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BOOGEY LIGHTS

Family Owned Motorsports Lighting Since 1989!

INSTALLATION GUIDE

KENWORTH W990 STACKS BACKLIGHT LED LIGHT KIT

IMPORTANT! No two installation scenarios are the same. Accent lighting is highly subjective. Not everyone shares the same lighting or installation quality goals. Some folks are OK with twisting wires together, others want to solder and heat shrink them. Some folks are OK with running wires where they may be seen or unprotected to save money/time, others want a tidy, clean install so they wrap plastic split-loom around all exposed cables. Some folks are OK with mounting their LED strips to whatever surface they can find, others want to take the time necessary to build out appropriate mounting surfaces to provide the best lighting effect on their vehicle and maximize the longevity of their lighting system. The point is it's not possible to provide all the materials necessary for all installation scenarios on all types of vehicles to meet everyone's quality goals. Our light kits provide the essential components needed for a high-quality, functioning lighting system. Installation of our light kit to your specific vehicle will however likely require additional items to make it look, fit and work the way you want. This is particularly the case with electrical wiring, switching functionality and mounting surfaces for the LED strips. We have created a list of additional items you may need. Here's the link: **https://www.boogeylights.com/other-items-you-might-need/** . While we offer them for sale you can also find these items locally. We urge you to review this information before starting your install.

BENCH TEST YOUR LIGHTING COMPONENTS FIRST!

We know this takes a few extra minutes, but we STRONGLY suggest you bench test your lights AND your controller / switches on a table before doing anything further. Test all of them. While we test every light strip and controller before shipping, bench testing your lights will eliminate the possibility of any problems with the lights or controller before mounting. It also lets you know everything is working properly. Also, the process of bench testing gives you an opportunity to understand the wiring system without interference from other wires, connectors and cables. You can use any 12vdc battery to do this (e.g. car battery, motorcycle battery, lawn tractor battery or 12vdc power supply). If you're not sure how to bench test, download this pdf: https://docs.boogeylights.net/?wpdmdl=1305 . Bench testing takes an extra 10 or 15 minutes. It's simple to do and can potentially save you hours of time and frustration down the road.

Did we mention the importance of bench testing every LED strip and controller first?

THIS IS A GUIDE. NOT A HOW-TO. It's simply not possible to provide detailed instructions for all installation scenarios. Far too many variables. The information in this document is intended to be used as a guide. It is not a detailed step-by-step how-to installation manual. We do not spell out every single step along the way. We cover the essential steps related to installing this kit. Beyond that we assume the installer has the skills, knowledge and tools necessary to do the work using the information we provide as a guide. You may need to vary your installation and/or make adjustments based on your vehicle. This is particularly the case with led strip mounting locations, electrical wire routing, electrical connections, electrical load sizing and switching. If you're unsure about how to do the installation – particularly the electrical components – we urge you to seek assistance from someone who has those skills.

YOU MUST HAVE AN UNDERSTANDING OF 12V POWER. An essential skill with installation of any Boogey Lights LED products is knowing how to correctly wire the product to a 12vdc circuit. This includes understanding the importance of having a properly sized fuse at the power source, polarity, how to properly seal an electrical connection, using properly sized wire gauge for the load, measuring voltage and measuring the additional amperage draw you're adding. If you are uncertain or unfamiliar with any of these concepts, we urge you to ask someone who has the knowledge to assist you. Electricity is unforgiving.

MOUNTING SURFACE. How and where you mount your LED strips will for the most part determine the longevity of your lighting system. If you mount the LED strips to smooth, clean, continuous, straight, flat surfaces as we recommend, you can expect your lighting system to last for many years

SECURE THE POWER LEADS. Make sure the power lead wire that connects to one end of the LED strip is firmly secured to the boat. Do not allow that power lead to move or flex at the point where it attaches to the LED strip. If you do, it will fail prematurely and is not covered under warranty.

INSTALLATION TIME. We suggest allocating 2 to 4 hours to properly install this light kit.

RGB/MULTI-COLOR KIT Installations: Installation of this led light kit takes 2 to 4 hours depending on whether or not you're adding this light kit to an existing installation or installing this kit as a stand-alone. If the LED Controller is already installed with another kit (e.g. Under-Glow), this kit will simply tie into that controller. If you need to also install the LED Controller, it will take additional time to do this. Wiring diagram is included at the end of the guide.

