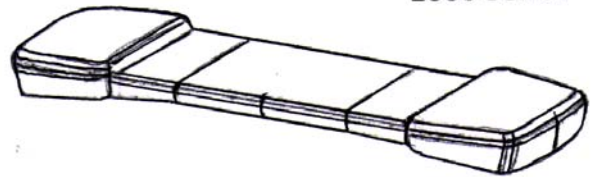
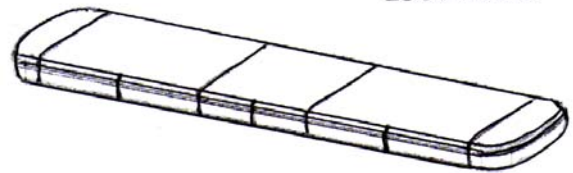


## Lightbar Installation and Operation Instructions

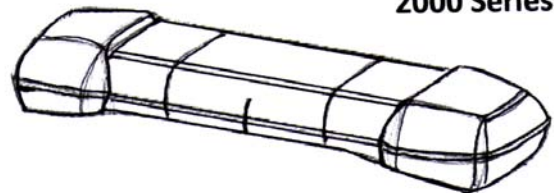
**1000 Series**



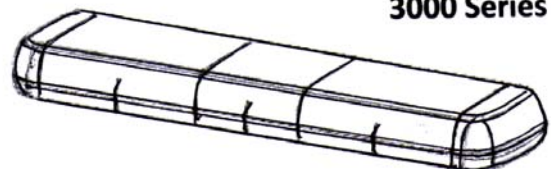
**1500 Series**



**2000 Series**



**3000 Series**



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**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 injury, and/or death to 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 the 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 he/she 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.

### **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 Australian Warning Systems. **DO NOT USE DAMAGED OR BROKEN PARTS.**

Ensure the lightbar voltage is compatible with the planned installation.

## 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 centre 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 optimised. Mounting should be such that there is no less than 12mm (1/2") clearance between the roof and the lightbar at any point.

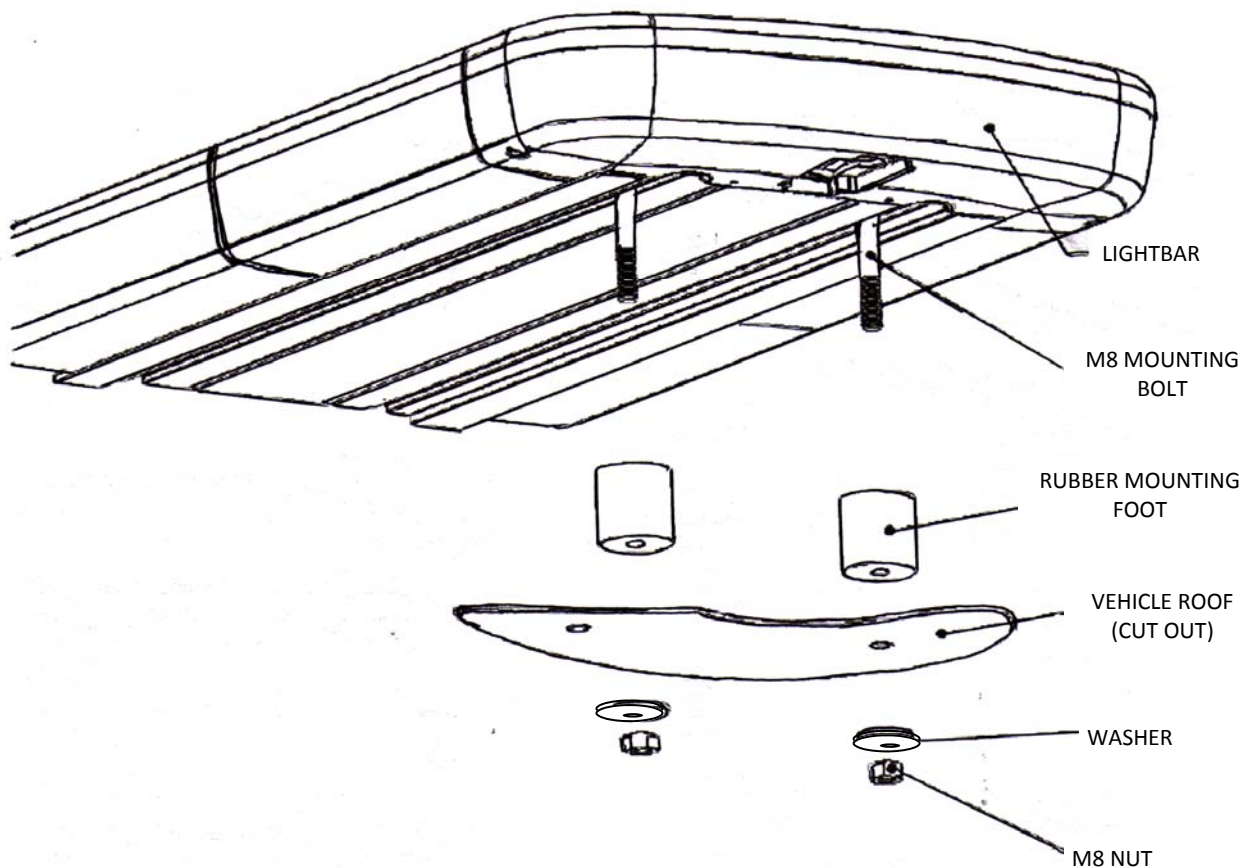


#### Caution:

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.

