

# WHELEN<sup>®</sup>

## ENGINEERING COMPANY INC.

51 Winthrop Road  
Chester, Connecticut 06412-0684  
Phone: (860) 526-9504  
Fax: (860) 526-4078  
Internet: [www.whelen.com](http://www.whelen.com)  
Sales e-mail: [autosale@whelen.com](mailto:autosale@whelen.com)  
Canadian Sales e-mail: [canadiansales@whelen.com](mailto:canadiansales@whelen.com)  
Customer Service e-mail: [custserv@whelen.com](mailto:custserv@whelen.com)

### Installation Guide: Freedom™ Mini Edge® NFPA Lightbar

#### Warnings to Installers

Whelen's emergency vehicle warning devices must be properly mounted and wired in order to be effective and safe. Read and follow all of Whelen's written instructions when installing or using this device. Emergency vehicles are often operated under high speed stressful conditions which must be accounted for when installing all emergency warning devices. Controls should be placed within convenient reach of the operator so that they can operate the system without taking their eyes off the roadway. Emergency warning devices can require high electrical voltages and/or currents. Properly protect and use caution around live electrical connections. Grounding or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or vehicle damage, including fire. Many electronic devices used in emergency vehicles can create or be affected by electromagnetic interference. Therefore, after installation of any electronic device it is necessary to test all electronic equipment simultaneously to insure that they operate free of interference from other components within the vehicle. Never power emergency warning equipment from the same circuit or share the same grounding circuit with radio communication equipment. All devices should be mounted in accordance with the manufacturer's instructions and securely fastened to vehicle elements of sufficient strength to withstand the forces applied to the device. Driver and/or passenger air bags (SRS) will affect the way equipment should be mounted. This device should be mounted by permanent installation and within the zones specified by the vehicle manufacturer, if any. Any device mounted in the deployment area of an air bag will damage or reduce the effectiveness of the air bag and may damage or dislodge the device. Installer must be sure that this device, its mounting hardware and electrical supply wiring does not interfere with the air bag or the SRS wiring or sensors. Mounting the unit inside the vehicle by a method other than permanent installation is not recommended as unit may become dislodged during swerving; sudden braking or collision. Failure to follow instructions can result in personal injury. Whelen assumes no liability for any loss resulting from the use of this warning device. PROPER INSTALLATION COMBINED WITH OPERATOR TRAINING IN THE PROPER USE OF EMERGENCY WARNING DEVICES IS ESSENTIAL TO INSURE THE SAFETY OF EMERGENCY PERSONNEL AND THE PUBLIC.

#### Warnings to Users

Whelen's emergency vehicle warning devices are intended to alert other operators and pedestrians to the presence and operation of emergency vehicles and personnel. However, the use of this or any other Whelen emergency warning device does not guarantee that you will have the right-of-way or that other drivers and pedestrians will properly heed an emergency warning signal. Never assume you have the right-of-way. It is your responsibility to proceed safely before entering an intersection, driving against traffic, responding at a high rate of speed, or walking on or around traffic lanes. Emergency vehicle warning devices should be tested on a daily basis to ensure that they operate properly. When in actual use, the operator must ensure that both visual and audible warnings are not blocked by vehicle components (i.e.: open trunks or compartment doors), people, vehicles, or other obstructions. It is the user's responsibility to understand and obey all laws regarding emergency warning devices. The user should be familiar with all applicable laws and regulations prior to the use of any emergency vehicle warning device. Whelen's audible warning devices are designed to project sound in a forward direction away from the vehicle occupants. However, because sustained periodic exposure to loud sounds can cause hearing loss, all audible warning devices should be installed and operated in accordance with the standards established by the National Fire Protection Association.

