

INSTALLATION INSTRUCTIONS

**FREIGHTLINER CASCADIA GEN2
UNDER-GLOW LED LIGHT KIT**



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Thank you for purchasing genuine Boogey Lights® LED Lighting products! We know you're anxious to get started but we strongly recommend taking time to read through these instructions. You'll likely save yourself some grief and aggravation if you do. For additional installation support refer to www.BoogeyLights.com or give us a call at 800.847.1359 for assistance.

JULY 2022 UPDATE – IMPORTANT!

These instructions make reference to some ALUMINIMUM FLAT BAR. That is no longer the case. We are now including PLASTIC FLAT BAR instead of the aluminum flat bar. The plastic flat bar should be mounted the same way as the aluminum with one exception when mounting to the bottom of the fuel tanks: make sure the plastic flat bar is securely fastened to the fuel tank in multiple places across the entire length of the flat bar (not just on the two ends as some of the photos show). The goal is to minimize the amount of flexing the plastic flat bar does.

ABOUT THIS GUIDE

Installation of this led light kit takes 6 to 8 hours depending on whether or not you're adding this kit to the existing UNDER-CAB light kit or installing this kit as a stand-alone.

There are 16 different mounting locations in this kit and all of the power leads need to be carefully run. While you do not necessarily need to remove the side skirts, we recommend doing so as it's much easier to work under the truck. If you're installing an LED controller with this kit, you'll need to remove the driver's side steps to access the batteries (all power connections come from the battery directly). Also, the LED controller can be mounted in either the driver's side storage / jockey box or passenger's side (passenger's side is usually less cluttered). Regardless of which side you choose, you will need to drill a hole in the floor of that box to connect power to the battery box, led wires and antenna. The 12vdc positive side of the LED controller will connect directly to the battery bank (with fuse). The 12vdc negative side will connect to any bare metal support.

All of the Heavy Duty LED strips include a 3' power lead. Most of the strips will need to have additional power lead cable added which we include in the kit. We recommend connecting all of LED strips under the front bumper together and then running one feeder cable back to the LED controller. Do the same for the LED strips mounted on the passenger's side and LED strips mounted on the driver's side. Wiring it this way means you'll have a total of four power lead cables connecting to the LED controller: one for the front bumper LEDs, one for the passenger's side LEDs, one for the driver's side LEDs, one for the rear LEDs. If you're adding this kit along with the UNDER-CAB light kit, you can usually connect the LED strips in that kit to the same feeder cables used in this kit although the UNDER-CAB light kit requires connections using quick-disconnects because that kit is mounted to the inside of the side skirts. There are other wiring options too if you are using a Dual Zone led controller. For example, you might want to assign ZONE 1 to the Under-Glow light kit and ZONE 2 to the Under-Cab light kit. If you decide to go this route you'll need to run two sets of feeder cables, one for each zone. We recommend planning out your install on paper first.

In putting together this installation guide we assume the installer has access to and has a basic understanding of using the tools needed to complete this installation. We also assume the following:

- The installer knows how to access and remove the steps and side panels of the truck.
- The installer understands 12vdc electricity, making electrical connections using crimp on connectors, the importance of having a fuse in the circuit at the battery location and polarity.
- How to access the batteries, remove / connect battery connections, how to make electrical connections (e.g. crimping) and the importance of making sure all electrical connections are sealed properly (e.g. no water intrusion).
- How to run cabling such that the power leads and related wiring are secured in a way as to not create a hazard when driving the truck and/or placing them in locations which might damage them (e.g. up against the exhaust pipe, DPF, drive shaft, wheels, etc.).

- Capable of getting under the truck to safely run the power lead connections to the battery box on the driver's side.

TOOLS & SUPPLIES YOU WILL LIKELY NEED

Metric tools (e.g. torx), wire cutters, wire strippers, crimping tool, electrical tape, rubbing alcohol, shop rags, extra zip ties.

