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FEDERAL SIGNAL CORPORATION
Emergency Products

INSTRUCTION SHEET
FOR
MODEL 650301
12-OUTPUT, 2 CHANNEL FLASHER

SAFETY MESSAGE TO INSTALLERS

⚠ WARNING

The lives of people depend on your proper installation and servicing of Federal 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:

- To properly install this kit: 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. Remove all burrs from drilled holes. To prevent electrical shorts, grommet all drilled holes through which wiring passes.
- Never attempt to install aftermarket equipment, which 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 vehicle for proper operation after installation.
- Locate control so the VEHICLE and CONTROLS can be operated safely under all driving conditions. Do not attempt to activate or deactivate light control while driving in a hazardous situation.
- This product is designed to replace an SPS4-NFPA strobe supply with a 12VDC flasher intended to flash LED lights. The voltages and control of a GL5 LED light are different than a GS5 Strobe light. IF THE GS5 STROBE LIGHTS ARE BEING REPLACED ON A VEHICLE, THE STROBE SUPPLY MUST ALSO BE REPLACED with a 12VDC flasher.
- This product is designed to flash high intensity LED devices. To prevent permanent eye damage, DO NOT stare into the light beam at close range.
- DO NOT install equipment or route wiring in the deployment path of an air bag.
- In order for the light to function properly, a separate ground connection must be made. If practical, it should be connected to the negative battery terminal.
- You should frequently inspect the light 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 reinstalling the product.

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

I. GENERAL.

The Model 650301 flasher has two (2) light circuits with 6 outputs each. Each channel has 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.

The flasher is in a metal housing and can be mounted in a variety of locations. User-supplied hardware is required to mount the flasher and user-supplied switches are required to activate the flasher.

II. INSTALLATION.

⚠ WARNING

DO NOT connect flasher to brake light circuit of ANY vehicle. Connection of aftermarket electrical equipment into this circuit may interfere with the brake shift interlock. This could cause the vehicle to unexpectedly move forward causing possible property damage, injury or death to the vehicle operator or others.

A. *Flasher Mounting.*

CAUTION

Never mount the flasher in the vehicle's engine compartment. It is recommended that the flasher be installed either under the dash, in a console, in an equipment compartment, or in the trunk of the vehicle.

NOTE

The Model 650301 Flasher is designed to mount on the same mounting footprint as a Federal Signal SPS4-NFPA Strobe Power Supply. If you are replacing an existing SPS4-NFPA Strobe Supply with this flasher, replace the strobe supply with the flasher using the same hardware.

1. Locate a suitable mounting location for the flasher.

2. Using the flasher as a template, scribe drill position marks on the mounting surface.

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, electrical wiring or other vital parts.

3. Drill four mounting holes at the previously scribed drill position marks. The hole diameter should be chosen to accommodate user-supplied hardware.

4. Secure the flasher to the vehicle with user supplied hardware.

B. *Wiring.*

⚠ WARNING

Do not connect this system to vehicle battery until ALL other electrical connections are made and mounting of all components is complete.

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.

See figure 1 when performing the following procedure.

1. Connect the flashers GND (-) to a good vehicle ground point with a 0.250 fully- insulated Quick Connect Terminal.

2. Connect the Power (+) lead to the + 12VDC electrical system with a 0. 187 fully- insulated Quick Connect Terminal. If it is desired to switch the flasher on and off, the power (+) needs to be controlled through a switch sufficiently rated to the fused current rating of the source. Wire gauge should be sized appropriate to the fused current rating of the source.

⚠ WARNING

The selection of the wire gauge for the input power and the determination of the current rating of the fuse for the input power are important. It should be determined by a technician having a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and use of safety warning equipment.

3. The flasher has 12 outputs, arranged in two rows/ channels of 6-outputs in parallel. These outputs switch the +DC source from source to the loads. This flasher is designed to accept a cable, which previously went to a GS5 strobe head. This three-position connector has three numbers on it, which go to a certain wire color in the strobe cable. Refer to figure 1 for termination of the wires and the position. If the strobe cable was terminated in accordance to the instruction sheet for the SPS4-NFPA, there should be three wires: red, white, and black in a jacketed cable. The red wire should go to position 1 which would have connected to the anode of the flashtube. The white wire should go to position 2 which would have connected to the trigger of the flashtube. The black wire should go to position 3 which went to the cathode of the flashtube.

If it is desired to terminate the cables, there are twelve connectors along with terminals to terminate your cables. In the 650301 flasher, only two of the three positions are used in the connector. The white wire should go to position two on the connector and will have +12V while flashing. The black wire should go to position 3 on the connector and is connected to ground inside the flasher.

⚠ 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.

C. *Programming (see table 1).*

The flasher will provide the end user with two preselected flash patterns. The preselected flash patterns are to be chosen from the nine factory programmed patterns provided with each flasher. It is recommended that the preselected flash patterns be determined and programmed during installation.

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

Turn on the flasher by applying power (+) and ground (-). The flasher will begin to flash in Mode 1 (Primary Pattern). There

