INSTALLATION GUIDE

KENWORTH W900
UNDER-GLOW 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.

BEFORE YOU START

It's simply not possible to provide detailed instructions for all installation scenarios. Far too many variables and truck 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 however we must assume the installer has the skills, knowledge and tools necessary to do the work using the information we provide. You may need to vary your installation based on your truck. 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 (and 3M Adhesion Promoter) 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. 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.

Tools You May Need

Sockets/wrenches in the sizes necessary to remove the driver's side steps to access the battery bank, wire cutters/strippers, crimping tool, electrical tape, rubbing alcohol, shop rag or two, rivet gun and a heat gun for the heat shrink connections. We also suggest a 12vdc multi-meter to confirm/check voltages.

Installation Time

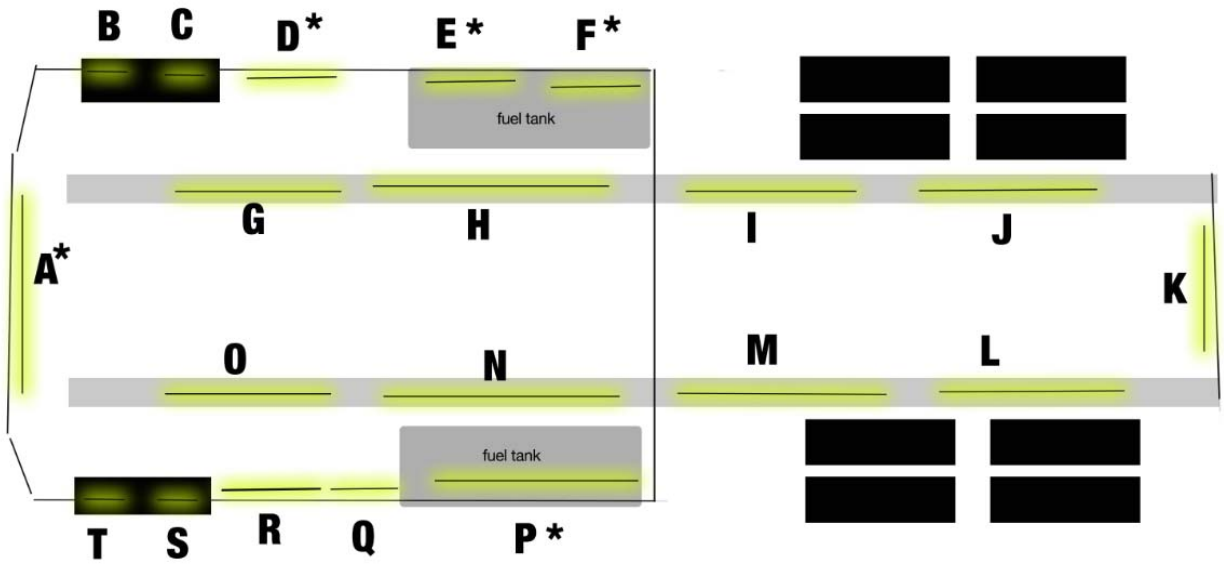
Installation of this led light kit takes 6 to 8 hours depending on whether or not you're adding this light kit to an existing installation or installing this kit as a stand-alone. Also, the type of lighting and switching you're using will impact the installation time too. Wiring diagrams are included at the end of the guide. We include wiring diagrams for the following scenarios:

- Multi-Color RGB Single Zone
- Multi-Color RGB Dual Zone
- Multi-Color RGBA
- Dual-Color with RGBA
- Single-Color
- Wiring RGB for MAGENTA
- Multi-Color RGB with Single Color LEDs

Mounting & Placement Locations / Planning Your Install

All 20 of the LED strips in this kit are built on our Heavy Duty LED strips. Each Heavy Duty LED strip is encased in rubber with a 36" power lead. Each LED strip will have to have it's power lead extended (using the included power lead cable) based on where the LED strip is located on the truck. In total there are 20 different mounting locations in this kit and all of the power leads need to be carefully run.

The mounting locations are focused in the following areas (see diagram below):



* Indicates the LED strip is mounted on plastic L channel.

