

INSTALLATION INSTRUCTIONS FOR MODEL 413106 STROBE POWER SUPPLY

SAFETY MESSAGE TO INSTALLERS

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 this unit: 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 strobe light system is a high current device. In order for it to function properly, a separate ground connection must be made. It should be connected to the negative battery terminal.**
- **Do not drill any holes in the power supply housing.**
- **Locate light control so the VEHICLE and CONTROL can be operated safely under all driving conditions.**
- **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 reinstalling the product.**

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

WARNING

This power supply is designed to supply flash energy of up to 425Vdc max at average power of 15 watts max. Strobe heads and cables must be rated to handle these voltage and power ratings.

I. GENERAL.

The Federal Model 413106 Ricochet™ strobe power supply is a six outlet (three pairs) supply that can operate from one to six strobe heads without any variation of output power. This power supply will normally operate with input voltage from 12 - 30vdc and will provide reduced performance operation with

input voltage from 7 - 12vdc. The unit supplies 15 watts per head average power in all modes of operation.

The power supply has four control inputs. Three inputs allow for three prioritized modes of operation. The fourth input puts the unit into low power (50%) operation. The three mode inputs can be programmed, via push buttons to operate one of ten flash patterns and any combination of the three outlet pairs. The programming for the control inputs can be cloned into another power supply via a cloning cable (Model 413207).

The Ricochet has several unique features.

- A cable tray and wire loom system, integral to the extruded housing. This allows for all cabling to be routed to the input jacks from either end or both.
- A hinged clear plastic cover, protects all cable connections and controls.
- Six LED's, located adjacent to each strobe tube outlet indicates the triggering of that outlet.

II. SPECIFICATIONS.

Input Voltage:

Normal Operation - 12 - 30vdc
(13.6vdc nominal)

Reduced Performance - 7 - 12vdc

Input Current @ 12.8vdc
Operating - 8.9amps
Standby - 6.5mA

Fuse 15amp Mini ATC

Power Per Head 15 watts (all patterns)

Dimensions:

Length 10.03" (255mm)
Width 6.98" (177mm)
Height 3.18" (81mm)
Weight 5.0lb (2.27kg)

Mounting Centers 9.3" (236mm) x 5" (127mm)

III. INSTALLATION.

CAUTION

The power supply is NOT waterproof. It must be mounted in a location, which is sheltered from falling rain, snow, standing water, etc. Also it must be installed in an adequately ventilated area. Never install near heater ducts.

Do not mount power supply in engine compartment.

When selecting a mounting location for the power supply unit, it is necessary to keep in mind that the cables are

available in either a 10-foot (413210), 16-foot (413216), 22-foot (413222), or a 30-foot (413230) length. Plan all wiring and cable routing before performing any installation.

A. *Mechanical.*

1. Use the power supply as a template and scribe four drill-positioning 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.

⚠ WARNING

DO NOT drill holes in ANY part of the power supply chassis or cover. Damage to the unit, serious injury or death to you or others may result.

2. Drill four mounting holes at the position marks.
3. Secure the power supply to the mounting surface, with user supplied 1/4" (6mm) hardware.
4. Install the strobe units as described in the instructions packed with the units

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.

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

Verify that no short circuits exist, before making connection to the vehicle battery.

NOTE

Powering multiple devices with a common control lead may cause one or more units to briefly remain functional after signal power is removed. For example, due to the high input filter capacitance, a strobe supply can briefly supply the current required to operate a low current device such as a Cuda TriOptic™. If necessary, use a relay to isolate devices with large filter capacitors. See figure 1 for the schematic; all components/wires are user-supplied.

1. Disconnect vehicle battery. Ensure that power is disconnected from all vehicle lighting control systems.
2. Ensure that the power supply chassis is grounded to the vehicle chassis. If necessary, connect a wire from the power supply chassis (mounting screw) to a known good vehicle chassis ground.

IMPORTANT

See figure 2 while completing the electrical connections.

3. Connect the user-supplied 10 AWG black wire to the power supply's "GND" terminal, using the quick connect crimp terminal supplied in the installation kit.

IMPORTANT

To ensure that the low EMI characteristics of this power supply are maintained, the 10 AWG black wire must be connected to - /NEG terminal of the vehicle battery.

