

INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR VECTOR™ SL LED LIGHTBAR

SAFETY MESSAGE TO INSTALLERS AND USERS

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 lightbar, you must have a good understanding of automotive 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 air bag.
- This product contains high intensity LED devices. To prevent permanent eye damage, DO NOT stare into the light beam at close range.
- 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 used.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.
- Locate the light system controls so the VEHICLE and CONTROLS can be operated safely under all driving conditions.
- The mounting system should be periodically inspected to ensure 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 Vector SL warning system is a full-featured, programmable halogen/LED warning light system. V-shaped construction allows the Vector SL warning system to maximize light warning efficiency at crucial 45° angles. The LED pods are two-tier with the wide angle Solaris™ LEDs positioned to provide 360° coverage. Fixed halogen takedown and alley lights operate both steady burn and flashing. Pattern selection can be performed during or after installation. The unit is supplied with mounting hardware and an eighteen-foot cable and has an operating temperature of -40°C to +65°C.

II. UNPACKING.

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

III. INSTALLATION.

A. General.

Before proceeding, ensure that the lightbar has been installed on the vehicle roof in accordance with the instructions packed with the mounting kit. The lightbar 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. The basic light functions of the unit must be controlled by a user-supplied control head.

WARNING

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

1. Route the control cable into the vehicle and near the eventual location of the user-supplied control head. Route the Power cable into the vehicle and to the battery.

2. For proper light operation, the control cable must be properly terminated inside the user-supplied control head. Using figure 1 and table 1 as a guide,

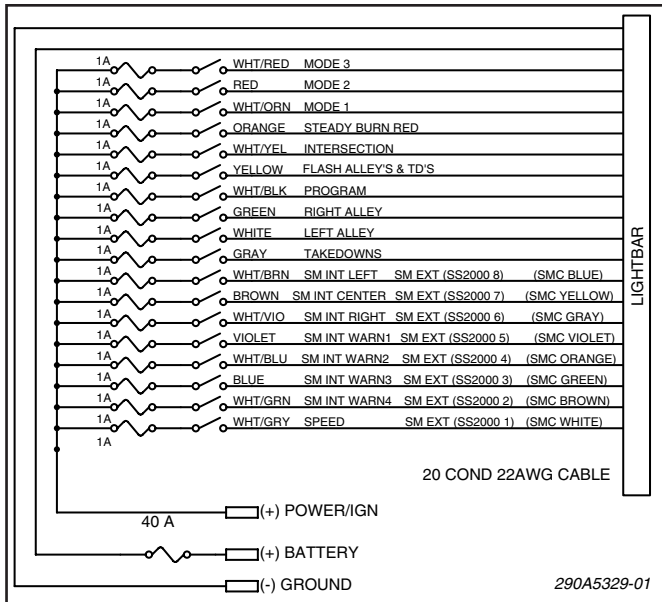


Figure 1.

make the appropriate electrical connections. Ensure that the lines are adequately fused as shown and that the switch capacity is adequate for the current requirement.

CAUTION

Reverse polarity may damage any power supply and prevent operation. Ensure that the correct polarity is observed. The positive (+) power lead must be fused at the source for 40 amps.

3. Connect the separate 10 gauge black lead to the vehicle battery ground terminal (-) and the separate

Table 1.