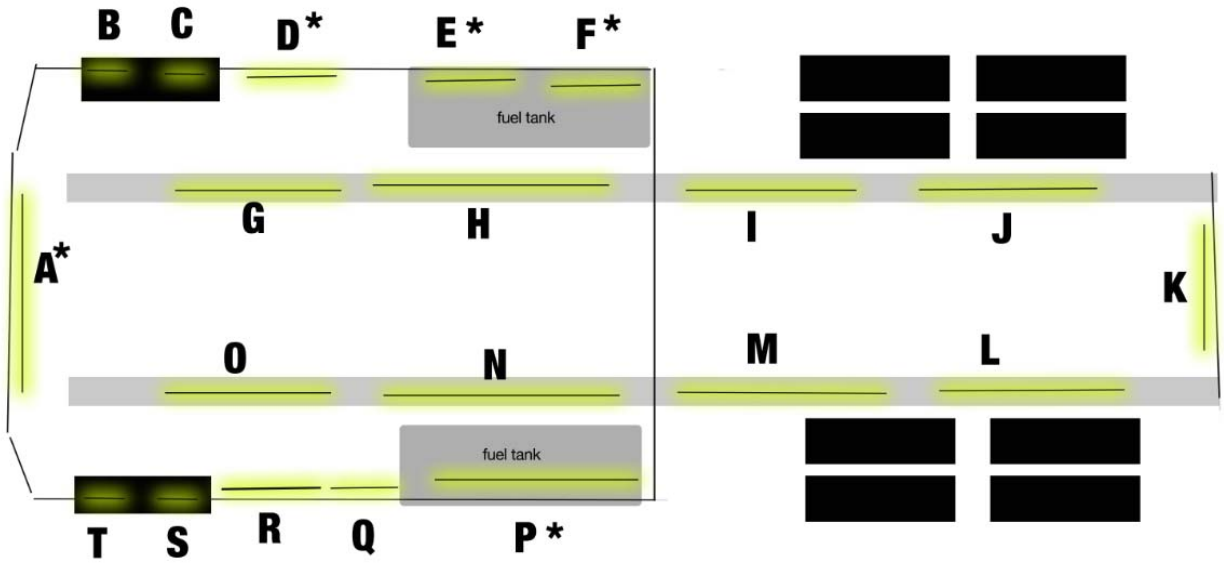
For power, you'll need access to the driver's side steps to access the batteries. Also, if you're installing an LED controller, the LED controller can be mounted in either the driver's side storage box or the passenger's. We prefer to use the driver's side as it is closest to the battery bank. While either location will work, be aware if you mount the controller in the passenger's side, you'll need to extend the positive battery cable a little further than if you mounted the controller in the driver's side storage. The 12vdc + power going to the LED Controller should connect directly to the 12vdc+ terminal on your truck's battery bank. You can connect the ground wire on the LED controller to any metal part of the chassis. Regardless of which side bay you use, you will need to drill a hole in the floor of that box to connect power to the battery box, led wires and antenna. 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 (heat shrink is included to make these connections.)

We recommend connecting all LED strips in similar locations together and then running one feeder cable back to the LED controller. Doing so reduces the total number of power leads coming back to the LED controller. We will typically connect the following LED segments together – creating 4 groups of led strips - and then use a single feeder cable to connect each of those LED groups back to the controller or switching mechanism you're using: A B C T S + D E F G H + I J K M L + O N P Q R S

We strongly recommend planning out your install on paper first. Be sure to wrap all power leads in split-loom which is also included and then secure them to the truck using zip ties.

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. Note that we provide actual photos of some of the placement locations at the end of this guide. Refer to the below lettered diagram for LED strip placement.



* Indicates the LED strip is mounted on plastic L channel.

- A = 45 LED strip mounted with 31” x 1.25” plastic ‘L’ channel.
- B = 30 LED strip mounted in forward wheel well.
- C = 30 LED strip mounted toward rear of wheel well.
- D = 60 LED strip mounted under the step with 42” x 1.25” plastic L channel.
- E & F = 45 LED strips (each) mounted on fuel tank with 64” x 1.25” plastic L channel
- G & H = 75 LED strips (each) mounted on frame rail.
- I = 75 LED strip mounted under frame rail
- J = 30 LED strip mounted under frame rail
- K = 45 LED strip mounted under rear frame rail
- L = 30 LED strip mounted under frame rail
- M = 75 LED strip mounted under frame rail
- N & O = 75 LED strips (each) mounted on frame rail
- P = 60 LED strip mounted with 42” x 1.25” plastic L channel to bottom of fuel tank
- Q = 15 LED strip mounted to bottom of DEF tank
- R = 45 LED strip mounted to bottom of step.
- S = 30 LED strip mounted toward rear of wheel well
- T = 30 LED strip mounted toward front of wheel well

Mounting Info

Black Plastic "L" Channel. We like to use rivets when connecting these to the truck's body because the LED strip can easily be mounted on top of the flat side of the rivet. You can also use screws or bolts however if you do, it's important not to mount the LED strip on top of the screw or bolt head. The 'L' shape of the bracket provides more rigidity and also will stop the light from the LED strip from shining sideways which in some configurations can be a problem. See photos of our install at the end of this guide for an example of how they should look.

