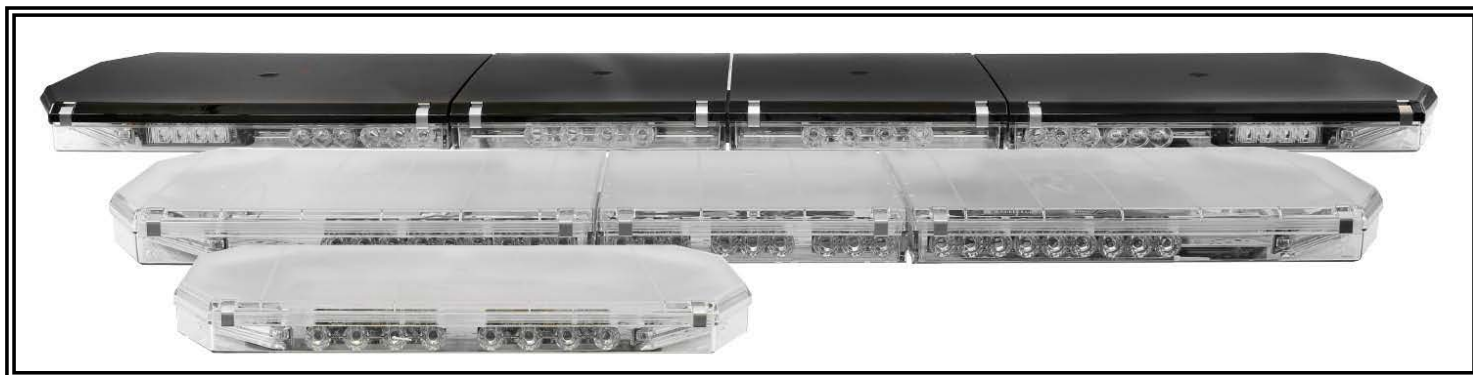




ECCO[®]

Installation and Operation Instructions 21 Series IF and CC Lightbars



ECCO 21 Series Lightbars are versatile and powerful warning devices that offer numerous lighting module and length options. The 21 Series is suitable for many vehicle applications and features a durable aluminum chassis, polycarbonate lenses and a sleek, low profile design. These lightbars can either be mounted permanently to the vehicle or using an optional, semi-permanent roof mounting kit. There are two types of 21 Series lightbar - IF (independent flashing) and CC (centrally controlled). IF (Independent Flashing) indicates the lightbars modules have individual electronic circuits that control their operation, each module, a group or a pair of modules can be controlled independently. CC (Centrally Controlled) indicates the lightbar's modules are controlled by a centralized electronic driver board which provides simpler and greater programming flexibility of all lightbar functionality.

Unpacking and Pre-Installation:

Carefully remove the lightbar and place it on a flat surface. Examine the unit for transit damage and locate all parts. If damage is found or parts are missing, contact the transit company or ECCO. Do not use damaged or broken parts.

Ensure the lightbar voltage is compatible with the planned installation.

IMPORTANT! Read all instructions before installing and using. Installer: This manual must be delivered to the end user. This manual assumes installation by a suitably qualified Automotive Technician.



WARNING!

Failure to install or use this product according to manufacturer's recommendations may result in property damage, serious bodily/personal injury, and/or death to you and those you are seeking to protect!



Do not install and/or operate this safety product unless you have read and understand the safety information contained in this manual.

1. Proper installation combined with operator training in the use, care and maintenance of emergency warning devices are essential to ensure the safety of emergency personnel and the public.
2. Emergency warning devices often require high electrical voltages and/or currents. Exercise caution when working with live electrical connections.
3. This product must be properly grounded. Inadequate grounding and/or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or severe vehicle damage, including fire.
4. Proper placement and installation is vital to the performance of this warning device. Install this product so that output performance of the system is maximized and the controls are placed within convenient reach of the operator so that s/he can operate the system without losing eye contact with the roadway.
5. It is the responsibility of the vehicle operator to ensure daily that all features of this product work correctly. In use, the vehicle operator should ensure the projection of the warning signal is not blocked by vehicle components (i.e., open trunks or compartment doors), people, vehicles or other obstructions.
6. The use of this or any other warning device does not ensure all drivers can or will observe or react to an emergency warning signal. Never take the right-of-way for granted. It is your responsibility to be sure you can proceed safely before entering an intersection, drive against traffic, respond at a high rate of speed, or walk on or around traffic lanes.
7. This equipment is intended for use by authorized personnel only. The user is responsible for understanding and obeying all laws regarding emergency warning devices. Therefore, the user should check all applicable city, state, and federal laws and regulations. The manufacturer assumes no liability for any loss resulting from the use of this warning device.
8. This product may contain high intensity LEDs staring directly into these lights could result in temporary and/or permanent vision impairment.

Specifications:

Cross Section:	2.3" x 12.3"	STT Pair:	1.0 A avg.
Input Voltage:	10-16 VDC	DOT Strip:	0.2 A avg.
Nominal Current @ 12.8 VDC:		Flash Rate:	See Wiring Section
3-6 LED Module:	0.5 A avg.	Temp. Range:	-22°F to 122°F -30°C to 50°C
9 LED Module:	1.0 A avg.		
AL, WL, TD Pair:	1.0 A avg.		

Installation & Mounting:

Mounting

Before proceeding with installation, plan all wiring and cable routing. Select the mounting location for the lightbar on a flat, smooth surface and center the unit across the width of the vehicle. The mounting location for the lightbar should be chosen such that the lightbar is level and visibility to approaching traffic is optimized.



Caution:

When drilling into any vehicle surface, make sure that the area is free from any electrical wires, fuel lines, vehicle upholstery, vehicle support members, etc. that could be damaged.

Permanent Mounting with Adjustable Mounting Feet

1. Loosen the 5/16" nuts to allow the mounting feet to slide along the base. Place the lightbar over the center of the vehicle and slide the mounting feet into position near the curved edges of the roof when possible.
2. Secure the feet in location on the lightbar by tightening the four nuts on each foot.
3. With the feet positioned, remove the adjustable foot cover and mark the location of the mounting hole centers on the roof of the vehicle. Remove the lightbar and drill the mounting holes as marked. Note: The center distance between the mounting holes in an adjustable mounting foot is 11.1" or 281.94 mm.
4. Attach the appropriate foot pad for the curvature of the roof surface per FIGURE 2. Secure the lightbar feet to the vehicle using the supplied 1/4"-20 hardware and reattach the adjustable foot cover as shown in FIGURE 1. See the Wiring section of this manual for further wiring instructions.