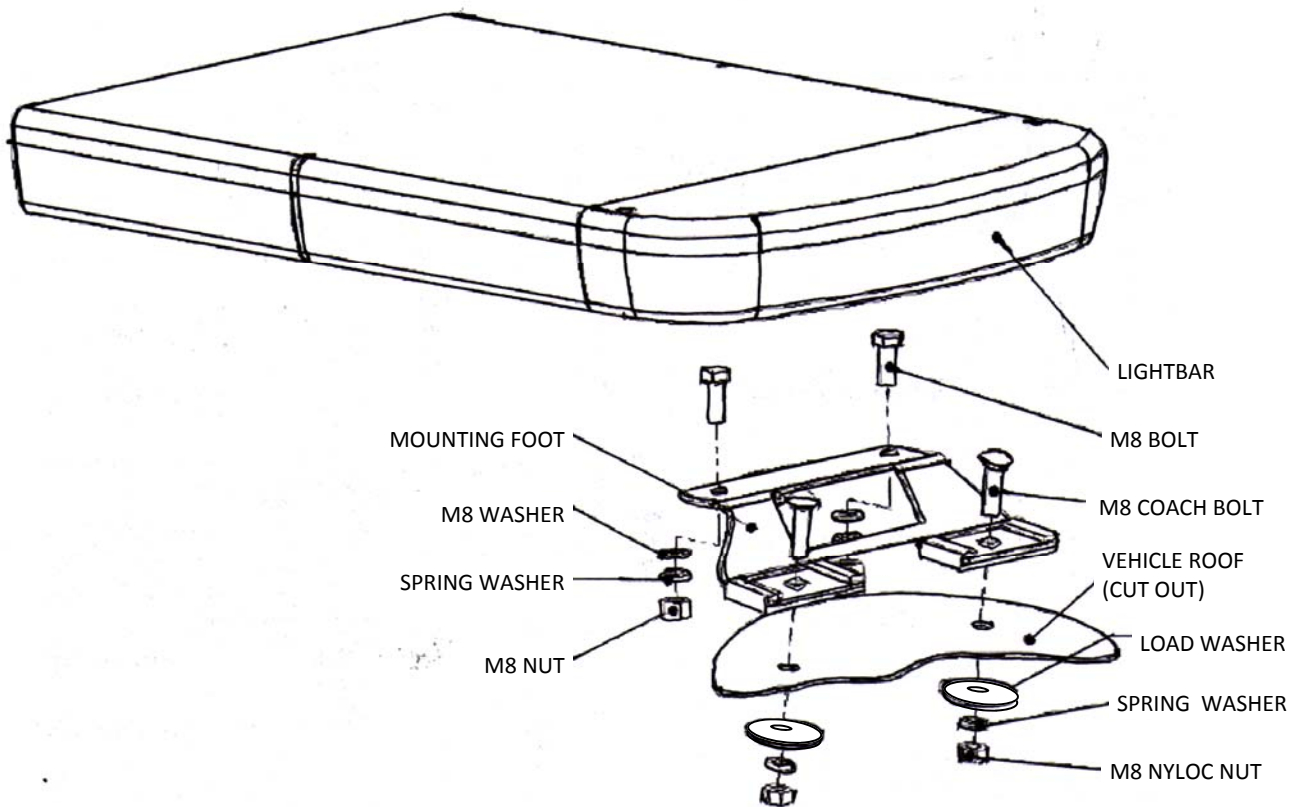
### Permanent Mounting—Rubber Feet

1. Determine the location of the lightbar, and the best route for the wiring.
2. Determine the position of the four mounting feet and drill the 8.5mm - 9.0mm diameter (11/32") mounting holes accordingly. The spacing of the mounting hardware from front to back is fixed at 120mm. The spacing of the mounting hardware from left to right is adjustable. It is suggested that the positioning of the feet be symmetrical and be near the curved edges of the roof where the roof is strongest.
3. Insert the heads of the MB mounting bolts into the opening at the end of the slots on the base of the lightbar. Push the rubber mounting feet over the bolts to hold them in position. Slide the bolts along the extrusion so they are symmetrical about the bar and line up with the holes in the roof.
4. Mount the lightbar, with the bolts going through the holes drilled in step 2, routing the wire as planned in step 1 (refer to diagram). See the 'Wiring' section of this manual for further wiring instructions. Install washers and nuts and secure the unit. The use of locking compound is recommended.



## Permanent Mounting—Mounting Bracket

1. If the mounting feet are not already installed on the bar, install as follows:  
Insert the heads of the M8 mounting bolts into the opening at the end of the slots on the base of the lightbar. Loosely fasten mounting feet to base extrusion using M8 nuts and spring washers (refer to diagram).
2. Determine the location of the lightbar, and the best route for wiring.
3. Loosen the M8 nuts to allow the mounting feet to slide along the base. Place the lightbar on the vehicle in the determined location and slide the mounting feet into position. It is suggested that positioning of the feet be symmetrical and positioned near the curved edges of the roof where the roof is strongest.
4. With the feet positioned, mark the location of the mounting hole centres on the roof. Remove the bar and drill the 8.5mm - 9.0mm diameter (11/32") mounting holes as marked. Note: the centre distance between the mounting holes in a foot is 135mm (5 5/16").
5. Insert M8 coach bolts into the mounting feet (refer to diagram) and tighten the M8 nuts holding the feet to the base of the lightbar. Note: If the mounting feet are at the extreme ends of a 1000 & 2000 series bar, the feet may have to be temporarily moved to allow insertion of the coach bolts.
6. Mount the lightbar, with the bolts going through the holes drilled in step 4, routing the wire as planned in step 2 (refer to diagram).  
See the 'Wiring' section of this manual for further wiring instructions. Install washers and M8 Nyloc nuts, and secure the unit.