WHAT'S INCLUDED

In addition to the LED light strips, power leads (and controller / switch if ordered), 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.

- Feeder Cable – 4 Conductor will work for both RGB and Single Color. 5 conductor is included for RGBA. Use this cable to extend the LED power leads back to the battery box and/or the LED controller/switch.
- 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 the LED controller (if purchased) to the wall in the storage compartment or similar location.
- Split Wire Loom / ¼". All power leads and the battery extension cables need to be protected from chaffing. Wrap them in this first.
- 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.
- Black plastic L channel along with rivets. Note that we do not cut the L channel to the lengths as shown in the diagram. You'll have to cut the channel to match your installation.
- Battery Extension Cable (if LED Controller or switch is purchased). We include some 10awg 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 (at least). In some cases we will include a 30 or 40 AMP fuse holder. 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 or switch 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 in a number of places to secure the LED power lead to the truck as well as to fill in holes drilled. Butyl will only work if you apply it to a clean surface so make sure you first clean the surface with rubbing alcohol.
- Heat Shrink (½" and 1/8"): We include heat shrink for extending the power leads on each of the heavy duty LED strips as well as sealing the connections to the LED controller if purchased. The 1/8" heat shrink is used to seal each of the individual connections. Then, the 1/2 " heat shrink is used to seal over top of that group. We have included a photo further on in this guide showing how this is done using quick-disconnect connectors (not applicable to this kit) but the concept remains the same.
- 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.
- 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. Here is a LINK to a page on our website that list some of these items: https://www.boogeylights.com/other-items-you-might-need/ .

If you purchased a kit without an LED Controller or switch we do not include any switching devices with the kit. We assume you already have a switch available in your truck or will be installing another switch of some type. Regardless of how you decide to switch your single color LEDs, be mindful of the amperage that adding 990 LEDs will draw. If you're considering adding these LEDs to an existing circuit (e.g. with your existing marker or running lights) we strongly suggest using a relay vs simply tapping into the existing circuit. This is especially important on newer trucks where the LCM will likely throw an error when you add more LEDs to the system.

- 990 Tri-Chip LEDs = 2970 diodes (RGB/Single color)
- 990 Quad-Chip LEDs = 3960 diodes (RGBA)
- 990 Dual-Color LEDs = 1980 to 2970 diodes (Dual Color, depends on color selection)

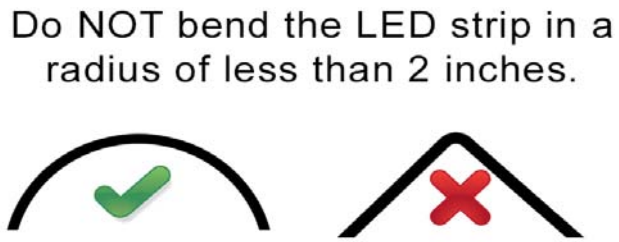
Follow these steps for mounting your LED strips:

- 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).

  If the area is especially greasy, you'll need to clean it with a degreaser or similar solvent. IF you do, be sure to use rubbing alcohol on the surface next to completely remove any left-over residue from the degreaser.

- 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.

