the unit. Federal Signal's obligation under this warranty is limited to repairing or exchanging the unit. Exchanging units under this warranty is as follows: 100 percent of purchase price for the first two years, 75 percent of the purchase price for the third year, 50 percent of the purchase price for the fourth year, and 25 percent of the purchase price for the fifth year. Warranty is void if the unit was installed incorrectly or maliciously damaged. All warranty claims must be accompanied by dated proof of purchase. Federal Signal retains the right to be the sole mediator of what constitutes defects in performance or manufacturing.

Obtaining Technical Support and Service

For technical support and service, please contact:

Federal Signal Corporation
Public Safety Systems
Service Department
Phone: 1-800-433-9132
Fax: 1-800-343-9706
Email: empserviceinfo@fedsig.com

Returning a Product to Federal Signal

Before returning a product to Federal Signal, call 800-264-3578, 800-433-9132, or 800-824-0254 to obtain a Returned Merchandise Authorization number (RMA number). To expedite the process please be prepared with the following information:

- Your Federal Signal customer or account number.
- The purchase order number under which the items were purchased.
- The shipping method.
- The model or part number of the product being returned.
- The quantity of products being returned.
- Drop ship information as needed.
- Any estimate required.

When you receive your RMA Number:

- Write the RMA number on the outside of the box of returned items.
- Reference the RMA number on your paperwork inside of the box.
- Write the RMA number down, so that you can easily check on status of the returned equipment.

Send all material with the issued RMA Number to:

Federal Signal Corporation
Public Safety Systems
2645 Federal Signal Drive
University Park, IL 60484-3167
Attn: Service Department
RMA: # _____

800-433-9132
800-343-9706 (fax)
www.fedsig.com



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