INSTALLATION INSTRUCTIONS

WESTERN STAR
REAR FAIRING ACCENT LED LIGHT KIT

RULE THE NITE™

BOOGEY LIGHTS®

Family Owned Motorsports Lighting Since 1989

800.847.1359

www.BoogeyLights.com

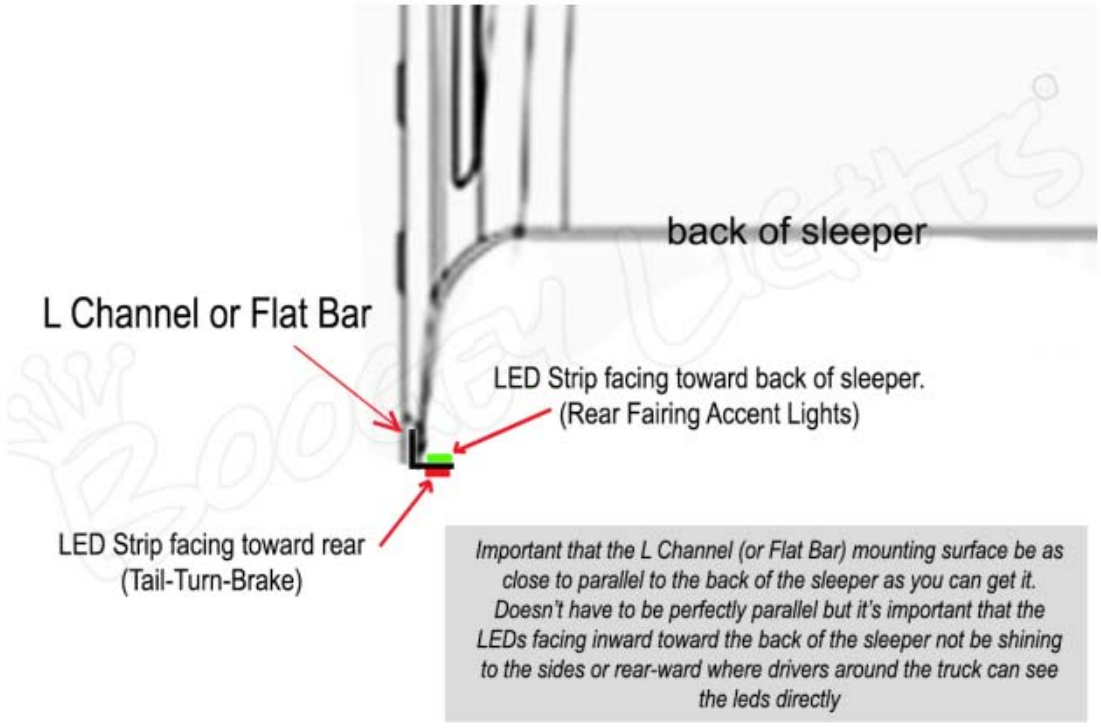
Thank you for purchasing genuine Boogey Lights® L\ED Lighting products! We know you're anxious to get started but we strongly recommend taking time to read through these instructions. You'll likely save yourself some grief and aggravation if you do. For additional installation support refer to www.BoogeyLights.com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

JULY 2022 UPDATE – IMPORTANT!

We have made two changes to this light kit which are not reflected in the installation documentation.

The first change relates to the type of LED strips we use for all rear fairing accent light kits installed on semi-trucks. All rear fairing accent light kits now use our HEAVY DUTY LED strips versus the low profile strips which are shown in some of the photos for this installation guide. Our Heavy Duty LED strips are better able to handle the vibration and flexing when the strips are mounted to the vertical fairings. They are installed the same way as the low profile strips. They're just a little wider and taller.

The second change is the type of mounting surfaces we include with the kit. We now include three different types of plastic mounting surfaces: two types of 'L' channel and one type of plastic flat bar. Previously, we only included one 'L' channel type. The reason we include three different types is because not all trucks – even the same make and model year -- have the same fairing structure. It's important to use the mounting surface that works best for your truck. How do you know what's best? Choose the one that provides a rigid, flat mounting surface such that the led strips are mounted facing directly toward the back of the cab. Below is a close-up diagram showing what we're referring to. In some cases, you may have to secure the mounting surface to the actual brackets that hold the fairings to the truck. In others, you can rivet the mounting piece directly to the fairing itself (assumes the fairing is rigid). Whichever method you choose, it's important the mounting surface be solid – if it's mounted in such a way that it can twist or flex as the truck drives down the road, the LED strip that's secured to it will fail prematurely due to the constant flexing/twisting. Note: If your truck has a flexible rubber boot tip at the end of your fairing, do not mount to that rubber boot.



BEFORE YOU START

It's simply not possible to provide detailed instructions for all installation scenarios. Far too many variables and variations. **The information in this manual 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 electrical wire routing 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.

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).

Bench test your setup. We know this takes a few extra minutes but we STRONGLY suggest you bench test your lights (and LED controller if purchased) 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/switches before mounting.