BEFORE YOU START

We suggest you carefully review the following before you begin:

1. It's simply not possible to provide detailed instructions for all installation scenarios. The information in this manual is intended to be used as a guide. You may need to vary your installation based on your unique situation. This is particularly the case with electrical wiring and LED placement.
2. Make sure you have ample area in which to work and that the area is protected from rain or cold temperatures. The 3M adhesive tape works best if applied when the air temperature is above 40 degrees (and of course is DRY).
3. Make sure you know where your electrical connections will terminate. For this kit, you can purchase it with and without an LED controller.
 - If you're purchasing without an LED controller, we assume you already have one (e.g. included with the Under-Cab light kit) and know how to add the LED strips in this kit to that controller.
 - If you purchased this kit with an LED controller, the LED controller can be located in the driver's side or passenger's side storage box on the forward wall. We include some 3M Quick-Lock to mount the controller to the wall. The LED power leads and power cable coming from the controller will need to exit the storage box through the floor and then connect to the battery box. We supply the battery lugs, battery extension cable and fuse holder to make the power connection. It's important this be done properly. If you are unfamiliar with 12vdc power, we strongly suggest you ask someone who is familiar with it to assist you in this process.

We also include some LED power lead feeder cable that can be used to extend the power leads for the LEDs coming out of the LED Controller down to the battery box area. We find it easier if we make all of our connections at the battery box area than to try to run all of the power leads from the LED strips all the way to the LED controller mounted inside the storage box.

MULTI-COLOR INSTALLATIONS: We have included two wiring diagrams later on in this guide. One is for the SINGLE ZONE Heavy Duty LED controller. The other for the DUAL ZONE Heavy Duty LED controller.

SINGLE- COLOR INSTALLATIONS: Single color LEDs do not require an LED controller to operate. They do however require a switch somewhere in the circuit to turn them off/on. There are a number of ways to do this but regardless of how you decide to switch your single color LEDs, you need to be mindful of the amperage that 420 LEDs will draw. If you're adding these LEDs to an existing circuit (e.g. with your marker or running lights) we strongly suggest using a relay vs tapping into the existing circuit. This especially important on newer trucks where the LCM will likely throw an error when you add 420 more LEDs to the system.

4. The LED strips mounted to the fuel tanks must first be mounted to the included plastic flat stock. For both the driver's and passenger's side we provide plastic flat stock which will need to be cut to fit your truck. There's also a piece of plastic flat stock included that is mounted on the drivers side in front of the fuel tank on the outside of the air tanks.

We use 3M Quick-Lock to secure these plastic flat stock pieces to the fuel tanks. We also add some zip ties for safety. You'll need to drill a hole in the plastic flat stock for those zip ties.

5. Bench test your setup. We know this takes a few extra minutes but we **STRONGLY** suggest you bench test your lights AND your controller on a table before doing anything further. 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. 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). Bench testing takes an extra 10 or 15 minutes. You can also use a common 9vdc battery to test your lights if you don't have a 12vdc bench testing power source available (the lights won't be as bright). It's simple to do and can potentially save you hours of time and frustration down the road. Please take our advice. Bench test your LEDs AND controller before mounting.

BTW ... Did we mention we suggest bench testing your LEDs and controller before installing? You would be surprised at how many people don't take our advice on this step.

TYPICAL LED PLACEMENT

These are the LED placement locations we used for this kit. It's important to follow this placement pattern to ensure the LED strips are protected. Mounting them in any other way voids warranty. We include some photos at the end of the guide showing further details.

Front Bumper Area (left to right):

- 1 - 15 LED strip under the bumper
- 1 - 45 LED strip under the bumper
- 1 - 15 LED strip under the bumper

Driver's Side (front to rear):