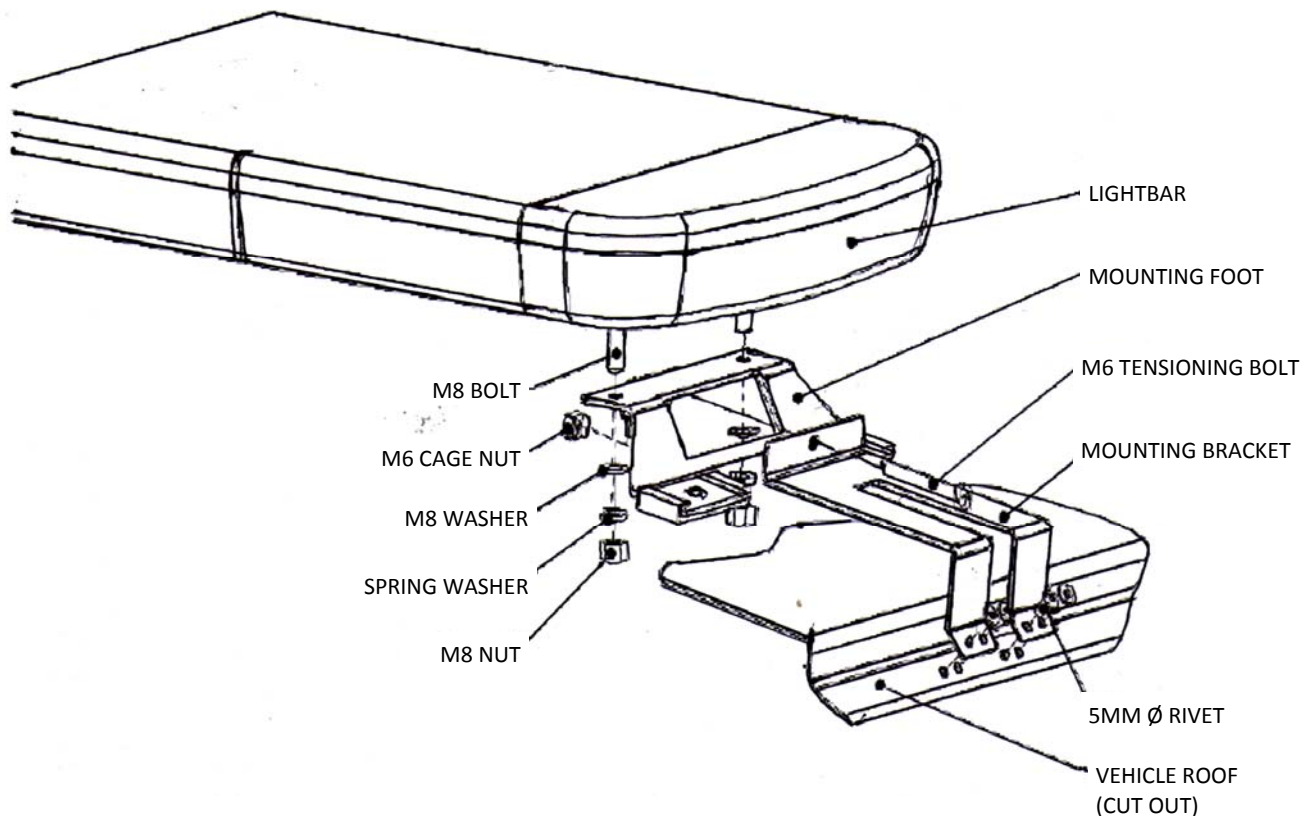


## Gutter Mounting

### Important:

Gutter mount brackets are specific to the vehicle model—Ensure the brackets are suitable for the vehicle before installation.

1. If the mounting feet are not already installed on the bar, install as follows:  
Insert the heads of the M8 mounting bolts into the opening at the end of the slots on the base of the lightbar. Loosely fasten mounting feet to base extrusion using M8 nuts and spring washers (refer to diagram).
2. Insert M6 cage nut into each mounting foot taking care to insert into the correct side (refer to diagram).
3. Loosen the M8 nuts to allow the mounting feet to slide along the base. Adjust the mounting feet to the position detailed in the instructions supplied with the mounting bracket. (The feet should be positioned near the curved edges of the roof where the roof is strongest). Tighten the M8 nuts to fasten the feet in position. Note: If the mounting feet are at the extreme ends of a 1000 & 2000 series bar, the brackets may have to be inserted before positioning the feet (see step 5).
4. Determine the location of the lightbar, and the best route for the wiring. Note: Gutter mounting brackets are designed for mounting the lightbar at the highest point on the roof surface.
5. With the bar positioned on the roof, slide the mounting brackets through the slots in the feet, and fit the hooks under the gutter (refer to diagram). Note: Brackets are often designed to fit under door trim, the trim may have to be temporarily removed for installation.
6. Insert the M6 tensioning bolts through the brackets and into the cage nuts inserted in step 2. Using a No.3 point Phillips head screwdriver, tighten the tensioning bolts evenly ensuring the lightbar remains centred.
7. Using the holes in the hooks as a guide, drill 5mm (3/16") diameter holes in the vehicle and fit the supplied rivets (refer to diagram).
8. Replace trim as required and ensure doors close properly.



## Wiring Instructions:

**Important!** This unit is a safety device and it must be connected to it's own separate, fused power point to assure it's 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 vehicle damage, including fire.
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.

## General Wiring Instructions

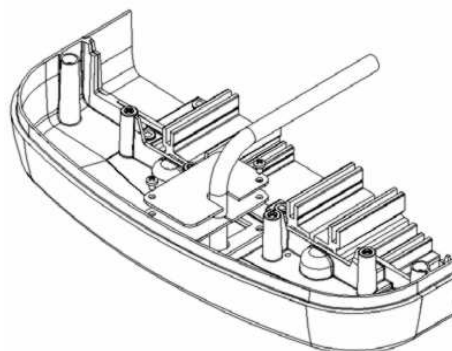
Before attempting to connect the lightbar wiring harness, refer to the insert sheet supplied with your specific lightbar for wiring detail. The insert sheet describes the function for each wire.

1. Route wires from the vehicle positive (battery, alternator, fuse block) to switch panel in cab. Use suitable high-temperature wire if it passes through the engine compartment. Install a suitable fuse as close to the point of tapped power as possible. For each circuit use a fuse according to the insert sheet.
2. Connect the wires to the positive side of the control switch panel with quick-connect terminals or by soldering.
3. After the lightbar has been mounted, route the wiring harness into the vehicle to the switch panel location.
4. Connect the wires of the lightbar wiring harness to the switched side of each switch. See the insert sheet for wire colour / function legend.
5. Connect the lightbar cable Black wire to a solid ground connection on the vehicle (ideally, directly to the battery negative terminal).
6. Use cable ties and grommets to secure and protect all cables and wires.

## Lightbar Removal

The 1000/1500/2000/3000 Series Lightbars have been designed with a unique cable access hole enabling the lightbars to be removed without uninstalling the wiring harness.

1. Remove upper lens set as described in "Lens Removal and Installation" - in the 'Options and Maintenance' section of this manual.
2. Using a No.2 point Phillips screwdriver, remove the two retaining screws from the cable exit cover and remove the screw grounding the external harness to chassis.
3. Unplug and remove harness. If the lightbar is fitted with a LED message display or safety director, the corresponding harness will also have to be removed—take care to record the connection details.
4. When connecting the lightbar, connect the wiring harnesses and cable cover as originally installed.