SINGLE / DUAL-COLOR KIT Installations: Installation of our single color kit typically takes 2 to 3 hours. With single color installations we always recommend using a dedicated on/off switch OR if you want to tie them into an existing circuit (e.g. marker lights), we suggest adding a relay to the circuit. If you purchased the on/off wireless switch we offer, you do not need a relay provided the breather lights in this kit are the only lights you're switching on it.

POWER LEADS. All of the power leads coming from the LED strips will need to be routed back to your power source/switch/controller which is usually mounted near the battery bank. We typically will mount the led controller in the driver's side storage box (aka 'jockey box'). If you're installing this kit along with another one of our light kits, you can usually merge the wiring together. It's important these power lead be secured (especially at the point where the power lead attaches to the LED strip) and wrapped in split loom to prevent chafing.

Mounting Locations

Each exhaust stack has two led strips; one on each side of the stack and facing outward. See photos for placement. The led strips are mounted to plastic L-Channel which is included. That L-Channel is either bolted to or riveted to the stack's shield three mounting brackets (which are secured to each exhaust stack). Because those shield mounting brackets may need to be removed from the truck to service the exhaust stacks, we include 2 M/F pairs of quick-disconnect connectors with this kit. Each stack has one quick-disconnect. Both LED strips on the stack come together at the bottom of the stack to use one quick-disconnect.

If you're installing an LED controller (or wireless on/off switch) with this kit, you'll need to remove the driver's side steps to access the batteries. You can mount it anywhere you have a dry area. We prefer to mount our led controllers in either the driver's or passenger's side storage box but it's not required. You can just as easily mount the controller in the engine compartment or also inside the battery box. The key is making sure you're mounting it where it is protected from water or extreme heat. There should be air flow too around the controller. If mounting inside either of the storage boxes, you will need to drill a hole in the floor of that box to connect power to the battery box, led wires and antenna. We provide some butyl tape to seal this hole.

We include photos of the installation at the end of this guide. The photos are of the passenger's side of the truck. You'll need to repeat the process for the driver's side stack.

CUTTING YOUR LEDS- While you shouldn't have to do so, if you need to cut your LED strip you can do so as long as you cut in the proper location – which is every three LEDs as shown in the below photo. Cutting incorrectly could damage your lights and is not covered by the warranty. If you cut the strip, be sure to use the included heat shrink tubing to seal the cut end. You can also use silicone found at your local hardware or RV store. If you do need to cut your LED strip, we strongly suggest doing so BEFORE you mount the strip.

MOUNTING THE LED STRIPS

Follow these steps for mounting your LED strips:

- The area where you are mounting the LEDs has to be clean: free of all dirt, oil or anything that might affect the LED from sticking. You only get one opportunity to mount the LEDs so it's critical the area be prepared properly.

- Use rubbing alcohol to clean the area where you are going to mount the LED strip. Be sure to let the alcohol dry completely before proceeding to the next step. (Note: Do not use acetone or similar cleaner).

- Next, use the 3M Adhesion Promoter supplied with your kit to "paint" on the promoter where you are going to mount the LED strip. ***This is an important step. Do not bypass.*** Allow the promoter to dry for 60-90 seconds.

Do NOT bend the LED strip in a radius of less than 2 inches.

Do NOT bend the LED strip on a horizontal plane.

- Peel off the red backing tape that protects the 3M adhesive tape on your LED strip. Be careful not to let the tape touch anything. The 3M backing tape on these LED strips are one-use only. They cannot be reused.

Carefully push the LED strip to the area you have prepared. You will want to apply only enough pressure to the strip to make sure it is firmly mounted. *You only get one opportunity to do this.* Once the LED strip touches a properly prepared surface that has been promoted, that LED strip will be very difficult to remove. Moreover, if you do remove the LED strip, the strip cannot be used again without adding another layer of 3M adhesive tape to the back. DO NOT press too hard as too much pressure can damage the LEDs and connecting wires in the strip. Also, do not pull, stretch or twist the LED strip. Too much tension on the strip will also damage the LEDs such that some of the LEDs in the strip will not illuminate. The strip must be mounted flat against a single continuous mounting surface, in a straight line. Really important that the ENTIRE STRIP be stuck to the mounting surface and that you NOT attempt to span across multiple mounting surfaces.

INSTALLATION

1. Remove the heat shield on each exhaust stack. There are 6 bolts (and lock washers with nuts) total for each stack.

2. Each stack will require 2 L-Channels to mount the LED strips. One on each side of the stack. We have photos showing the placement. One of the L-Channels is riveted to the shield bracket. The other L-Channel mounts using the existing shield bolt so you'll have a drill 3 holes in it where the heat shield bracket's line up. See photos starting on next page.