4. Connect the supplied four conductor control harness.

The control inputs are from left to right as follows:

- High Priority
- Medium Priority
- Low Priority
- Low Power (50%)

5. Connect other end of the supplied control harness to user-supplied SPST switches (30Vdc/lamp min). Connect other side of switches to a 12/24vdc source capable of supplying lamp min. The 12/24vdc should be fused at the source with a 3-amp fuse.

NOTE

A three-position slide switch (normal or progressive) may be used in lieu of the three- SPST switches to connect the prioritized control inputs.

6. Using the quick connect crimp terminal supplied in the installation kit, connect the user-supplied 10 AWG red wire to the power supply's "+12/24V" terminal. Connect it to a 12/24 volt power source (switch, relay, or vehicle lighting controller) capable of supplying a minimum of 10-amperes. The 12/24 volt supply should be fused at the source with a 15-amp fuse.

7. Connect the strobe head cables to outlet pairs 1 & 2, 3 & 4, 5 & 6. Note that when the power supply is operating heads 1, 3, & 5 fire alternately with heads 2, 4, & 6.

- | | | |
|---|---|--------------|
| 1 | 3 | 5 (1st side) |
| * | * | * |
| 2 | 4 | 6 (2nd side) |
| * | * | * |

8. Check all connections and wiring. Ensure that there are no short circuits and that all wires are protected

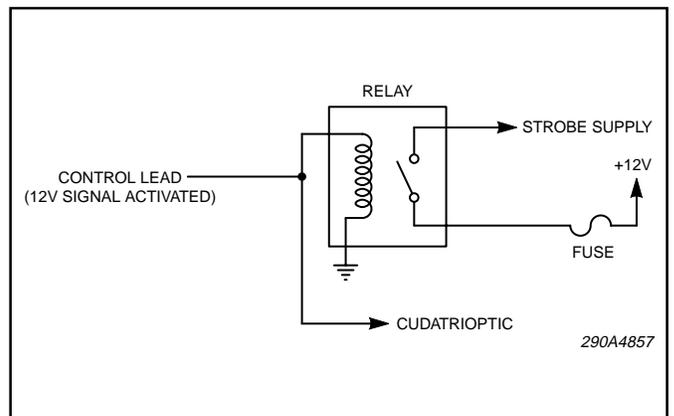


Figure 1.

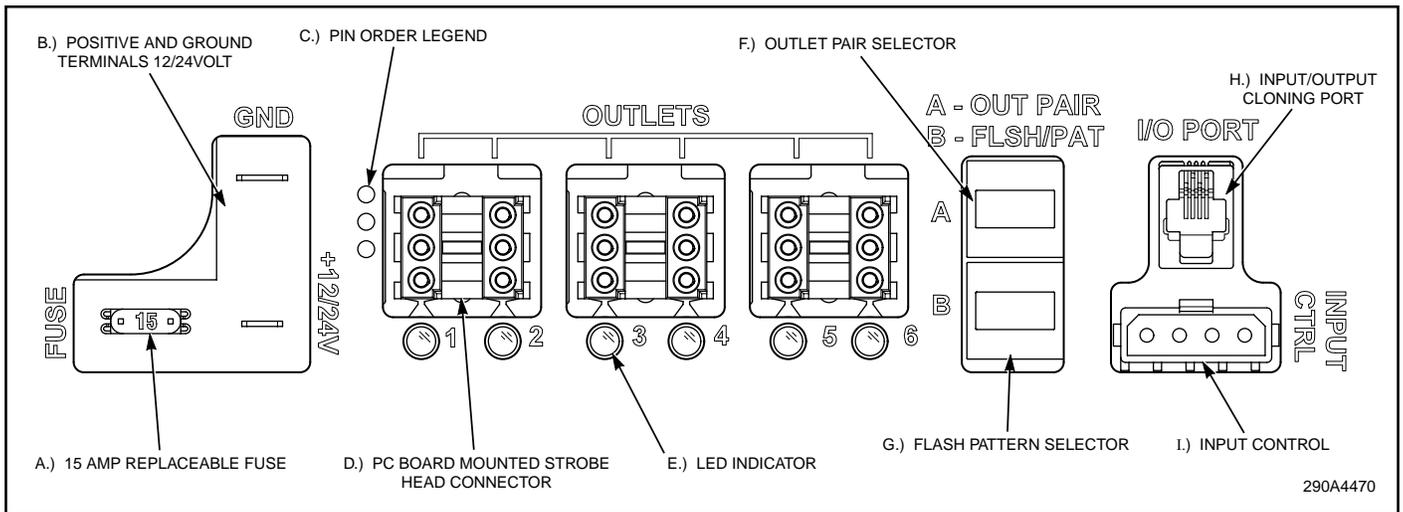


Figure 2.

