INSTALLATION AND INSTRUCTION MANUAL

STARLASER®

Ultra Low Profile Modular Lightbar

PROUDLY MADE IN THE USA
An ISO 9001:2008 Certified Company

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PLIT414 REV. F 3/2/17

These lightbars contain one or more of the following light sources: Strobe Lights, Halogen Lamps, and/or High Intensity LED Lamps. DO NOT stare directly into any of these light sources as temporary blindness and/or permanent eye damage may occur.

It is the sole responsibility of the owner to ensure the lightbar is mounted securely. Check your light every time you enter the vehicle to ensure that it is mounted securely. The manufacturer assumes no responsibility for the secure mounting of this light.

PLEASE NOTE: THE DIRECT MOUNT IS THE STANDARD MOUNT INCLUDED WITH THE LIGHTBAR.
THE HOOK MOUNTS MUST BE USED ON ALL POLICE AND/ OR OTHER EMERGENCY VEHICLES!!!

THE HOOK MOUNTS ARE SOLD SEPARATELY. THEY ARE NOT INCLUDED WITH EACH LIGHTBAR. THEY MUST BE ORDERED SEPARATELY. SEE THE ACCOMPANYING HOOK MOUNT MANUAL FOR A COMPLETE LIST OF AVAILABLE MOUNTS AND KNOWN VEHICLE APPLICATIONS.

When mounting your lightbar, please be sure to keep any radio frequency sensitive equipment at least 20" from the bar and power cable(s). This is especially critical in lightbars utilizing strobes. Our strobe power supplies have been designed to limit RFI emissions, but certain very sensitive equipment may still be affected. Symptoms may include, but are not limited to, sporadic operation and degraded performance. Star Headlight & Lantern Co., Inc. cannot assume any responsibility for any radio frequency induced malfunction or damage to any radios, sirens, lightbars, or any other equipment mounted within 20" a strobe lightbar. Any antennae mounted in the proximity of the lightbar may cause your radio to suffer the aforementioned results.

NOTICE

Due to continuous product improvements, we must reserve the right to change any specifications and information, contained in this manual at any time without notice. Star Headlight & Lantern Co., Inc. makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Star Headlight & Lantern Co., Inc. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

Table of Contents

Please Note: These instructions are provided as a general guideline only. *Some vehicles may require special mounting, wiring, and/or weather-sealing. This is the sole responsibility of the installer.* Star Headlight & Lantern Co., Inc. assumes no responsibility for the integrity of the installation for this or any of its products.

Mounting Instructions

Please review the separate Mounting Bracket manual that is also enclosed with your bar for mounting instructions.

Wiring Instructions

All standard lightbar models are designed for 12VDC negative ground vehicles only. Reverse polarity may cause serious damage to the lightbar and/or vehicle. Contact the automotive dealer if there are any doubts about the polarity of your vehicle.

⚠ *RF INTERFERENCE*

Please take the following steps to help eliminate any Radio Frequency Interference (RFI) with your two-way radio.

- *DO NOT* run the power wire for the lightbar along same path as any antenna wires.
- *DO NOT* run the power wire for the lightbar along same path as any radio power wires.
- *DO NOT* tap power for the lightbar off of the radio power wires.
- *DO NOT* mount the lightbar within 20" of any antennae. Sometimes mounting the lightbar or antenna over by just one foot can make a large difference in the interference.
- Ensure the black wire from the lightbar has a good connection to the ***negative side of the battery***.

- All standard Laser lightbars have two 15' harnesses. The first is a 2-conductor (plus a drain wire and a foil shield) "power harness" that has a RED power wire and a BLACK ground wire. The second harness is a 19-conductor cable (plus a drain wire and a foil shield) that is used to control the various functions of the lightbar. Any Laser lightbars with a traffic director (arrowstick) will also have a third, 10-conductor harness. All wires are color coded and sized at the correct gauge. If this length is not sufficient, it is recommended that the wire harnesses be completely replaced, with the only connections to be made directly at the terminal blocks inside the lightbar. This will reduce the number of wire connections and help prevent any weathering problems on these connections. Refer to the *Wire Harness Replacement* section on the page 5 for further instructions on this.
- **CAUTION: All wires and switches should be rated for at least 125% of their maximum current load.** In addition, the red power wire (from the Power Harness) should be connected to the positive terminal of the battery and fused at the battery for 125% of its rated load. The current for each component is shown on the Parts list on page 16. **Do not use** a 1/4" diameter glass fuse, as it is not suitable for continuous duty above 20 amps. If you are unsure of the current draw, please contact our Customer Service Department.
- **TESTING THE LIGHTBAR BEFORE IT IS PROPERLY FUSED WILL VOID THE WARRANTY!!**
- The black ground wire (from the Power Harness) should be connected to the negative terminal of your vehicle's battery. This wire should be at least #10 AWG wire and be as short as possible in order to minimize the voltage loss in this wire and reduce any chance of overheating.
- The *Control Wire Harness* section and diagram on the next page lists the different wire colors and the lights controlled by those wires. Your harness WILL contain all 19 of the colored wires, the drain wire, and a foil shield, although they may not all be utilized.

Wire Connections

PLEASE NOTE: If you need a cable longer than the existing 15-foot harnesses supplied with the lightbar, it is recommended that you completely replace the harness, rather than adding on to it. Please see the Wire Harness Replacement section on pages 5-6.

To aid with installation, the Laser lightbar utilizes two "shielded" wiring harnesses (three harnesses for models with a traffic director). One harness contains the "control wires" and is typically run to your switchbox, while the other harness contains the Power and Ground wires, which are typically run to the battery.

Control Wire Harness

The wire colors utilized in all of our Laser lightbars will always control the light heads in a *specific location(s)*. Please review the diagrams on page 4 for a complete list of wire colors used in each different length lightbar.

- Your Control Wire Harness will contain all 19 of the colored wires, the drain wire, and the foil shield. Most applications will not use every wire.
- The "dead" wires in the harness will be connected to the terminal block inside your lightbar, but if there are no heads in the corresponding locations inside the lightbar, then those wires will be non-functional.
- The "dead" wires can be used if you wish to move the location of any of the heads (i.e. you wish to move the takedown lights from the center to the outer location), or for additional components that may be added at some point in the future.