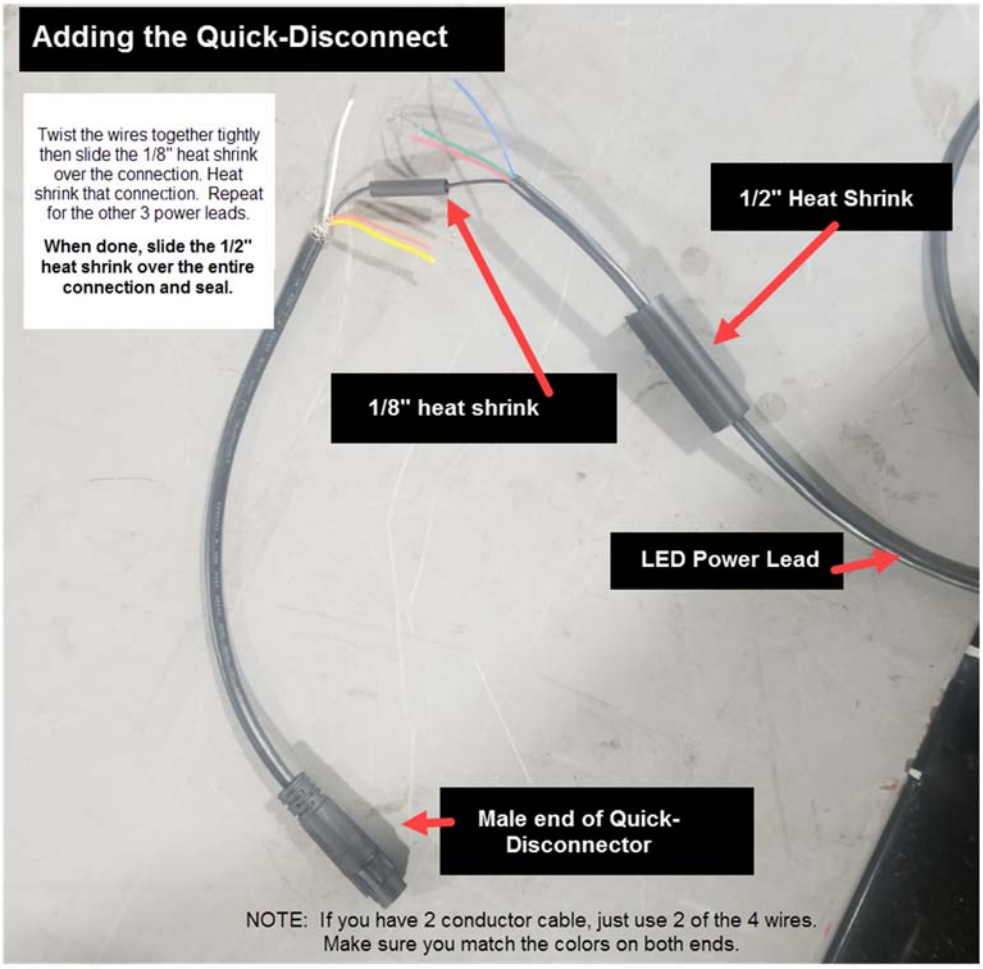


- Peel off the red backing tape that protects the 3M adhesive tape on your LED strip. Be careful not to let the tape touch anything. The 3M backing tape on these LED strips are one-use only. They cannot be reused.

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.

Here's a photo showing how to use the 1/8" and 1/2" heat shrink to connect and seal the feeder cable connections to the power leads of each Heavy Duty LED strip. Tightly twist the copper wires together. Important that none of the copper wire strands poke through the heat shrink. Make sure they're all laying down (and not pointing outward). Then, slide the 1/8" heat shrink over the connection and heat shrink that connection. Repeat for the other 3 (or 1 if single color LEDs). When those connections have been made, slide the ½" heat shrink on top of the bundle and heat shrink. For the 1/8" heat shrink you only need about an inch (1") or 1.25" of heat shrink to seal each connection. Use 2 or 2.5 inches of the ½" heat shrink to cover the bundle.

NOTE: There are no quick-disconnect connectors in this kit. The below diagram is provided for illustration purposes of showing how to use the heat shrink.



WIRING DIAGRAMS & POWER CONSIDERATIONS

The following pages contain wiring diagrams for all switching, LED color and/or controller configurations we offer for this product. Be sure to select the wiring diagram for the product 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.

AMPERAGE DATA

LOW PROFILE		AMPERAGE DRAW PER LED	
		INPUT VOLTAGE	
RGB (MULTI COLOR)	# DIODES LIT	12.5 Volts	13.5 Volts
White	3	0.0114	0.0138
Red	1	0.0048	0.0055
Green	1	0.0048	0.0059
Blue	1	0.0047	0.0057
Magenta	2	0.0084	0.0101
SINGLE COLOR			
White	3	0.0104	0.0126
Red	3	0.0109	0.0124
Green	3	0.0105	0.0124
Blue	3	0.0102	0.0121
Pink	3	0.0102	0.0124
Amber	3	0.0106	0.0121
Orange	3	0.0116	0.0133
UV	3	0.0084	0.0105
RGBA (1)			
Amber	1	0.0066	0.0075
RGBWW (2)			
Warm White	1	0.005	0.006
Cool White	1	0.005	0.006
RGBW (3)			
Warm White	1	0.007	0.0086

Meaurements calculated with a 15', 20 awg power lead

(1) Amperage draw is for the Amber diode. Refer to amperages for RGB component of this strip.

(2) Amperage draws are for the Warm White and Cool White diodes. Refer to amperages for RGB component of this strip.

(3) Amperage draw is for the Warm White diode. Refer to amperages for RGB component of this strip.