from any sharp edges. Reconnect the vehicle battery. Test for proper operation of the strobe system, by energizing the high priority control input. Check that all the strobe heads are flashing and that the strobe heads have the desired alternating pattern.

NOTE

Strobe heads that are positioned in pairs (i.e., rear deck, grill, and dual mirror) are normally connected to the same outlet pair. This allows them to flash alternately and to be “cut out” at the same time.

If necessary, adjust the positions of the strobe head plugs connected to the power supply. When satisfied with the flashing patterns, use a permanent marker and mark the strobe plugs with the appropriate outlet numbers.

⚠ 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.

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 making connection to the vehicle battery.

9. Disconnect vehicle battery. Ensure that power is disconnected from all vehicle lighting control systems.

10. Unplug all connections. Remove retaining screw for front cover plate and cable comb. See figure 3. Slide cover plate out, towards the end that the cables enter the cable tray. If cables enter from both ends, slide towards the end that has the least amount of cables entering the cable tray.

11. Insert the 10AWG red and 10AWG black wires into the cable slot directly over the “+12/24V” and “GND” opening on the cover plate, leaving about 2" of wire extending through toward the front of the power supply. Slide cover plate into the extruded housing, leaving the next cable slot exposed out of the extruded housing. See figure 4.

NOTE

There is an opening in the cable tray, for the wires and cables to pass through into the cable tray.

12. Insert strobe head cables for outlets 1 & 2 into the next slot. Slide cover plate into extruded housing as described in step 10. See figure 5.

13. Repeat step 10 for outlets 3&4, 5&6. See figure 6.

14. Insert control input harness or cable into next slot. Slide cover plate into extruded housing, so that it is equal distance from both. Reinstall retaining screw into cover plate.

NOTE

The above procedure is applicable when the cables and wires enter from the right side of the power supply. When entering from the left side, reverse the order of the cables and wires installed.

15. Re-make all connections and work slack in the cables and wires into the cable tray and out the end of the housing.

16. Install the bushing in the end cap that has the cables and wires exiting and the hole plug in the other end cap. See figure 7.

17. Check all connections and wiring. Ensure that there are no short circuits and that all wires are protected from any sharp edges. Reconnect the vehicle battery. Test for proper operation of the strobe system, by energizing the high priority control input. Check that all the strobe heads are flashing and that the strobe heads have the desired alternating pattern.

IV. PROGRAMMING.

Each of the three prioritized control inputs on the Ricochet Power Supply can be programmed to operate one of the ten available flash patterns on any combination of the three outlet pairs. A default configuration is supplied from the factory as follows:

INPUT	ASSIGNMENT
High Priority	Quad Flash, All outlets on
Med Priority	Ricochet flash, All outlets on
Low Priority	Triple flash, outlets 1 & 2 off

The available flash patterns are as follows:

- 0 Null - All outlets off (start point).
- 1 Double - 9 Joule/3 Joule sequence alternating even and odd heads.
- 2 Triple - 8J/2J/2J impulse sequence alternating even and odd heads.
- 3 Quad - 6J/2J/2J/2J impulse sequence alternating even and odd heads.
- 4 Action - 8.1J impulse applied to individual outlets in sequence 45-6-3-2-1.
- 5 Random - 8-1J impulse applied to 2 outlets at a time in a pseudo random order.
- 6 Ricochet - Sequence of three Quad flashes followed by six 9J single flashes alternating even and odd heads.

- 7 Double-2 - Double flash twice alternating even and odd heads.
- 8 Triple-2 - Triple flash twice alternating even and odd heads.
- 9 Sweep - Impulses applied alternating even and odd heads, progressively changing repetition rate and energy levels.
- 10 Quad-2 - Quad flash twice alternating even and odd heads.