RGB/MULTI-COLOR KIT Installations

Installation of this led light kit takes 2 to 5 hours depending on whether or not you're adding in the optional TAIL-TURN-BRAKE light integration and/or integrating with an existing Boogey Lights LED controller and light system from another one of our lighting systems. We have included some photos later on in this guide to help you better understand how the lighting system is mounted.

SINGLE COLOR KIT Installations

Installation of our single color kit typically takes 2 to 4 hours depending on whether or not you're adding in the optional TAIL-TURN-BRAKE light integration and/or integrating with an existing Boogey Lights lighting system. 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 any of the on/off wireless switches we offer, you do not need a relay in this kit are the only lights you're switching on it. The single color on/off wiring diagram is included at the end of this guide.

Know your Power Consumption

Regardless of which switching mechanism you're using, it's important to be mindful of the amount of amperage you're drawing through your lighting circuit and not exceed the circuit component limitations. 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. It's important to keep in mind that

the amperage ratings for the switches/controllers/LEDs assume 12.5 vdc input voltage. If you're wiring your lights to a vehicle that has a charging mechanism (e.g. alternator), the input voltage will likely increase when the engine is on; particularly as RPMs increase. It's not unusual for an alternator to charge the battery at a rate of 13.5 to 14 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. This is why we strongly suggest measuring actual amperage drawn for your particular installation to make sure it's fused and wired appropriately. If you are not familiar with DC electricity and how to measure both voltage and amperage draw, we urge you to seek the assistance of someone who does. Improperly sized circuits can cause fires and/or damage other electrical systems in your vehicle.

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 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.
- If installing the optional Tail/Turn/Brake integration is able to access the rear tail/turn/brake lights and to tap into those four circuits (brake, tail lights, left turn, right turn).

TOOLS & SUPPLIES YOU WILL LIKELY NEED

Drill, rivet gun, wire cutters, wire strippers, crimping tool, electrical tape, rubbing alcohol, shop rags, extra zip ties.

MOUNTING SURFACE LOCATIONS

There are 4 mounting locations. Two Heavy Duty LED strips are mounted on each side of the truck along the end of the fairing. These Heavy Duty LED strips fasten to a plastic mounting surface which is riveted to the truck's fairing. There are a wide variety of rear fairing structures on the market today. Some trucks have wind deflectors, some don't. Some fairings have a flat mounting surface, some don't. In this kit we have included eight plastic mounting pieces. Four plastic 'L' channels. Four plastic flat bars. You'll only use one type or the other. Each are 72" long. You will need to cut them to fit your truck. In most cases the plastic 'L' channel will work for the Western Star.

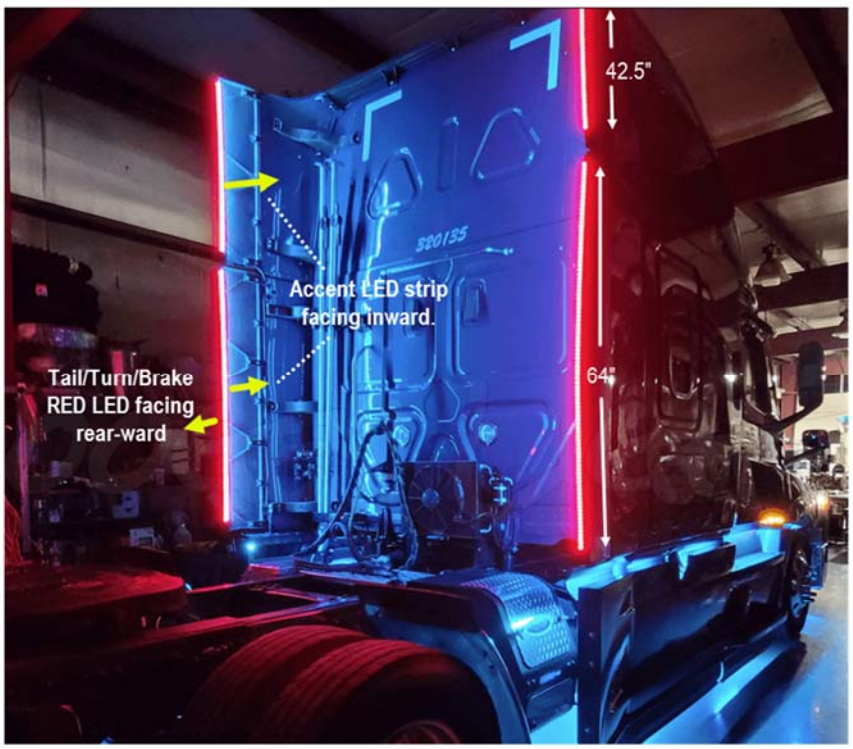
The first step is to rivet the included right angle black plastic “L” channel (or plastic flat bar) to each of the four fairing extensions on the truck. Our kit includes the 5/16" rivets to do this. We recommend at least 4 rivets in each piece. This plastic molding sits INSIDE the fairing flair such that only about 5/8” of the molding sticks out beyond the stock fairing edge. This is where the LED strip is mounted. See photos at the end of the guide . The ACCENT LED strips mount to the inside of each of the plastic angles facing inward toward the rear of the cab.