CONROL CABLE	MAIN FUNCTIONS	SM INTERNAL	S2000/SM	SMC16	SMC56
WHT/RED	MODE 3	MODE 3	MODE 3	MODE 3	MODE 3
RED	MODE 2	MODE 2	MODE 2	MODE 2	MODE 2
WHT/ORG	MODE 1	MODE 1	MODE 1	MODE 1	MODE 1
ORG	STEADY RED	STEADY RED	STEADY RED	STEADY RED	STEADY RED
WHT/YEL	INTERSECTION	INTERSECTION	INTERSECTION	INTERSECTION	INTERSECTION
YEL	FLASH A & TD	FLASH A & TD	FLASH A & TD	FLASH A & TD	FLASH A & TD
BLK/PNK	N/C	N/C	N/C	N/C	N/C
BLK	N/C	N/C	N/C	N/C	N/C
WHT/BLK	PROGRAM	PROGRAM	PROGRAM	PROGRAM	PROGRAM
GRN	RIGHT ALLEY	RIGHT ALLEY	RIGHT ALLEY	RIGHT ALLEY	RIGHT ALLEY
WHT	LEFT ALLEY	LEFT ALLEY	LEFT ALLEY	LEFT ALLEY	LEFT ALLEY
GRY	TAKEDOWNS	TAKEDOWNS	TAKEDOWNS	TAKEDOWNS	TAKEDOWNS
WHT/BRN	N/C	LEFT	(8)	BLU	BLU
BRN	N/C	CENTER	(7)	YEL	YEL
WHT/VIO	N/C	RIGHT	(6)	GRY	GRY
VIO	N/C	WARN 1	(5)	VIO	VIO
WHT/BLU	N/C	WARN 2	(4)	ORG	ORG
BLU	N/C	WARN 3	(3)	GRN	GRN
WHT/GRN	N/C	WARN 4	(2)	BRN	BRN
WHT/GRY	N/C	SPEED	(1)	WHT	WHT

rate 10 gauge red lead to the vehicle battery hot terminal (+).

NOTE

All the lightbar functions can be activated by applying 12VDC to the appropriate control line. The 10 gauge black and red power leads must be connected to their respective battery terminals for a function check.

B. *Function Activation – Excluding SignalMaster™.*

NOTE

Refer to table 1 and figure 1 for proper connections.

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 an LED. If necessary, use a relay to isolate devices with large filter capacitors. See figure 2 for the schematic; all components/wires are user-supplied.

1. Mode Inputs.

There are three prioritized mode of operation available with mode three being the highest

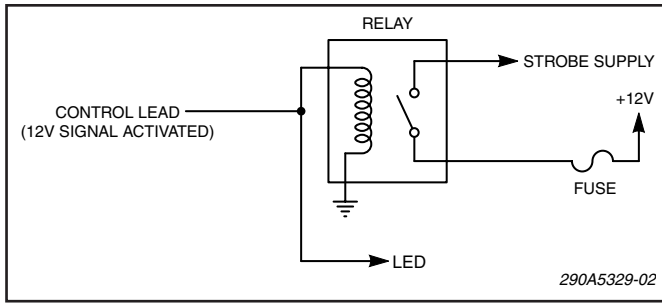


Figure 2.

priority. Mode 3 (WHT/RED) will override Mode 2 (RED) and Mode 2 will override Mode 1 WHT/ORN). One of the available flash patterns can be programmed to each mode input. Default configuration is Mode 3 Random Flash, Mode 2 Quad Flash and Mode 1 595 Flash. Programming will be covered later in this section. To activate a mode, apply 12VDC to a mode input wire. 12VDC must also be applied to the front cutoff wire (BLK/PNK) for the front of the bar to operate. See figure 1 for proper fusing.

2. Steady Burn Red.

When the Vector SL is equipped with a Steady Burn Red led module, applying 12VDC to the Orange wire will cause that module to operate when any mode input is selected.

3. Intersection Mode.

When 12VDC is momentarily applied to the (WHT/YEL) wire, it will cause the flash rate of the selected mode input to double. When 12VDC is applied again the flash rate will return to normal.

4. Flash Alley's and Takedowns.

Applying 12VDC to the Flash Alley' & Takedowns (YEL) wire will cause the halogen Alley and Takedown lights to flash when a mode input is selected .

5. Right Alley.

Applying 12VDC to the Right Alley (Green) wire will cause the Right Alley lights to illuminate.

6. Left Alley.

Applying 12VDC to the Left Alley (White) wire will cause the Left Alley lights to illuminate.

7. Takedowns.

Applying 12VDC to the Takedowns (Gray) wire will cause the Takedowns lights to illuminate.