#### Safety First

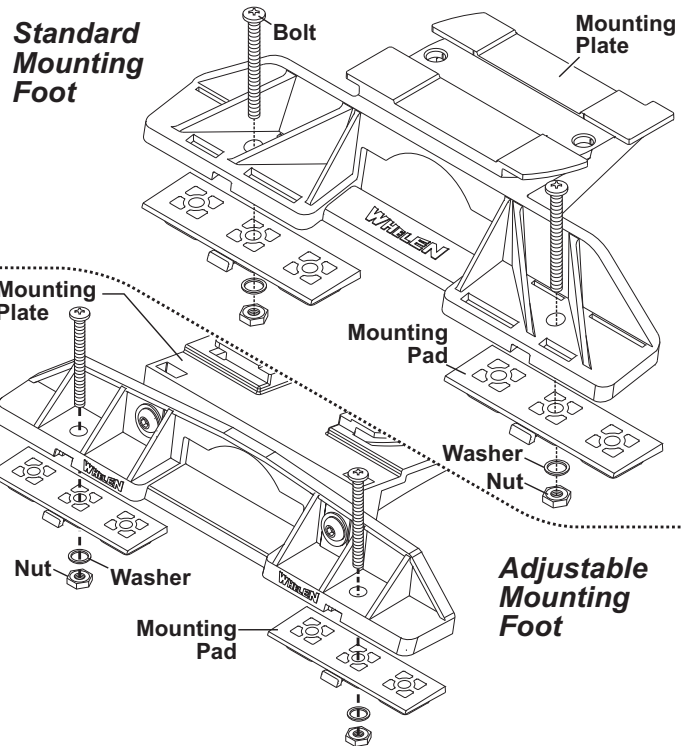
This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- **Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.**
- **Whelen Engineering requires the use of waterproof butt splices and/or connectors if that connector could be exposed to moisture.**
- **Failure to use specified installation parts and/or hardware will void the product warranty.**
- **If mounting this product requires drilling holes, the installer MUST be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr the holes and remove any metal shards or remnants. Install grommets into all wire passage holes.**
- **If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro®, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.**
- **Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.**
- **For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the NEGATIVE (-) battery post (this does not include products that use cigar power cords).**
- **If this product uses a remote device for activation or control, make sure that this device is located in an area that allows both the vehicle and the device to be operated safely in any driving condition.**
- **Do not attempt to activate or control this device in a hazardous driving situation.**
- **This product contains either strobe light(s), halogen light(s), high-intensity LEDs or a combination of these lights. Do not stare directly into these lights. Momentary blindness and/or eye damage could result.**
- **Use only soap and water to clean the outer lens. Use of other chemicals could result in premature lens cracking (crazing) and discoloration. Lenses in this condition have significantly reduced effectiveness and should be replaced immediately. Inspect and operate this product regularly to confirm its proper operation and mounting condition. Do not use a pressure washer to clean this product.**
- **It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.**
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

**IMPORTANT! The lightbar should be located a minimum of 16" from any radio antennas!**

**Permanent Mounting:**

1. Locate the mounting foot and mounting plate included with your lightbar. If not already present, install the mounting plate onto the mounting foot. When properly positioned, this plate is centered from side to side on the mounting foot.
2. Flip the lightbar upside-down to expose the bottom of the extrusion and place the mounting foot onto the extrusion.
3. Rotate the mounting foot 90° in a counter-clockwise direction. Make sure that the edges of the mounting foot swing into position under the extrusion mounting lip.
4. Repeat this procedure for the remaining mounting foot and return the lightbar to its right side-up position.
5. Position the lightbar onto the vehicle roof in the desired mounting location. One often selected location is directly above the B-pillars. This area is the strongest part of the roof. Refer to your lightbar manual for cable exit location, to be sure that the lightbar is facing the proper direction.
6. Adjust the two mounting feet outwards so that they are as close to the edge of the roof as possible. Make sure that both mounting feet are in full contact with the roof. Be sure that there is no less than 1/2" clearance between the roof and the lightbar at their closest point. When the mounting feet are in their proper position, lightly tighten the mounting foot allen head set screws.
7. Turn the lightbar upside down and tighten all of the set screws from step 6 (2 or 4 per side) to 14-16 In. Lbs.
8. Note that on the adjustable foot, use the hole in the pad as a guide to drill the two holes into the mounting foot at the locations shown.