RGB and Single Color LEDs are 5050 Tri-Chips
The Amber, Warm White and Cool White chips on the RGBA, RGBW and RGBWW are single diode chips.

HEAVY DUTY		AMPERAGE DRAW PER LED	
		INPUT VOLTAGE	
RGB (MULTI COLOR)	# DIODES LIT	12.5 Volts	13.5 Volts
White	3	0.0156	0.0189
Red	1	0.0153	0.0176
Green	1	0.0162	0.0197
Blue	1	0.0169	0.0206
Magenta	2	0.0121	0.0144
SINGLE COLOR			
White	3	0.0156	0.0189
Red	3	0.0153	0.0176
Green	3	0.0162	0.0197
Blue	3	0.0169	0.0206
Pink	3	0.0177	0.0221
Amber	3	0.0152	0.0174
Orange	3	0.0154	0.018
RGBA (1)			
Amber	1	0.0081	0.0096

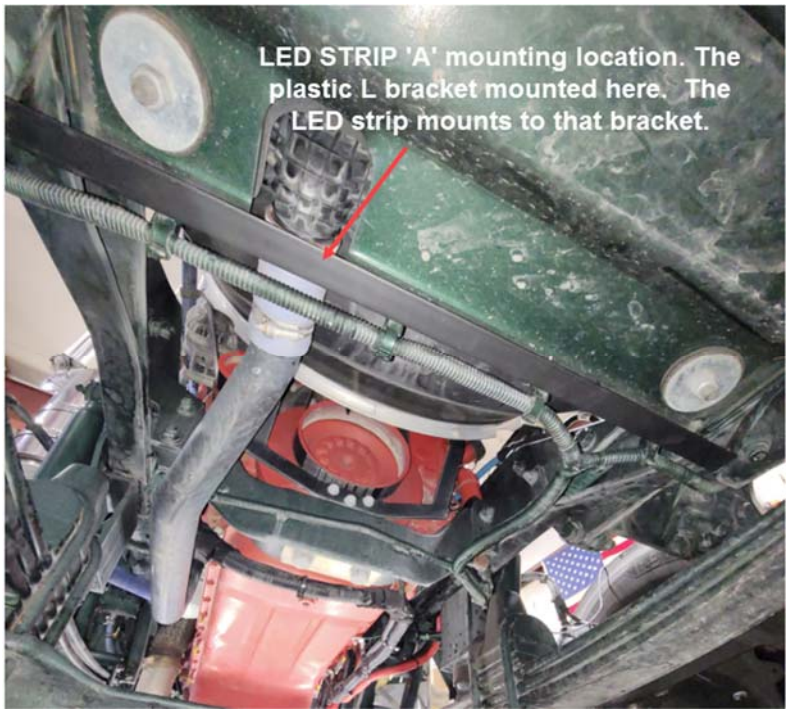
Meaurements calculated with a 3', 22 awg power lead

(1) Amperage draw is for the Amber diode. Refer to amperages for RGB component of this strip.

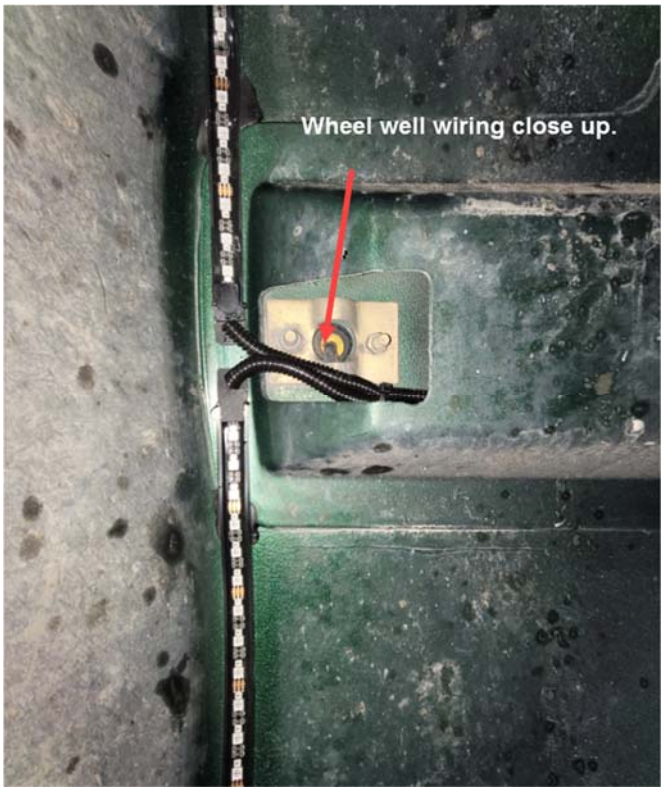
RGB and Single Color LEDs are 5050 Tri-Chips
The Amber chip on the RGBA is a single diode chip.