8. Programming.

There are three lightbar functions that can be programmed by the user, via three control input wires. There are six available LED flash patterns:

- Random
- Quad Flash alternating 75FPM
- Single Flash alternating 75FPM
- Alternate Flash POD's 1&7 90FPM rear

only

- Alternate Flash POD's 1&7 90FPM front and rear
- Alternate Flash POD's 1&7 with POD 4 90FPM rear only

Three default patterns are assigned to operate in the three mode inputs. They are as follows:

- WHT/ORG - Mode #1 – Single flash
- RED - Mode #2 – Quad flash
- WHT/RED - Mode #3 – Random

To change a flash pattern assigned to a slide switch perform the following:

- Activate lightbar in the desired mode by applying 12vdc to the control input .

- Apply 12vdc to the program input (WHT/BLK). The LED flash pattern will advance to the next available pattern and the end LED module in POD #1 will flash the selected pattern number. The lightbar will now operate in the selected pattern. Each time 12vdc is removed and re-applied the pattern number will advance. When the last available pattern number is reached the next operation of the switch will select the first available pattern.

- If patterns assigned to the other mode inputs are to be changed, apply 12Vdc to the desired mode input and repeat the above steps.

C. Function Activation – SignalMaster.

NOTE

Jumpers are factory installed for External SignalMaster Controller.

Refer to table 1 and figures 1 and 3 for proper connections.

1. SignalMaster Internal Controller.

- a. See figure 4. Ensure that jumpers JP2 & JP7 are installed as indicated

- b. When 12VDC is applied to one of the input wires the corresponding SignalMaster function will activate (see table 1). The first seven inputs are prioritized, with “Left” (WHT/BRN) being the highest priority and “Warn 4” (WHT/GRN) being the lowest priority. The highest priority input that has 12VDC applied will override any other input that has 12VDC applied. When using a three position progressive slide switch for “Left”, “Center” and “Right” functions, “Left” is connected to position one “Center” to position two and “Right” to position three. The “Fast” (WHT/GRY) input will cause

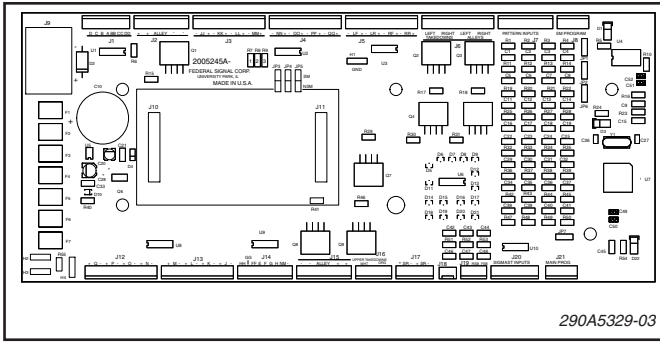


Figure 3.

the SignalMaster to operate at twice the normal speed, when 12VDC is applied to the input.

2. SignalMaster External Controller.

a. See figure 5. Ensure that jumpers JP2 & JP7 are installed as indicated.

b. Refer to table 1 and connect the SignalMaster input wires to the corresponding connections for the SS2000/SM, SMC16 and SMC56 SignalMaster controllers.

IV. TESTING.

⚠ WARNING

This product contains high output LED devices. To prevent permanent eye damage, do not stare into the light beam at close range.

After Installation, check the entire system to be sure the lights are flashing properly and all light system functions are operating properly.

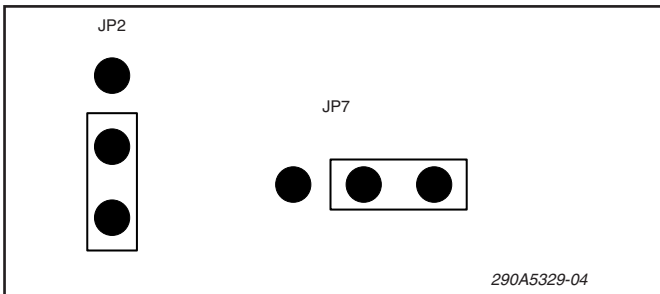


Figure 4.