3. The L-Channel that's riveted to the stack mounting bracket is installed first. You can attach the LED strip to that L-Channel too after it's secured to the stack mounting brackets. We have a photo of this as well.

4. The L-Channel that's bolted using the existing heat shield mounting bolts should not be mounted until AFTER you've installed the LED strip to it. This is important because once that bracket is bolted to the truck, there isn't room to get your hands in to affix the LED strip to the L-Channel. See photo.

5. The power leads from each LED Strip will come together at the bottom of the stack. This is where you'll need to add the male side of the quick-disconnect. Both power leads will use the same quick-disconnect. The female side of the quick-disconnect will connect to the power lead going to your switch, power source or LED controller. Note: We have a photo that shows how to wire the quick-disconnects for this kit and use heat shrink.

6. Determine how you're going to run the power lead that attaches to the LED strip from each stack. We usually run it under the truck over to the battery box but there are other options too. However you run it, it's important that the power leads be wrapped in split loom AND they're not touching or too close to the exhaust stack. Use zip ties to secure the power lead so it can't touch the exhaust stack.

7. Connect the power lead to your power source, switch or LED controller. If you have another Boogey Lights LED kit installed (e.g. under-glow, grill, etc) you can connect the power leads to that kit too.

WIRING DIAGRAMS & POWER CONSIDERATIONS

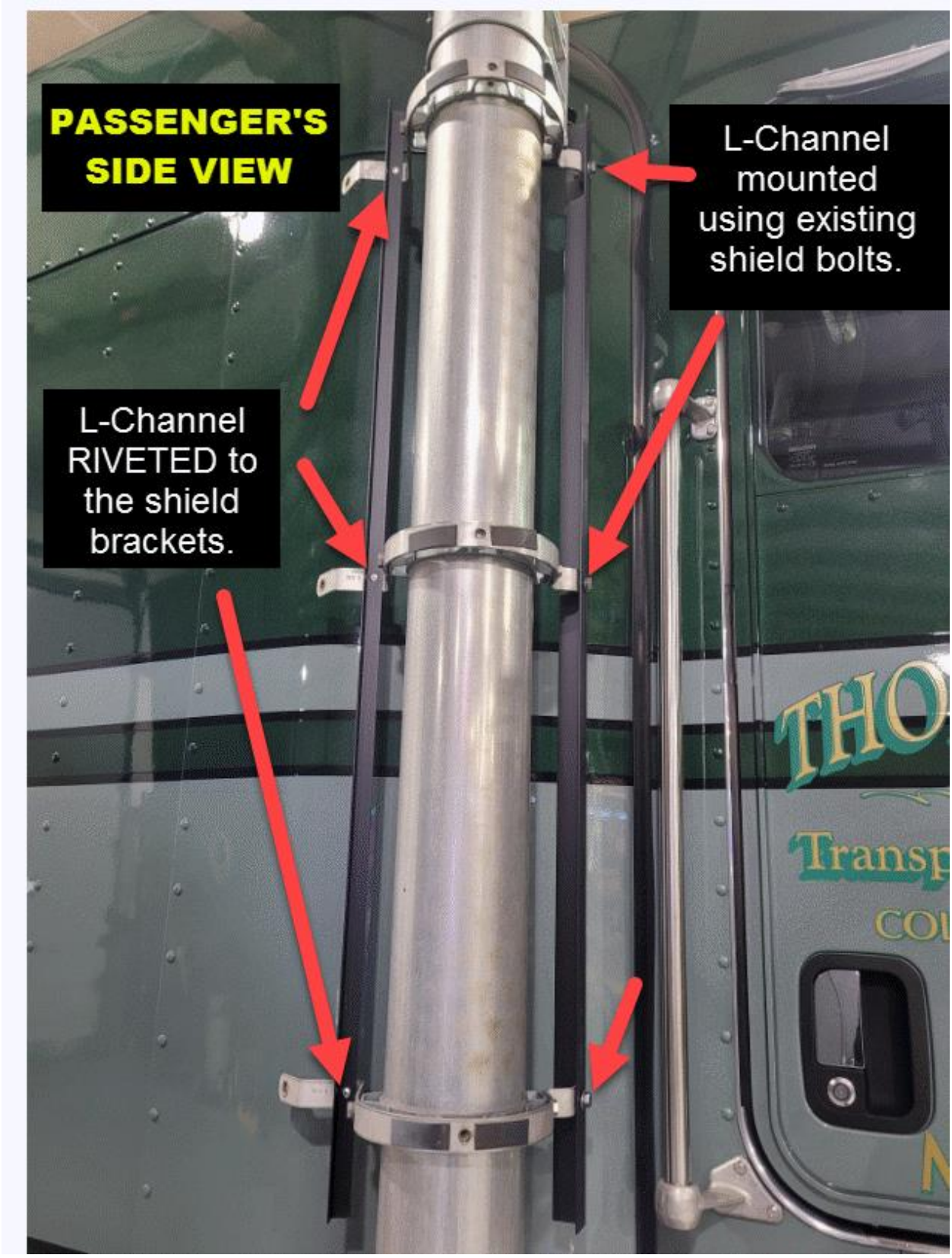
This kit includes the wiring diagrams for the configuration you purchased. **Please review carefully.** An essential skill with installation of any Boogey Lights LED product is knowing how to correctly wire the product to a 12vdc circuit. This includes understanding the importance of having a properly sized fuse at the power source, polarity, how to properly seal an electrical connection, using properly sized wire gauge for the load, measuring voltage and measuring the additional amperage draw you're adding. If you are uncertain or unfamiliar with any of these concepts, we urge you to ask someone who has the knowledge to assist you. Electricity is unforgiving.