The combination of outlet pairs are as follows:

- 0 All outlets off (start point)
- 1 All outlets on
- 2 Outlets 1 & 2 off, 3 & 4, 5 & 6 on
- 3 Outlets 3 & 4 off, 1 & 2, 5 & 6 on
- 4 Outlets 5 & 6 off, 1 & 2, 3 & 4 on
- 5 Outlets 5 & 6 on, 1 & 2, 3 & 4 off
- 6 Outlets 3 & 4 on, 1 & 2, 5 & 6 off
- 7 Outlets 1 & 2 on, 3 & 4, 5 & 6 off

To program the three prioritized control inputs perform the following:

- A. Apply DC input power to terminals "+12/24V- and "GND-.
- B. Apply +12/24 Volts to the control input to be programmed. Power should not be applied to any other control input.

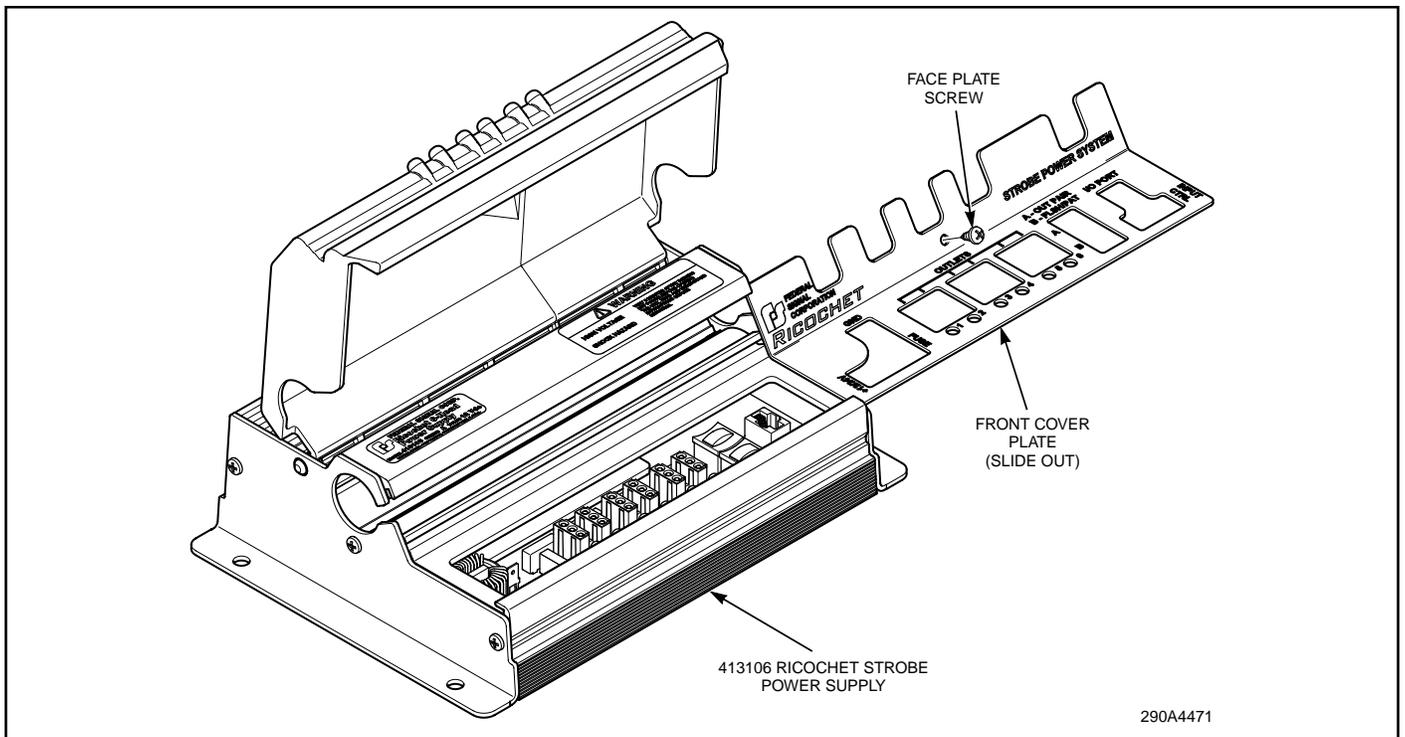


Figure 3.