Use the above data for planning only.
We strongly urge all customers to measure the actual amperage draw of their lighting system. The input voltage, the number of leds, the type of switches used and the amount of copper wire in your system will impact the actual amperage draw in your system when installed.

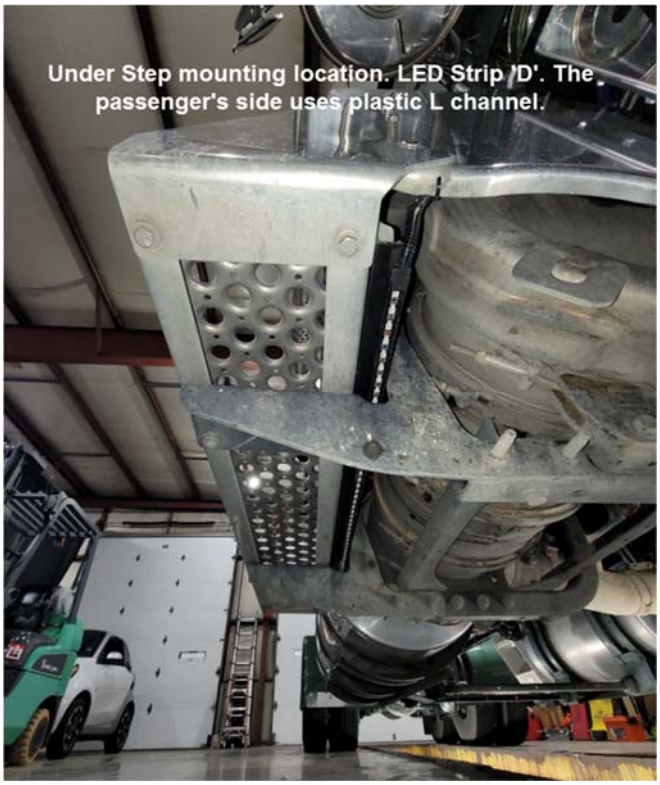
INSTALLATION PHOTOS



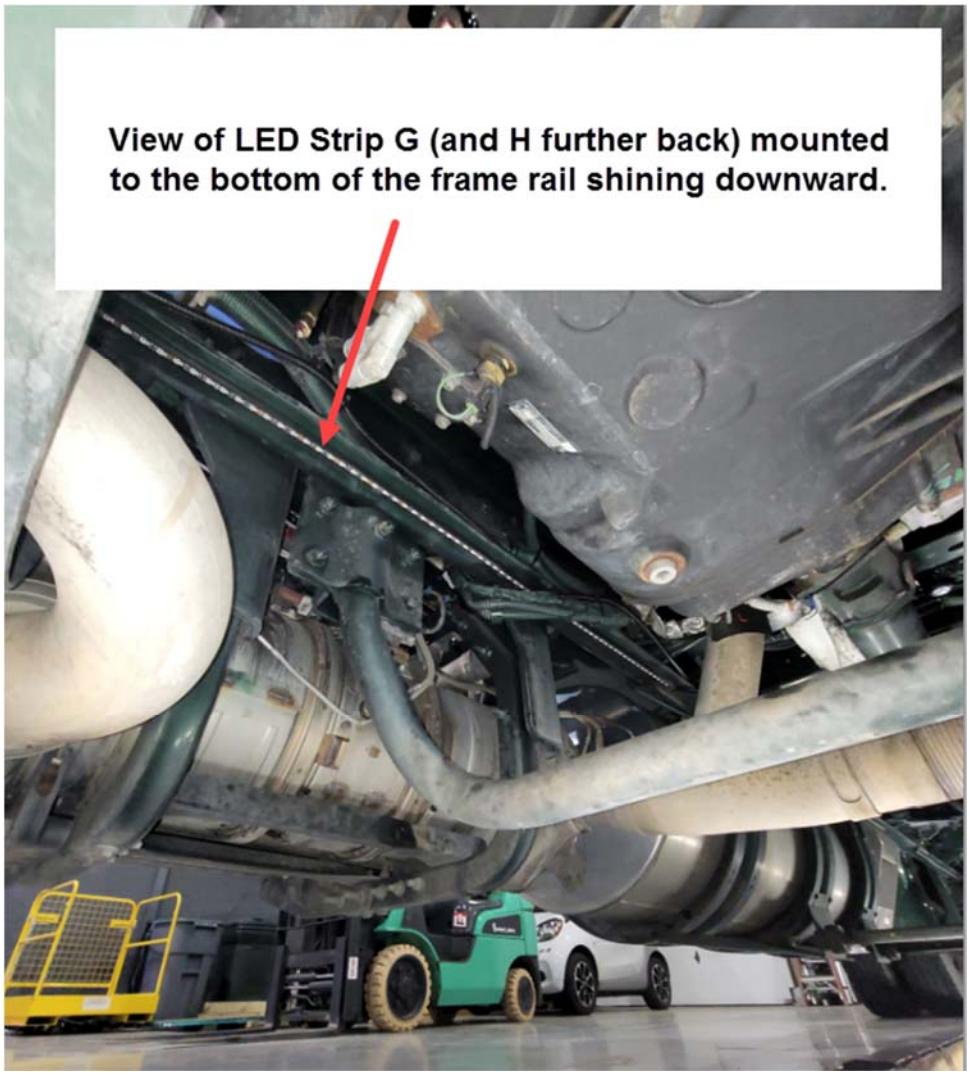

Wheel well mounting location. Both LED strips power leads come together in the middle.

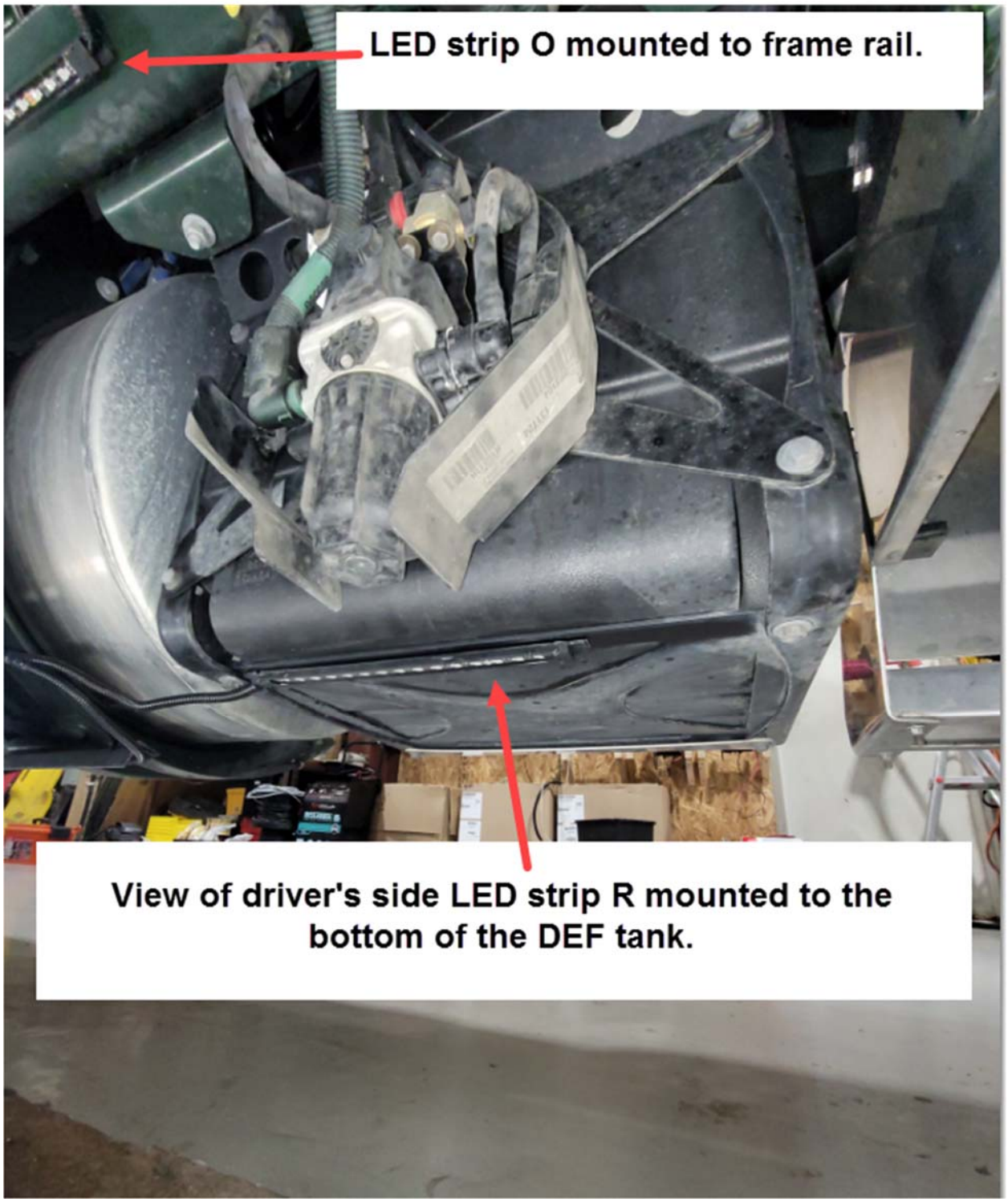

Wheel well wiring close up.