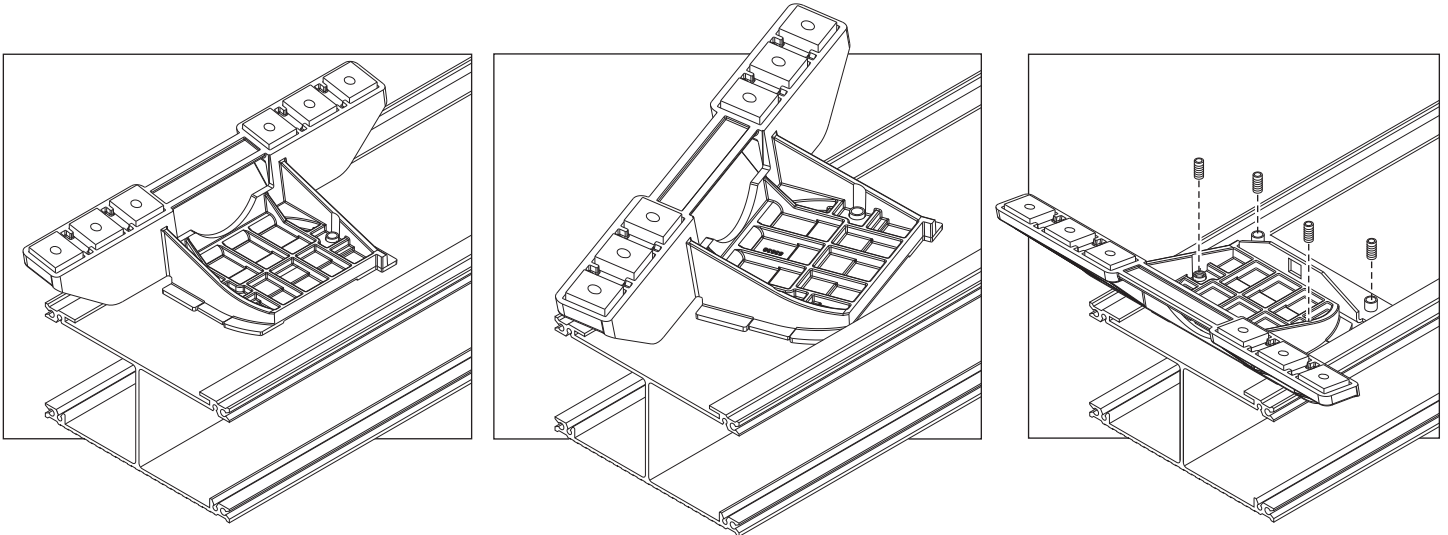


9. Place the lightbar in its final mounting position on the vehicle, mark the mounting hole locations off onto the mounting surface, remove the lightbar and drill the mounting holes.
10. Place the lightbar back onto the vehicle lined up with the mounting holes and secure the mounting feet to the vehicle using the supplied hardware as shown.

**Strap Mounting:**

1. Locate the mounting foot, mounting plate and tinnerman plate included with your lightbar. If not already present, install the mounting plate onto the mounting foot. When properly positioned, this plate is centered from side-to-side on the mounting foot.

2. Flip the lightbar upside-down to expose the bottom of the extrusion and place the mounting foot onto the extrusion.
3. Rotate the mounting foot 90° in a counter-clockwise direction. Make sure that the edges of the mounting foot swing into position under the extrusion mounting lip. Install a tinnerman plate onto the extrusion in the same manner.



- Repeat this procedure for the remaining mounting foot and tinnerman plate and return the lightbar to its right side-up position.
- Position the lightbar onto the vehicle roof in the desired mounting location. One often selected location is directly above the B-pillars. This area is the strongest part of the roof. Refer to your lightbar manual for cable exit location, to be sure that the lightbar is facing the proper direction.
- Adjust the two mounting feet outwards so that they are as close to the edge of the roof as possible. Both mounting feet must be in full contact with the roof. Be sure that there is no less than 1/2" clearance between the roof and the lightbar at their closest point. When the mounting feet are in their proper position, lightly tighten the mounting foot allen head set screws.
- Return the lightbar to an upside-down position. Slide each tinnerman plate outwards until it is fully engaged with its corresponding mounting foot. With the mounting feet and tinnerman plates in their proper positions tighten all of the set screws (2 or 4 per side) to 14-16 In. Lbs. Flip the lightbar right side-up and return it to its mounting position.
- Open both drivers side doors. In the area directly below the mounting foot, carefully pull the drivers side weatherstrip away from the vehicle.

- Remove enough so that the area where the mounting strap will be secured to the vehicle is exposed. Repeat procedure for passenger side.
- Insert the mounting strap through the mounting foot. Be sure that the strap fits flush against the area where it will be secured onto the vehicle. Insert the tension bolt through the mounting strap and into the tinnerman nut on the tinnerman plate. Tighten slightly with a long shafted, Phillips screwdriver. Repeat procedure for passenger side.
- If your mounting strap has mounting holes in the end of the strap, use these holes as a template to drill appropriately sized pilot holes through the strap and into the vehicle. Repeat for passenger side of the vehicle.
- Firmly tighten the tension bolts to secure the lightbar to the vehicle.