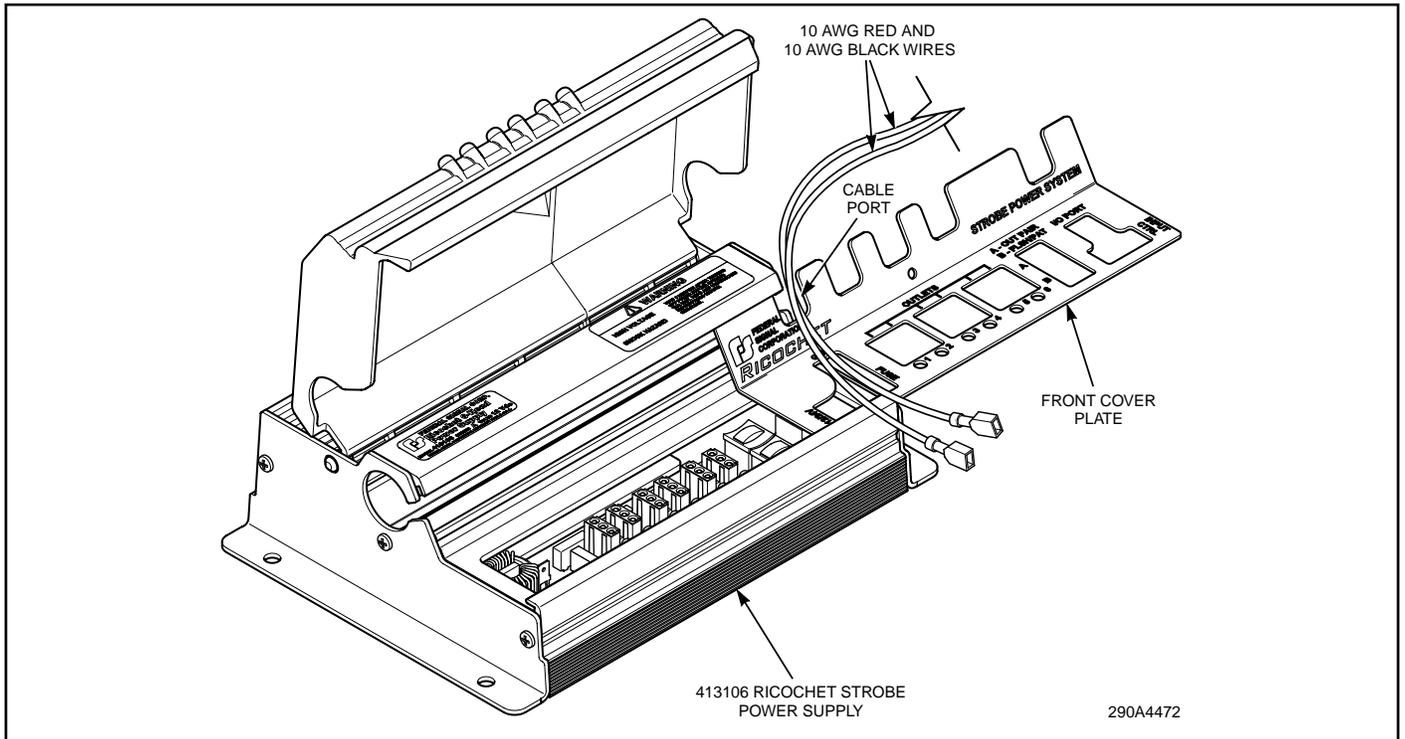


Figure 4.

C. Press and release the “B-FLSH/PAT” push button repeatedly until the Null pattern is found (observe that none of the led indicators are flashing).

NOTE

To advance to the next selection press and hold the push button down for second and release. The selection advances one step per push.

D. Press and release the “B-FLSH/PAT” push button until the desired pattern is found. The desired flash pattern

can be verified by observing the led indicators adjacent to the outlet pairs.

E. Press and release the “A-OUT PAIR” push button repeatedly until the all outlets off position is found (observe that none of the led indicators are flashing).

F. Press and release the “A-OUT PAIR” push button until the desired combination of outlet pairs are operating. The desired combination can be verified by observing the led indicators adjacent to the outlet pairs.