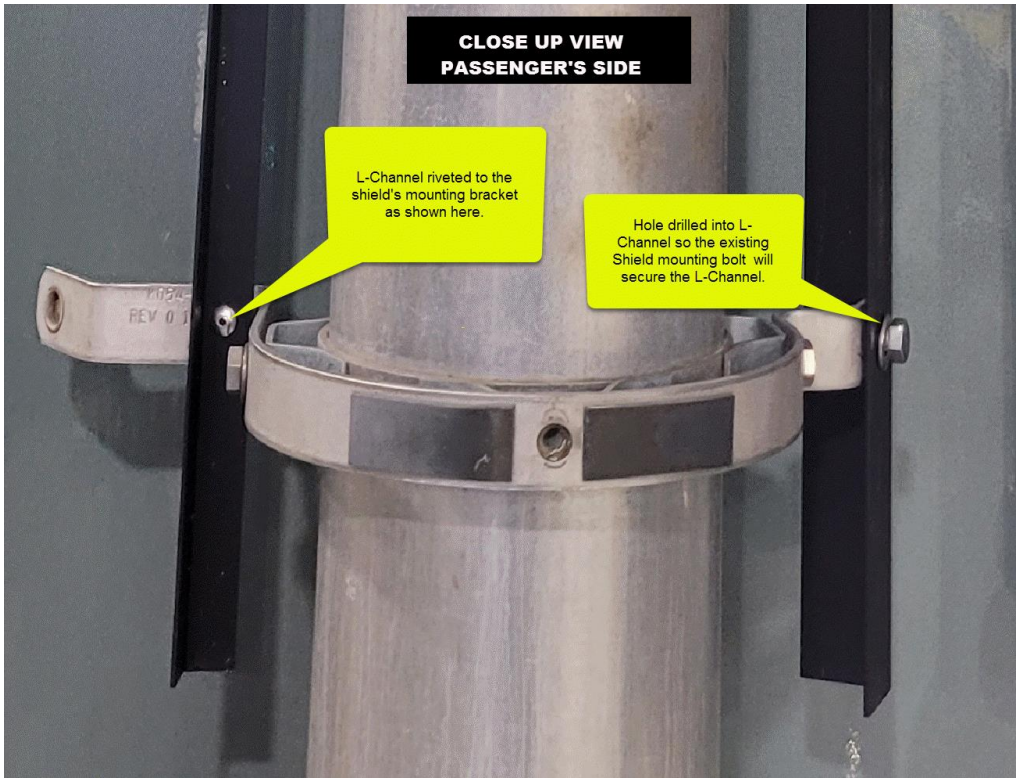
Be mindful of the amount of amperage you're drawing through your lighting circuit and to not exceed the circuit component limitations. We have included an amperage chart to give you a general idea of amperage draw but be aware that the amount of power (amps) you're pulling through the circuit will vary based on a combination of three factors: 1) The number of LEDs in the circuit, 2) the amount of copper wire in the circuit and 3) the input voltage to the circuit. The amperage ratings for our switches, controllers and LEDs assume 12.5 vdc input or less. If you're going to be driving with your Boogey Lights on, be aware that the input voltage will absolutely increase when the engine is on as RPMs increase. It's not unusual for an alternator to charge the batteries at a rate of 13.5 to 14.5 vdc depending upon the vehicle. Increasing the input voltage to the LED Controller/LEDs will also increase the amperage draw of those LEDs because they'll burn brighter. For example, we've seen circuits that draw 17 amps when the engine is off and the input voltage is 12.5vdc but jump up to drawing 24 amps when the engine is on and RPMs increased. This is because the input voltage jumps to 14vdc when the engine is running. If your circuit is only sized for 20 amps but the system requires 24 amps while running, you're going to have a problem.