Control Harness Wire Colors

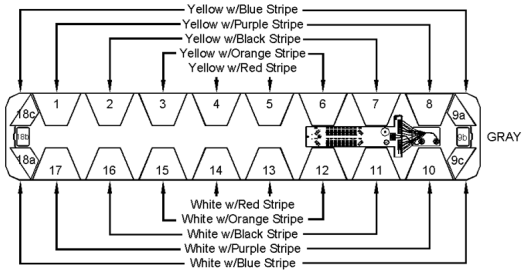
Lightbar Location	*Apply +12VDC to:*
18b	Blue *(Left Alley)*
9b	Gray *(Right Alley)*
18c/9a	Yellow w/Blue Stripe
1/8	Yellow w/Purple Stripe
2/7	Yellow w/Black Stripe
3/6	Yellow w/Orange Stripe
4/5	Yellow w/Red Stripe
18a/9c	White w/Blue Stripe
10/17	White w/ Purple Stripe
11/16	White w/Black Stripe
12/15	White w/Orange Stripe
13/14	White w/Red Stripe

Feature	*Apply +12VDC to:*
Fr. Takedowns	Green w/Yellow
Rear Worklights	Green w/White
Pattern Select	Red w/Green ***(TEMP)***
Left Turn Signal	Yellow
Right Turn Signal	Green
Tail Lights	Brown

Feature	*Connect to Ground:*
Low Power	Purple

Note:
The "drain" wire in both harnesses should be connected to a good chassis ground.

58"



Connect the appropriate wires from the Control Wire Harness to your switchbox (user provided). Whenever +12VDC is applied to any of the wires, the corresponding heads will be activated *(as long the red wire from the Power Harness is connected to +12VDC and the black wire from the Power Harness is connected to the negative side of the battery)*.

(Wire Connections CONT'D)

RED w/GREEN: (Pattern Select) - See ***LED Flash Pattern Selection*** section on page 8.

GREEN w/YELLOW: (Front Takedowns) - See the ***Takedown, Worklight, or Traffic Director Head Programming*** section on page 8.

GREEN w/WHITE:(Rear Worklights) - See the ***Takedown, Worklight, or Traffic Director Head Programming*** section on page 8.

PURPLE: (High/Low) - Used if you to switch your lightbar to low power at night.

- Disconnected for constant high power.
- Connect to ground through a switch to allow switching to low power (low when purple connected to ground).
- Non-Dimmable: Steady Burn Pattern, Steady Burn Alley, Takedowns, Work Lights

Note: The low power setting decreases the light output of emergency warning lights, thus reducing their effectiveness. Star does not recommend the use of low power mode in brightly lit areas (including daylight). Lightbars running on low power may not comply with applicable emergency warning light standards and/or specifications.

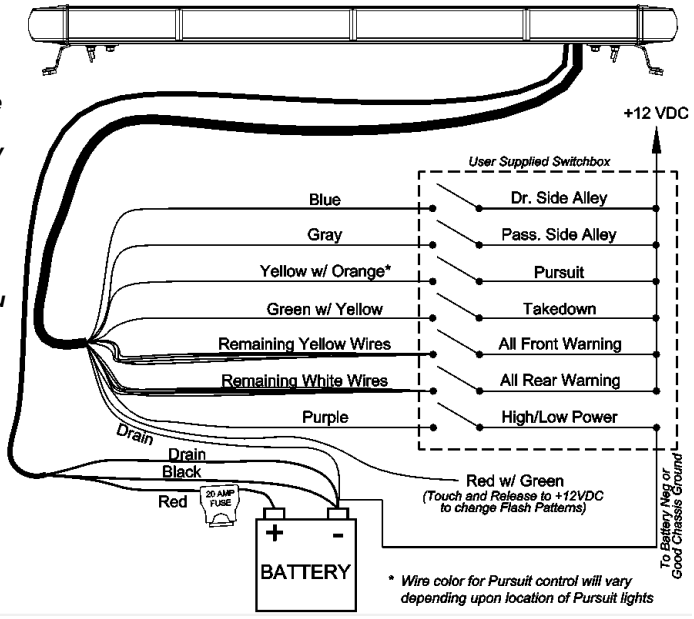
Power Wire Harness

The second harness will contain a red Power wire, a Black Ground wire, and a drain wire.

- Connect the black wire and the drain wire to the negative side of the battery.
- Connect the red wire to the positive terminal of the battery through a fuse at the battery for 125% of the rated load of all your components. The current for each component is shown on the Parts list on page 16. **Do not use** 1/4" diameter glass fuses, as they are not suitable for continuous duty above 20 amps.

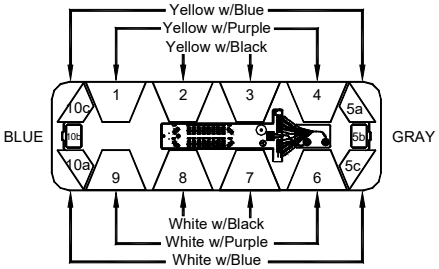
Please Note: *When the red wire is connected to +12VDC the lightbar will draw a small current (~100 mA). If your vehicle will be sitting for extended periods of time (i.e. more than a few days), it is recommended the red wire be routed through a switch or ignition switched relay.*

The diagram to the right shows the most common way to hook up a 46" Police lightbar. Connect your bar in a similar fashion, based upon the wires you will be utilizing in your Control Harness.

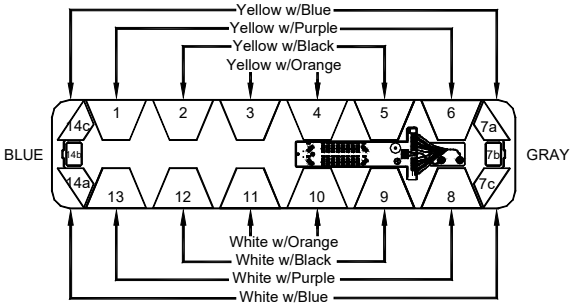


Control Wire Colors

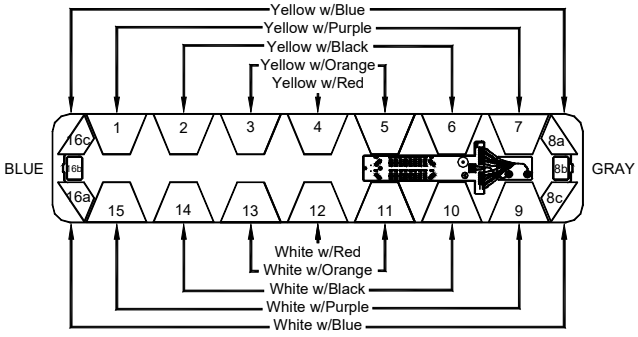
34"