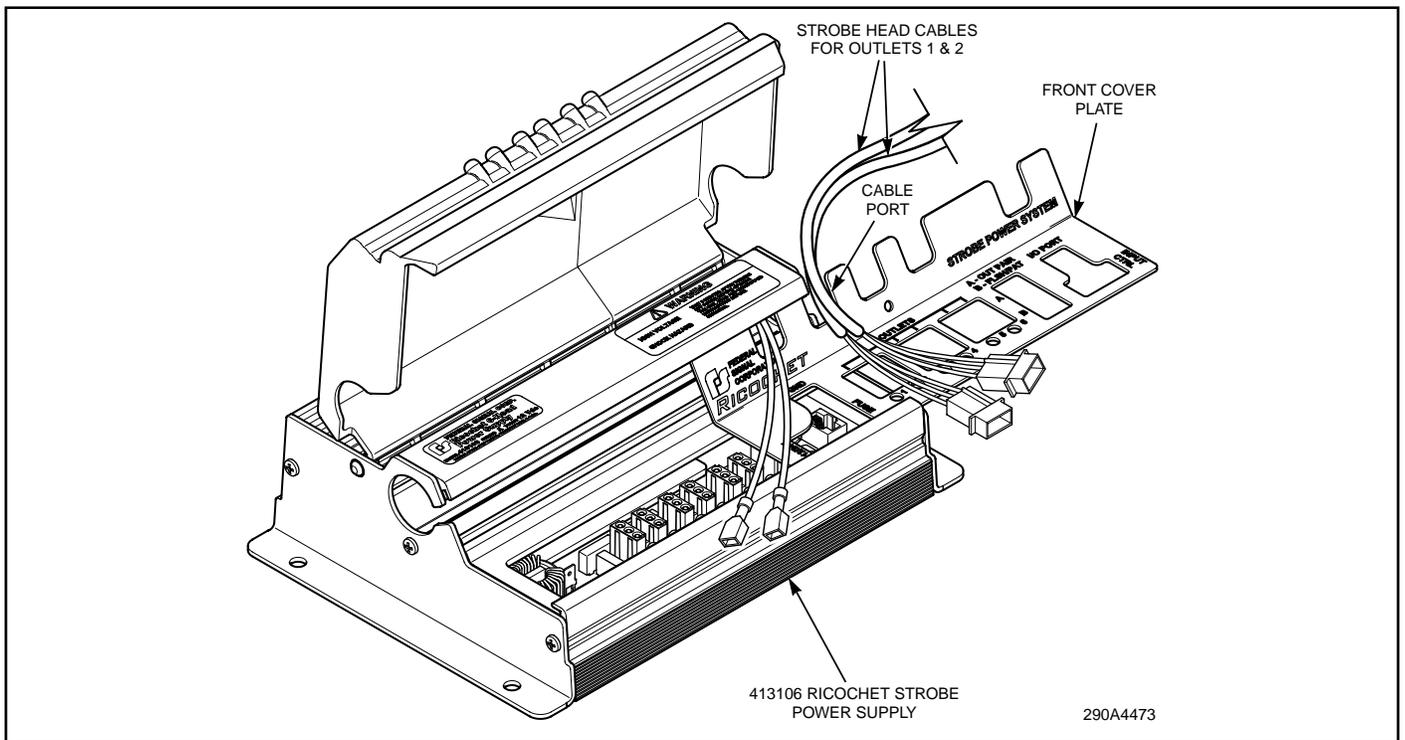


Figure 5.