## Options and Maintenance:

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. Do not subject the lightbar to high-pressure washers or automatic car washers.

### Lens Removal and Installation

#### 1000/1500 Series

1. Remove retaining screws from both ends of lightbar. Using a small flat blade screwdriver or similar tool, lever open the latches around the lightbar.
2. Insert flat blade screwdriver into the removal tag of the lens clips (the clips on the leading edge of the lens), gently push the clip towards the bar and lever the screwdriver upwards to disengage the lock. Pull the clip away from the lightbar to remove.
3. Carefully lift the lens off the seal—choose a suitable location to temporarily store the lens so as to not scratch the surface.
4. Ensure latches are captive in the lower lens before refitting the upper lens.
5. When re-installing, gently apply pressure around the upper lens taking care not to damage the seal around the lower lens set. Push all latches back on the lens. Replace the retaining screws. Re-install clips over the joins on the leading edge of the lightbar, ensure that the positioning barb is located within the lens join recess and the clip locks over the extruded aluminium lightbar chassis (an audible “click” will be heard when correctly installed). Note: Clips are to be installed over all lens joins apart from the joins that the end lenses of 1500 Series Lightbars.

#### 2000/3000 Series

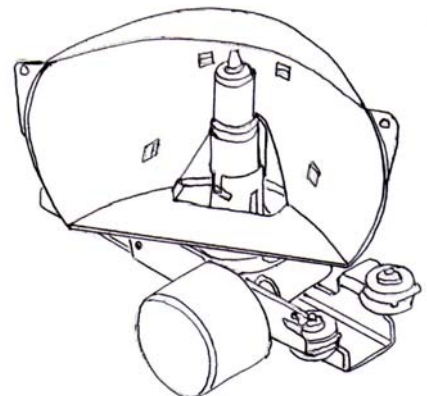
1. Remove four retaining screws from the end lenses taking care not to lose the o-rings (3000 Series only). Using a small flat blade screwdriver or similar tool, lever open the latches around the lightbar.
2. 2000 and 3000 Series lightbars are generally fitted with hinges at the front of the bar—if the lightbar does not have a hinge refer to step 2 in 1000/1500 Series lens removal. From the back of the lightbar gently lift the upper lens until it clears the seal, continue lifting the lens over the front of the bar until it rests on the hinge backstop.
3. Ensure latches are captive in the lower lens before refitting the upper lens.
4. When re-installing, gently apply pressure around the upper lens taking care not to damage the seal around the lower lens set. Push or lever all latches back on the lens. Replace the retaining screws and o-rings as required.

### Rotator

Rotating light sources are used as a primary warning system. Rotators may be installed in the upper level of both the 2000 and 3000 Series Lightbars, and are diagonally staggered to optimise light output through the ends of the lightbar. Rotators are available to suit either H1 or S795 (Bayonet) type bulbs, in 12V or 24V and 90 rpm or 150 rpm—these specifications are not configurable by the user.

ESR (Electronically Synchronised Rotators) keeps a number of rotators in synchronous phase with each other increases the effective intensity of their combined flashes, and is a requirement of European Regulation ECE-R65, in cases where a lightbar has more than one rotator on each side. Also allows rotators to be 90/180/270 degrees out of phase with others so enhance flash colour clarity.

Rotators are installed using 4 M4x16mm screws through rubber isolating feet. Do not oil or grease rotators—they are constructed with self-lubricating material.



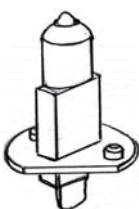
### Bulb Replacement



**WARNING: Halogen bulbs are extremely hot! Allow to cool completely before attempting to remove. Gloves and eye protection should be worn when handling halogen lamps as they are pressurized and accidental breakage can result in flying glass.**

Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

#### H1 Bulb:



1. See “Lens Removal” section for instructions on removing and replacing lenses.
2. With the rotator reflector facing the motor, undo the retaining clip.
3. Lift the globe out to reveal the spade receptacle. Slide the bulb and its holder toward the motor.
4. Grip both the bulb and receptacle and pull apart. Do not stress the wire.
5. Replace the equivalent bulb. **Do not touch the glass portion of the bulb**—natural skin oils can cause premature bulb failure.
6. Slide the bulb back into position and replace the clip.
7. Verify the rotor will spin.
8. Power up, and test the system before replacing lenses.

### 795 Bulb:



1. See "Lens Removal" for instructions on removing and replacing lenses.
2. Push down and turn the bulb counter clockwise to remove. (If necessary, turn the rotator reflector to allow easy access).
3. Replace the equivalent bulb. Do not touch the glass portion of the bulb—natural skin oils can cause premature bulb failure.
4. Verify the rotor will spin.
5. Power up, and test the system before replacing lenses.

### Strobe

Strobe lights are used to provide either a primary or secondary warning system in 2000 or 3000 Series Lightbars. Each strobe power supply controls four strobe heads. Of those available, the standard flash pattern is alternating quad-flash, 140 flashes per minute. The flash pattern is not user-configurable. The strobe power supply is multi-voltage and will operate at both 12V and 24V.

There are three types of strobe head available—'linear' and 'directional' for both upper and lower level of the lightbar. Strobe tubes can only be replaced on the linear and lower deck directional style heads.

### Strobe Tube Replacement



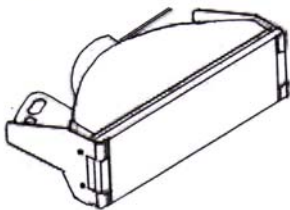
**WARNING! HIGH VOLTAGE!** Disconnect Power to the strobe unit and wait five minutes before changing any strobe tubes to ensure unit is properly discharged. The strobe tube may also be very hot. Gloves and eye protection should be worn when handling strobe lamps as they are pressurized and accidental breakage can result in flying glass.