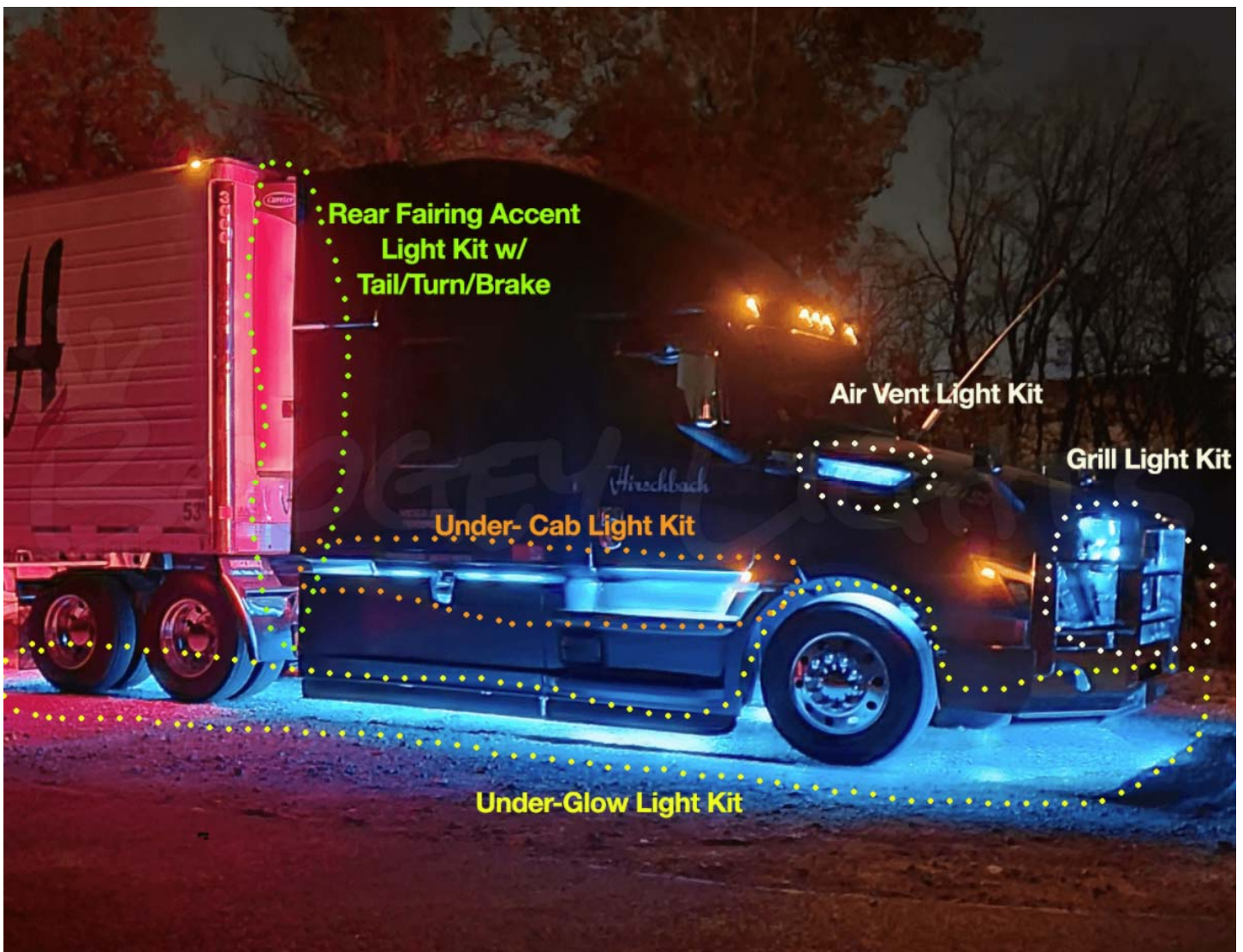
- 1 - 15 LED strip in wheel well
- 1 - 45 LED strip mounted on plastic flat bar secured to outside air tank under steps
- 1 - 75 LED strip mounted on plastic flat bar secured to bottom of fuel tank
- 1 - 15 LED strip mounted to frame structure (e.g. storage box) behind fuel tank. Note: Not all trucks will have this area available to mount to.
- 1 - 75 LED strip mounted to top frame rail shinning downward.
- 1 - 45 LED strip mounted to top frame rail shinning downward (between the air bags).

Passenger's Side (front to rear):

- 1 - 15 LED strip in wheel well
- 1 - 30 LED strip mounted under step structure.
- 1 - 75 LED strip mounted on plastic flat bar secured to bottom of fuel tank
- 1 - 15 LED strip mounted to frame structure (e.g. APU behind fuel tank.) Note: Not all trucks will have this area available to mount to.
- 1 - 60 LED strip mounted to top frame rail shinning downward.
- 1 - 45 LED strip mounted to top frame rail shinning downward (between the air bags).