**NOTE: Model MKAJ is an adjustable mounting foot. On this model you may loosen the screws on the rear of the foot and adjust the angle of the lightbar. This feature can be used if the angle of the roof is not level with the road.**

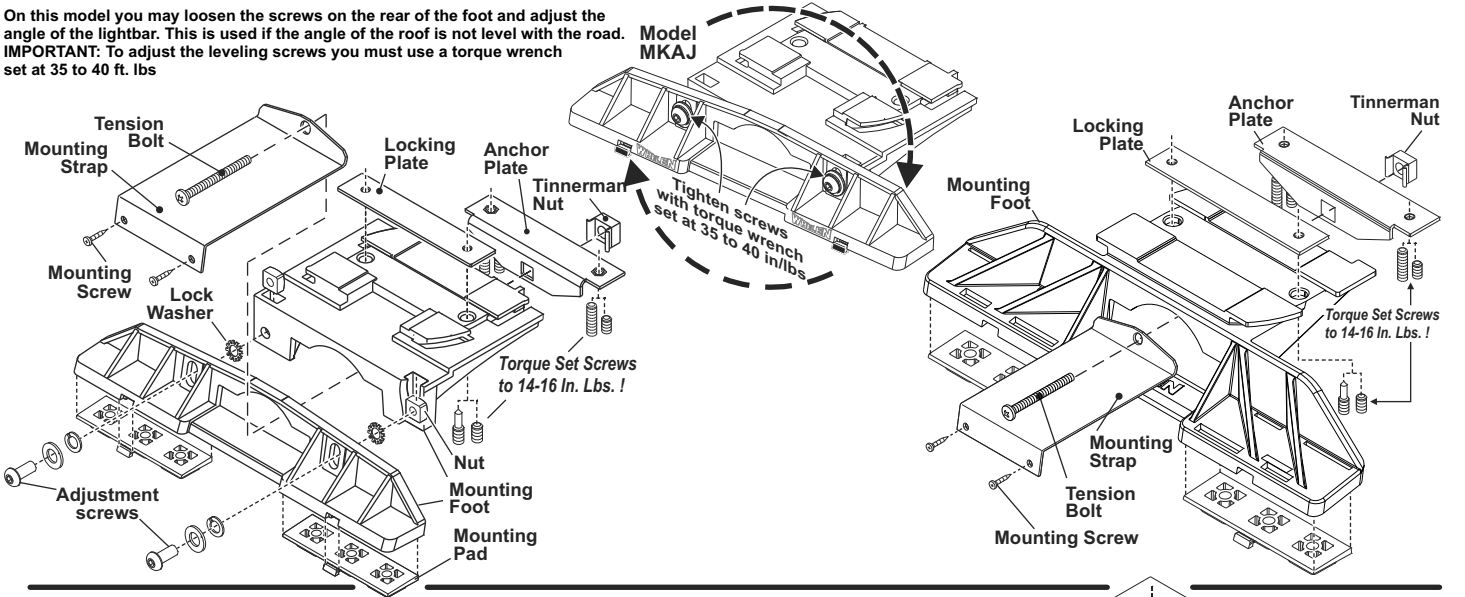
**IMPORTANT: To adjust the leveling screws you must use a torque wrench set at 35 to 40 in./lbs.**