Generally speaking, you don't have to be concerned about this issue if you're not within 60% or more of the collective max amperage rating for the components in your circuit. If however you're at or above that 60% rated load, we strongly suggest measuring actual amperage drawn for your installation to make sure it's fused and wired appropriately given the highest possible amperage draw when the alternator is charging the system at typical operating RPMs. If you have an over-voltage situation, there are a couple of solutions:

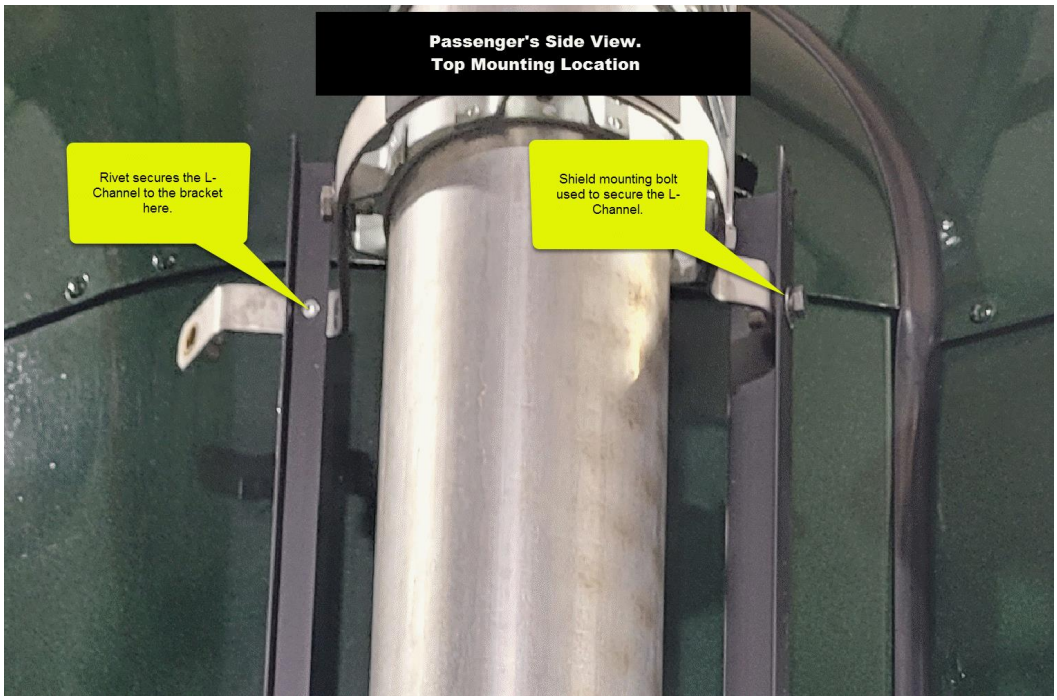
1) install a voltage regulator that will limit the input voltage going to the lights to 12.5 vdc regardless of the alternator output voltage. We sell them. They can also be purchased on Amazon/EBay.