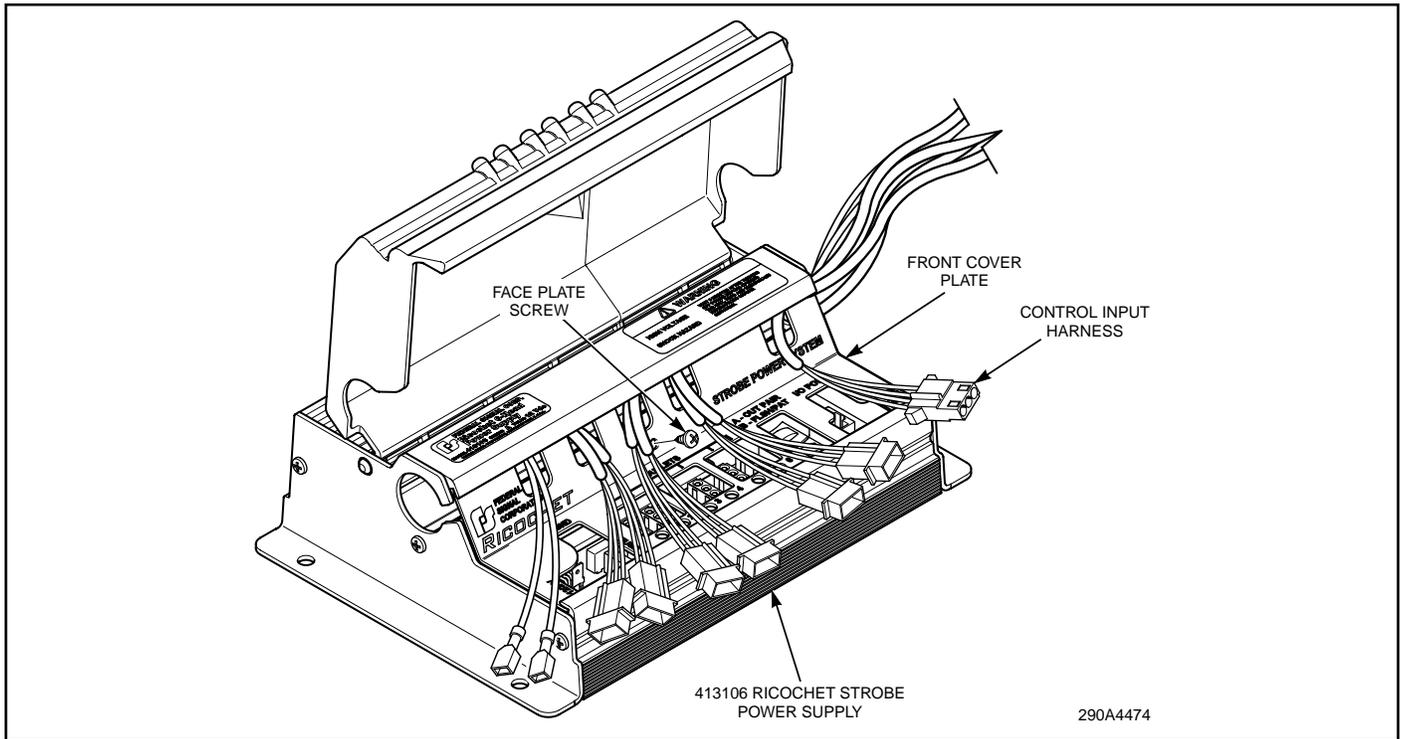


Figure 6.