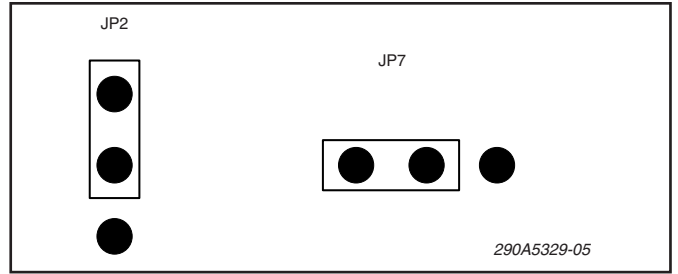


Figure 5.

SAFETY MESSAGE TO OPERATORS

⚠ WARNING

People's 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 manmade objects are between your vehicle and others, such as: raising your hood or trunk lid. If these situations occur, be especially careful.**
- **This product contains high intensity LED devices. To prevent permanent eye damage, DO NOT stare into the light beam at close range.**
- **At the start of your shift, you should ensure that the light is securely attached and operating properly.**

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 AND MAINTENANCE.

⚠ WARNING

Crazing (cracking) of lenses will cause reduced effectiveness of the light. Do not use cleaning agent (which will cause crazing) such as strong detergents, solvents, or petroleum products. If crazing of lenses does occur, reliability of light for emergency signaling purposes may be reduced until lenses are replaced.

A. Pod Service.

1. Dome Removal and Installation.

- a. Remove and retain the two Torx head screws which secure the dome to the pod.
- b. Carefully remove the dome and set it aside.

CAUTION

Excessive tightening of the Torx head screws will damage the screws.

- c. Replace the dome and secure with the previously removed Torx head screws.

B. Halogen Lamp Replacement.

See figure 6. To replace the lamp, twist to unlock and then pull the defective lamp out of the socket. Install a new lamp of the same type in the socket. See the replacement parts list for the Federal Signal part number.

C. PCB Servicing.

CAUTION

To avoid damage to the lightbar, disconnect all power at the battery before proceeding.

1. Cover Removal.

See figure 7. Remove and retain the four screws which secure the cover on the lightbar. Slide the cover back slightly and carefully lift to remove.

2. Printed Circuit Board Removal.

The lightbar contains one or two circuit boards. See figure 8. To remove a circuit board, remove and retain the fasteners which secure the circuit board to the lightbar.

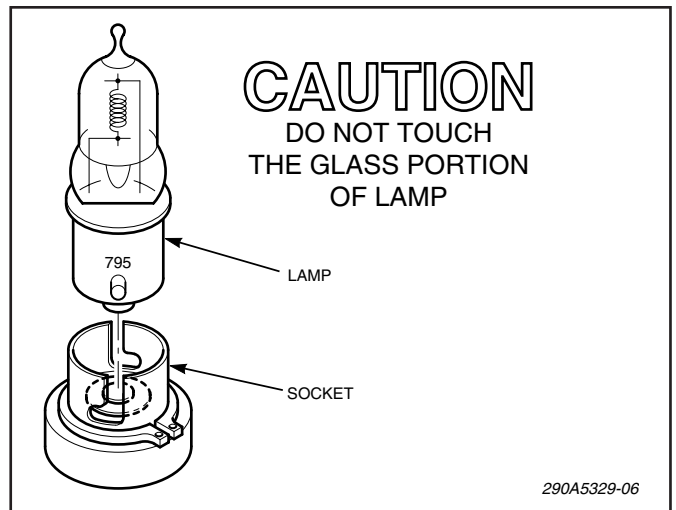


Figure 6.

D. LED Service.

1. Pod LED.

- a. Remove dome as described previously in paragraph V.A.1.
- b. See figure 9. Note or mark the screw location to ensure reassembly in the proper position. Remove the Phillips screws retaining the reflector assembly, slide the assembly free, and unplug the electrical connector.