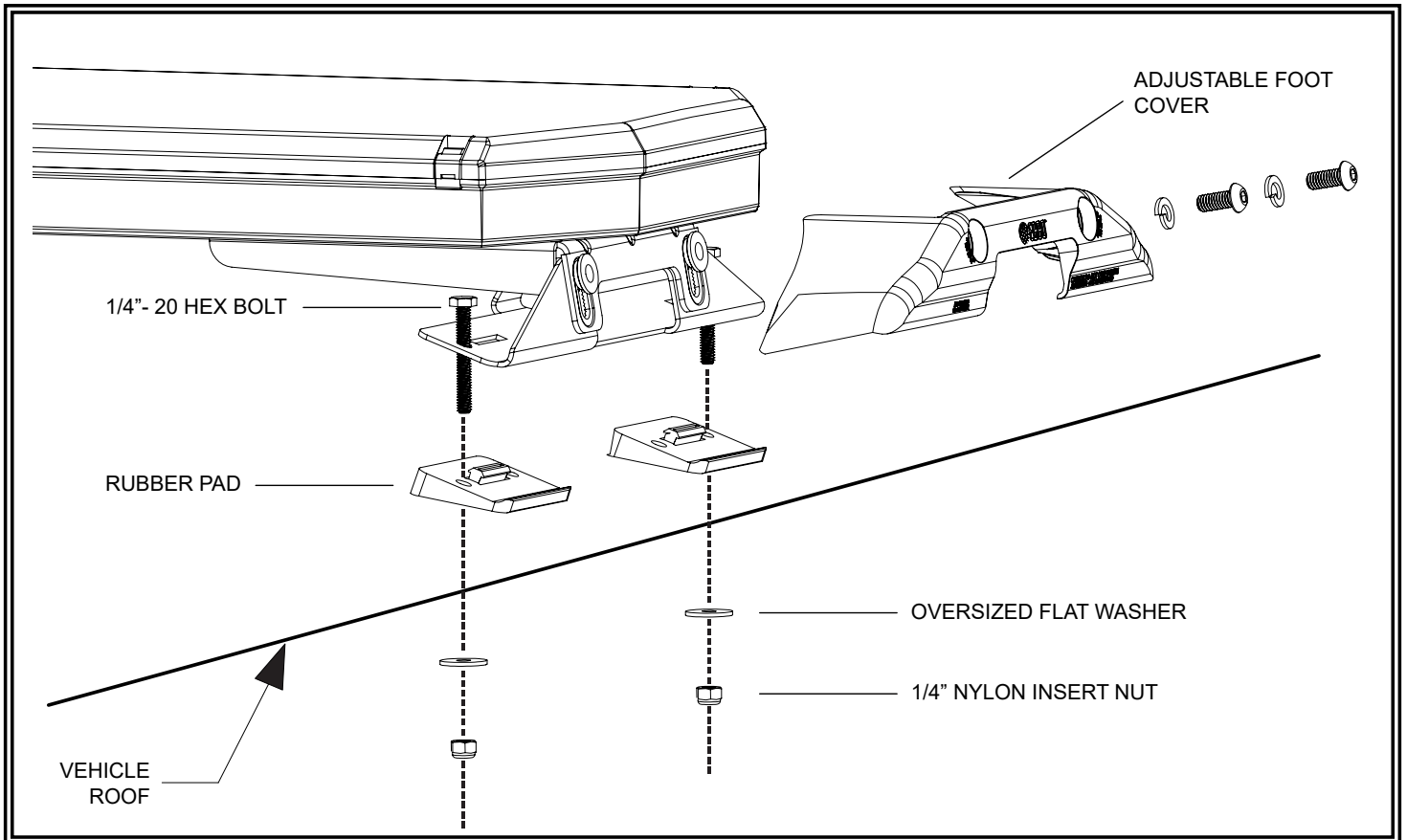


FIGURE 1

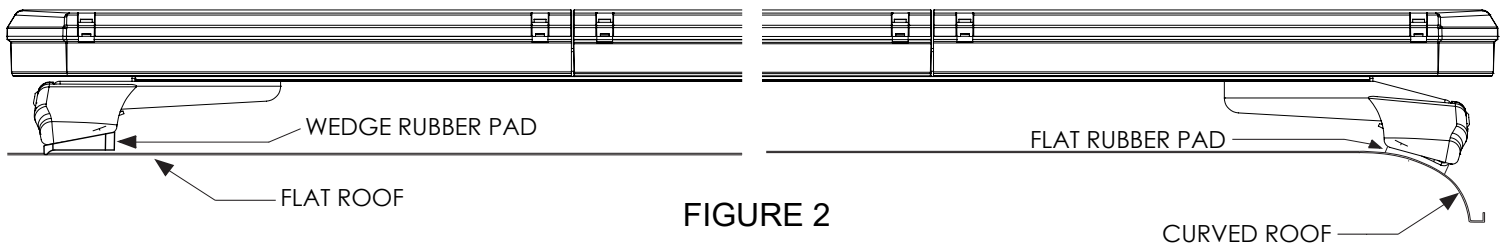


FIGURE 2

Permanent Mounting without Adjustable Mounting Feet

1. Insert the four 5/16"-18 carriage bolts in the channels on the under side of the lightbar.
2. Place the lightbar over the center of the vehicle and slide the mounting hardware into position near the curved edge when possible as shown in FIGURE 4.
3. With the mounting hardware positioned, mark the location of the mounting hole centers on the roof of the vehicle. Remove the lightbar and drill the mounting holes as marked.
4. Mount the lightbar as shown in FIGURE 3 and secure the unit. See the Wiring section of this manual for further wiring instructions.