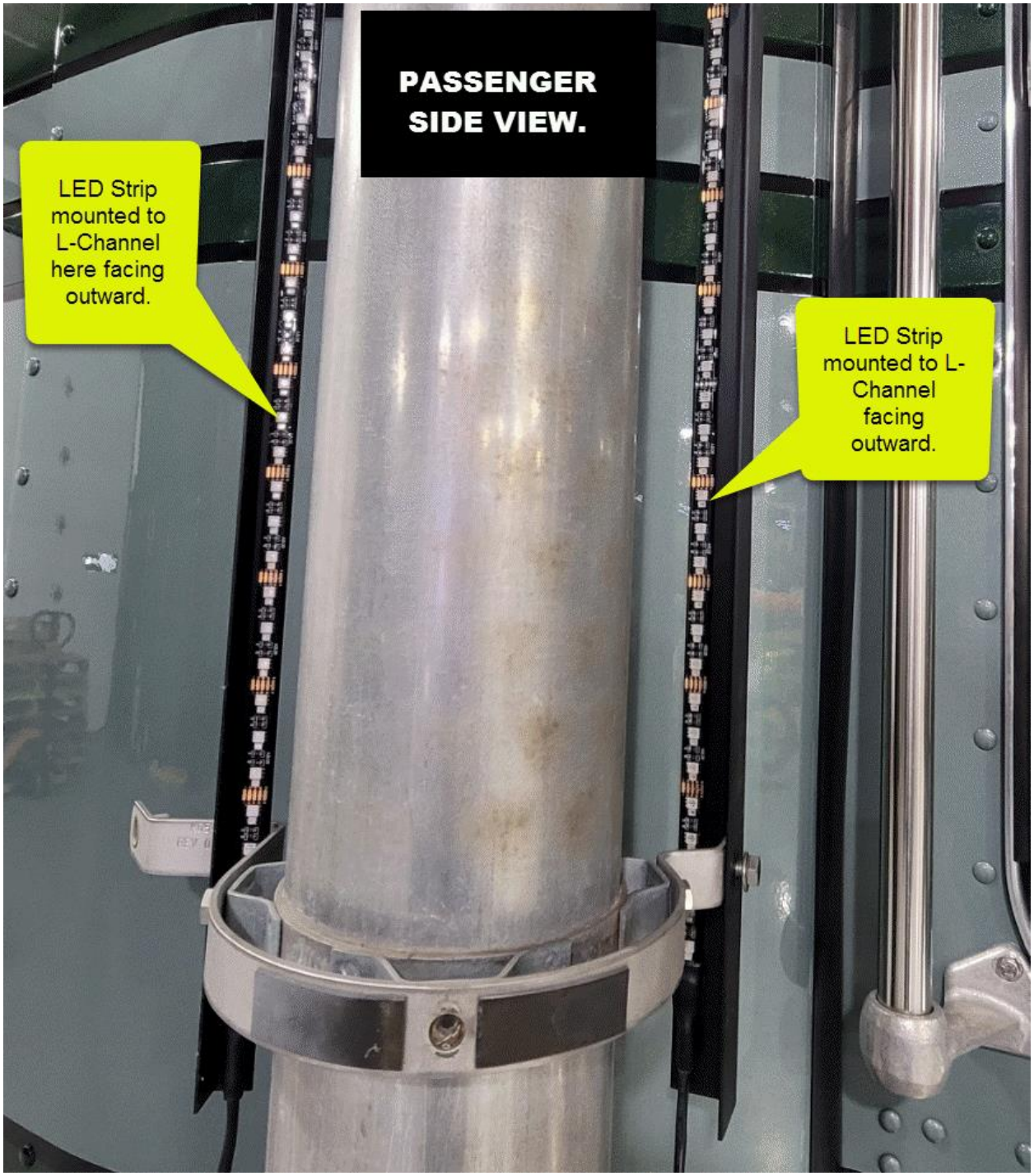
2) install a second fuse/relay circuit and balance the LED load between those two circuits. Doing so will effectively cut the load by 50% per circuit. This is our preferred solution when possible.


PASSENGER'S SIDE VIEW
L-Channel mounted using existing shield bolts.
L-Channel RIVETED to the shield brackets.