### Linear:



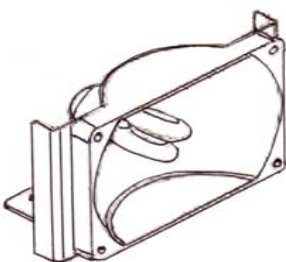
1. See "Lens Removal" for instructions on removing and replacing lenses.
2. Using a screwdriver or similar, gently lever out the old strobe tube from one end at the metal spring contacts.
3. Carefully replace with a new tube, observing correct orientation to ensure all three contacts are correctly aligned. **Do not touch the glass portion of the tube.**
4. Power up and test the system before replacing the lens.

### Lower Deck Directional



1. See "Lens Removal" for instructions on removing and replacing lenses.
2. Disconnect the 3-way connector to the strobe head.
3. Remove the strobe head assembly (left) from the lightbar by removing the 2 x M4 screws.
4. Remove the retaining screw at the rear of the strobe tube and slide out the old tube.
5. Carefully replace with a new strobe tube, taking care not to damage the tube when inserting it through the reflector. **Do not touch the glass portion of the tube.**
6. Replace the retaining screw and screw down the strobe head assembly as originally installed.
7. Re-connect the 3-way connector to the strobe head.
8. Power up and test the system before replacing the lens.

### Upper Deck Directional



1. See "Lens Removal" for instructions on removing and replacing lenses.
2. The strobe tube itself cannot be replaced. The strobe head assembly must be replaced with new.
3. Disconnect the strobe head by unplugging the 3-way connector.
4. Remove the 2 x M4 mounting screws from the mounting bracket.
5. Replace with a new strobe head assembly as originally installed. **Do not touch the glass portion of the tube.**
6. Re-connect the 3-way connector.
7. Power up and test the system before replacing the lens.



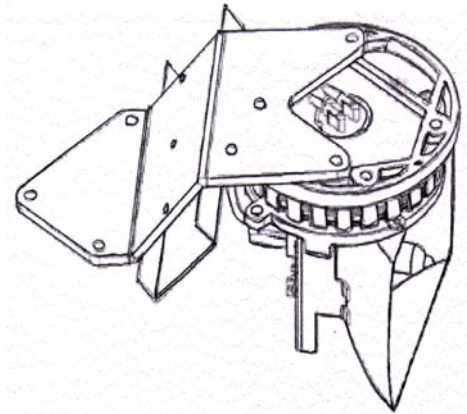
## Cleversector (Combination Intersection / Takedown / Alley)

Cleversectors are electronically controlled units, which provide the combined functions of Alley Lights, Takedown Lights and Intersection Clearing Lights.

Using a uniquely integrated direct-drive steering system, these lights will point forward when Takedown Lights are selected, sideways for Alley Lights, and will sweep rapidly back and forth through a 160deg. arc for the Intersection Clearing function. Additionally, a 'steering' function allows the Alley Light to be steered over a 56 deg. Arc (+/- 28 deg. From directly sideways). The Alley steering function can also be used as a continuous slow sweeping 'searchlight'.

Cleversectors are available as separate left / right versions, for both 12V and 24V systems. All models use a standard H1 style bulb (12V-55W or 240V-70W), which is user replaceable.

Cleversectors can only be installed in 1000 and 2000 Series Lightbars.



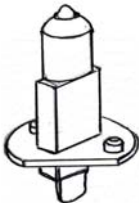
### Bulb Replacement



**WARNING: Halogen bulbs are extremely hot! Allow to cool completely before attempting to remove. Gloves and eye protection should be worn when handling halogen lamps as they are pressurized and accidental breakage can result in flying glass.**

Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

#### H1 Bulb:



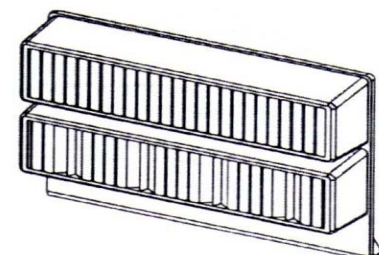
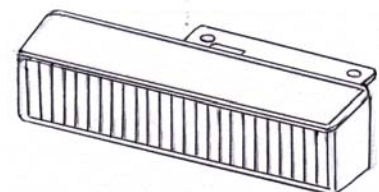
1. See "Lens Removal" section for instructions on removing and replacing the outer lightbar lenses.
2. Rotate the Cleversector to get best access to the back of the reflector.
3. Disconnect the flag terminal from the back of the bulb.
4. Release the bulb retaining spring and extract the H1 bulb.  
Note orientation of globe (chamfered section of base) during removal—it will only fit one way.
5. Install new bulb, ensuring correct orientation noted above.  
**Do not touch the glass section of the bulb** — natural skin oils can cause premature bulb failure.
6. Re-secure the retaining clip.
7. Re-connect the flag terminal to the back of the bulb.
8. Power up and test the system before re-installing the lightbar lenses.

### LED Lighthouse

The LED lighthouses have been designed to ensure long service life using high performance LEDs rated at 100,000 hours of operation and having no moving parts. The modules are low profile units that have a high intensity output with low current draw. There are different types of mounting brackets to suit different locations in the lightbar. LED lighthouses are not user serviceable.

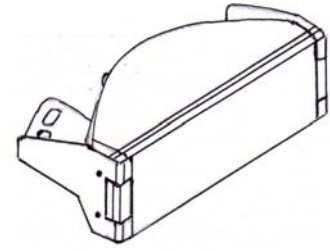
Lower deck options are low profile units that can be installed in 1000 to 3000 Series Lightbars and can be used in conjunction with LED Safety Director. For more information refer to the "Safety Director" section.

Upper deck options are available for 2000 and 3000 Series lightbars, in either single or dual head units (shown). Dual units feature both standard & wide-angle dispersion optics, giving optimum performance and coverage.



## Halogen Flasher

Halogen Flashers are used as an auxiliary warning device and are mounted in the lower level of 1000, 1500, 2000 and 3000 Series Lightbars. Each halogen flasher drives two light-heads with an alternating flash pattern operating at 54 flashes per minute. It is available in 12V and 24V versions.