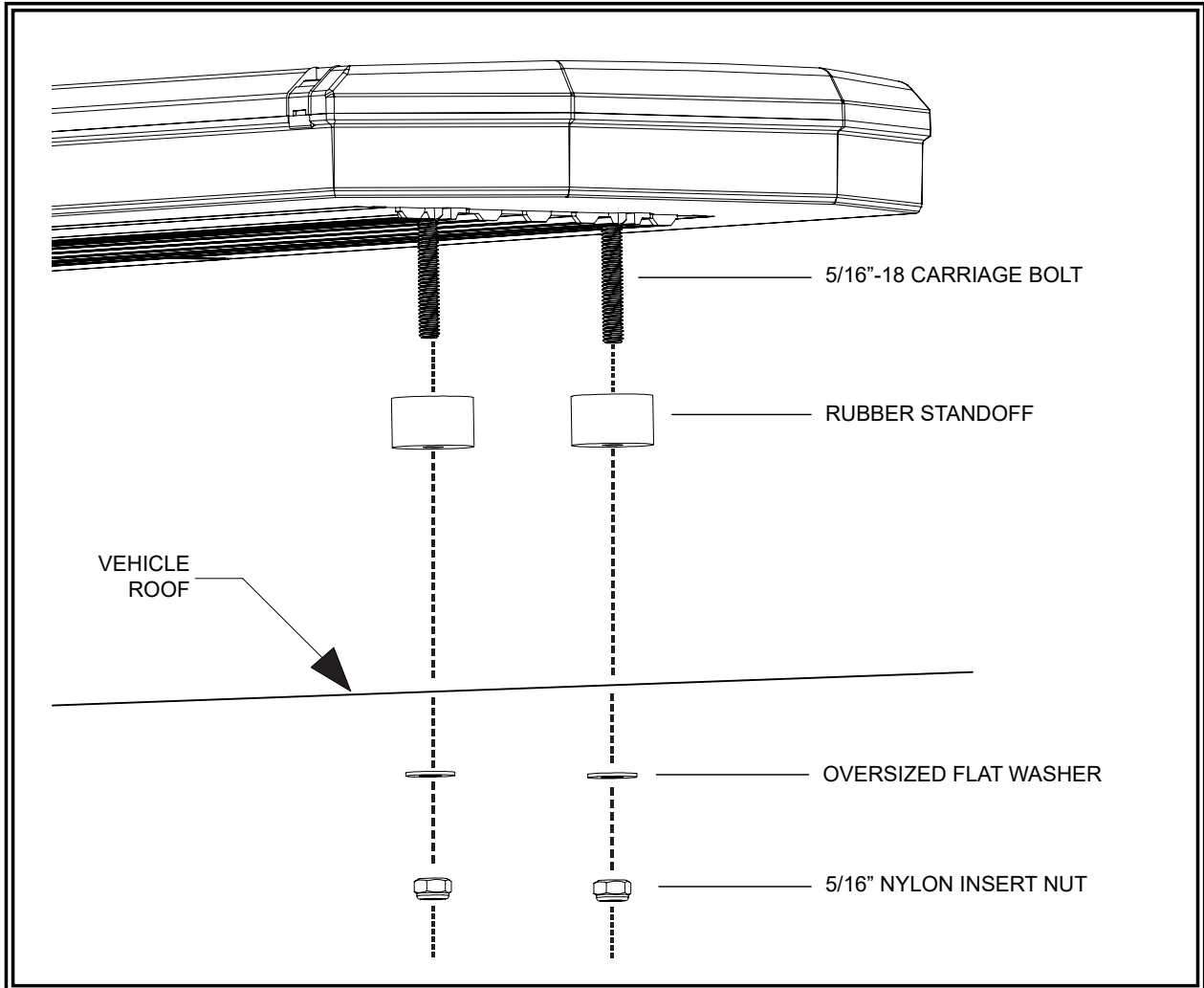


FIGURE 3

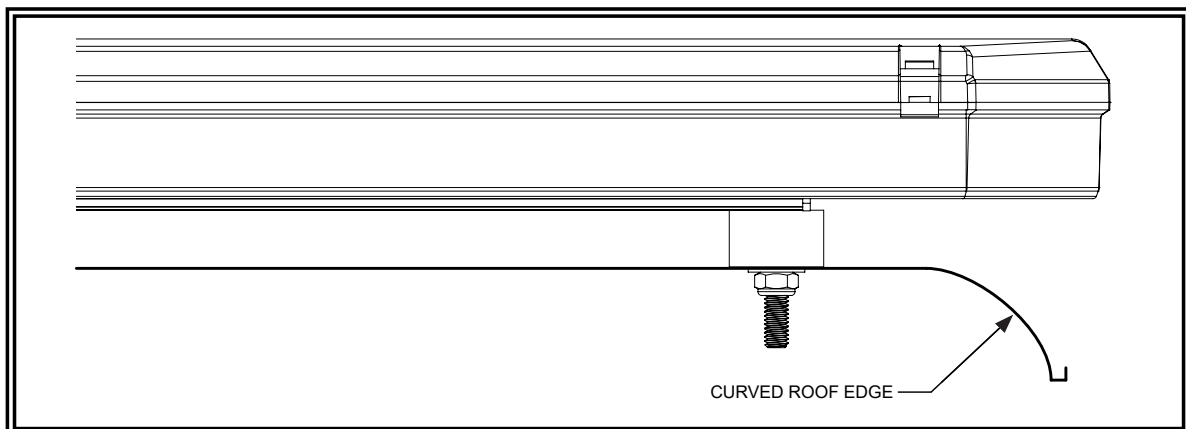


FIGURE 4

Pylon/Headache Rack Mounting

1. Insert the four (4) 5/16"-18 carriage bolts in the channels on the under side of the lightbar and loosely attach the mounting brackets.
2. Place the lightbar on the vehicle and slide the mounting brackets into position.
3. Secure the brackets to the lightbar with the supplied washers and nuts as shown in FIGURE 5.
4. With the mounting brackets positioned, mark the locations of the mounting hole centers on the roof of the vehicle. Remove the bar and drill the mounting holes as marked.
5. Secure the mounting brackets to the vehicle with customer supplied hardware. See the Wiring section of this manual for further wiring instructions.