If you're also installing the tail/turn/brake light kit, those RED led strips will mount to the same plastic angle pieces but facing toward the rear of the truck. All power leads run down the fairing and from there will connect to the switching device (e.g. LED controller, on/off switch) and/or the brake / tail / turn integration point which we like to do behind the cab area for easy access.

Starting June 1, 2022 we are using our HEAVY DUTY LED strips for both Rear Fairing Access LEDs and Tail-Turn-Brake light kits. The below photos show our low-profile LED strips.

LED PLACEMENT

Once you have the black right-angle molding riveted to the fairing it’s time to mount the LED strips to that molding. The LED accent light strips (usually RGB, but not necessarily) face inward toward the back of the cab. These LEDs will flood the rear of the truck with light WITHOUT the LEDs themselves being seen by drivers on either side of the truck. If you’re installing the RED tail/turn/brake light LED strips, those strips face rear-ward as shown in the photo below. NOTE: this photo is from our Freightliner kit but the process is the same on the Western Star.



The inward facing accent lighting LED power leads will connect to the Boogey Lights LED controller (assuming RGB installation) … OR … if this is a single color installation, those power leads will connect to whatever switch you’re using to turn them on/off.

OPTIONAL TAIL / TURN / BRAKE LIGHT INTEGRATION

If you purchased the optional TAIL/TURN/BRAKE Light integration, there are three wiring diagrams at the end of this guide you'll need to complete the installation. The power leads from these LED strips run down the fairing and from there will connect to the relay housing which we suggest locating immediately behind the cab or similar location where the relay housing can be accessed if needed. A 10 awg battery cable needs to be run to the truck's battery and connected to the 12vdc + power with the included fuse holder. The 12vdc - needs to be connected to the frame.

For integration with the truck's tail-turn-break lights to make the system work, you need access to THREE circuits: the truck's tail light circuit, left turn signal and right turn signal. The truck's brake light uses the same light as the turn signals. Where you pull those circuits from is up to you HOWEVER we prefer to pull them directly from the rear tail light assembly on the rear the truck and then run a feeder cable up to the relay housing where the connections are made. We think it's easier (and cleaner) to do it this way while minimizing the possibility you might interfere with any of the truck's other electrical systems (which is always a concern in these situations). The reality however is that you can also find these wires in the wiring harness that runs on the inside of the frame rails back to the rear tail light assembly. On the frame (aka 'chassis') ground, it's super important to make sure the surface you're connecting to is bare metal. In many cases you'll have grind off the painted surface first. Refer to the RELAY wiring diagram at the end of the guide.

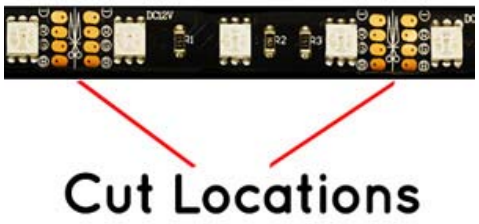
WHAT'S INCLUDED

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.

- 2 – 53" and 2 – 44" pieces of black 90 degree plastic angle with 5/16" rivets.
- 18AWG or 20AWG Feeder Cable – 4 Conductor. Use this cable to extend the LED power leads to the LED controller.
- 3M Adhesion Primer. Used to prep the surface before attaching the LED strips. *Always, always, always* use this adhesion primer with 3M adhesive products if you want the bond to hold.
- 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.
- 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.
- 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.
- If you purchased the optional tail/turn/brake light integration, we also include three 40A automotive relays with holders. See wiring diagram at the end of this guide.

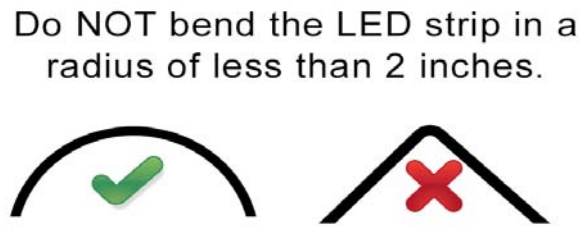
NOTE: Every installation varies a little so you may need to purchase additional items (or more of them such as zip ties) for your install.

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.



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.