### Adjustable Mounting Foot / Model MKAJ

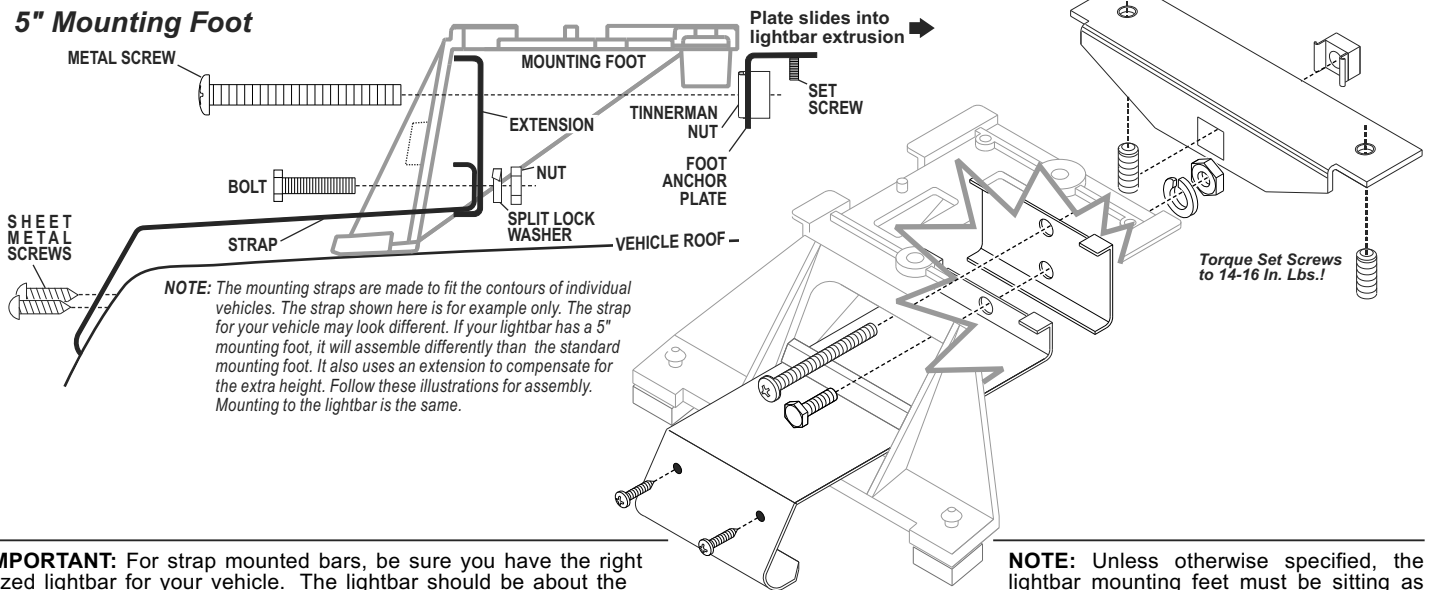
◀ For Reference Only ▶

### Standard Mounting Foot / Model MKEZ

On this model you may loosen the screws on the rear of the foot and adjust the angle of the lightbar. This is used if the angle of the roof is not level with the road. **IMPORTANT: To adjust the leveling screws you must use a torque wrench set at 35 to 40 ft. lbs**

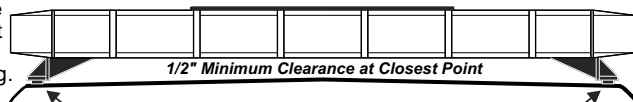


### 5" Mounting Foot



**NOTE:** The mounting straps are made to fit the contours of individual vehicles. The strap shown here is for example only. The strap for your vehicle may look different. If your lightbar has a 5" mounting foot, it will assemble differently than the standard mounting foot. It also uses an extension to compensate for the extra height. Follow these illustrations for assembly. Mounting to the lightbar is the same.

**IMPORTANT:** For strap mounted bars, be sure you have the right sized lightbar for your vehicle. The lightbar should be about the same width as the vehicle roof. If the lightbar is too large or small it will not mount properly to the vehicle and may shift or come loose during driving.



**NOTE:** Unless otherwise specified, the lightbar mounting feet must be sitting as close to the edge of the roof as possible. Mounting feet must also be in full contact with the roof and not be hanging off the edge.

**CAUTION: Permanent mounting will require drilling. The installer must be sure that no vehicle components or other vital parts will be damaged. Be aware of the location of any front, side or upper air bags.**

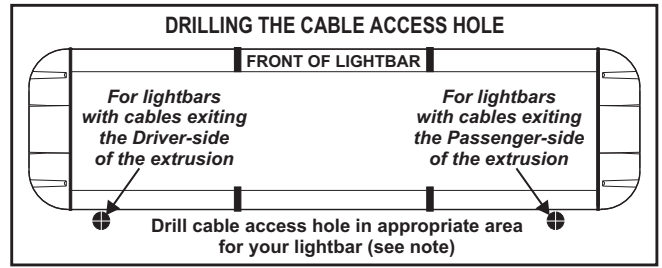
**CAUTION: There may be a roof support member that spans the distance between the driver's and passenger's side. Do not drill through this member. Adjust the location of the cable access hole until the hole can be drilled without contacting this support member.**

**IMPORTANT! It is the responsibility of the installation technician to make sure that the installation and operation of this product will not interfere with or compromise the operation or efficiency of any vehicle equipment!**

**CAUTION: Using a magnetic mounted light on the outside of a vehicle, while in motion, is not recommended and is at the sole risk of the user.**

**Installation:**

1. To protect the headliner from damage caused by drilling the cable access hole through the vehicle roof, allow a 5" to 7" distance between roof and headliner by lowering the headliner before drilling.
2. Using a 1" hole saw, drill the cable access hole. Use a round file to smooth and de-burr the edges and insert a 1" grommet (user supplied).
3. Insert the cable(s) through the cable access hole into the vehicle. Use RTV silicone to weatherproof the access hole after the cable(s) are pulled into the vehicle.
4. When routing the cable(s), be sure to use a path that avoids any vehicle components or other vital parts that may be damaged. Also be careful not to interfere with any vehicle air bags (front, side, etc.). Route the cable(s) towards your switch panel and refer to the instructions included with the switch panel for wiring information.



**Wiring:**

Your lightbar has reverse polarity protection. If the lightbar will not turn on, you may have blown an internal fuse. (See drawing on next page for fuse location.) To replace it you have to disassemble the lightbar. (See last page for assembly-disassembly instructions.)