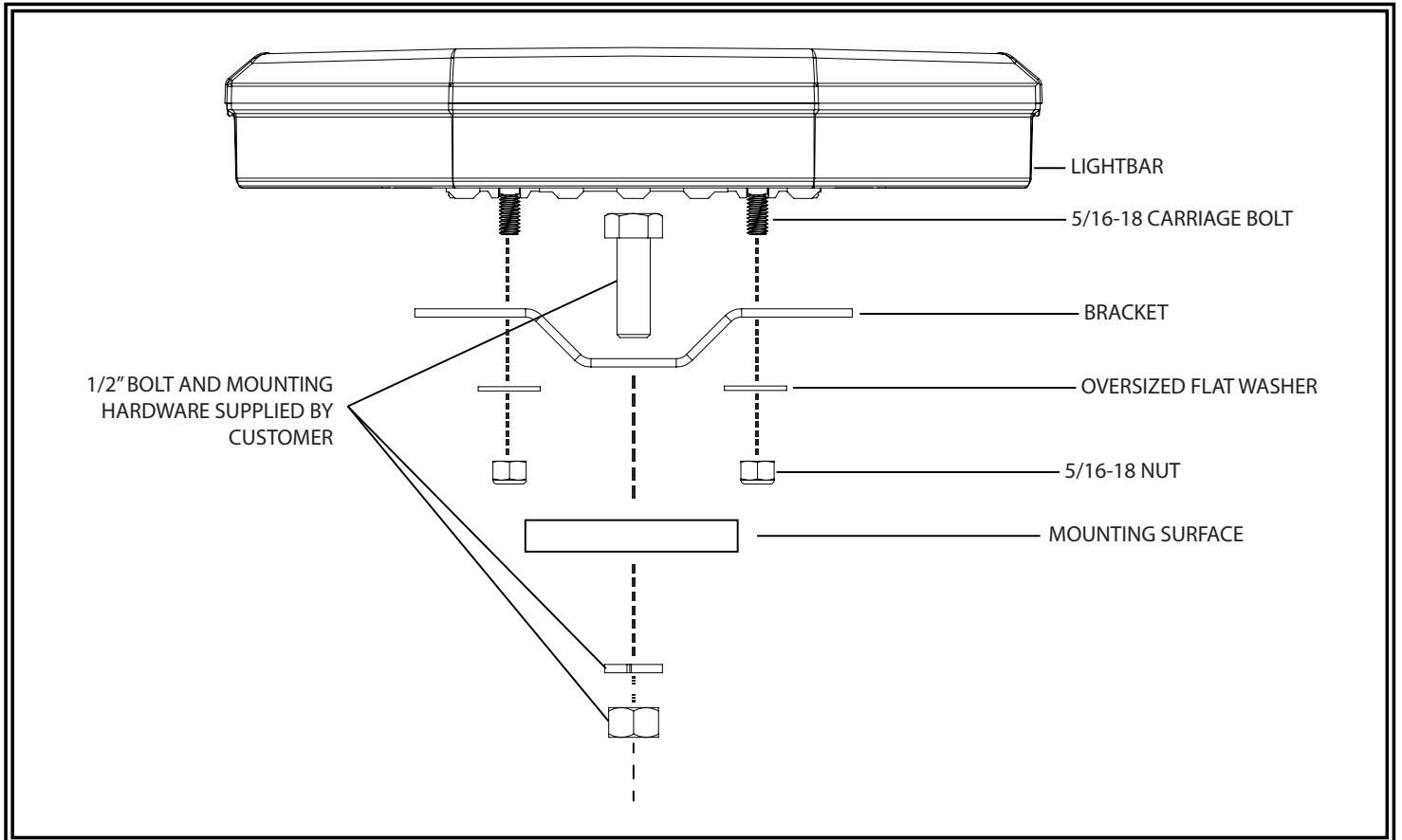


FIGURE 5

Strap Kit Mounting

Important!

Mounting brackets are specific to the vehicle model. Please make sure the brackets are suitable for the vehicle before installation.

1. Loosen the 5/16" nuts to allow the mounting feet to slide along the base of the lightbar. Loosely attach the mounting strap to each foot using the supplied pan head phillips screws and lock washers.
2. Center the lightbar across the vehicle and align the strap mount brackets to hook into the gutter of the vehicles door frame as shown in FIGURE 6.
3. Secure the feet to the lightbar in location by tightening the four nuts on each foot.
4. Slowly tighten the pan head screws to secure the strap mount brackets to the lightbar feet and around the door gutters, keeping the lightbar centered and level. Ensure the doors close completely and secure each strap mount bracket to the door frame. Mounting geometry and parts will vary for different vehicles. See the Wiring section of this manual for further wiring instructions.

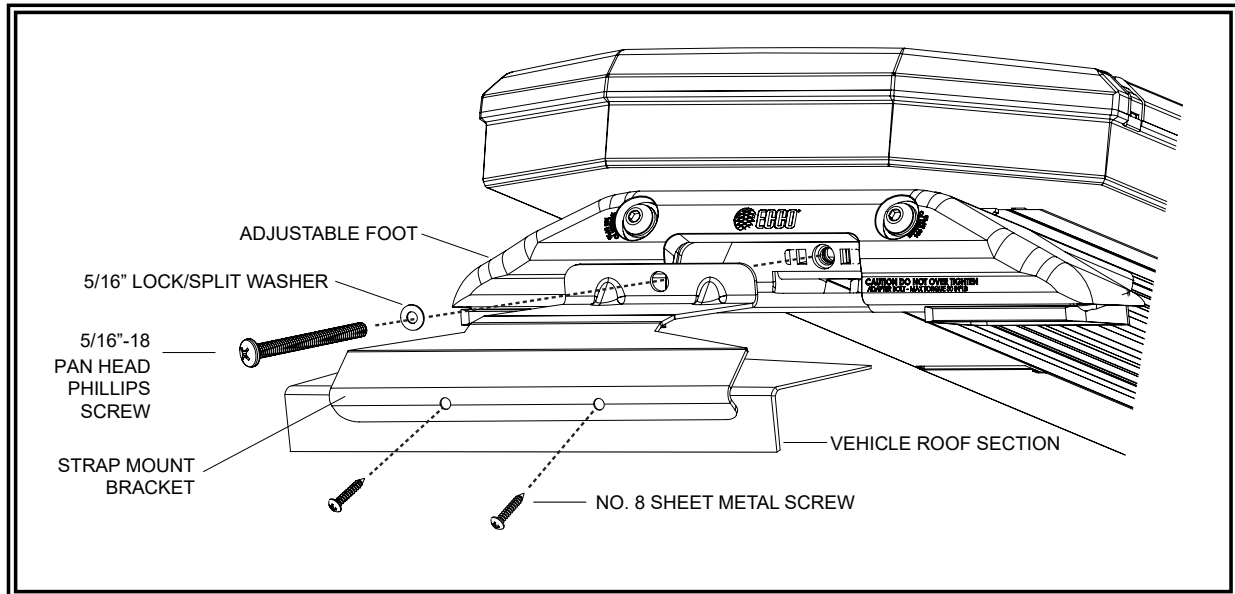


FIGURE 6

Wiring Instructions:

Important!

This unit is a safety device and it must be connected to its own separate, fused power point to assure its continued operation should any other electrical accessory fail. Do not wire in parallel with any other accessory.

Notes:

1. Larger wires and tight connections will provide longer service life for components. For high current wires it is highly recommended that terminal blocks or soldered connections be used with shrink tubing to protect the connections. Do not use insulation displacement connectors (e.g., 3M Scotchlock type connectors).
2. Route wiring using grommets and sealant when passing through compartment walls. Minimize the number of splices to reduce voltage drop. High ambient temperatures (e.g., under-hood) will significantly reduce the current carrying capacity of wires, fuses, and circuit breakers. All wiring should conform to the minimum wire size and other recommendations of the manufacturer and be protected from moving parts and hot surfaces. Looms, grommets, cable ties, and similar installation hardware should be used to anchor and protect all wiring.
3. Fuses or circuit breakers should be located as close to the power takeoff points as possible and properly sized to protect the wiring and devices.
4. Particular attention should be paid to the location and method of making electrical connections and splices to protect these points from corrosion and loss of conductivity.
5. Ground termination should only be made to substantial chassis components, preferably directly to the vehicle battery.
6. Circuit breakers are very sensitive to high temperatures and will "false trip" when mounted in hot environments or operated close to their capacity.



Caution:

Disconnect the battery before wiring up the lightbar, to prevent accidental shorting, arcing and/or electrical shock.

IF Series Wiring

An IF series lightbar has a dedicated ground wire and one or more +power wires routed to the modules. The black ground wire should be connected directly to the battery. The amp ratings for each module type are detailed in the specifications section of this installation guide.

Before attempting to connect the lightbar wiring harness, refer to the configuration specific wiring key included with the lightbar for the functions of each wire. Use an appropriate high-temperature wiring if it passes through the engine compartment. Use cable ties and grommets to secure and protect all cables and wires.