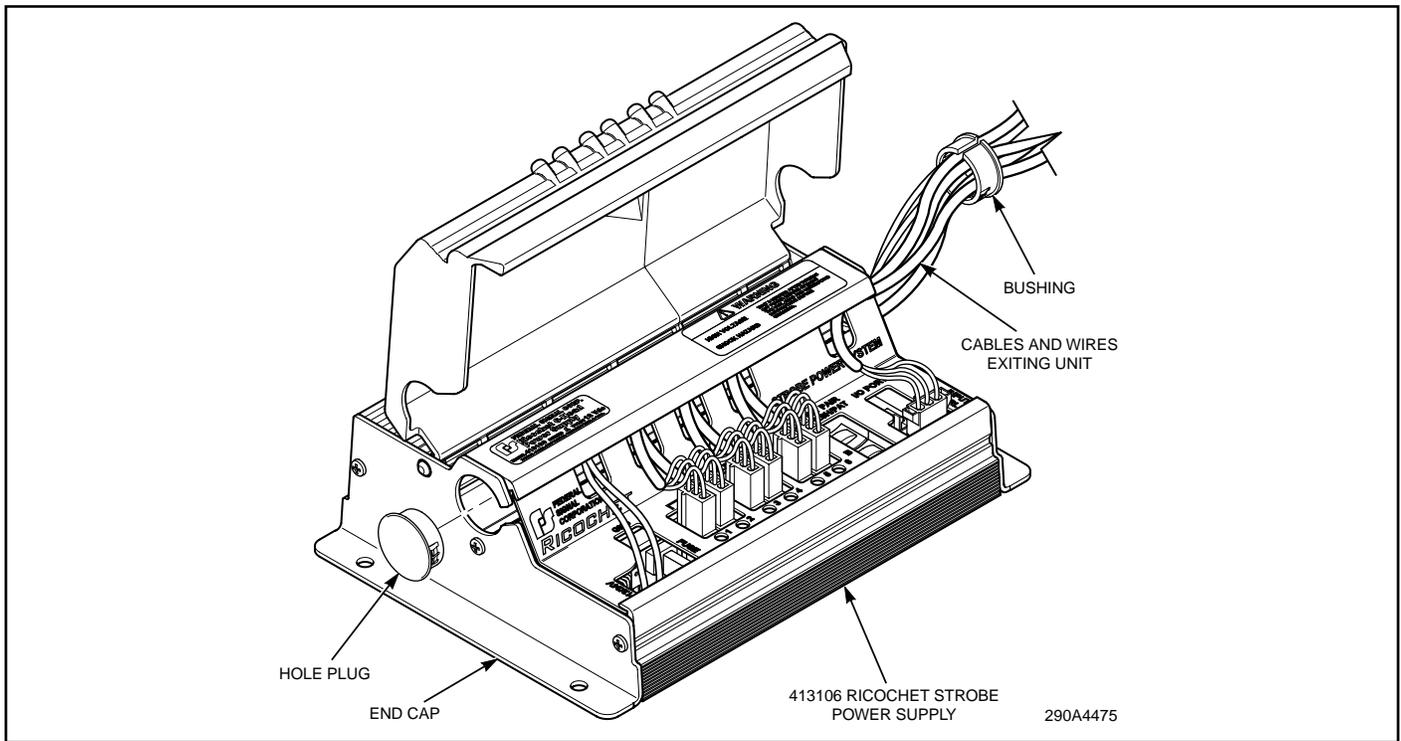


Figure 7.

G. Remove power from the control input while maintaining input power. The led indicator for outlet 6 will flash two times, indicating that the reprogramming was successful.

NOTE

If the programming is the same as what was the previous programming for that control input, the led indicator for outlet 6 will not flash.

H. To program the other control inputs, repeat steps A - G.

V. CLONING.

The programming in one unit may be cloned into another unit by performing the following with the cloning cable (Model 413207).

NOTE

The unit to be programmed is referred to as the "Clone".

- A. Unplug the control inputs from both units.
- B. Apply power to either unit.
- C. Connect cloning cable to the "I/O" port on both units.

D. On the "Clone" unit press the "A-OUT/PAIR" for 1/2-second minimum and release. The led indicator adjacent to outlet 6 will flash twice indicating the cloning operation was successful.

IV. 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:

- **Do not attempt to activate or deactivate light control while driving in a hazardous situation.**
- **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 lights are securely attached and all units 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

V. SERVICE.

 WARNING

High voltages are present in a strobe light system. Wait at least five (5) minutes, after shutting off power, before servicing the unit. Failure to do so may result in property damage, serious injury, or death to you and others.

Servicing should be performed by a qualified Federal Signal service center. If the power supply is not working properly, disconnect power and ground to the unit. Next, disconnect the electrical connections to the strobe tubes. Remove the power supply from the vehicle. Send the unit to the nearest authorized service center or to the Federal Signal,service department.

Communication and shipments should be addressed to:

Service Department
Federal Signal Corporation
2645 Federal Signal Drive
University Park, IL 60466
1-800-433-9132 (In Illinois) 708-534-3400

 WARNING

The fuse MUST be replaced with an exact replacement only.

After servicing is complete, perform a test to ensure the power supply is operating properly.

VI. REPLACEMENT PARTS.

Description	Part No.
Fuse, 15 Ampere	148181-06
Printed Circuit Board Assy.	2005131
Accessory Kit 8630113	

VII. KIT CONTENTS LIST.

Qty.	Description	Part No.
2	Terminal, Wide	224A216-04
1	Control Harness Assy.	1751129
2	Bushing, Split	231226
1	Bushing, Plug	231227

STROBE LOCATION WORKSHEET

SELECT SIX STROBE LOCATIONS