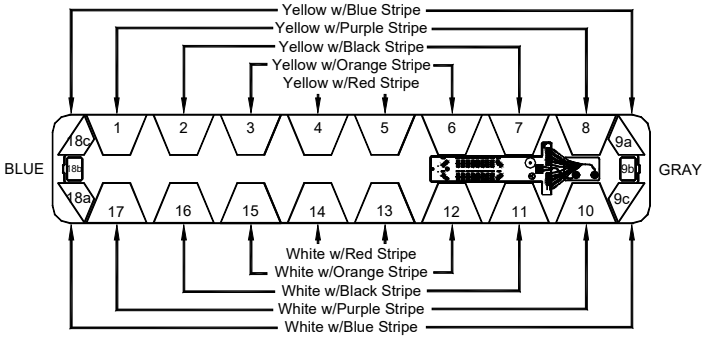
46"



52"



58"



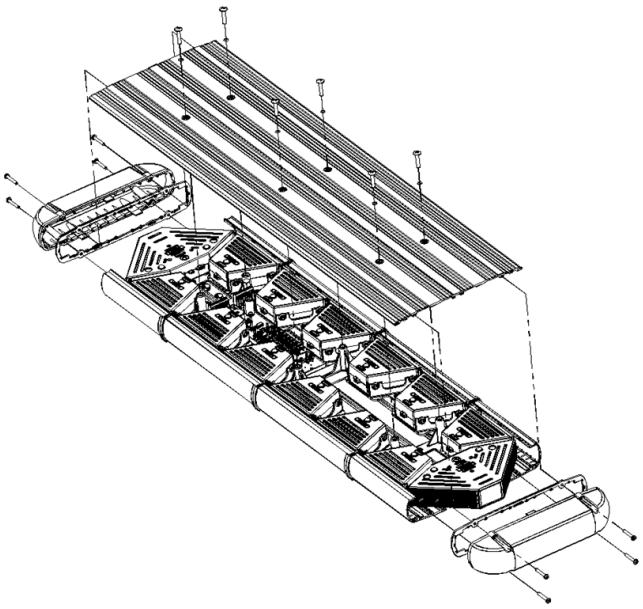
Wire Harness Replacement

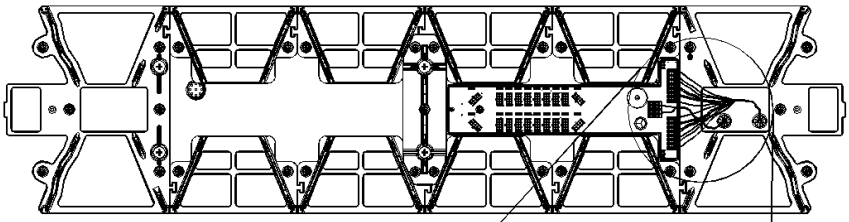
If you are using the existing 15-foot harnesses supplied with the lightbar, you may skip to the LED Head Programming ***section on page 7.***

Standard Laser lightbars come with two 15-foot wiring harnesses: a 2-conductor harness for Power and Ground, and a 19-conductor harness for the control wires. Laser lightbars with a traffic director (arrowstick) will have three harnesses. If any of the harnesses supplied with the lightbar is not long enough for your application, Star recommends ordering the proper cable of the desired length from the factory. Completely remove the pre-installed wire harness(es) and replace it (them) with one that is the correct length.

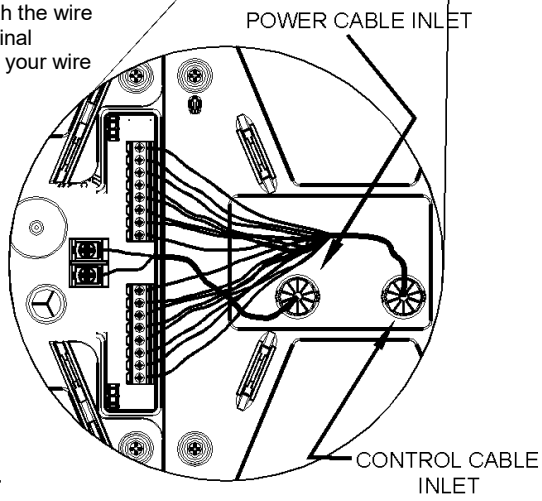
- *Star recommends direct wiring to the terminal block(s) on the inside of the lightbar, rather than making connections to the end of the wire that is supplied.*
- *This lightbar is designed so that when replacing the wire harness(es), no wire connectors are needed and only a few common tools are necessary.*
- *Direct wiring allows the wire connections to the lightbar to be made in a clean and dry environment, avoiding any problems that may arise due to weathering on external connections.*
- *Wiring directly inside the lightbar reduces the number of connections. There is an increase in voltage loss with the addition of each connection.*
- *Making connections to the wires already provided is an acceptable alternative, as long as these connections are good electrical connections and are resistant from weathering effects.*

1. To replace the wire harness(es) you will need to access the inside of the lightbar. Remove the endcaps by removing the four screws from each end and the screws that hold the top extrusion on the lightbar (ex. 6 screws on a 46” lightbar), and carefully lift the top off of the lightbar *(as shown below)*.

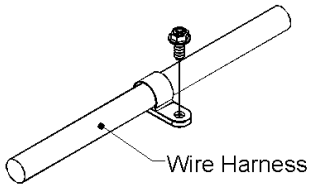




2. Locate the end of the lightbar with the wire harness attached to it. The terminal blocks, which you will be making your wire terminations to, are also located at this same end. The two harnesses enter the bar through separate openings and are each fastened to the extrusion with a small clamp.



3. Remove the screw that attaches the cable clamp to the extrusion.

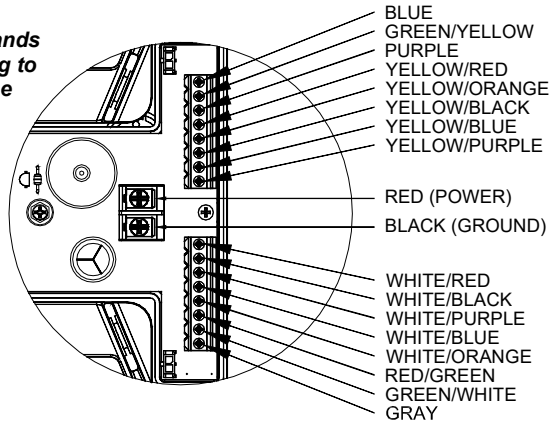


4. Loosen the screws that secure the wires in each terminal block, and slide the old harness(es) out through the inlet.

5. Run the new external harness up through the wire bushing into the base and into the terminal blocks. ***Take extreme caution*** that none of the wires frays at the end, shorting out to the adjacent terminal and/or adjacent wire.