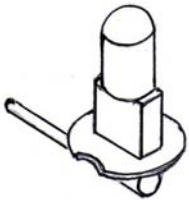
### Bulb Replacement



**WARNING: Halogen bulbs are extremely hot! Allow to cool completely before attempting to remove. Gloves and eye protection should be worn when handling halogen lamps as they are pressurized and accidental breakage can result in flying glass.**

Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

#### H3 Bulb:



1. See "Lens Removal" section for instructions on removing and replacing lenses.
2. Disconnect the spade connector on the wire connecting to the bulb.
3. Remove the retaining screw at the rear of the H3 bulb. If access to the retaining screw is limited by other components of the lightbar, remove the halogen lens but take care to replace all screws and washer as originally installed.
4. Lift the globe out and replace with an equivalent H3 bulb (35W max). **Do not touch the glass portion of the bulb** — natural skin oils can cause premature bulb failure.
5. Use the retaining screw to fix the bulb in position.
6. Reconnect the spade connector on the wire to the bulb.
7. Power up, and test the system before replacing lenses.

## Work Light

The Work Light is an adjustable halogen light which is mounted in the upper level of the 2000 or 3000 Series Lightbar.

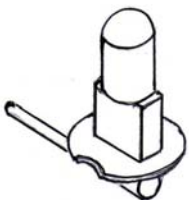
### Bulb Replacement



**WARNING: Halogen bulbs are extremely hot! Allow to cool completely before attempting to remove. Gloves and eye protection should be worn when handling halogen lamps as they are pressurized and accidental breakage can result in flying glass.**

Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

#### H3 Bulb:

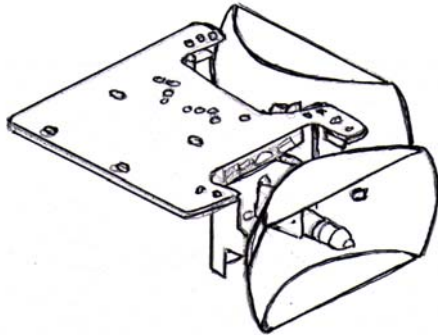


1. See "Lens Removal" section for instructions on removing and replacing lenses.
2. Using a #2 point Phillips screwdriver, remove the 2 screws from both sides of the work light. Remove the black retaining cover. The internal reflector will become loose.
3. From the rear of the internal reflector, remove the bulb retaining screw. Note: Separate the bulb wire spade connector.
4. Replace with equivalent bulb. **Do not touch the glass with bare hands.**
5. Reverse steps 1, 2, and 3 to re-assemble the work light.
6. Power up, and test the system before replacing lenses.

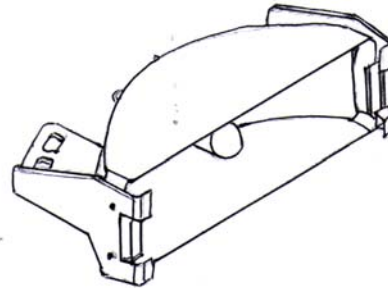
## Alley / Takedown

The Alley / Takedown lights are fixed halogen lights which are mounted in the 1000, 1500, 2000, and 30000 Series Lightbars. They are available in 12V and 24V versions.

### 1000, 2000 Series (H1 Bulb)



### 1500, 3000 Series (H3 Bulb)



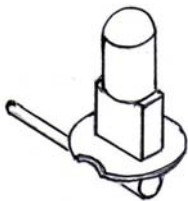
## Bulb Replacement



**WARNING:** Halogen bulbs are extremely hot! Allow to cool completely before attempting to remove. Gloves and eye protection should be worn when handling halogen lamps as they are pressurized and accidental breakage can result in flying glass.

Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

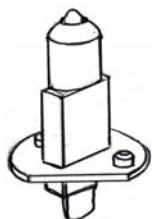
### H3 Bulb:



1. See "Lens Removal" section for instructions on removing and replacing lenses.
2. Disconnect the spade connector on the wire connecting to the bulb.
3. Remove the retaining screw at the rear of the H3 bulb. If access to the retaining screw is limited by other components of the lightbar, remove the halogen lens but take care to replace all screws and washer as originally installed.
4. Lift the bulb out and replace with an equivalent H3 bulb (35W max). **Do not touch the glass portion of the bulb** — natural skin oils can cause premature bulb failure.
5. Use the retaining screw to fix the bulb in position.
6. Reconnect the spade connector on the wire to the bulb.
7. Power up, and test the system before replacing lenses.

Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

### H1 Bulb:



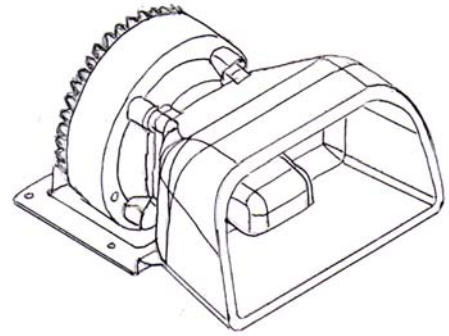
1. See "Lens Removal" section for instructions on removing and replacing lenses.
2. Remove the three screws fastening the mounting bracket to the chassis.
3. Disconnect the spade connector on the wire connecting to the bulb.
4. Undo the retaining clip.
5. Lift the bulb out of the reflector.
6. Replace with equivalent bulb. **Do not touch the glass section of the bulb** — natural skin oils can cause premature bulb failure.
7. Fix the bulb in place with the retaining clip.
8. Reconnect the spade connector on the wire connecting to the bulb.
9. Re-install reflector mounting bracket.
10. Power up, and test the system before replacing lenses.

## Loud Speaker

A 100W 110hm siren loudspeaker unit can be installed in the upper section of 2000 and 3000 series lightbars. The speaker fits entirely inside the lightbar and seals against a grill in the upper lens section of the bar. A separate siren amplifier is required to operate the loudspeaker.

No maintenance, or other user intervention is required.

While the speaker has been designed to maximise sound pressure ahead of the vehicle, users should be aware of possible Occupational Health and Safety issues relating to cabin noise and roof-mounted siren speakers.