Rear:

- 1 - 30 LED strip across the back bumper. Note: Not all trucks will have this area available.



WHAT'S INCLUDED

In addition to the LED light strips and power leads, this kit includes some additional items you'll need. Here's a quick review of those items and why we include them. Some of the photos at the end of this guide reference these items too.

- 18AWG or 20AWG Feeder Cable – 4 Conductor. Use this cable to extend the LED power leads to the LED controller. We recommend ganging up the connections for LED strips located in the same area and then using the feeder cable to extend those LEDs to the controller.
- Three 72" plastic flat bars which will need to be cut to fit. Used to mount a 75 LED strip to each fuel tank. See photo later on in this guide. Also used to mount a 45 LED strip on the driver's side under the air tanks.
- 3M Adhesion Primer. Used to prep the surface before attaching the LED strips AND the 3M quick-lock tape. *Always, always, always* use this adhesion primer with 3M adhesive products if you want the bond to hold.
- 3M Quick Lock Reclosable Tape. This is a heavy duty "Velcro like" product. Used to mount plastic flat stock to each of the fuel tanks. Also, if you purchased the LED controller, you'll use this to mount the LED controller to the wall in front of the driver's storage compartment.
- Split Wire Loom / ¼". All power leads and the battery extension cables need to be protected from chaffing. Wrap them in this first. See photos.
- Split Wire Loom / ½". We include the ½" split wire loom to be used when you're connecting multiple power leads together. Helps protect that connection.
- Battery Extension Cable (if LED Controller is purchased). We include some 12awg cable to extend the battery power inputs going to the LED Controller to the battery. Be sure to wrap this extension cable in split loom.
- Fuse Holder – 25AMP (if LED Controller is purchased). Insert this fuse holder on the 12vdc positive side of the battery connection before the battery extension cable. This is critical.
- Battery Terminal Lugs (if LED Controller is purchased). We include a couple of battery terminal lugs that attach to the battery extension cable (crimp on) to make it easy to connect the positive and negative power leads to the truck's battery to the LED controller. It's a much better way to make this connection than to just simply wrap the bare cable around the battery post.
- Butyl Tape. We use butyl tape to seal the hole in the storage box where the LED controller is located. We also use it in a few places on this installation to help hold power lead wires in place. Butyl will only work if you apply it to a clean surface so make sure you first clean the surface with rubbing alcohol.
- 8" Zip Ties. We include some zip ties which you'll need to secure the LED power leads to the truck.
- 14" Zip Ties. Safety ties for the 2 plastic flat stock pieces.
- Crimp On Wire Connectors. These are used to secure the wire connectors at the LED Controller as well as making all power lead connectors to the feeder cable. We recommend wrapping each connector after it's crimped with electrical tape to protect it from water intrusion.

NOTE: Every installation varies a little so you may need to purchase additional items (or more of them such as zip ties) for your install.

CUTTING YOUR LEDS- 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.



Cut Locations

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 the supplied alcohol pads 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.