6. Strip each wire 1/4". Connect each wire to the proper terminal, as indicated in the diagram below, by inserting the stripped portion of the wire under the rising clamp screw and tightening down the screw. No wire terminals are needed for connecting wires to this terminal block.

   Be sure to check that no strands of wire are loose and shorting to the adjacent terminal or to the base of the lightbar.



7. Once your new wire harness has been connected to the lightbar, secure it with the cable clamp and reassemble the top extrusion and endcaps. Then you may continue to the *Wire Connections* section.

Optional LED Head Flash Programming

All LED heads installed at the factory will already be pre-programmed with a default Flash Pattern and programmed for an appropriate Phase. If the default flash pattern is acceptable, you can skip to the Takedown, Worklight, or Traffic Director Head Programming ***section on the next page.***

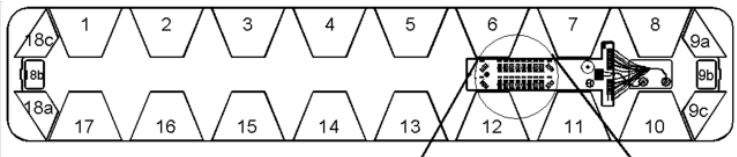
LED Head programming consist of two options, **Phase** and **Pattern**:

Phase: Each light head in the Laser lightbar can be set for one of two phases. Two heads that are set for the same phase will flash at the same time (simultaneous) and two heads set for opposite phases will flash opposite of one another (alternating).

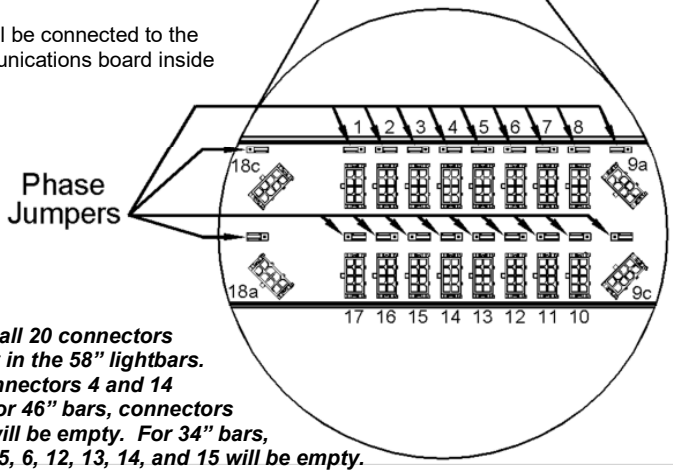
Pattern: Each LED head has 10 programmable patterns. If you have a pair of LED heads that are both activated by the same color control wire *(see page 4)*, they will be programmed together. All LED heads that will be utilizing the same pattern should be programmed together. Do so by activating all of the appropriate control wires together, and then programming them.

Phase Selection

1. Remove the top extrusion from the lightbar as described on page 5, under the ***Wire Harness Replacement*** section.



2. Each lighthead will be connected to the "T" shaped communications board inside the lightbar.



Please note that all 20 connectors will be used only in the 58" lightbars. For 52" bars, connectors 4 and 14 will be empty. For 46" bars, connectors 4, 5, 13, and 14 will be empty. For 34" bars, connectors 3, 4, 5, 6, 12, 13, 14, and 15 will be empty.

3. Above each connector you will find the Phase Jumper. All of the heads that have the jumpers on the left two pins will flash on and off at the same time (if their control wires are activated). All of the heads with the jumpers on the right two pins will also flash together with one another, but they will also be flashing opposite the heads with the jumper on the left two pins.

LED Flash Pattern Selection

1. Connect the red wire to +12VDC, and the black wire to the negative side of the battery.
2. Activate the LED heads that you wish to program by applying +12VDC to the appropriate control wire (see page 4).
3. Briefly touch the red w/green stripe wire to +12VDC and release it **once ALL of the heads go out.** The next pattern will be displayed. Continue to briefly touch and release this wire to +12VDC until you find the pattern desired.
4. Once you have the pattern you like, turn the heads off. The heads will remember the pattern next time it is activated.
5. Repeat steps 1-3 for each additional heads you wish to program.
6. Once your programming is complete, tape the end of the red w/green stripe wire so that it does not come into contact with +12VDC.

LED Flasher Patterns

Pattern	*Warning Pattern Style*
1	Alternating Slow Single
2	Alternating Fast Single
3	Pursuit Mode ***(Alternating Quint Burst with Fast Alternating Single Flash) - Default Pattern***
4	Unsynchronized Quint Burst with Fast Alternating Single Flash *(Phase 1)*
5	Unsynchronized Quint Burst with Fast Alternating Single Flash *(Phase 2)*
6	Steady Burn ***(non-dimmable)***
7	Alternating Quintflash
8	Alternating Fast Doubleflash
9	Pursuit Mode 2 ***(Alternating Quint Burst , Fast Alt. Single Flash, Fast Alt. Doubleflash)***
10	Alternating Doubleflash w/Post Pop

SHORTCUT: *At any time during the programming sequence, you can reset the flash pattern back to the default mode (Pattern 3 – Pursuit) by holding the red w/green Pattern Select wire to +12VDC for 3 seconds, then releasing it after the light flashes once.*

Please note: If you do NOT release the wire after 3 seconds, once the bar reaches 6 seconds it will flash again and set the lights into an unsynchronized pattern that is typically NOT desired. If you accidentally enter this mode, simply repeat the LED Flash Pattern Selection instructions and use the 3 second shortcut to go back to the default pattern (#3).

Optional Takedown and Worklight Programming

If your lightbar came pre-configured with Takedown or Worklights the appropriate heads will already be pre-programmed for Takedown Mode compatibility, and you may skip this step.

If you wish to change the functionality of specific heads (e.g. change a flashing light to a Worklight), proceed below.

Takedown Lights - Refers to non-dimmable steady-burn lights pointed toward the front of the vehicle.

Worklights - Refers to non-dimmable steady-burn lights that point toward the rear of the vehicle.

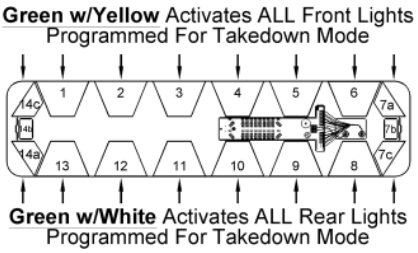
If your lightbar has a Traffic Director, you CANNOT use the rear worklight feature.