### WARNING!

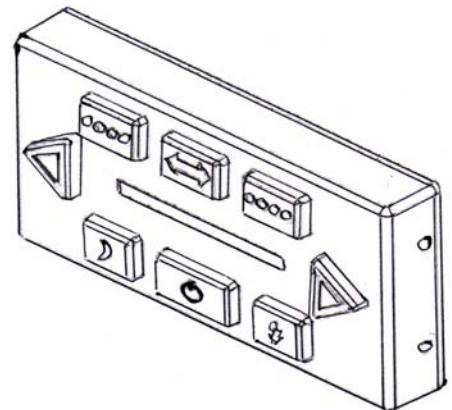


To be effective, sirens must produce very high sound levels that can potentially result in hearing damage. Installer should wear hearing protection, clear bystanders from the area, and not operate the siren indoors during testing. Vehicle operators and occupants should assess their exposure to siren noise and determine what steps, such as consultation with professionals or the use of hearing protection should be implemented to protect their hearing.

## Safety Director

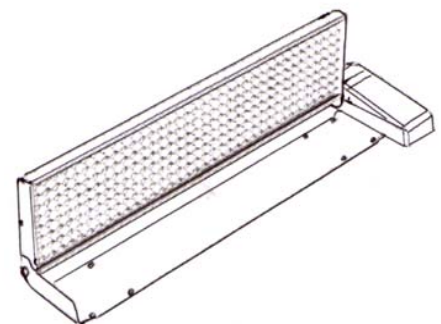
The Safety Director System is used to provide traffic directions from the rear of the vehicle, using a number of sequenced patterns controlled from a remote keypad. The system is available in 12V and 24V Halogen or LED versions and can be installed in the lower level of 1000, 1500, 2000 and 3000 Series Lightbars. The Safety Director controls 5, 6, 7 or 8 light-heads, depending on the length of the lightbar and the number of other lower level components. A manual is supplied with each keypad detailing the operation and configuration options if required.

The Safety Director can also be used as an auxiliary warning system with flash patterns selected using either the keypad or hard-wired input wires. The Safety Director is designed to be maintenance free with the exception of lighthouse bulb replacement. For bulb replacement, refer to the "Halogen Flashers" sections.



## LED Message Display

A self-raising variable LED message display, mounted on the top of the 1000, 1500, 2000 and 3000 series lightbars this unit remains closed until activated from the remote keypad controller within the vehicle. Once activated this unit will automatically 'flip-up' and the 130mm high LED message display will be visible from the rear of the vehicle. A unique mechanical 'break-back' clutch protects the raised display panel if struck by an object in a forward or rearward direction. This clutch will also release if the vehicle is driven too fast with the LED panel up.



## Synchronisation

Many LED products include a synchronising feature. If your device has a 'sync' wire, this may be connected to the sync wire(s) on other devices, so that the connected devices flash in sync with each other. Note that for this feature to work correctly, the synchronised devices must have compatible flash patterns.

### Compatible Flash Patterns

The sync feature works by ensuring that all devices restart their flash patterns at the same time.

Typical flash patterns have been designed with a period (flash pattern length) of 800 milliseconds. In this case, every 800ms the sync connection will signal all devices to restart their flash patterns. However, not all flash patterns have a period of 800ms. For example, the ESR patterns have a period of 450ms to match the mechanical ESR rotator units.

If devices with different period flash patterns are synchronised, the device with the shorter pattern will reset the other devices before their flash pattern is complete. This may lead to unintended and undesirable behaviour. For example, an 800ms side-alternating pattern that is continually reset about half-way through its flash period when it is connected to the sync of a 450ms ESR pattern, this will result in the side-alternating pattern getting 'stuck' with only one side flashing.

Flash pattern periods are normally provided in user/install manuals or on lightbar wiring information sheets.

**IMPORTANT!** Ensure that devices being synchronised have compatible flash patterns (i.e. The same period) in all models of operation (e.g. Primary and secondary flash patterns) and always verify correct operation of the sync feature after installation.



**WARNING:**

Do not connect the SYNC wire to GND. Flash pattern configuration may be reset if the SYNC wire is connected to the GND. If unused, leave this wire unconnected and insulated.

<b>Replacement Parts/Accessories:</b>	
<b>Description</b>	
<b>Globes / Tubes</b>	
H1 Bulb 12 V 55W for Cleversectors	900-H11255
H1 Bulb 24 V 70W for Cleversectors	900-H12470
H3 Bulb 12 V 35W for MH reflectors	900-H31235
H3 Bulb 24 V 35W for MH reflectors	900-H32435
795 Bulb 12V 55W for rotators	900-0795
795 Bulb 24V 70W for rotators	900-0794
Sign Light Bulb 12V 20W to suit 2000 and 3000 Series	900-1156
Sign Light Bulb 24V 20W to suit 2000 and 3000 Series	900-7739
Strobe Flash Tube for lower strobes to suit 2000 and 3000 Series	900-1660
Linear Turbo Strobe Tube to suit 2000 and 3000 Series	900-5334
<b>Lenses (includes Lens Joining Tape)</b>	
Upper End Lens to suit 1000 Series	562-2020
Upper End Lens to suit 1500 Series	562-2021
Upper End Lens to suit 2000 Series	562-2012
Upper End Lens to suit 3000 Series	562-2013
Upper Mid Lens Short to suit 1000 and 1500 Series 260mm	562-2019
Upper Mid Lens Long to suit 1000 and 1500 Series 390mm	562-2018
Upper Mid Lens Short to suit 2000 and 3000 Series 260mm	562-2017
Upper Mid Lens Long to suit 2000 and 3000 Series 390mm	562-2016
Lower End Lens to suit 1000 and 2000 Series	562-2010
Lower End Lens to suit 1500 and 3000 Series	562-2011
Lower Mid Lens Short to suit all Series 260mm	562-2015
Lower Mid Lens Long to suit all Series 390mm	562-2014
Micro Halogen Reflector Lens	562-2918
<b>Halogen / Strobe Lights</b>	
Rotator Assembly Fast 150 FPM 12V (S795 Bayonet)	562-2031
Rotator Assembly Slow 90 FPM 12V (S795 Bayonet)	562-2030
Rotator Assembly Fast 150 FPM 24V (S795 Bayonet)	562-2033
Rotator Assembly Slow 90 FPM 24V (S795 Bayonet)	562-2032
Cleversector Left 12V to suit 1000 and 2000 Series	562-2912
Cleversector Right 12V to suit 1000 and 2000 Series	562-2913
Cleversector Left 24V to suit 1000 and 2000 Series	562-2914
Cleversector Right 24V to suit 1000 and 2000 Series	562-2915
Lamp MH Reflector Assembly to suit 1000 and 2000 Series	562-2917
Directional Strobe Head to suit 2000 and 3000 Series	562-2250
Linear Strobe Head to suit 2000 and 3000 Series	561-2260
<b>LEDs</b>	
12V Front/Rear LED Lighthouse to suit all Series	562-109924
12V Corner LED Lighthouse to suit 1000 and 2000 Series	562-109938
12V Corner LED Lighthouse to suit 1500 and 3000 Series	562-159938
24V Front/Rear LED Lighthouse to suit all Series	562-109925
24V Corner LED Lighthouse to suit 1000 and 2000 Series	562-109939
24V Corner LED Lighthouse to suit 1500 and 3000 Series	562-159939