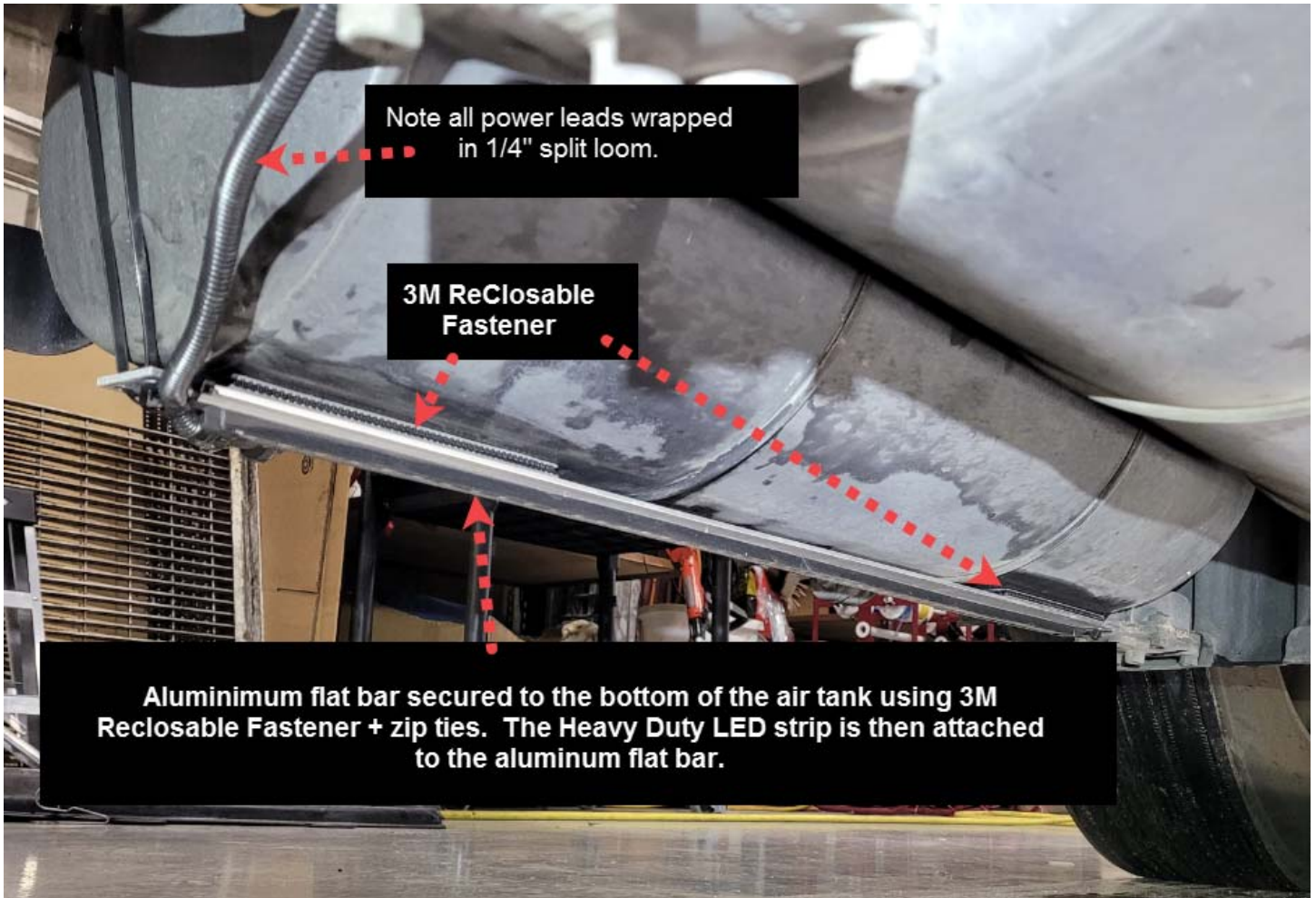
Do NOT bend the LED strip on a horizontal plane.



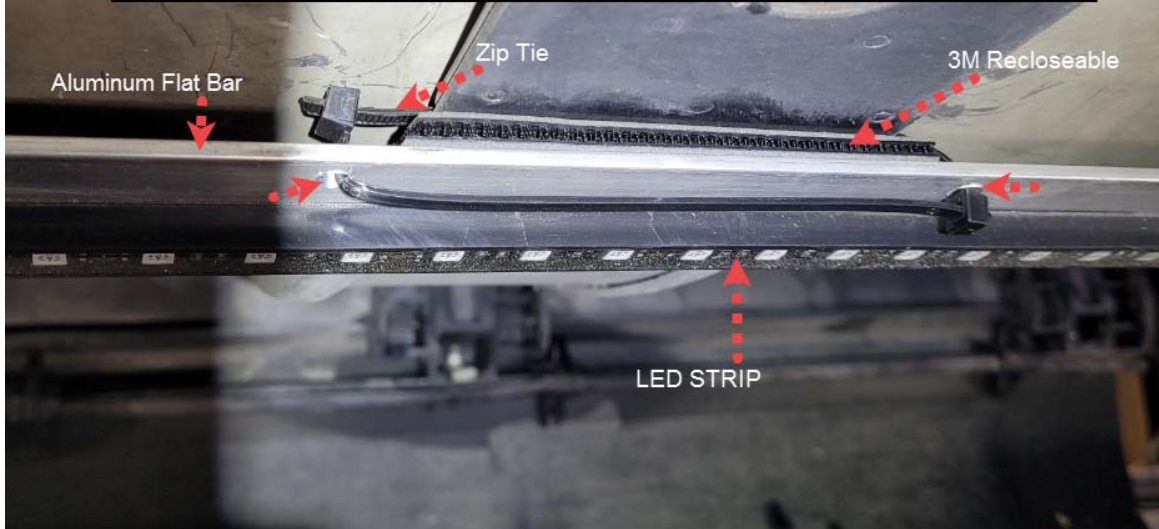
- Peel off the red backing tape that protects the 3M adhesive tape on your LED strip. Be careful not to let the tape touch anything. The 3M backing tape on these LED strips are one-use only. They cannot be reused.
- Carefully push the LED strip to the area you have prepared. You will want to apply only 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 PHOTOS