CAUTION

Do not overtighten screws.

- c. Reassembly is the reverse. Do not over tighten Phillips screws. Use due caution when replacing screws in previously installed reflector assemblies to reengage the existing cut thread in the plastic reflector.

2. Trioptic LED SignalMaster Removal and Installation.

- a. Remove the cover and SignalMaster board as described in paragraph V.C.

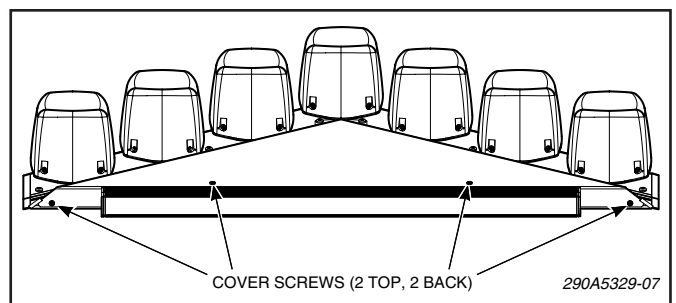


Figure 7.

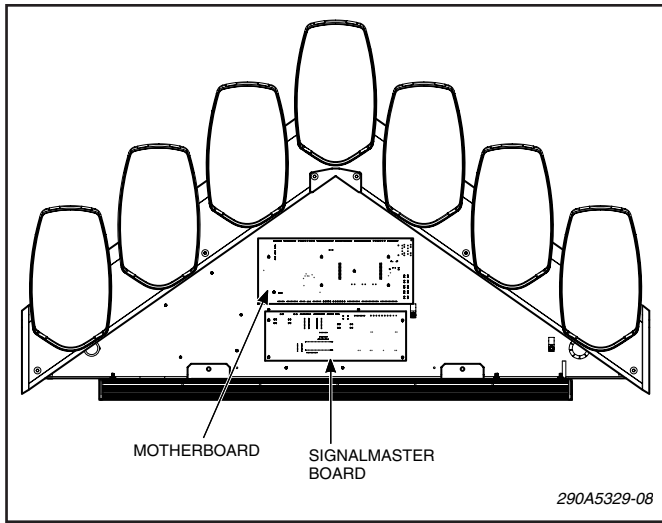


Figure 8.

b. Disconnect cable connection and remove cable hold down clamp.

c. See figure 10. Remove the 4 Keps Nuts securing the SignalMaster to the cover. Remove the SignalMaster.

d. Installation is the reverse.

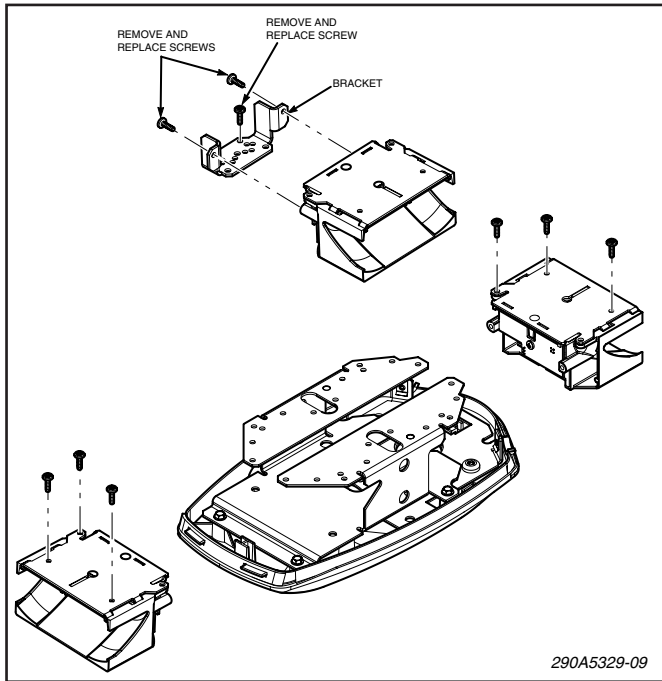


Figure 9.