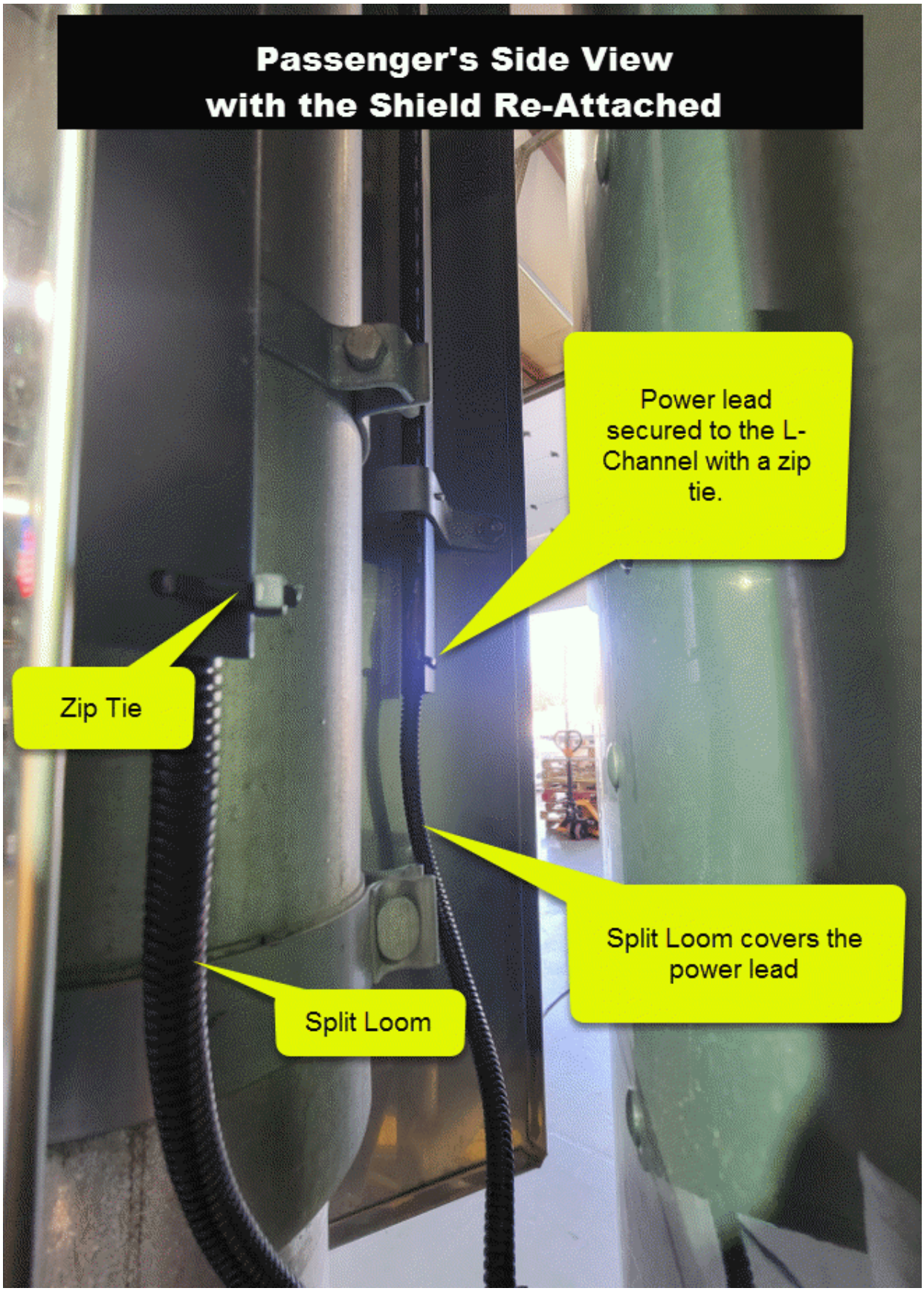

CLOSE UP VIEW
PASSENGER'S SIDE
L-Channel riveted to the shield's mounting bracket as shown here.
Hole drilled into L-Channel so the existing Shield mounting bolt will secure the L-Channel.