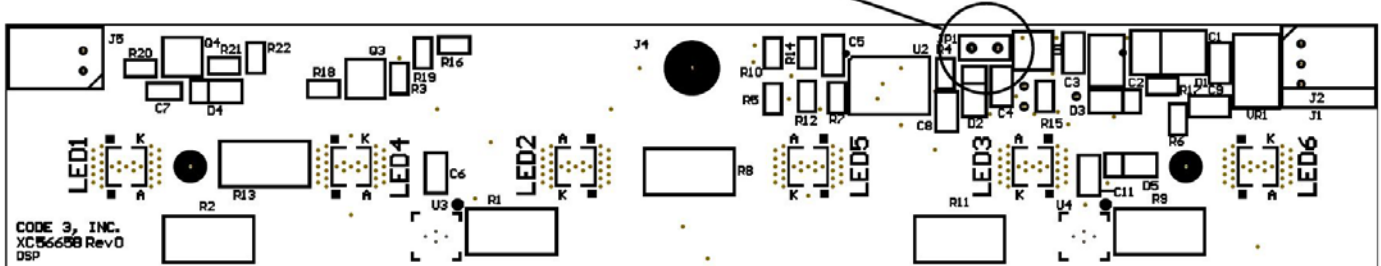
IF Series Flash Pattern Selection

Directional and Corner Module Flash Patterns	
Order	Flash Pattern
1	Cycle Flash 70 FPM (Default)
2	NFPA Quad Flash 80 FPM
3	Quad Flash 70 FPM
4	Steady Burn
5	Five Flash 70 FPM
6	Triple Flash 70 FPM
7	Double Flash 70 FPM
8	Single Flash 70 FPM
9	Quad Pop Flash 70 FPM
10	Triple Pop Flash 70 FPM
11	Mod Flash
12	Cycle Flash 150 FPM
13	Five Flash 150 FPM
14	Quad Flash 150 FPM
15	Triple Flash 150 FPM
16	Double Flash 150 FPM
17	Single Flash 150 FPM
18	Single Flash 250 FPM
19	Single Flash 375 FPM

TABLE 1

The flash pattern on corner and directional modules can be cycled to the next flash pattern on each individual module by momentarily shorting together the JP1 pins with a wire or the blade of a screwdriver (shown below). The light head will reset to the default flash pattern when the JP1 pins are shorted together for 5 seconds or more and then releasing. Module pairs connected by a sync wire must be individually set to the same flash pattern to properly synchronize.

Momentarily short and release to change patterns



Optic removed for clarity

Located on front of Integrated PCB/Light Engine

FIGURE 7

CC Series Wiring

A CC series lightbar has a 2-wire power cable and a 16-wire control cable. The entire power load of the bar goes through the power cable. The black ground wire should be connected directly to the battery. The 10 AWG red power wire requires a constant 10 to 16V power source with a customer supplied in line fuse. To select an appropriately rated ATO (regular) or Maxi Fuse, add the amp ratings, found in the specifications section, of the modules in your configuration specific lightbar and based on that sum, insert a fuse of the next larger size (to be no larger than a 30 A fuse). The 16 control cable wires carry only low power (30 mA average) input signals to control the lightbar functions and must be routed to the output of a control switch (or directly to multiple switches).

Before attempting to connect the lightbar wiring harness, refer to the configuration specific wiring key included with the lightbar for the configuration specific functions of each wire. Use an appropriate high-temperature wiring if it passes through the engine compartment. Use cable ties and grommets to secure and protect all cables and wires.

Standard CC Function Wire Definitions			
Function Wire Color	Function	Description	Notes
GRN/BLK	L1	Level 1 Emergency Mode	
WHT/BLK	L2	Level 2 Emergency Mode	
RED/BLK	L3	Level 3 Emergency Mode	
RED	Arrowstik Left	Left Arrowstick	Overrides L1, L2, & L3 for rear of lightbar
ORG	Arrowstick Right	Right Arrowstick	Overrides L1, L2, & L3 for rear of lightbar
WHT	Drivers Side Cut	Cut Driver Side Directional and Alley Lights	Designed to interface with the driver's door switch
BLK/RED	Pattern Select	Pattern Select	
BLK	Take Down Flash	Take Down/Work Light Wig/Wag Flash	
ORG/BLK	Take Down Lights	Take Down/Work Light Steady Burn	Overrides Take Down Flash
BLU/WHT	Alley Light Flash	Enables Alley Light Wig/Wag Flash	
BLK/WHT	Left Alley Light	Left Alley Steady Burn	Overrides Alley Light Flash
RED/WHT	Right Alley Light	Right Alley Steady Burn	Overrides Alley Light Flash
GRN/WHT	Front Cut-Off	Blacks-Out Front Facing LEDs	
BLU/BLK	Rear Cut-Off	Blacks-Out Rear Facing LEDs	
GRN	Cruise Lights	End LEDs only	Overridden by all other functions except for Dim
BLU	Lightbar DIM	Sets LEDs to DIM mode	

TABLE 2

Note:

- When the Arrowstik Left and Arrowstik Right wires are both connected to +power, the Center-Out Arrowstik function is activated.
- The Front Cut and Rear Cut functions must be used with the greatest care to ensure that the use of these functions do not diminish the effectiveness of the Emergency Warning signal.
- When the Pattern Select wire is connected to +power alone, test mode is enabled to exercise all outputs in sequence.
- The Dim Function lowers the brightness of the LEDs in both the ArrowStik mode and Emergency Warning Flash modes.
- The WHT Drivers Side Cut wire may be changed to Arrowstik Flash. Please see the Arrowstik flash pattern selection section below for details.
- Lightbars equipped with a DOT strip assembly are wired in conjunction with the STT tail light function. All STT functions are powered independent of the central driver PCA.

Emergency Mode Flash Pattern Selection

There are seven customizable emergency flash pattern modes available based on the wire combinations shown in TABLE 3. When using individual switches, make sure to configure all possible switch combinations. The default setting is unsynchronized which allows each light head module group to be configured separately and the lightbar to flash in an unsynchronized pattern. Steps to synchronize the light head module groups together are detailed in later sections.

Level Mode Combinations	
Function Wire Color	Flash Pattern Modes
GRN/BLK	L1
WHT/BLK	L2
GRN/BLK & WHT/BLK	L1 + L2
RED/BLK	L3
GRN/BLK & RED/BLK	L1 + L3
WHT/BLK & RED/BLK	L2 + L3
GRN/BLK, WHT/BLK & RED/BLK	L1 + L2 + L3

TABLE 3

The module groups in each mode come with the default flash patterns shown in TABLE 4.