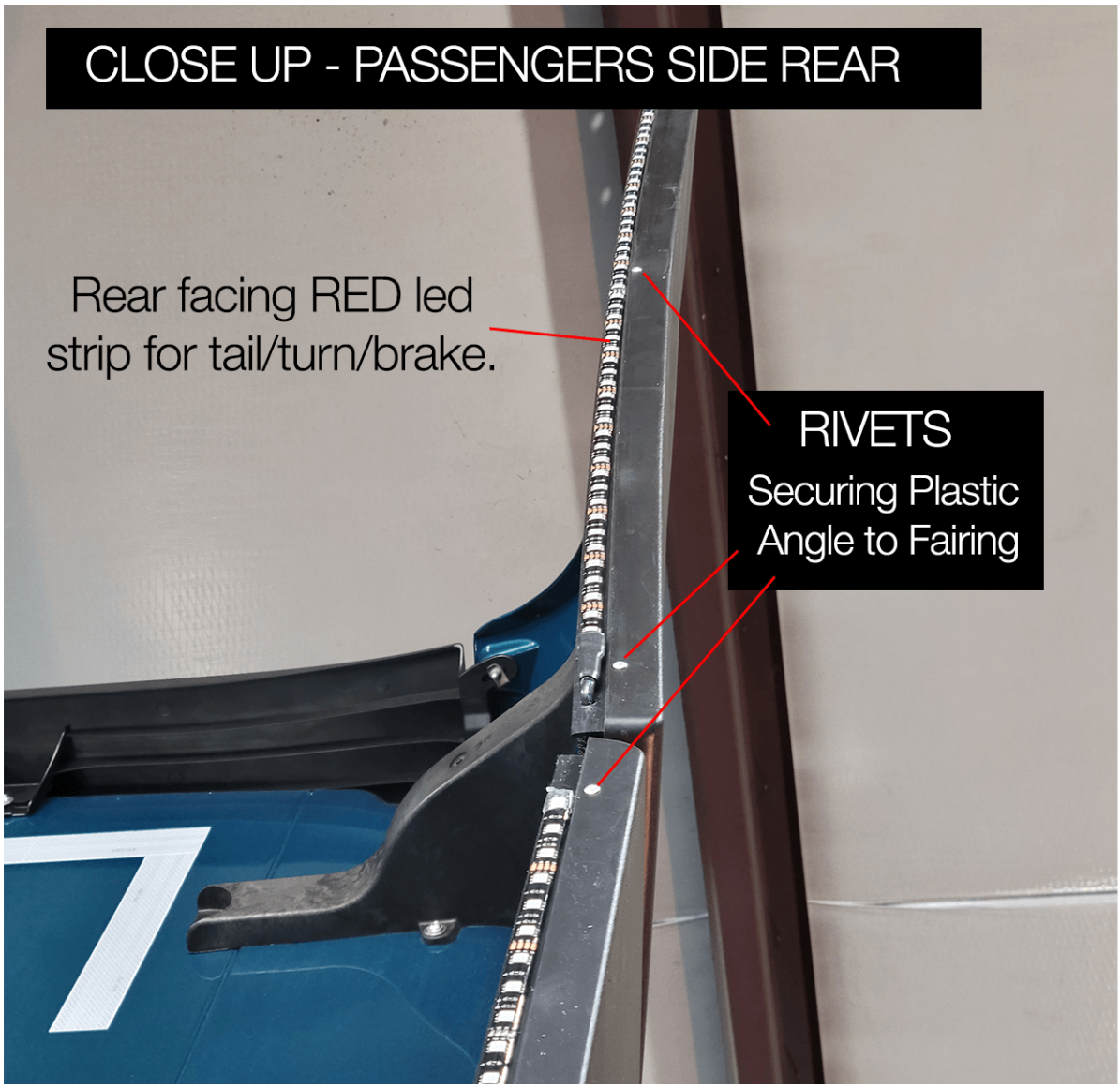
- Peel off the red backing tape that protects the 3M adhesive tape on your LED strip. Be careful not to let the tape touch anything. The 3M backing tape on these LED strips are one-use only. They cannot be reused.