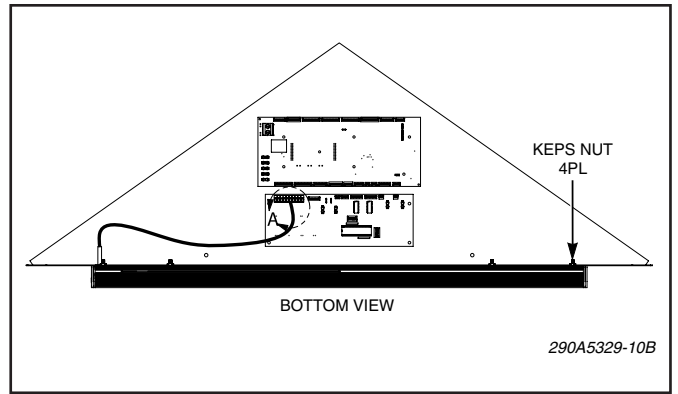


Figure 10.

3. Trioptic SignalMaster LED Service.

The unit must not be opened under any circumstance. Failure to adhere to this may result in moisture entering into the unit causing premature failure. Please contact the factory if the unit is not functioning properly.

4. Standalone SignalMaster Connections.

If a shorter cable is desired:

a. Remove the cover and Smart Pod/SignalMaster board as described in paragraphs V.C.1. and V.C.2.

b. Unplug the SignalMaster cable from the board and cut the cable to the desired length, allowing 4 inches for the circuit board connection. Discard cut end and connectors.

c. See figure 11. Strip the cable jacket back 4 inches, then strip 1/4" of the insulation from the wires shown in figure 11.

d. Connect the wires to the screw header on the SignalMaster board as shown in figure 11.

e. Test for proper operation, trim extra wires flush with jacket, then reassemble in reverse order.

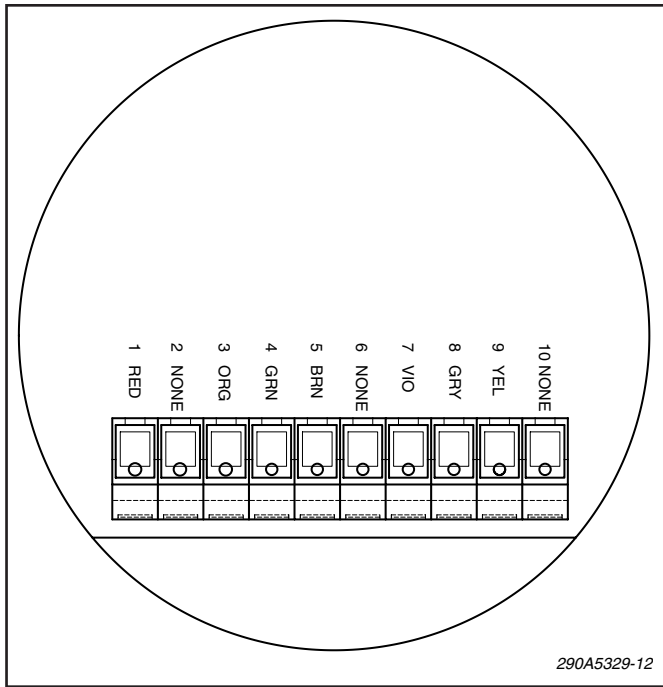


Figure 11.

VI. MAINTENANCE.

Cleaning the Plastic Domes.

WARNING

Crazing (cracking) of domes will cause reduced effectiveness of light system. Do not use cleaning agents (which will cause crazing) such as strong detergents, solvents, or petroleum products. If crazing of domes does occur, reliability of light for emergency purposes may be reduced until domes are replaced.

Ordinary cleaning of the plastic lenses can be accomplished by using mild soap and a soft rag. Should fine scratches or a haze appear on a lens, they can best be removed with a specialty plastic cleaner/polish such as Plexus® and a soft cloth. Alternatively, non-abrasive, high quality, one-step, automotive paste cleaner/wax may be used.