Level Mode Default Flash Patterns by Group - Unsynchronized				
Light Head Module Group	L1	L2	L3	
Front Outboard	Off	Quad 75 FPM	Cycle Flash	
Front Inboard	Off	Quad 75 FPM	Cycle Flash	
Front Center	Off	Quad 75 FPM	Cycle Flash	
Front Corner	Off	Quad 75 FPM	Cycle Flash	
Rear Outboard	Quad 75 FPM	Off	Cycle Flash	
Rear Inboard	Quad 75 FPM	Off	Cycle Flash	
Rear Center	Quad 75 FPM	Off	Cycle Flash	
Rear Corner	Quad 75 FPM	Off	Cycle Flash	
Rear End	Quad 75 FPM	Off	Cycle Flash	
	L1 + L2	L1 + L3	L2 + L3	L1 + L2 + L3
Front Outboard	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Front Inboard	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Front Center	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Front Corner	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Rear Outboard	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Rear Inboard	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Rear Center	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Rear Corner	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash
Rear End	Quad 75 FPM	Cycle Flash	Cycle Flash	Cycle Flash

TABLE 4

To change a light head group flash pattern selection:

1. Power-up the Lightbar and apply +power to the level mode wire you wish to change (see TABLE 3). The lightbar will flash the default pattern shown in TABLE 4.
2. Twist together the BLK/RED Pattern select wire in the 16 conductor cable and the wire of the light head group you want to change shown in TABLE 5.
3. Momentarily touch the BLK/RED and group wire from step 2 to power to cycle through the patterns in TABLE 6. The pattern for the set of light heads configured will only be set in the level mode selected.

Light Head Group Wires - Unsynchronized	
Function Wire Color	Light Head Group
GRN/WHT	Front Outboard
BLU/BLK	Front Inboard
ORG/BLK	Front Center
GRN	Front Corner
BLK/WHT	Rear Outboard
RED/WHT	Rear Inboard
BLU/WHT	Rear Center
BLU	Rear Corner
BLK	Rear End

TABLE 5

Light Head Group Flash Patterns - Unsynchronized	
Order	Group Flash Rate
1	Quad 75 FPM
2	Single 150 FPM
3	Double 75 FPM
4	Triple Pop 75 FPM
5	Variable Rate - Single
6	NFPA Quad 77 FPM
7	Cycle Flash
8	Off

TABLE 6

To restore the Factory Default Flash Rate to a module group, apply +power to the level you wish to change (see Table 2), then hold the appropriate rate selection wire and the BLK/RED wire to +power for more than four seconds. The four corner light heads will flash once, and then stay on to indicate that the Factory Default setting has been restored.

For instructions related to the California Title 13 steady burning red warning lamp requirement during level mode operation, please contact ECCO directly.

Emergency Mode Flash Pattern Selection – Synchronized

The seven customizable emergency flash pattern modes in Table 3 each have the option to be synchronized. This condenses the module groups from TABLE 5 to front and rear.

To synchronize a set of module groups:

1. Power-up the Lightbar and apply +power to the appropriate level mode wires (see Table 3) and the BLK/RED Pattern select wire in the 16 conductor cable.
2. Momentarily touch the RED wire to +power set the level mode to synchronized. The four corner modules will turn on each time the lightbar is toggled between unsynchronized and synchronized.

Once synchronized, the module group in each mode flash sequence defaults to OFF. To change a light head group flash sequence selection:

1. Power-up the Lightbar and apply +power to the appropriate level mode wires (see Table 3) and the BLK/RED Pattern select wire in the 16 conductor cable.
2. Momentarily touch the appropriate light head group wire, shown in Table 7, to +power to cycle through the sequences shown in shown in Table 7.

Light Head Group Wires - Synchronized	
Function Wire Color	Light Head Sequence Group
GRN/WHT	Front
BLU/BLK	Rear

TABLE 7

Light Head Group Flash Sequence - Synchronized	
Order	Sequence
1	Off
2	Left/Right
3	Even/Odd

TABLE 8

After the module groups have a sequence selected, a flash pattern rate can be chosen. The default rates are as follows in TABLE 9.

Level Mode Default Patterns by Group - Synchronized				
Light Head Group Flash Rate	L1	L2	L3	
Front	Quad 75 FPM	Quad 75 FPM	Cycle	
Rear	Quad 75 FPM	Quad 75 FPM	Cycle	
	L1 + L2	L1 + L3	L2 + L3	L1 + L2 + L3
Front	Quad 75 FPM	Cycle	Cycle	Cycle
Rear	Quad 75 FPM	Cycle	Cycle	Cycle

TABLE 9

To change a light head group flash pattern rate selection:

1. Power-up the Lightbar and apply +power to the appropriate level mode wires (see Table 3) and the BLK/RED Pattern select wire in the 16 conductor cable.
2. Momentarily touch the appropriate light head group wire, shown in Table 10, to +power to cycle through the flash pattern rates shown in shown in Table 11.

Light Head Group Flash Rate Wires - Synchronized	
Function Wire Color	Light Head Group
BLK	Front
BLU/WHT	Rear

TABLE 10

Light Head Group Flash Rates - Synchronized	
Order	Flash Pattern
1	Double 75 FPM
2	Triple 75 FPM
3	Quad 75 FPM
4	Quint 75 FPM
5	Triple Pop 75 FPM
6	Quad Pop 75 FPM
7	Single 150 FPM
8	Double 150 FPM
9	Triple 150 FPM
10	Quad 150 FPM
11	Quint 150 FPM
12	Triple Pop 150 FPM
13	Quad Pop 150 FPM
14	Single 375 FPM
15	NFPA Qud 77 FPM
16	Cycle Flash

TABLE 11

To restore the Factory Default Emergency Warning Flash Rate to module group in a level mode, hold the appropriate rate selection wire and the BLK/RED wire to +power for more than four seconds. The four corner light heads will flash once, and then stay on to indicate that the Factory Default Emergency Warning Flash Rate has been restored.

Arrowstik Flash Pattern Selection

The CC Series Lightbar is designed to offer user selectable traffic directing and traffic warning flash patterns. Each of the ArrowStik® functions (LEFT, CENTER-OUT, RIGHT and FLASH) can be programmed individually for unique patterns and flash rates. This allows the greatest flexibility when controlling the various Lightbar configurations available. A Lightbar may be wired as a 5, 6, 7 or 8 light head configuration. The Lightbar will come from the factory with the Building Fast flash pattern as the default for LEFT, CENTER-OUT and RIGHT. The default pattern for FLASH is Drivers Side Cut – Front, corner & alley.

When selecting a flash pattern for one of the four Arrowstik functions, apply power to the lightbar and the desired function wire (listed in Table 2). Briefly touch the Pattern Select wire (RED/BLK) to +power to cycle through the flash patterns shown in the table below. Ensure power isn't applied to any other function wire during flash pattern selection.

Flash patterns marked with an asterisk (*) can be selected in Fast, Medium or Slow flash rate.