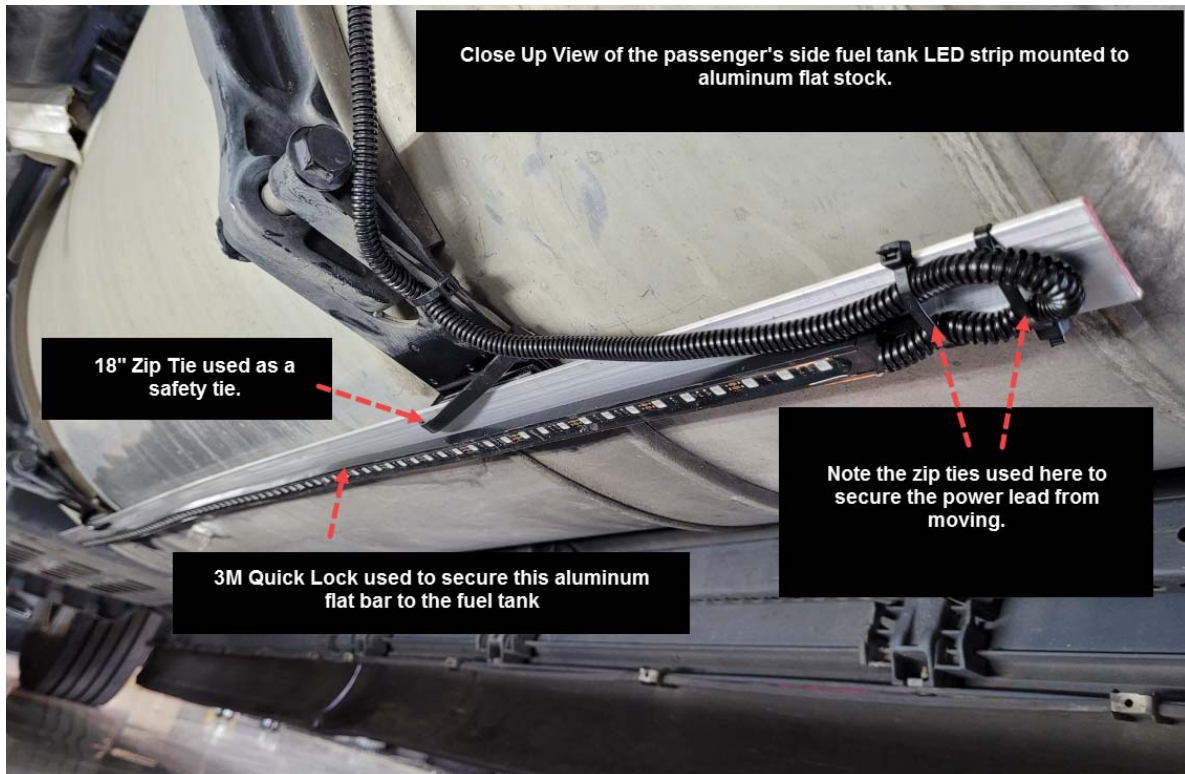
Here are some photos with comments on the installation we did in building this kit. We've commented on key parts of the installation along the way. Note: Since these photos were taken, we've changed out the aluminum flat bars with plastic flat stock.