VII. VECTOR SL REPLACEMENT PARTS LIST.

<i>Description</i>	<i>Part Number</i>
Printed Circuit Boards	
Bar Controller PCB (w/SML)	2005245-12
Bar Controller PCB (Figure 12)	2005245-123
SignalMaster PCB (Figure 13)	2005325-1
SignalMaster PCB (Stand-alone SML)	2005325
Domes	
Dome, Clear	8572001
Dome, Red	8572001-01
Dome, Amber	8572001-02
Dome, Blue	8572001-03
Dome, Green	8572001-04
Dome, C.I.E. Blue	8572001-05
Fuses	
Fuse, 2 Amp., Pico Fuse	148151-08
Fuse, 2 Amp., Automotive Blade	148A142-10
Fuse, 5 Amp., Automotive Blade	148A142-03
Fuse, 15 Amp., Automotive Blade	148A142-06
Fuse, 20 Amp., Automotive Blade	148A142
LED Pod Components	
PCB Assembly (to be replaced by 2005340-1)	2005272-1
Reflector Assembly, Amber (Includes PCB)	8654167-12
Reflector Assembly, Blue (Includes PCB)	8654167-13
Reflector Assembly, Red (Includes PCB)	8654167-14
Reflector Assembly, White (Includes PCB)	8654167-15
LED, 6 Button, Amber	8625234-A
LED, 6 Button, Blue	8625234-B
LED, 6 Button, Red	8625234-R
LED, 6 Button, White	8625234-W
Reflector, Polyparabolic	8654165
LED, Trioptic 3-pack, Amber (pod 4 R&L)	8572484-02
LED, Trioptic 3-pack, Blue (pod 4 R&L)	8572484-03
LED, Trioptic 3-pack, Red (pod 4 R&L)	8572484-04
LED, Trioptic 3-pack, White (pod 4 R&L)	8572484-05
Halogen Lamps	
Takedown, 50W (horizontal filament)	8107119
Alley, 50W (vertical filament)	8107141