Arrowsik Left, Center-Out & Right Flash Patterns	
Order	Flash Pattern
1	Building*
2	Building, 3-Flash*
3	Traveling Ball, 3-Flash*
4	Build/Collapse*

TABLE 12

Arrowstik Flash Patterns	
Order	Flash Pattern
1	Drivers Side Cut - Front corner & alley
2	Drivers Side Cut - Rear corner & alley
3	Drivers Side Cut - Front outboard, corner alley
4	Standard Flash*
5	Quad Flash Standard
6	Simultaneous Flash*
7	Quad Flash Simultaneous
8	Even/Odd Flash*
9	Quad Flash Even/Odd
10	Left/Right Flash*
11	Quad Flash Left/Right
12	Travelling Ball Flash*

TABLE 13

To restore the Factory Default ArrowStik Flash Patterns, hold the BLK/RED and desired function wire to +power for ~four seconds.

Takedown, Work and Alley Light Flash Pattern Selection

When selecting a flash pattern for one of the Takedown/Work Light or Alley Light Modes, power-up the light bar and apply power to the Takedown Flash Mode (BLK) or the Alley Flash Mode (BLU/WHT). Programming will not work if more than one function is selected. Touch the Pattern Select wire (RED/BLK) to +power to cycle through the flash patterns shown in the table below.

Takedown, Work & Alley Light Flash Patterns	
Order	Flash Pattern
1	Medium Single 115 FPM
2	Slow Single 60 FPM
3	Fast Double 115 FPM
4	Slow Double 60 FPM
5	Fast Six 80 FPM
6	Slow Six 60 FPM
7	Variable Rate - Single
8	NFPA Quad 75 FPM
9	Cycle Flash
10	Fast Quad 80 FPM
11	Slow Quad 60 FPM
12	Fast Single 375 FPM

TABLE 14

TR Series Wiring

A TR series lightbar has a single cable with 11 colored wires. A dedicated ground wire, a dedicated power wire and five colored control wires run through the main driver board and the 4 additional wires supply (+) power directly to any additional modules such as Work Lights, Alley Lights, Take Downs or Stop/Turn/Tail (STT) modules.

The 16 AWG black ground wire should be connected directly to the battery. The 16 AWG red power wire requires a constant 10 to 16V power source with a customer supplied in line 15A fuse.

The five control cable wires (listed in TABLE 15 below) routed through the driver board carry only low current (30 mA average) input signals to control the light bar functions and must be routed to the output of a control switch (or directly to multiple switches).

Before attempting to connect the lightbar wiring harness, refer to the configuration specific wiring key included with the lightbar for the configuration specific functions of each wire. Use appropriate high-temperature wiring if it passes through the engine compartment. Use cable ties and grommets to secure and protect all cables and wires.

Standard TR Function Wire Definitions		
Function Wire Color	Function	Description
BLU	L1	Level 1 Emergency Mode
ORG	L2	Level 2 Emergency Mode
YEL	L3	Level 3 Emergency Mode
GRN	Pattern Select	
WHT	Lightbar Dim	Sets LEDs to DIM mode

TABLE 15

NOTICE: When the GRN Pattern Select wire is connected to +power alone, test mode is enabled to exercise all outputs in sequence.

Emergency Mode Flash Pattern Selection

There are seven customizable emergency flash pattern modes available based on the wire combinations shown in TABLE 16. When using individual switches, make sure to configure all possible switch combinations.

Level Mode Combinations			
Flash Pattern Modes	Function Wire Color(s)	Default Flash Pattern	Pattern
L1	BLU	Fast In-Out Quad - Rear	13
L2	ORG	Fast In-Out Quad - Front	25
L3	YEL	Cycle - Front/Rear	11
L1 + L2	BLU & ORG	Fast In-Out Quad - Front/Rear	11
L1 + L3	BLU & YEL	Cycle - Front/Rear	11
L2 + L3	ORG & YEL	Cycle - Front/Rear	11
L1 + L2 + L3	BLU, ORG, & YEL	Cycle - Front/Rear	11

TABLE 16

To change a flash pattern on a single emergency level mode:

1. Power-up the Lightbar and apply +power to the level mode wire(s) you wish to change (see TABLE 16). The lightbar will flash the default pattern.
2. Momentarily touch the GRN pattern select wire to (+) power to cycle through to the next flash pattern shown on TABLE 17.
3. To reset the flash pattern to the factory default, hold the GRN pattern select wire to (+) power for ~5 seconds.

Level Mode Flash Patterns	
Order	Flash Pattern - Module Group
1	Fast In-Out Quad - Front/Rear
2	Picket Fence Single - Front/Rear
3	In-Out Single - Front/Rear
4	Picket Quad - Front/Rear
5	Picket Fence Six - Front/Rear
6	Slow In-Out Quad - Front/Rear
7	Slow In-Out Six - Front/Rear
8	Fast In-Out Six - Front/Rear
9	Variable Rate Picket Fence Single - Front/Rear
10	In-Out Quad - Front/Rear
11	Cycle - Front/Rear
12	Simultaneous Quad - Front/Rear
13	Fast In-Out Quad - Rear
14	Picket Fence Single - Rear
15	In-Out Single - Rear
16	Picket Fence Quad - Rear
17	Picket Fence Six - Rear
18	Slow In-Out Quad - Rear
19	Slow In-Out Six - Rear
20	Fast In-Out Six - Rear
21	Variable Rate Picket Fence Single - Rear
22	In-Out Quad - Rear
23	Cycle - Rear
24	Simultaneous Quad - Rear
25	Fast In-Out Quad - Front
26	Picket Fence Single - Front
27	In-Out Single - Front
28	Picket Fence Quad - Front
29	Picket Fence
30	Slow In-Out Quad - Front
31	Slow In-Out Six - Front
32	Fast In-Out Six - Front
33	Variable Rate Picket Fence Single - Front
34	In-Out Quad - Front
35	Cycle - Front
36	Simultaneous Quad - Front

TABLE 17

For instructions related to the California Title 13 steady burning red warning lamp requirement during level mode operation, please contact ECCO directly.

Lightbar Dim Operation

Lightbar LED modules are equipped with a low power "Dimming" mode. Dimming is controlled by applying +power to the blue wire of the control cable. Dimming can also be controlled by an optional photo cell. Please contact the factory for more information or upgrade options.

Options and Maintenance:

Lens Cleaning

Occasional cleaning of the lenses will ensure optimum light output. Take care when cleaning lenses - although tough, polycarbonate scratches easily. Clean the lens and base with soap and water or a lens polish using a soft cloth. Do not use solvents as they may damage the polycarbonate.

Lens Removal and Installation

1. Uninstall the lens clips (4 per lens), as shown in FIGURE 9, using a flat blade screwdriver.
2. Insert the screwdriver into the gap along the lens edge, and twist the screwdriver to lift the lens.
3. When finished, reinstall making sure the lens gasket is not damaged or folded. Replace the clips by hooking into the bottom lens slot and pressing the upper portion into the clip pocket.

LED Module Removal and/or Replacement

1. Remove screw(s) securing the light head assembly to the mounting plate. See FIGURE 9.
2. Lift the light head assembly and disconnect wiring at the connectors.
3. During re-assembly, repeat the prior steps in reverse order. Torque screw(s) securing the light head assembly to the mounting plate using 10 in-lbs or 1.13 Nm.