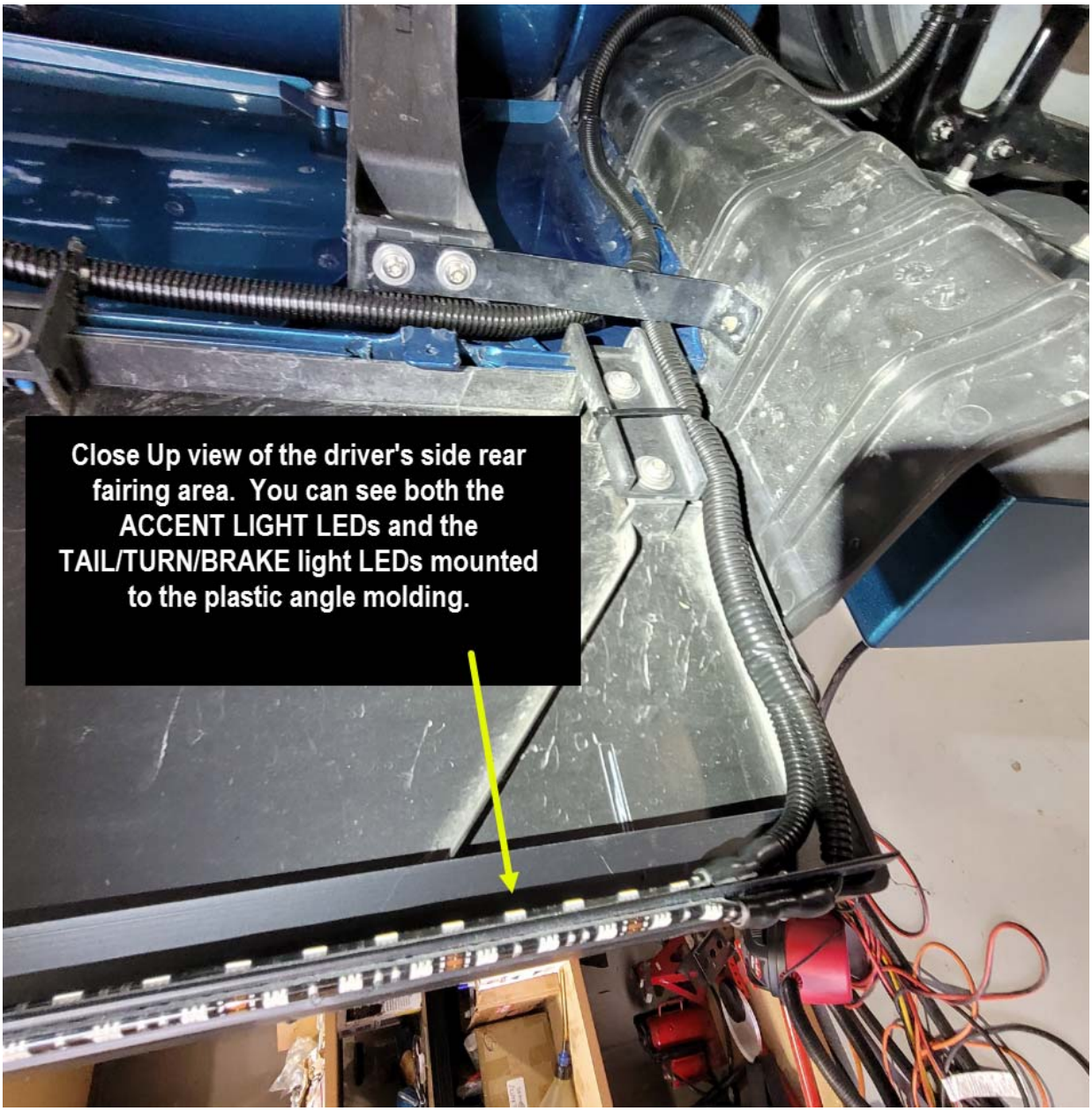
- Carefully push the LED strip to the area you have prepared. You will want to apply only enough pressure to the strip to make sure it is firmly mounted. *You only get one opportunity to do this.* Once the LED strip touches a properly prepared surface that has been promoted, that LED strip will be very 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.