This lightbar is equipped with an 11-conductor cable, the wire function chart below, gives: wire color, function, voltage to apply to activate the function, and how many Amps to fuse the wire at.

<u>COLOR / VOLTAGE</u>	<u>FUNCTION</u>	<u>FUSE @</u>
RED / +12VDC	LED Flasher (+) Positive .....	5 Amps
BLK-YEL / +12VDC .....	(+) Scan-Lock™ .....	1 Amp
GRY / +12VDC .....	Front Corner LEDs .....	1Amp
WHT / +12VDC .....	Halogen 1 (Optional) .....	5 Amps
WHT-BLK / +12VDC .....	Inboard LEDs .....	5 Amps
YEL / +12VDC .....	Halogen 2 (Optional) .....	5 Amps
WHT-BLU / +12VDC .....	Rear Corner LEDs (Optional) .....	1 Amp
BLK-WHT / Ground .....	Halogen 1 & 2 (-) Ground (Optional) ....	N/A
WHT-VIO / +12VDC .....	Endcap LEDs .....	1 Amp
VIO / +12VDC .....	Low Power .....	1 Amp
BLACK / Ground .....	LED Flasher (-) Ground .....	N/A

**WARNING: All Customer supplied wires that connect to the positive terminal of the battery, must be sized to supply at least 125% of the maximum operating current and FUSED at the battery to carry that load. DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!**

**Hi/Low Control:**

The type of switch used is dependant on how the operator wishes the Hi/Low feature to function:

**Option 1: Latching Mode:** By applying +voltage to the VIOLET wire for less than 1 sec., the power supply is "latched" into low power operation. The unit must be turned off and then back on to restore normal, Hi power operation. A momentary switch is best for this method.

**Option 2: Level Mode:** Applying +voltage to the VIOLET wire for more than 1 sec. holds the power supply in low power mode until that voltage is removed. A toggle switch is best for this method.

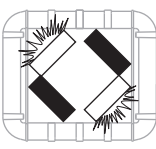
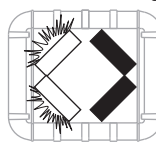
**Scan-Lock™:**

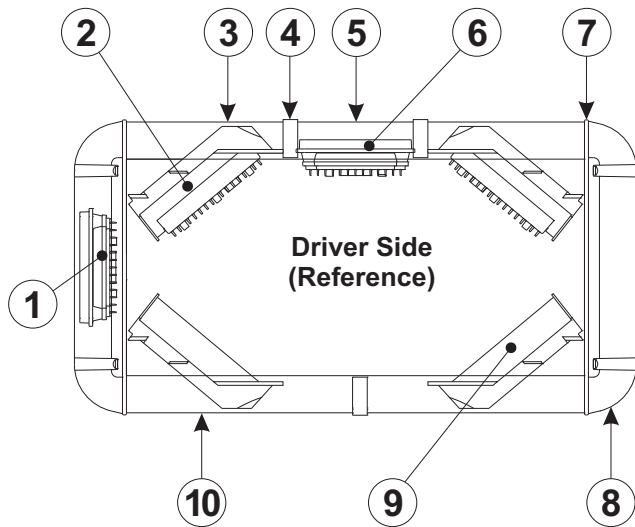
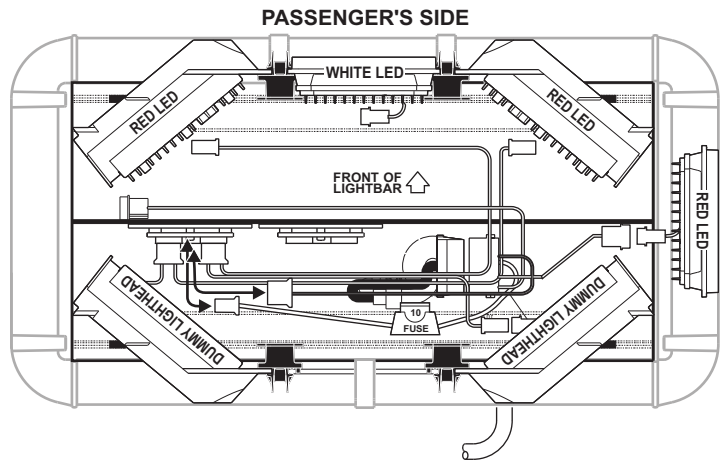
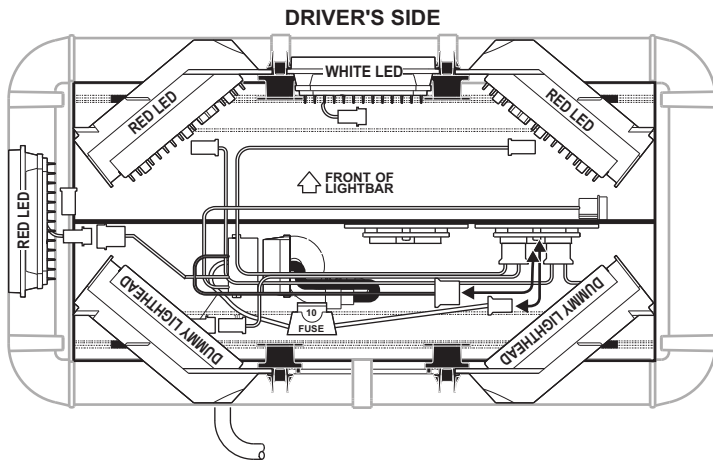
**To cycle forward through all patterns:** Apply power to the control wire of the function you want to change, then apply power to the BLACK-YELLOW (Scan-Lock) wire for less than 1 second and release. This will change the pattern. Repeat for next pattern.