Takedown Mode Programming Summary

RED - +12VDC
BLACK - Battery Negative (-)

GREEN w/YELLOW *-(Front)* } +12VDC
or
GREEN w/WHITE *-(Rear)* }

- Activate the heads you want to program with +12VDC to Proper Control Wire *(see page 4)*
- Use RED w/GREEN to +12VDC to program.



GREEN w/YELLOW: Illuminates ***all*** of the front facing heads that have Takedown mode activated into a steady-burn mode.

GREEN w/WHITE: Illuminates ***all*** of the rear facing heads that have Takedown mode activated into a steady-burn mode.

NOTE: Before programming any heads for Takedown mode, examine the wires from the power harness and be sure the RED wire is connected to constant +12VDC, and the BLACK wire is connected to the negative side of the battery.

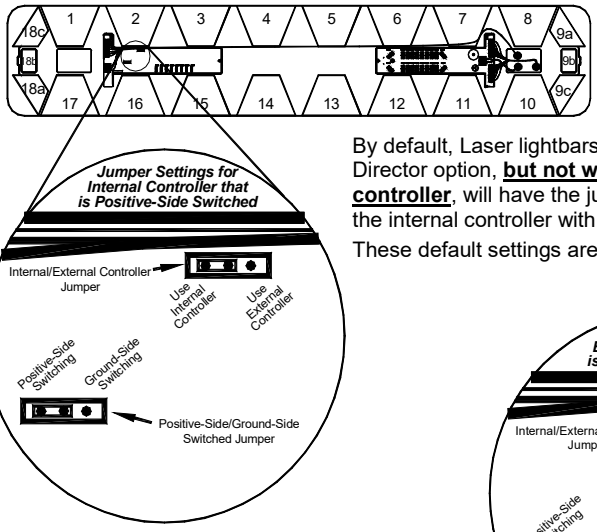
1. Apply +12VDC to all of the appropriate control wires for each front location *(see page 4)*. All of the corresponding lights should start flashing.
2. With the heads still flashing from Step 1, **also** connect the GREEN w/YELLOW Front Takedown wire to +12VDC.
   - Any lights that illuminate in a steady-burn mode are already programmed to act as takedowns.
   - Lights which continue flashing are NOT programmed for Takedown Mode.
3. Note which heads are already programmed for Takedown Mode and which are not, then disconnect the front control wires.
4. To program any flashing front heads for Takedown Mode or remove the Takedown Mode from any heads, leave the GREEN w/YELLOW wire connected to power and activate the heads you wish to change by connecting the appropriate control wire(s) *(see page 4)* to +12VDC.
5. Briefly touch the RED w/GREEN stripe wire to +12VDC and release it.
   - The heads that were flashing should now be lit in a steady-burn mode. This indicates that they are now programmed to activate as Takedowns whenever power is applied to the GREEN w/YELLOW stripe wire.
   - The heads that WERE NOT flashing should now be flashing, and are no longer in Takedown Mode.
6. Once you completed the programming, disconnect the control wires and the GREEN w/ YELLOW wire to turn the light off.
7. To add or remove Takedown mode for any of the rear heads, repeat steps 1-6, using the GREEN w/WHITE wire, instead of the GREEN w/YELLOW wire.
8. Once your programming is complete, tape the end of the RED w/GREEN stripe wire so that it does not come into contact with +12VDC.

Optional Traffic Director Setup

You may skip this section if any of the following is true:

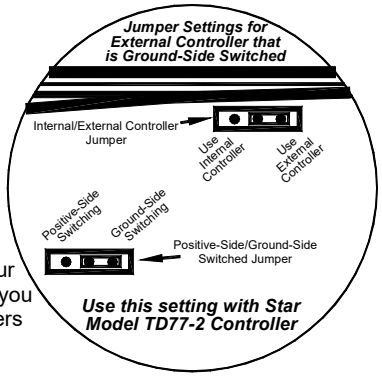
- ***Your lightbar is not equipped with a Traffic Director control circuit***
  or
- ***Your lightbar came with a TD77-2 Traffic Director Control Box and you will be using it***
  or
- ***Your lightbar came with the Traffic Director control circuit but it did not come with a controller and you will be using the internal controller with standard On/ Off switches that switch +12VDC***

The Laser Traffic Director circuit has two internal jumpers that will allow it to be operated through the internal controller via standard +12VDC On/Off switches, or to be operated with an external ground-side switched Traffic Director controller of some sort (e.g. Star model TD77-2).

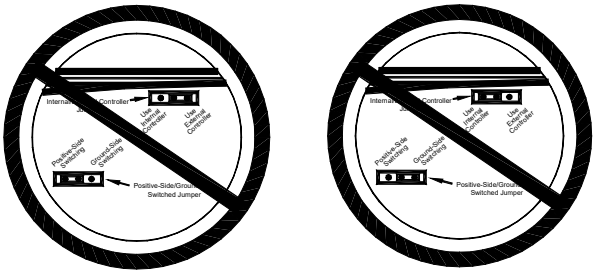


By default, Laser lightbars shipped with the Traffic Director option, **but not with the optional controller**, will have the jumpers set to operate using the internal controller with positive-side switching. These default settings are shown to the left.

If you will be using an **external Traffic Director controller** that is **ground-side switched**, such as our ***TD77-2***, set your jumpers as pictured to the right. If you ordered a TD77-2 with your Laser lightbar, the jumpers should already be preset for use with the TD77-2.



DO NOT use either of the configurations pictured below!! Your traffic director WILL NOT function properly.



Traffic Director Wiring and Programming

Note: **Connect all of the necessary wires from your standard lightbar harness PRIOR to connecting the traffic director harness.**

Internal Traffic Director Controller Wiring

If you will be using an external controller (such as the TD77-2) to operate your traffic director, skip to the **External Traffic Director Controller Wiring** section on page 13.

- Use of the internal (built-in) controller will require three (3) standard On/Off switches (user supplied). The three switches will individually operate the **Warn**, **Right**, and **Left** Patterns. Activating the Right and Left patterns both at the same time will produce a **Center-Out** Pattern.
- The traffic director functions will be activated by applying +12VDC to the appropriate wires.
- Only 6 of the wires from the Traffic Director Harness will be used. Connect them as described below.