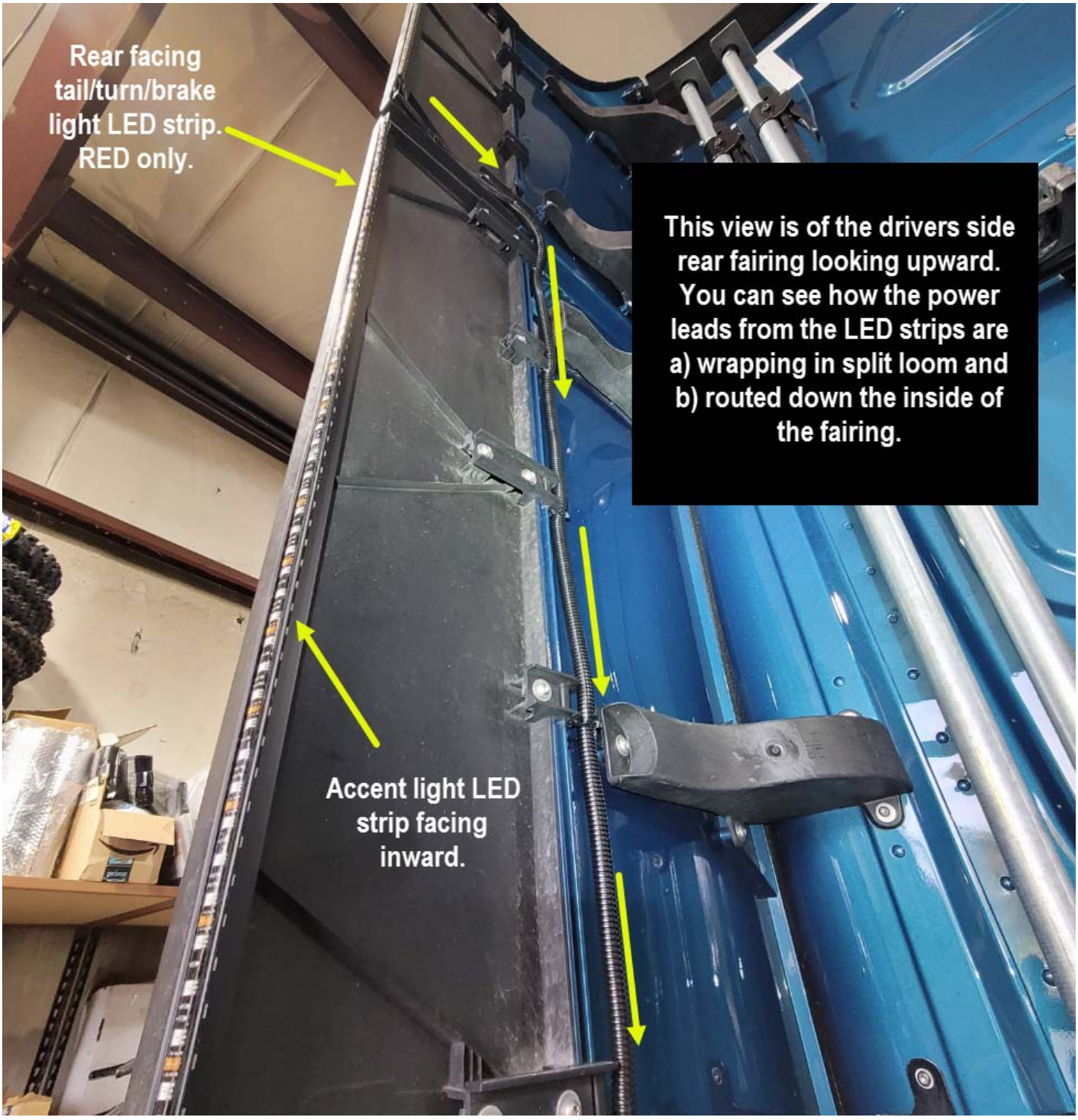
INSTALLATION PHOTOS

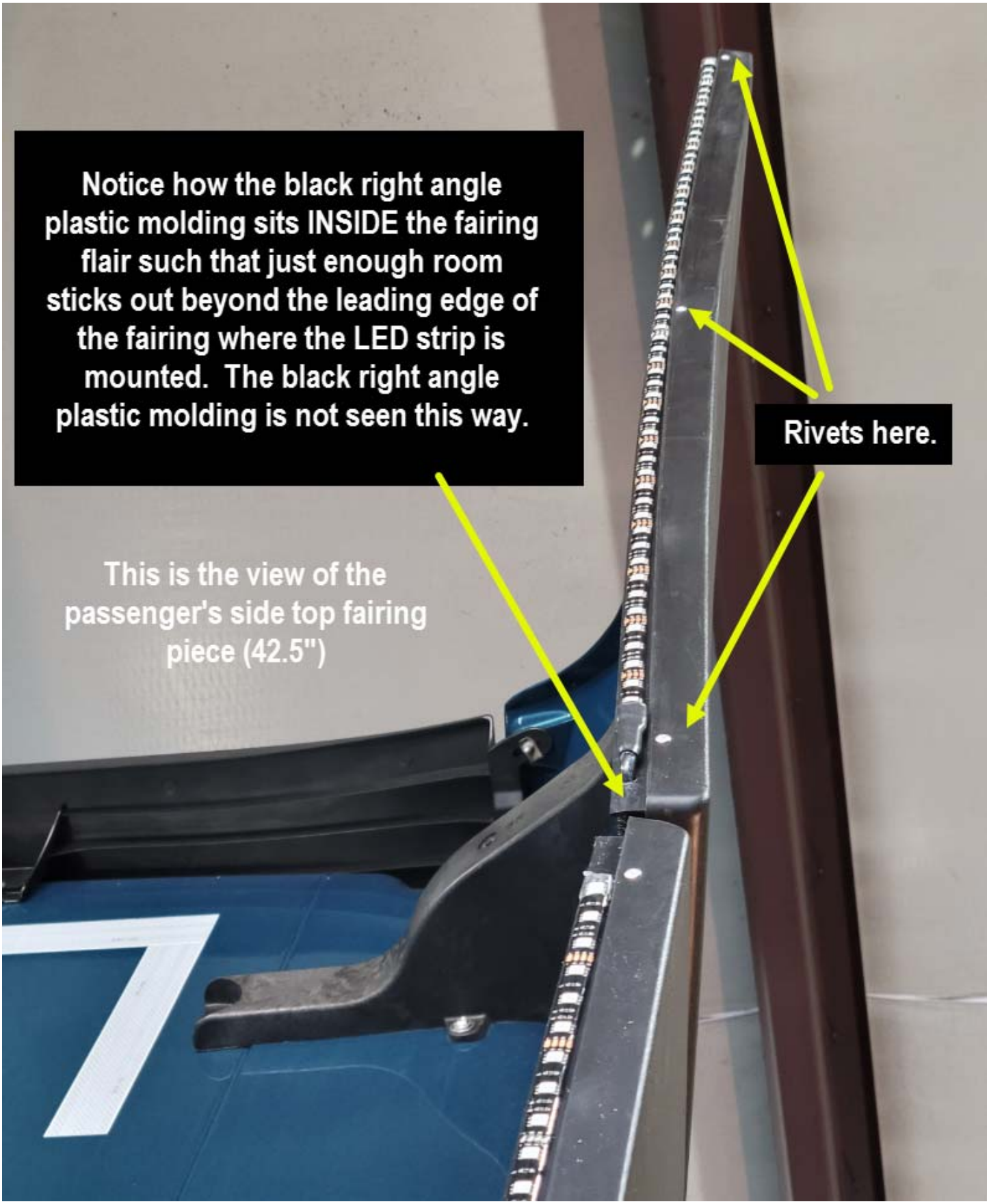
Here are some photos with comments on the installation we did in building this kit. We've commented on key parts of the installation along the way. NOTE: These photos are from our Freightliner light kit. The process is the same for the Western Star. Also, these photos showing our low-profile led strips. Starting June 1, 2022 we are only using our HEAVY DUTY LED strips for both Rear Fairing Access LEDs and Tail-Turn-Brake light kits.