**To choose a pattern:** While cycling through the patterns, when you find the pattern you want let it run for more than 5 seconds and it will lock in and become the default pattern.

**To reset to the factory default pattern:** Turn off power, apply power to the Scan-Lock wire and the wire of the function you want to reset, then turn power back on.

Scan-Lock can be connected to a customer supplied SPST switch.

 Corners / Cross	 Corners / Alternating	<b>1A SignalAlert™</b> ..... Alternating <b>1B SignalAlert™</b> ..... Cross <b>1C SignalAlert™</b> ..... 3 cycles of 1A & 3 cycles of 1B <b>2A CometFlash®</b> ..... Alternating <b>2B CometFlash®</b> ..... Cross <b>2C CometFlash®</b> ..... 3 cycles of 1A & 3 cycles of 1B <b>3A DoubleFlash</b> ..... Alternating <b>3B DoubleFlash</b> ..... Cross <b>3C DoubleFlash</b> ..... 3 cycles of 1A & 3 cycles of 1B <b>4A SingleFlash</b> ..... Alternating <b>4B SingleFlash</b> ..... Cross <b>4C SingleFlash</b> ..... 3 cycles of 1A & 3 cycles of 1B <b>6 SteadyFlash</b> ..... 1 & 2 Steady 3 & 4 SingleFlash (SIM.) <b>7 Steady</b> ..... 1, 2, 3 & 4 Steady
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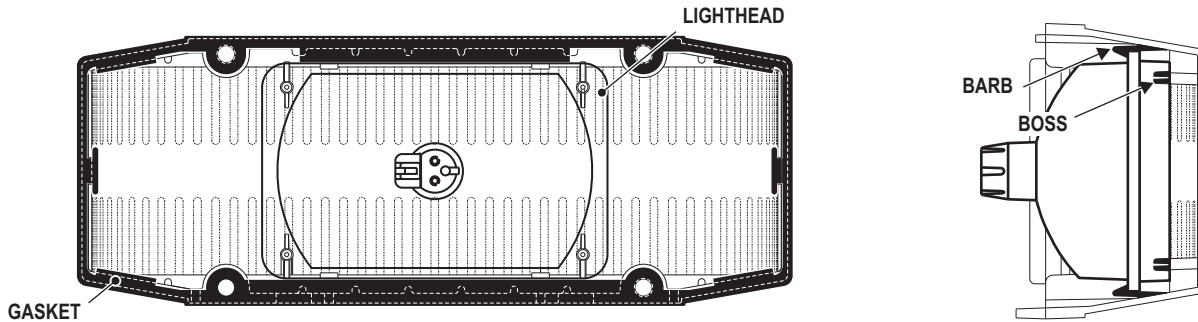
QTY	ITEM	PART NUMBER	DESCRIPTION
		01-0684222-36	NFPA Freedom™ Mini, 4-LEDs, Perm Mount (Pair)
2	1	02-0364528255	400 LED (SPLIT) RED/RED
4	2	01-0263814-50	LED CORNER LINEAR (RED)
4	3	68-1983817-30	LENS (CLEAR) 6.562"
6	4	02-0341448-30	LENS DIVIDER (CLEAR)
2	5	68-1983816-30	LENS (CLEAR) 5.000"
2	6	02-0364528233	400 LED (SPLIT) WHT/WHT
4	7	38-0283381-00	ENDCAP GASKET
4	8	68-1183369-30	ENDCAP (CLEAR)
4	9	68-5983915-01	CORNER FILLER
4	10	68-1984104-30	LENS (CLEAR) 9.250"