Close-Up view of how the aluminum flat bar is secured to the bottom of the FUEL TANK. We use the 3M Re Closeable Fastener on the fuel tank's support strap and then add a zip tie through the two holes we drilled in the aluminum flat bar. From there, the HEAVY DUTY LED strip is mounted to the aluminum flat bar. If the fuel tank ever needs to be removed from the truck, the aluminum flat bar with LED strip attached can be removed without damaging the LED strip.



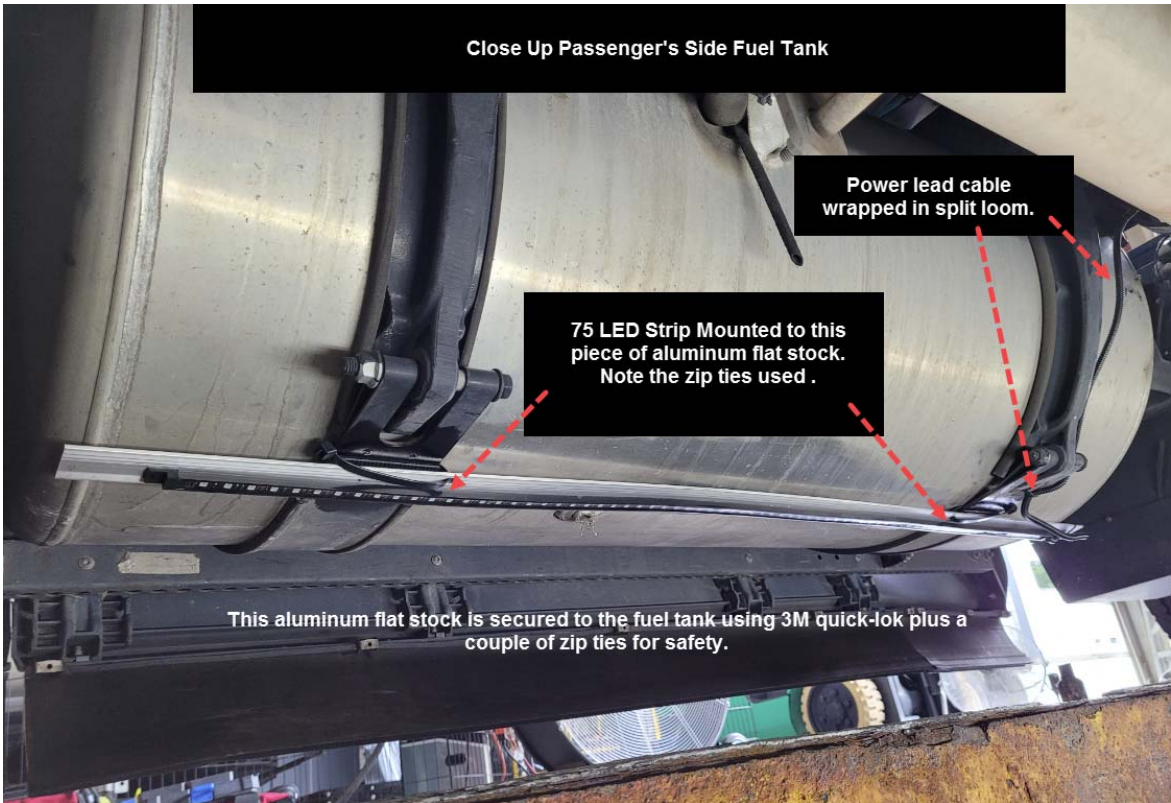
Close Up View of the passenger's side fuel tank LED strip mounted to aluminum flat stock.





View looking forward to the driver's side. Frame Rail 75 Heavy Duty LED Strip.

Driver's side fuel tank led strip mounted to aluminum flat stock.



Close Up Passenger's Side Fuel Tank

Power lead cable wrapped in split loom.

75 LED Strip Mounted to this piece of aluminum flat stock. Note the zip ties used .

This aluminum flat stock is secured to the fuel tank using 3M quick-lok plus a couple of zip ties for safety.