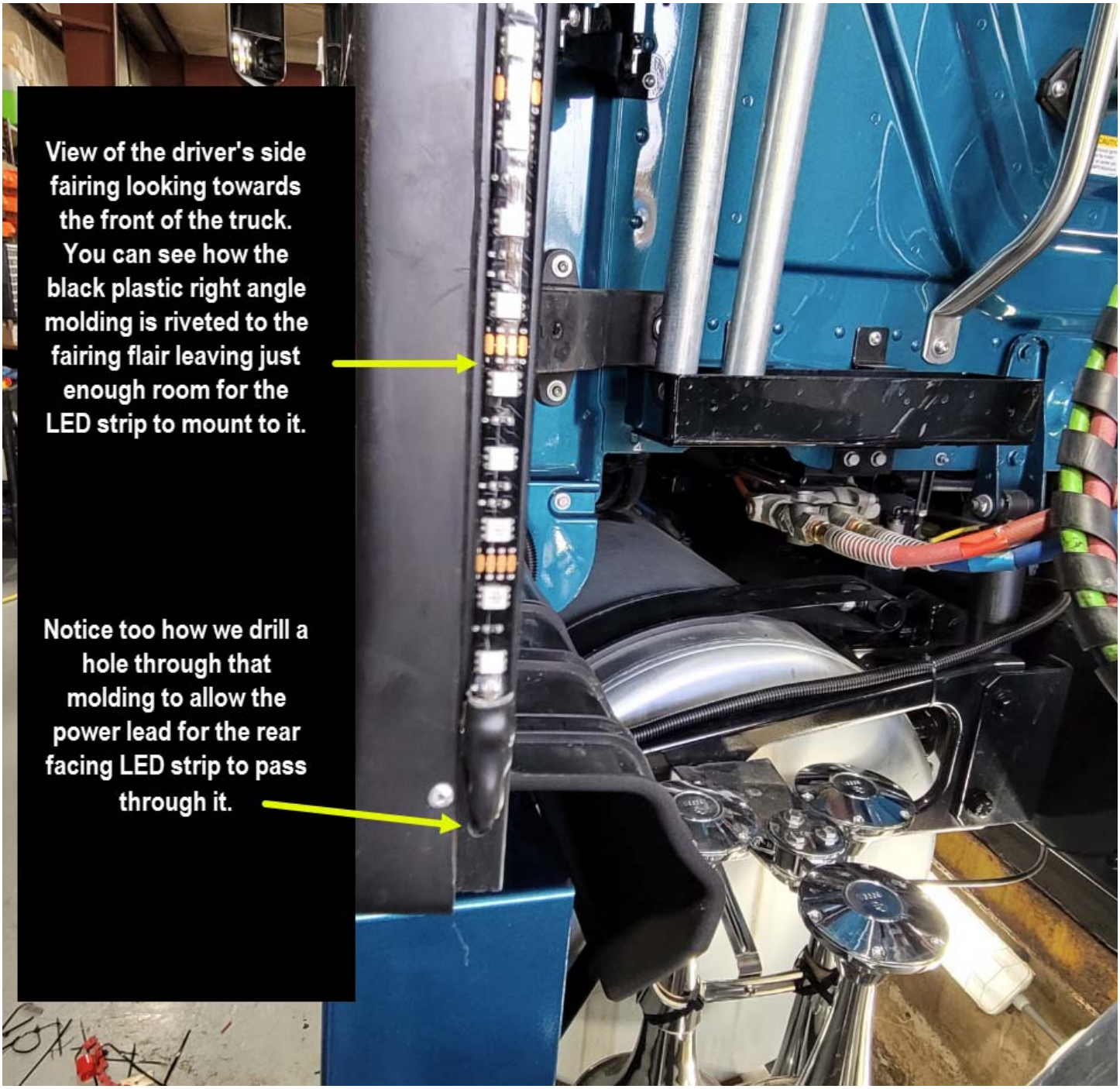

CLOSE UP - DRIVERS SIDE
Accent Strip Facing toward Back of Cab
RED LED Strip facing toward rear


CLOSE UP - PASSENGERS SIDE REAR
Rear facing RED led strip for tail/turn/brake.
RIVETS
Securing Plastic Angle to Fairing


Close Up view of the driver's side rear fairing area. You can see both the ACCENT LIGHT LEDs and the TAIL/TURN/BRAKE light LEDs mounted to the plastic angle molding.


Rear facing tail/turn/brake light LED strip. RED only.
This view is of the drivers side rear fairing looking upward. You can see how the power leads from the LED strips are a) wrapping in split loom and b) routed down the inside of the fairing.
Accent light LED strip facing inward.


Notice how the black right angle plastic molding sits INSIDE the fairing flair such that just enough room sticks out beyond the leading edge of the fairing where the LED strip is mounted. The black right angle plastic molding is not seen this way.
Rivets here.
This is the view of the passenger's side top fairing piece (42.5")


View of the driver's side fairing looking towards the front of the truck. You can see how the black plastic right angle molding is riveted to the fairing flair leaving just enough room for the LED strip to mount to it.
Notice too how we drill a hole through that molding to allow the power lead for the rear facing LED strip to pass through it.