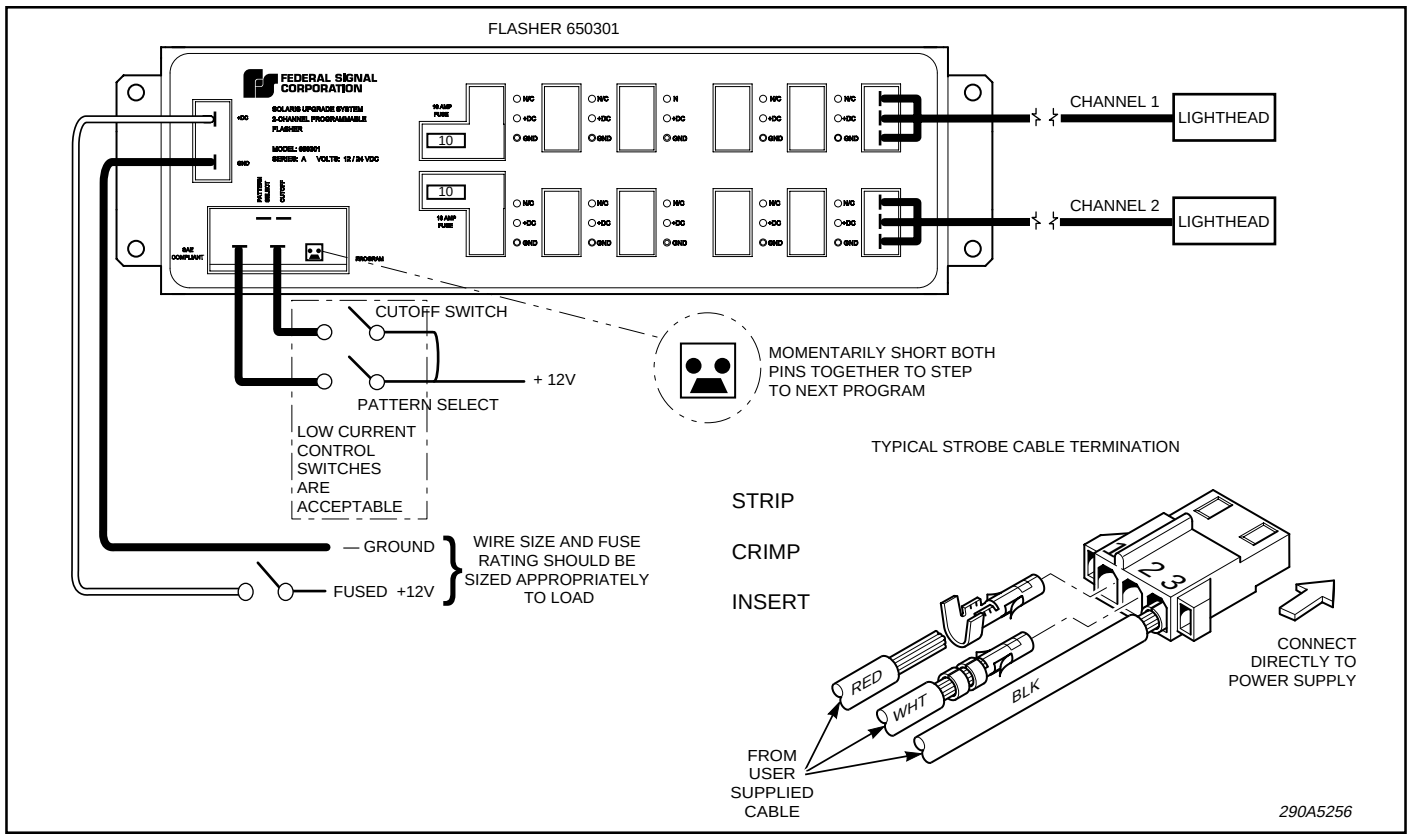

Figure 1.

Table 1

Pattern 1	Alternating Quad Flash 76FPM - SAE Compliant
Pattern 2	Overlapping Penta Flash 87FPM - SAE Compliant
Pattern 3	Overlapping Alternate 95 Ptns/Min - SAE Compliant
Pattern 4	175 FPM Alternating Single Flash
Pattern 5	Simultaneous/Overlapping Triple/Nine
Pattern 6	Alternating Single
Pattern 7	640 FPM Alternating with Overlap 5/2 Flash
Pattern 8	2 @ 60 FPM 4 Pulse Alternating then 2 @ 60 FPM 2 Pulse Simultaneous
Pattern 9	Steady Burn

is a white 2-position header next to the black control cable header. You are able to change the program by shorting the two pins together on the programming header. Momentarily shorting the pins will step the flasher 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 ninth pattern is displayed. To lock in a chosen pattern, allow the pattern to run for 15-seconds and it is now programmed. There is a two color LED which may change color during the programming of the flasher. When the LED is a steady green, the flash pattern is SAE/NFPA compliant.

To program 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 after the ninth pattern is displayed. To lock in a chosen pattern, allow the pattern to run for 15-seconds and it is now programmed.

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 Mode 1 (Primary Pattern).

D. *Pattern Select.*

The flasher is able to flash in two different modes with one pattern programmed in to Mode 1 and a second pattern programmed in to Mode 2. When power is supplied, the flasher will normally flash in Mode 1. When +12V is applied to the Pattern Select Pin, the flasher will flash the pattern in Secondary Mode. The default patterns as shipped from the factory should be Pattern one for Mode 1 and Pattern 2 for Mode 2. If a different pattern is desired, refer to the Programming section to select a different pattern for Mode 1 or Mode 2.

The Pattern Select input can be connected to by either connecting to the blue wire coming out of the three-position connector on the PC board or directly connecting to the 0.25 Quick Connect terminals above the three-position connector.

E. *Cutoff.*

There is a single channel cutoff input. When this input has +12V applied to it, all of the 6 outputs on channel 1 will turn off. Removing the +12V will allow the channel on the flasher to continue to flash. This input can be activated by either accessing the green wire coming out of the three-position control wire cable or connecting directly to the 0.25 Quick Connect terminal above the three-position connector.

III. REPLACEMENT PARTS.

Description	Part No.
Fuse, 10 Amp	148181-05
Circuit Board	2005307
Accessory Kit	8575377

IV. 8575377 KIT CONTENTS LIST.

Qty-	Description	Part No.
1	Terminal, Wide	224A216-04
1	Terminal, Narrow	224A215A-04
12	Connector, 3-position	140A203
40	Terminal	233A160