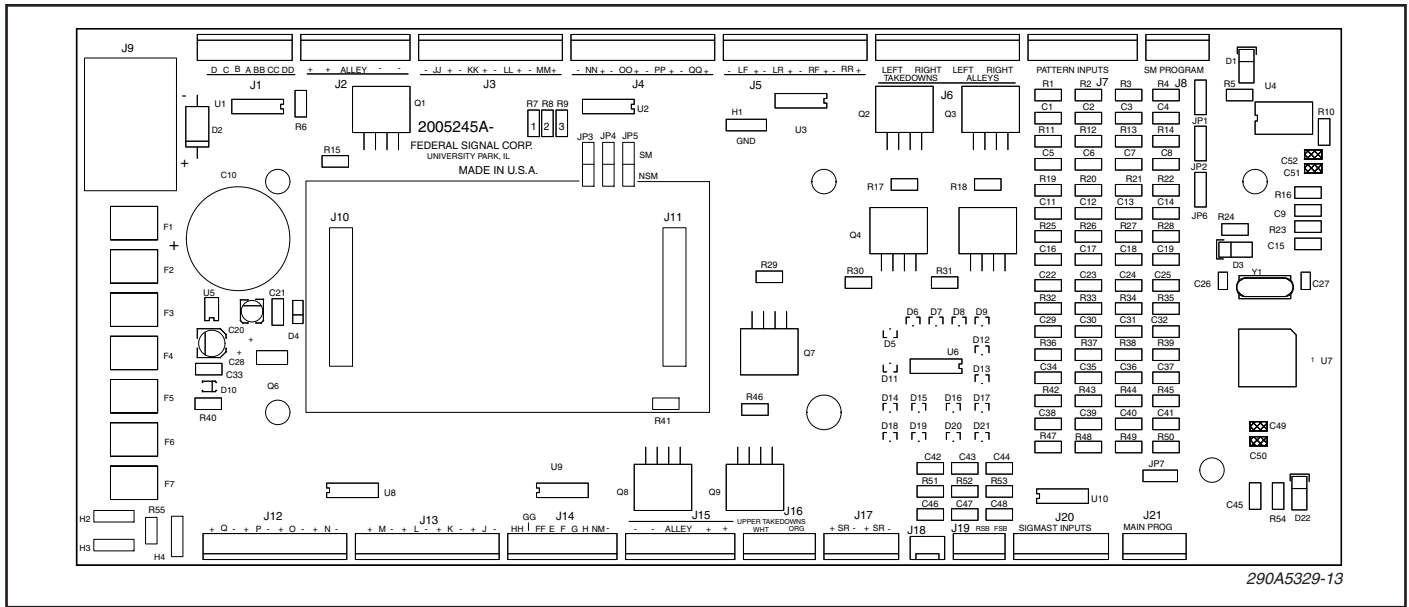


Figure 12.

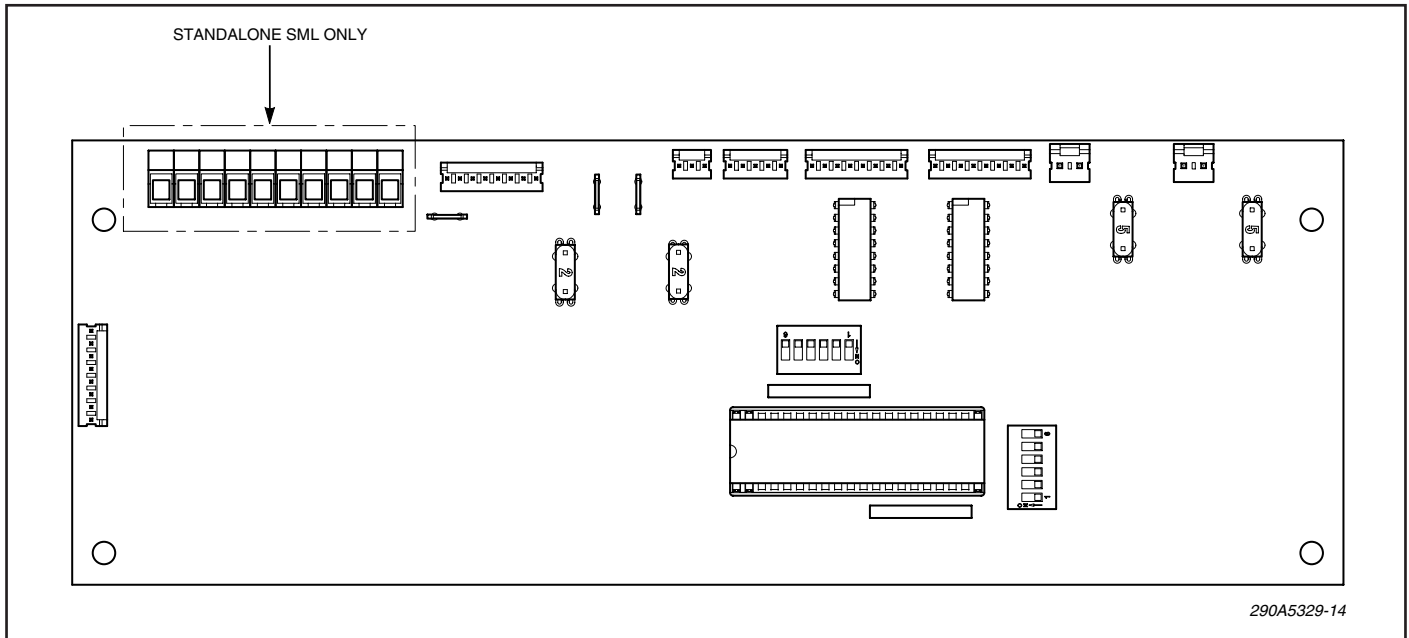


Figure 13.