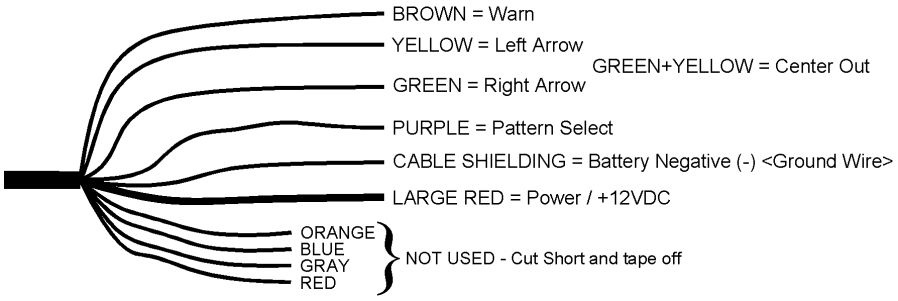
BROWN *(Activates WARN Pattern)*
YELLOW *(Activates LEFT Arrow)*
GREEN *(Activates RIGHT Arrow)*
*(Center-Out pattern displayed by Activating RIGHT and LEFT at the same time - **GREEN+YELLOW**)*

} These three wires should each be connected to +12VDC through three separate switches (user provided).

Silver **CABLE SHIELDING** *(RFI Reduction)* - Connect to the negative terminal of your battery (provides shielding and grounding).

LARGE RED *(Power)* - Connect to constant +12VDC.

PURPLE *(Programming)* - ONLY used during Programming. Touch and release to +12VDC to program ***Number of Heads*** and *Pattern Style* (described on the following page).



Internal Traffic Director Controller Programming

If you will be using an external controller (such as the TD77-2) to operate your traffic director, skip to the **External Traffic Director Controller Wiring** section on the next page.

Prior to utilizing the internal Traffic Director Controller, you must first program these two different options: *Number of Heads*
Pattern Style

Number of Heads

If your lightbar came with the internal traffic director controller and appropriate heads already installed, it will already be pre-programmed for the correct number of heads and you can skip this step and proceed to the Pattern Style ***section below.***

Determine how many heads in your Laser lightbar will be used for the traffic director and program the bar as described below:

With the LARGE BLACK wire *from the standard lightbar harness* grounded, and the LARGE RED wire *from the traffic director harness* connected to +12VDC, activate the WARN pattern by applying +12VDC to the BROWN wire *from the traffic director harness*.

If you have…	***Touch the purple wire to +12VDC for…***	***Heads will Blink***
6 Heads	3 seconds	One Time
7 Heads	6 seconds	Two Times
8 Heads	9 seconds	Three Times

Pattern Style

The Internal Traffic Director Controller allows you to select one of three different "Pattern Styles" you wish your bar to display when activated.

Standard: Starts at one end and adds lights until the bar is fully illuminated, then repeats.

End Blink: Same as Standard, but when the pattern gets to the end, the final light will "double blink" for increase conspicuity.

Rolling Pattern: Only two lights will be illuminated at one time. The two lights will "roll" in the direction of the selected arrow mode.

You can scroll through the three Pattern Styles using the PURPLE wire:

- With the LARGE BLACK wire *from the standard lightbar harness* grounded, and the LARGE RED wire *from the traffic director harness* connected to +12VDC, activate the LEFT pattern by applying +12VDC to the YELLOW wire *from the traffic director harness*.
- Briefly touch the PURPLE wire to +12VDC and release it (approx. 1 sec.) to scroll through the three different Pattern Styles listed above.
- Once you have properly programmed the ***Number of Heads*** and the ***Pattern Style***, you should "cap off" the end of the PURPLE wire so that it does not come into contact with anything.

If your lightbar came with the internal traffic director controller you can skip this section. The instructions below only apply if you will be using the TD77-2 external Traffic Director Controller.

External Traffic Director Controller

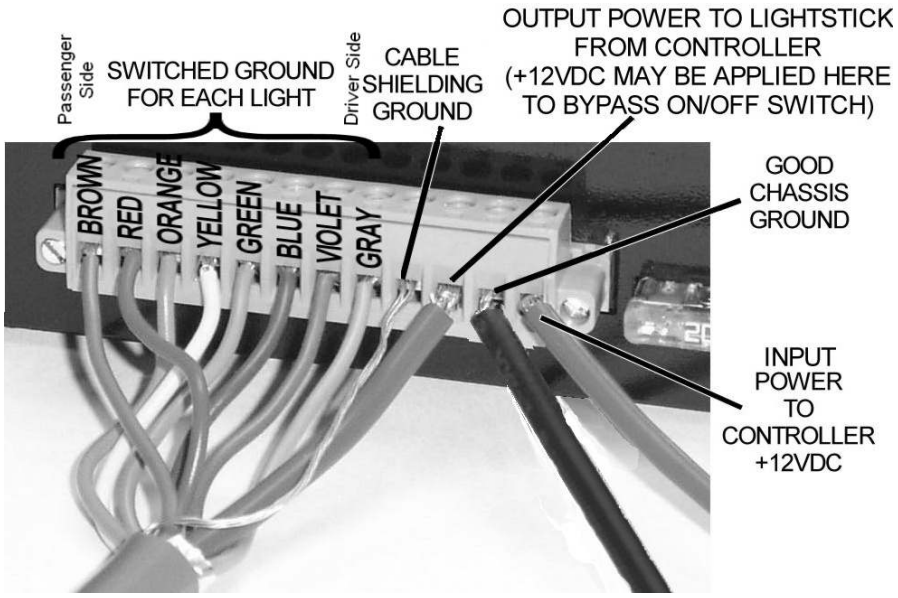
If you will be using an external controller (such as the TD77-2) to operate your traffic director, use all of the wires in the harness and connect them as described in the manual shipped with your controller.

Be sure that you have set your jumpers correctly, as described on page 10.

Follow the instructions included with your controller for any possible jumper settings, programming options, and operational information.

If you are using the TD77-2 controller, you may reference the picture below.

TD77-2 Connections



If you are using an alternate ground-side switched controller of some sort, refer to the diagram above for proper connection of the 8 wires that control each head in the traffic director. They are in the same order as the lightstick, with the gray wire illuminating the furthest left light (driver's side).