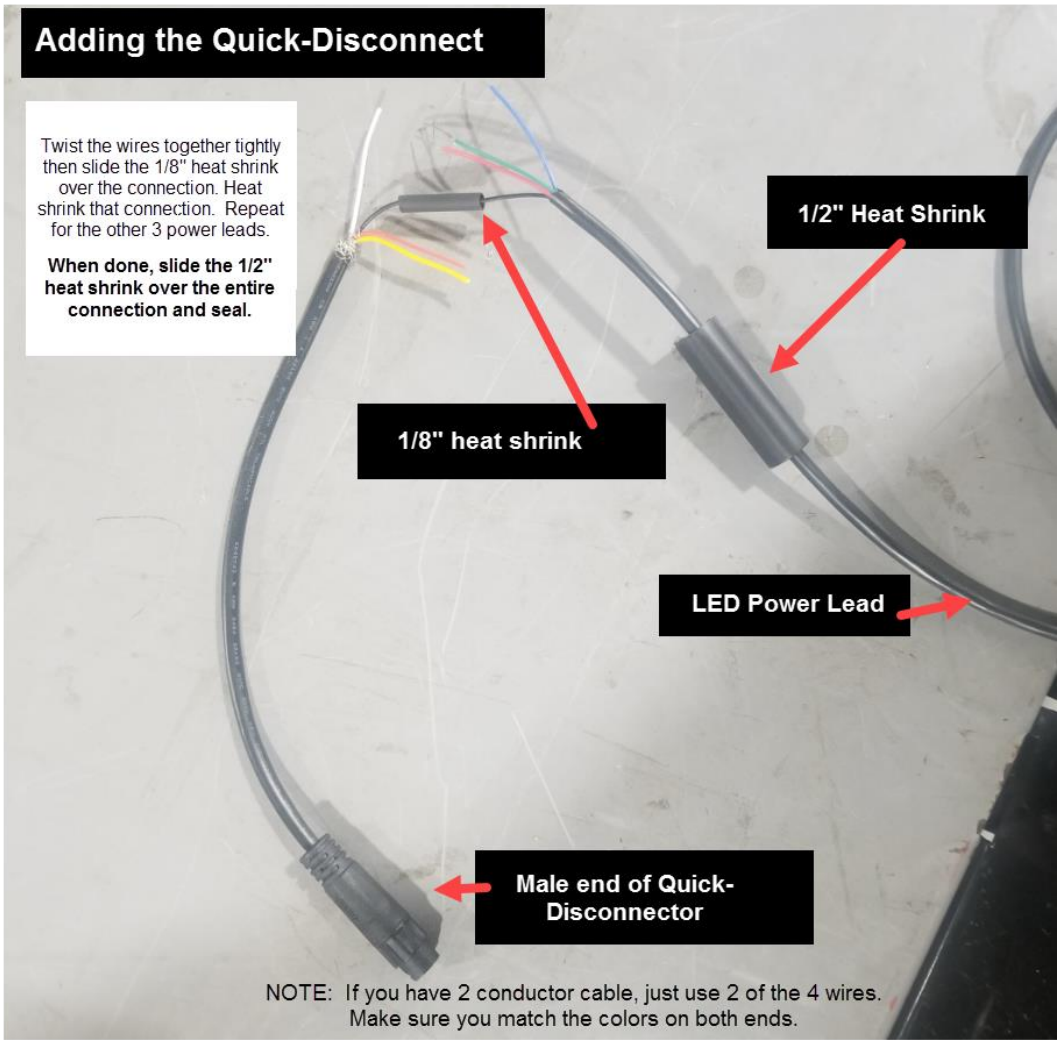
8.


Passenger's Side View.
Top Mounting Location
Rivet secures the L-Channel to the bracket here.
Shield mounting bolt used to secure the L-Channel.

9. 
PASSENGER SIDE VIEW.
LED Strip mounted to L-Channel here facing outward.
LED Strip mounted to L-Channel facing outward.

10. 
Note on this L-Channel, we mount the LED Strip to the L-Channel first before mounting the L-Channel to the stack.

11. 
Passenger's Side View
with the Shield Re-Attached
Power lead secured to the L-Channel with a zip tie.
Zip Tie
Split Loom covers the power lead
Split Loom


Adding the Quick-Disconnect
Twist the wires together tightly then slide the 1/8" heat shrink over the connection. Heat shrink that connection. Repeat for the other 3 power leads.
When done, slide the 1/2" heat shrink over the entire connection and seal.
1/2" Heat Shrink
1/8" heat shrink
LED Power Lead
Male end of Quick-Disconnector
NOTE: If you have 2 conductor cable, just use 2 of the 4 wires.
Make sure you match the colors on both ends.

Additional Resources

- Product Page: https://www.boogeylights.com/kenworth-w990-led-accent-light-kit/
- How to Videos: https://www.boogeylights.com/how-to-videos/
- Troubleshooting: https://www.boogeylights.com/trouble-shooting-guide/
- Installation Resources: https://www.boogeylights.com/installation-resources/
- How to Bench Test: https://docs.boogeylights.net/?wpdmdl=1305
- Amperage Data: https://docs.boogeylights.net/?wpdmdl=1137
- GEN2 LED Controller Wiring Diagrams + Operating Info: https://docs.boogeylights.net/?wpdmdl=1163
- GEN2 RF Wireless Remote Operating Info: https://docs.boogeylights.net/?wpdmdl=1164
- GEN2 Bluetooth APP Operating Info: https://docs.boogeylights.net/?wpdmdl=1169
- GEN2 Bluetooth APP Quick-Start: https://docs.boogeylights.net/?wpdmdl=1167

Support

- Phone: 800.847.1359 (M-F, 9-6 Eastern)
- Text: 859.955.8155
- Open a Support Ticket: https://www.boogeylights.com/email-us/
- Online: 24/7 resources at https://www.boogeylights.com/installation-resources/
- How to Make a Warranty Claim: https://www.boogeylights.com/make-a-warranty-claim/

Warranty

The Boogey Lights® warranty requires an original sales receipt from Boogey Lights or an authorized dealer. It covers product replacement only, not labor or other costs. Register your purchase at: https://www.boogeylights.com/warranty-registration/. Full details: https://www.boogeylights.com/warranty/.