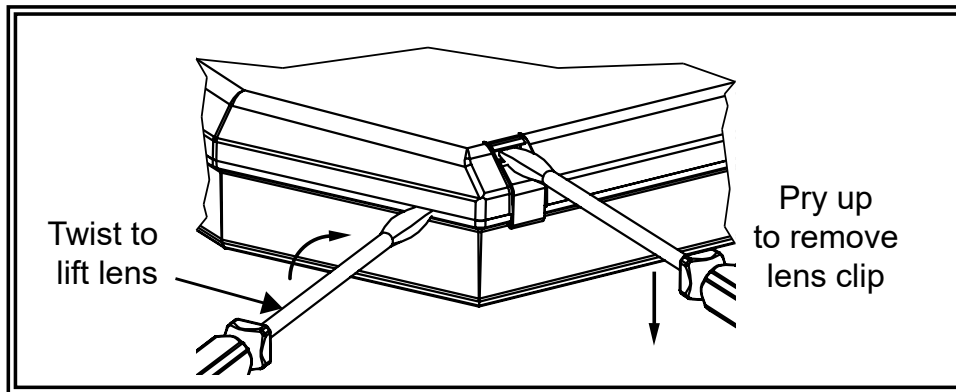


FIGURE 9

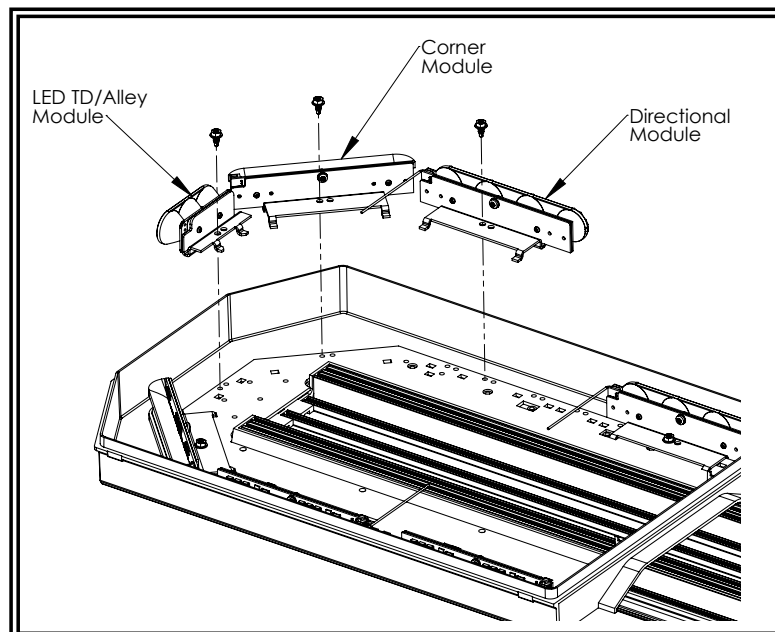


FIGURE 10

Replacement Parts/Accessories:

Description	Part No.
Lenses	
Lower end	EZ2101C
Lower mid/center short (8"/203mm)	EZ2108C
Lower mid/center medium (11"/280mm)	EZ2111C
Lower mid/center long (16"/406mm)	EZ2116C
Upper mid/center medium, (11"/280mm)	EZ2127U11X*
Upper mid/center long, amber (11"/280mm)	EZ2127U16X*
22"/0.7m (upper)	EZ2127U22X*
Upper mid/center short (8"/203mm)	EZ2127U8X*
Upper end	EZ2127UX*
22"/0.7m, (lower) clear	EZ21L22C
Mounting	
Universal headache rack	A2127HRMK
Ford Super Duty Truck 2010-2016	A212701RMK
Ford E Series Van 1996-2014, GM Van (Express/Savanna) 2003-2014, Universal Gutter Mount	A212702RMK
Ford Escape/Explorer 2012-2016, Toyota Tacoma 2005-2015	A212703RMK
GM Truck 1/2T 2007-2013	A212704RMK
Ford Super Duty Truck 1999-2009	A212705RMK
Dodge Truck 1/2T 2009-2016	A212706RMK
Dodge Truck 3/4-1T 2003-2009,/GM Truck 1/2T 1998-2006, 1T Tahoe/Yukon 2007-2014	A212707RMK
GM Truck 1/2T 2014-2016, 1T Tahoe/Yukon 2015-2016	A212708RMK
Ford Truck 1/2T 2015-2016	A212709RMK
10 & 14 Series Ford Truck 1/2T 2010-2014	A212710RMK
Standard feet, for use with 21 & 27 Series lightbars	A2127FT
Magnet Mount Kit 22"	EZ2122MG
Accessories	
Controller: integrated Safety Director, for use with centrally controlled modules	EZ2127ASCC
Controller: integrated Safety Director, for use with independent flashing modules	EZ2127ASIF
Driver Board: for use with centrally controlled modules, software version 1000	EZ2127CC600
Driver Board: for use with centrally controlled modules, software version 1050	EZ2127CC800
Driver Board: for use with centrally controlled modules, software version 1051	EZ2127CC950
Lens Retaining Clip	EZ2127LC
Photo Cell: day/night auto dimming	EZ2127PC
Switchbox: 3 level progressive slide and 6 rocker switches, 12 VDC	EZ2127SB
Solar Panel	EZ2127SP
Modules	
LED DOT Strip Module: external mount	EZ2127DOT
LED Stop Tail Indicator Module (pair)	EZ21STT
Front/Rear, TR18 (centrally controlled)	EZ21CC18XX*
Front/Rear, TR3 (centrally controlled)	EZ21CC3X*
Front/Rear, TR4 (centrally controlled)	EZ21CC4X*
Corner, TR6 (centrally controlled)	EZ21CC6X*
Corner, TR9 (centrally controlled)	EZ21CC9X*
Front/Rear, TR3 (independent flashing)	EZ21IF3X*
Front/Rear, TR4 (independent flashing)	EZ21IF4X*
Front/Rear, TR9 (independent flashing)	EZ21IF9X*
LED Worklamp/Alley Module, TR3	EZ2127WL

*Where X indicates color options: A=Amber, B=Blue, C=Clear (White), G=Green, R=Red

Troubleshooting:

All lightbars are thoroughly tested prior to shipment. However, should you encounter a problem during installation or during the life of the product, follow the guide below for troubleshooting and repair information. If the problem cannot be rectified using the solutions given below, additional information may be obtained from the manufacturer – contact details are at the end of this document.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Does not function	Poor power or ground connection	In CC Lightbars, a green light on the central control board should flash when power is first applied to the bar and during flash pattern selection.
	Blown fuse	Check wiring, replace fuse
Incorrect flash patterns	Wrong flash configuration	Cycle through flash patterns according to the supplied wire key and wiring instructions section of this installation guide.

 **NOTE:** Operating the vehicle without the outer lens installed on the product may result in damage that will NOT be covered under the warranty.