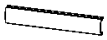
Replacement Parts

720-23-*
END DOME

720-23C/O-*
END DOME

720-21S-*
SHORT SIDE LENS

720-21M-*
MEDIUM SIDE LENS



720-21L-*
LONG SIDE LENS

30047-101
END DOME GASKET

720-22
SIDE LENS CLIP

30047-100
SIDE LENS CLIP GASKET

30019-124
FRONT/REAR BLOCK OFF PLATE

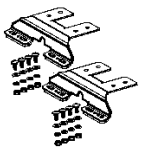
30047-104
EXTRUSION/LENS GASKETING
(1 FOOT)

P30047-131
FOAM GASKETING FOR EXTRUSION SLOTS
(1 FOOT)

P30054-8
#10 x 1" END DOME SCREW

30056-35
1/4"-20 X 1-1/4"
TOP EXTRUSION SCREW

30076-10
TOP EXTRUSION SCREW WASHER



720-39
DIRECT MOUNT KIT

HOOK MOUNTS
THESE ARE PICTURED IN THE HOOK MOUNT MANUAL AND WORK IN CONJUNCTION WITH THE 720-39
*=COLOR

S720-9* ***(0.5A)***
LINEUM LED LIGHTHEAD

S720-9** ***(0.5A)***
DUAL COLOR LINEUM LED LIGHTHEAD

S720-9T** ***(0.5A)***
LINEUM TRAFFIC DUAL COLOR LED LIGHTHEAD

S720-12-** ***(1.5A)***
HIGH DENSITY 12-LED LIGHT HEAD

S720-18-** ***(1.5A)***
HIGH DENSITY 18-LED LIGHT HEAD

720-3* ***(0.8A)***
STARBURST LED LIGHTHEAD

720-6S ***(0.7A)*** 720-6 ***(0.35A)***
LED ALLEY LIGHT LED END WARNING LIGHT

720-9*6S-9* ***(1.7A)***
LINEUM END LED LIGHTHEAD
w/LED ALLEY LIGHT

720-12*6S12* ***(3.7A)***
12-LED H.D. END LED LIGHTHEAD
w/LED ALLEY LIGHT

720-18*6S18* ***(3.7A)***
18-LED H.D. END LED LIGHTHEAD
w/LED ALLEY LIGHT

720-3*6S3* ***(2.3A)***
STARBURST END LED LIGHTHEAD
w/LED ALLEY LIGHT

720-9*6*9* ***(1.35A)***
LINEUM END LED LIGHTHEAD
w/END LED WARNING LIGHT

720-12*6*12* ***(3.35A)***
12-LED H.D. END LED LIGHTHEAD
w/END LED WARNING LIGHT

720-18*6*18* ***(3.35A)***
18-LED H.D. END LED LIGHTHEAD
w/END LED WARNING LIGHT

720-3*6*3* ***(1.95A)***
STARBURST END LED LIGHTHEAD
w/END LED WARNING LIGHT

720-9*BO9* ***(1.0A)***
LINEUM END LED LIGHTHEAD
w/END BLOCK OFF PLATE

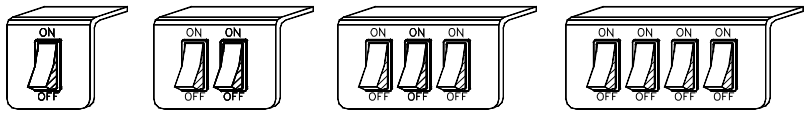
720-12*BO12* ***(3.0A)***
12-LED H.D. END LED LIGHTHEAD
w/END BLOCK OFF PLATE

720-18*BO18* ***(3.0A)***
18-LED H.D. END LED LIGHTHEAD
w/END BLOCK OFF PLATE

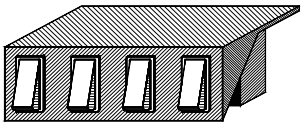
720-3*BO3* ***(1.6A)***
STARBURST END LED LIGHTHEAD
w/LED w/END BLOCK OFF PLATE

Please note that these items are not drawn to scale.

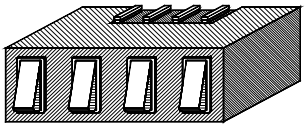
Switch Panels and Switch Boxes



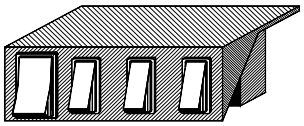
SP3860-1 **SP3860-2** **SP3860-3** **SP3860-4**



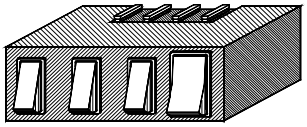
SP1515



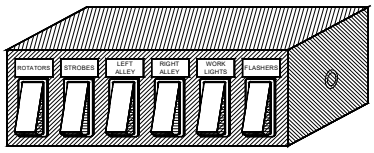
SB1515



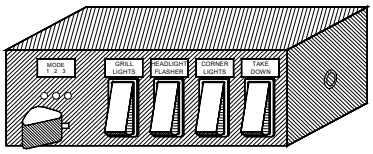
SP3015



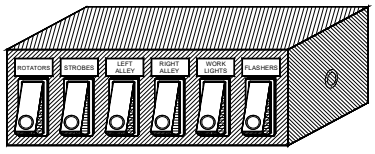
SB3015



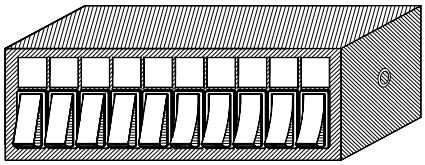
SB4020



SB4040



SB4020T



SB4425

CAUTION: High voltages can exist in many of our products. Before attempting service on any of our products, be sure to disconnect power for at least five minutes to allow any capacitors to discharge. Failure to heed this warning may result in severe electrical shock and/or injury

Please Note: Many failures can be traced to wiring and/or battery problems. Before attempting service on the product itself, please be sure to check all connections and wiring to ensure that the correct voltage and/or polarity is

Troubleshooting Guide

If a light on your bar fails to work, please refer to this section to help solve your problem. If you still cannot resolve your problem, please contact our ***Customer Service Department*** *at 585-226-9787.*

The chart below contains some basic guidelines for troubleshooting any problems you may experience with your bar. The section following the chart will explain in further detail how to perform some of the troubleshooting tasks.

Symptom:	Possible Solutions
One single LED light is Out	LED Head needs to be replaced
One head does not flash or illuminate	Check mini harness between Connector Board and defective head to see if it is loose (not fully inserted) or damaged If the control wire for that head only controls 1 head, check that +12VDC is applied to the appropriate control wire. Check head
Multiple heads not flashing or illuminating	Check power to terminal block Check that the bar is properly grounded Check that +12VDC is applied to control line for those heads Check that the red w/green stripe pattern select wire is not connected to +12VDC

Determining if the bar is properly grounded:

1. While the bar is turned on, using a test meter, measure the voltage from the base of the bar itself to the negative post of the battery or a good chassis ground if the battery can't be easily reached. You may need to scrape away a bit of anodizing or paint in order to ensure a good connection with the probe of your test meter.
2. If the difference shown is greater than .25 volts, then your ground is not sufficient.
3. If the ground is insufficient, locate the ground wire connection in your lightbar by removing the top extrusion *(see page 9)*, exposing the area where the wires enter the bar. The ground wire is the large (10AWG) black wire found in the Power Wire Harness. Check the integrity of the connection of the ground wire to both the terminal block inside the lightbar and at the other end to the negative side of the battery.
4. While inspecting the ground wire connections you should also check that the wire itself is not damaged. Carefully inspect the wire along its entire length, paying special attention to those areas where the wire passes through any holes that may have sharp edges, which can damage the wire, and the areas where the wire makes any sharp bends.