WIRE COLOR & VOLTAGE	FUNCTION	FUSE @
RED / +12VDC	LED Flasher (+) Positive	5 Amps
BLACK-YELLOW / +12VDC	(+) Scan-Lock™	1 Amp
GRAY / +12VDC	Front Corner LEDs	1 Amp
WHITE / +12VDC	Halogen 1 (Optional)	5 Amps
WHITE-BLACK / +12VDC	Inboard LEDs	5 Amps
YELLOW / +12VDC	Halogen 2 (Optional)	5 Amps
WHITE-BLUE / +12VDC	Rear Corner LEDs (Optional)	1 Amp
BLACK-WHITE (-)	Halogen 1 & 2 (-) Ground (Optional)	N/A
WHITE-VIOLET / +12VDC	Endcap LEDs	1 Amp
VIOLET / +12VDC	Low Power	1 Amp
BLACK / Ground	LED Flasher (-) Ground	N/A

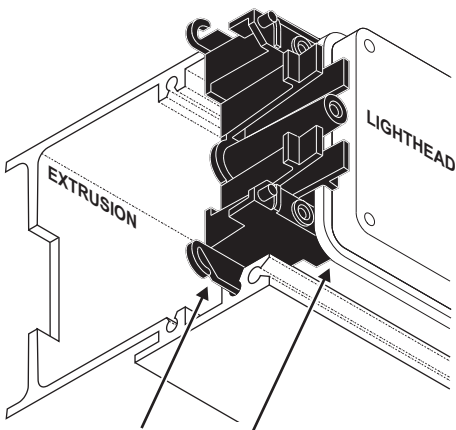
**Note:** Should you need to service or repair your lightbar, the diagrams below will show you how to gain access.

**Installing Endcap Gasket & Alley Light**

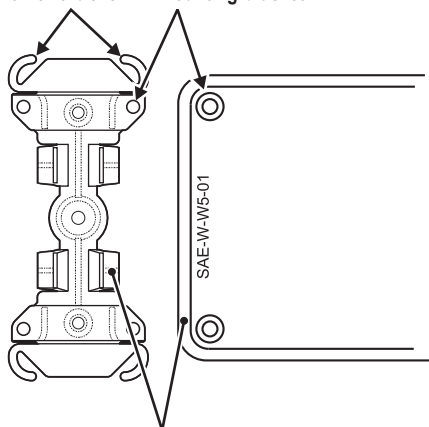
Place the endcap gasket into position on the endcap, locating all tabs and holes. Align the reflector assembly of the alley light with the 4 bosses in the endcap and press the reflector in place until the 4 barbs engage around the reflector.



**Lighthead Mounting Bracket**

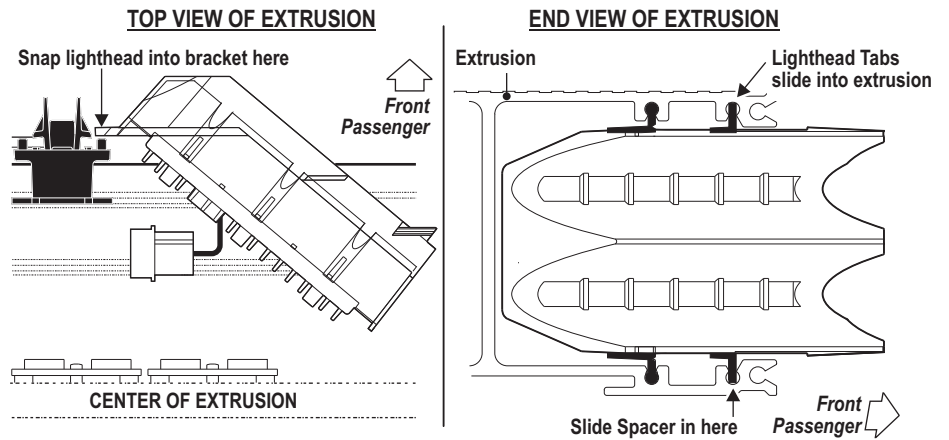


Ears on mounting bracket slide into the channels in the extrusion. Lighthead mounting holes snap into the raised bosses on the mounting bracket.



The edge of the lighthead snaps into the clips on the mounting bracket.

**Installing a Corner LED**



**Removing the Endcap and Lenses**

Remove the four screws (A) that hold the endcap (B) on and pull the endcap and gasket (C) off. Slide the lenses (D) out of the lightbar, to gain access to the extrusion. When reinstalling the endcap, first place the gasket into position on the endcap. Be sure to line up all the tabs and holes on the gasket.