TAIL / TURN / BRAKE LIGHT INTEGRATION

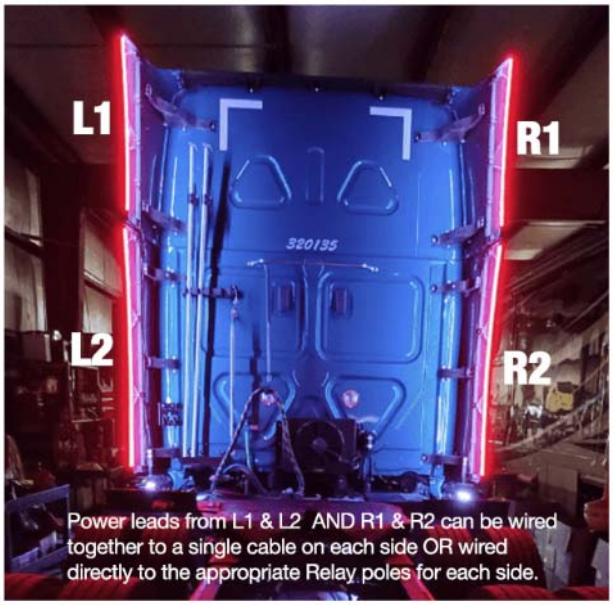
If you purchased the optional TAIL/TURN/BRAKE Light integration, these two diagrams show you how the LED strips need to be wired. NOTE: You must use the RELAYS we provide. Do not attempt to run the Boogey Lights tail/turn/brake light system using the truck's own lighting system power. Doing so will over-load the truck's LCM which will cause all of the lights on the truck to shut down. When that happens, you won't have any lights at all.

This photo shows the Freightliner Cascadia kit. The Western Star is the same configuration.

FREIGHTLINER CASCADIA TAIL-TURN-BRAKE LED WIRING

BOOGEY LIGHTS
LED STRIP
LEFT SIDE power leads
coming from L1 & L2

BLACK = chasis ground
BLUE (diode 1) -> RELAY 2
GREEN (diode 2) -> RELAY 1
RED (diode 3) -> RELAY 1

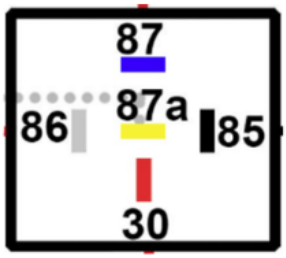


BOOGEY LIGHTS
LED STRIP
RIGHT SIDE power leads
coming from R1 & R2

BLACK = chasis ground
BLUE (diode 1) -> RELAY 2
GREEN (diode 2) -> RELAY 3
RED (diode 3) -> RELAY 3

FREIGHTLINER CASCADIA TAIL-TURN-BRAKE RELAY WIRING

RELAY 1



view of bottom of relay
each pole is numbered

85: Frame ground.

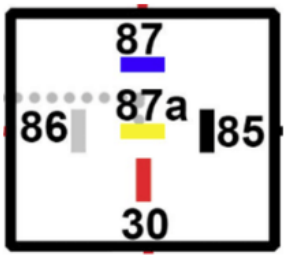
86: 12vdc+ trigger wire INPUT from truck's LEFT turn signal.

87: 12vdc+ OUT to Diodes 2 and 3 on the LEFT SIDE Boogey Lights LED STRIP.

87a: not used. cap the wire

30: Connects to 12vdc+ side of battery (with inline fuse).

RELAY 2



view of bottom of relay
each pole is numbered

85: Frame ground.

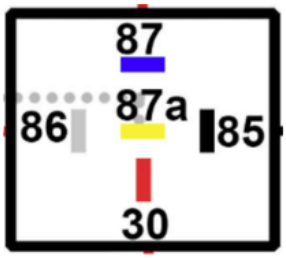
86: 12vdc+ trigger wire INPUT from truck's TAIL LIGHT aka Running Lights.

87: 12vdc+ OUT to Diode 1 on BOTH the LEFT and RIGHT SIDE Boogey Lights LED STRIPS

87a: not used. cap the wire

30: Connects to 12vdc+ side of battery (with inline fuse).

RELAY 3



view of bottom of relay
each pole is numbered

85: Frame ground.

86: 12vdc+ trigger wire INPUT from truck's RIGHT turn signal.

87: 12vdc+ OUT to Diodes 2 and 3 on the RIGHT SIDE Boogey Lights LED STRIP.

87a: not used. cap the wire

30: Connects to 12vdc+ side of battery (with inline fuse).

Be sure the RELAYS are mounted in the provided housing OR something similar to keep them dry.

NOTE: When wiring up the relays, make sure you compare the numbers on the relay posts itself (eg. 85, 86, etc) and NOT rely on the color coding of the wires coming from the relay base to determine which wire goes where. This is super important. Don't ask us how we know.

View of the 3 relays in the water proof housing.