Checking the power to the terminal block
(Determining if the proper voltage is reaching your bar):

1. Locate the terminal block in your lightbar by removing the top extrusion and endcaps *(see page 9)*. After the harnesses enter the bar, the wires will be connected to the terminal blocks with a number of small screws.
2. With the bar turned on (all control wires activated), use a test meter to test the voltage at the terminal block, for each individual wire. A nominal 12.5 volts should be present (except for the black wire, red w/green stripe, and purple wires). Low voltage can cause erratic flashing in strobe heads or even complete failure of the heads. A minimum of 10 volts should be present for the heads to operate properly. Low voltage can result in lowered intensity or even complete failure.
3. Be sure to test each wire that comes into the terminal block for proper voltage.
4. Carefully inspect each wire in the terminal block. Check that the ends of the wires have not frayed and shorted against one another or against the base. This may cause lights to operate inadvertently or may result in the failure of lights.

Checking one non-working head:

If a problem exists in only one head, the head may be defective, or there may be an open electrical connection or short in the mini harness.

1. Disconnect the mini harness from the back of both the faulty head and a working head. Carefully lift them both out of the lightbar and place the faulty head in the location the working head previously occupied.
2. Plug the mini harness that was formerly connected to the good head, into the back of the faulty head.
3. Activate the wire/function that controls that particular head location in the lightbar *(see pg. 8)*.

   If the formerly faulty head now works in the new location, the problem lies in the other mini harness (connected to the location that this head was formerly in). Verify this by plugging the other head (the original good head you just unplugged) into the position that previously had the non-working head. It should also fail in this position. If so, check connections at and between the Connector Board and the faulty head. If necessary, replace the defective mini harness.

   If the faulty head still does not work, then the problem lies in the head itself. If the head contains a halogen bulb, check that the bulb is still good. If the head uses a different light source (i.e. LED or strobe), then the head must be replaced.

Checking multiple non-working strobe or LED heads:

If two or more of the heads connected to the same switch are not flashing, follow these steps to determine the problem:

1. Check that the bar is grounded properly as explained on the previous page.
2. Check all fuses, including those at the battery, at the switch panel, and in the dash (if applicable). Remove these fuses, and check them to confirm they have not blown. Replace any blown fuses with only fuses of identical values. Replacing the fuse with the wrong rating may damage your pack and/or vehicle, and will void your warranty.
3. Check that there is NO VOLTAGE on the Red w/Green Stripe wire (Pattern Select wire). Measure the voltage at the terminal block between the Red w/Green stripe wire and a good chassis ground. If there is voltage being applied to this wire, it will prevent the heads from flashing.
4. Check the power on the red power wire and the corresponding control wires at the terminal block as explained on the previous page. If sufficient voltage is not reaching the terminal block perform the following tests:
   a. With the vehicle turned off and while the pack is running, measure the battery voltage *at the battery*. A nominal 12.5 volts should exist. Note this voltage. If this voltage is below 10.0 volts the bar will not function properly and the problem is with the battery. This reading should not be more than 1-1.25 volts higher than the reading taken from each wire at the terminal block. If there is an excessive difference then continue on to the next step.
   b. With the vehicle not running and the lightbar on, measure the voltage in the red wire by taking a reading from the positive side of the battery to pin 1 of your switch. If this reading exceeds 0.25 volts then there is a poor connection between the switch and the battery in the red wire and it should be checked.
5. If the leads in one of the heads have shorted out, the output voltage of the other heads may be held down as well. To test for this, unplug all of connectors for all of the faulty heads ***at the Connector Board***, and plug them in individually, one at a time. If your problem is a result of a shorted head (or harness), then the other heads should function properly if the faulty head is no longer connected. Note: A burned out strobe tube does not cause a short and will not affect the operation of the remaining heads.
6. If the problem is with one of the heads and/or mini harnesses, try that non-working head in a different location to determine whether it is the head or harness that is bad.
7. If the problem is not with a shorted head and if proper voltage is reaching the terminal block, then the problem is most likely internal to the “T” shaped Connector Board.

LED FIVE YEAR LIMITED WARRANTY

The manufacturer warrants the **LED components** in this light against factory defects in material and workmanship for **five years** after the date of purchase. The owner will be responsible for returning to the Service Center any defective item(s) with the transportation costs prepaid. The manufacturer will, without charge, **repair or replace *at its option***, products, or part(s), which its inspection determines to be defective. Repaired or replacement item(s) will be returned to the purchaser with transportation costs prepaid from the service point. A copy of the purchaser's receipt must be returned with the defective item(s) in order to qualify for the warranty coverage. If a copy of the receipt is not provided, the warranty period shall cover the LED components five years from the date of manufacture.

Exclusions from this warranty include, but are not limited to, bulbs, strobe tubes, domes, and/or the finish. This warranty shall not apply to any light, which has been altered, such that in the manufacturer's judgment, the performance or reliability has been affected, or if any damage has resulted from abnormal use or service. This warranty does not apply to defect or damage occurring as a result of disaster, accident, abuse, misuse, lightning, power surges, or failure to follow instructions in any enclosed manuals. Any damage or defects occurring as a result of any unauthorized service or repairs by unauthorized persons shall be excluded from this warranty.

There are no warranties expressed or implied (including any warranty of merchantability or fitness), which extend these warranty period. **The loss of use of the product, loss of time, inconvenience, commercial loss or consequential damages, including costs of any labor, are not covered.** The manufacturer reserves the right to change the design of the product without assuming any obligation to modify any product previously manufactured.

This warranty gives you specific legal rights. You might also have additional rights that may vary from state to state. Some states do not allow limitations on how long an implied warranty lasts. Some states do not allow the exclusion or limitation of incidental or consequential damages. Therefore, the above limitation(s) or exclusion(s) may not apply to you.

If you have any questions concerning this or any other Star product,
please contact our **Customer Service Department** at (585) 226-9787.

If a product must be returned for any reason,
please contact our Customer Service Department to obtain a
Returned Materials Authorization number (RMA #) before you ship the product to Star.
Please write the RMA # clearly on the package near the mailing label.

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