<b>Driver Modules / Controller / Strobe Packs</b>	
12V/24V LED Driver Module (4 = 4 Head)	561-1004
12V/24V LED Driver Module (8 = 8 Head)	561-1008
12V/24V LED Driver Module (20 = 20 Head)	561-1020
12V/24V Halogen Driver Module	561-9020
Control Panel to suit in-Bar Safety Director all Series	561-2210
Strobe Power Supply 2 Head Quad Flash	250-7220
Strobe Power Supply 4 Head Double and Quad Flash	250-7450
Strobe Power Supply 4 Head Double, Quad, and Quin Flash	250-7480
Strobe Power Supply 6 Head Double, Quad, Quin, and Mega Flash	250-7660
<b>Screws / Latches</b>	
Lens Wire Latch to suit 1000 and 1500 Series Centre Lenses	562-2006
Lens Wire Latch to suit 2000 and 3000 Series Lightbars also for 1000 Series End Lens	562-2005
Inner Lens Joining Clip	562-2001
Lens Screw to suit 1000 Series End Lens	562-2009
Lens Screw to suit 1500 Series End Lens	562-2008
Lens Screw to suit 3000 Series End Lens	562-2007

## 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.

### ROTATOR

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Does not operate	Blown fuse	Check wiring, replace fuse
	No Power	Check control switches
Rotates but does not illuminate	Blown bulb	Replace bulb
Illuminates but does not rotate	Failed Motor	Replace rotator unit
Does not maintain correct speed	Failed motor	Replace rotator unit

### CLEVERSECTOR

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Positions correctly but does not illuminate	Blown bulb	Replace bulb
	Failed flex wire	Return cleversector for repair
An individual function does not work	No power to that function	Check for power at cleversector, check switches and fuses
Moves continuously with lamp off when any function selected	Failed position sensor	Return cleversector for repair

### STROBE LIGHT

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
No strobes operate	No power supply	Check fuses and red/black wires to strobe power-supply
	No control signal(s)	Check for power on coloured control wires
One strobe head does not flash	Failed strobe-tube	Check strobe head by connecting to a different output from the power-supply
Fuse blows repeatedly	Failed power-supply	Replace power-supply

### LED LIGHTHEAD

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Does not function	Poor power or ground connection	Check for power on the red wire at the control module. When power is first applied, a red led on control module should illuminate for a second and then turn off
	Blown fuse	Check wiring, replace fuse.
One LED head does not flash, but corresponding indicator LED on control module does flash	Open circuit wiring from control module to LED head	Connect a known-good LED head to the problem output to ensure the control module is working correctly. Repair or replace.
	Poor ground connection at LED head	Tighten or replace mounting screw and star washer
	Failed LED head	Replace LED head
	24V head in 24V system	Check correct LED head
One LED head does not flash, and corresponding indicator LED on control module does not flash when appropriate pattern selected	Wrong flash configuration	Call factory for reconfiguration instructions
	Failed control module	Replace control module
LED head flashes dimly	24V head in 12V system	Check correct LED head
Control module runs excessively hot	12V head in 24V system	Check correct LED head
Incorrect flash patterns	Wrong flash configuration	Call factory for reconfiguration instructions
Secondary pattern does not function	Normal operation	Primary function overrides secondary function—turn off primary function

**ALLEY / TAKEDOWN / WORKLIGHT**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Light does not function	Blown bulb	Replace bulb
	Blown fuse	Check wiring, replace fuse
	No Power	Check control switch output

**HALOGEN FLASHER**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Both/all lights do not function	Blown fuse	Check wiring, replace fuse
	No power	Check control switch output
	Blown bulbs	Replace bulb
	Failed flasher unit	Replace flasher unit

**SAFETY DIRECTOR**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
All lights turn on and stay on	Reverse battery connection	Check wiring
Keypad does not operate	Blown fuse	Check wiring, replace fuse
	No power	Check power to safety director
	Bad connection between safety director and keypad	Check data cable connections
Keypad continually flashes and won't respond to buttons	Keypad unable to communicate with safety director	Check data cable connections
One or more lights do not flash	Blown bulb(s)	Replace bulb(s)
	Wrong controller setup	Refer safety director manual for setup instructions on number of light-heads and end style
	Bad connection between light-head and driver	Check internal wiring
Lights flash dimly	Night-mode selected	Push night-mode button
	Wrong voltage bulbs	Check bulb types

**LED MESSAGE DISPLAY**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Controller does not function	Blown fuse	Check wiring, replace fuse
	No power	Check power to display
	Bad connection between display and controller	Check data cable connections
Controller operates normally, but display does not respond	Bad connection between display and controller	Check data cable connections
Dead pixels (LEDs always on or off) on display unit	Failed display unit	Return display unit for repair

## **Manufacturer Limited Warranty and Limitation of Liability:**

Manufacturer warrants that on the date of purchase this product will conform to Manufacture's specifications for this product (which are available from Manufacturer upon request), and Manufacturer further warrants that this product is free from defects in materials and workmanship. This Limited Warranty extends for twenty-four (24) months from date of purchase. Other warranties may apply, call Manufacture's for details. Manufacturer will, at it's discretion, repair or replace any product found by the Manufacturer to be defective and subject to warranty.

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12 Wedgewood Road, Hallam  
Victoria, Australia, 3803  
Tel: (61-3) 9796 5880  
Fax: (61-3) 9796 5885  
<http://www.warningsystems.com.au>  
Email: [sales@warningsystems.com.au](mailto:sales@warningsystems.com.au)