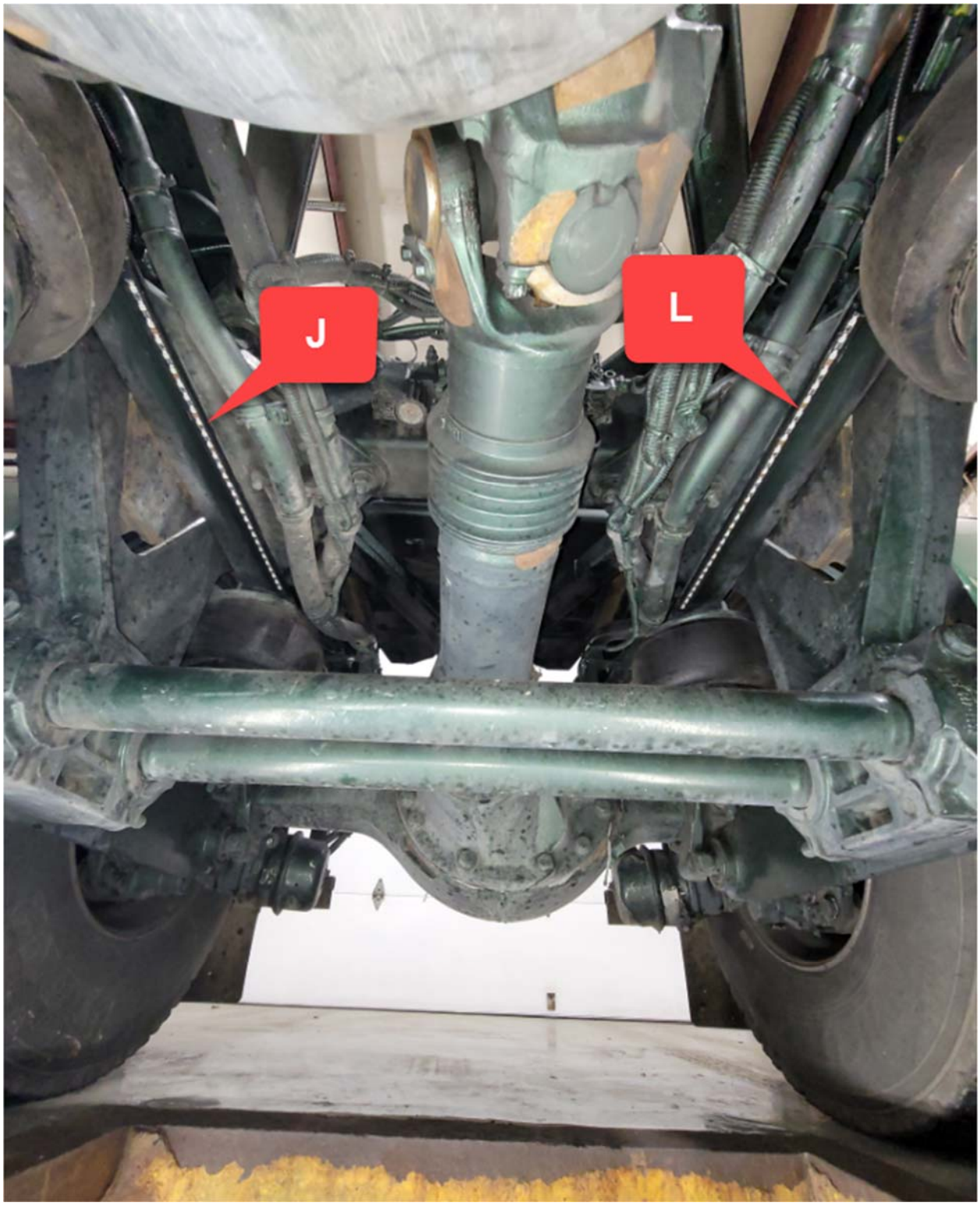

Under fuel tank. Passenger's side. Plastic L channel is riveted to the tank support struts. LED Strips E & F
Rivets

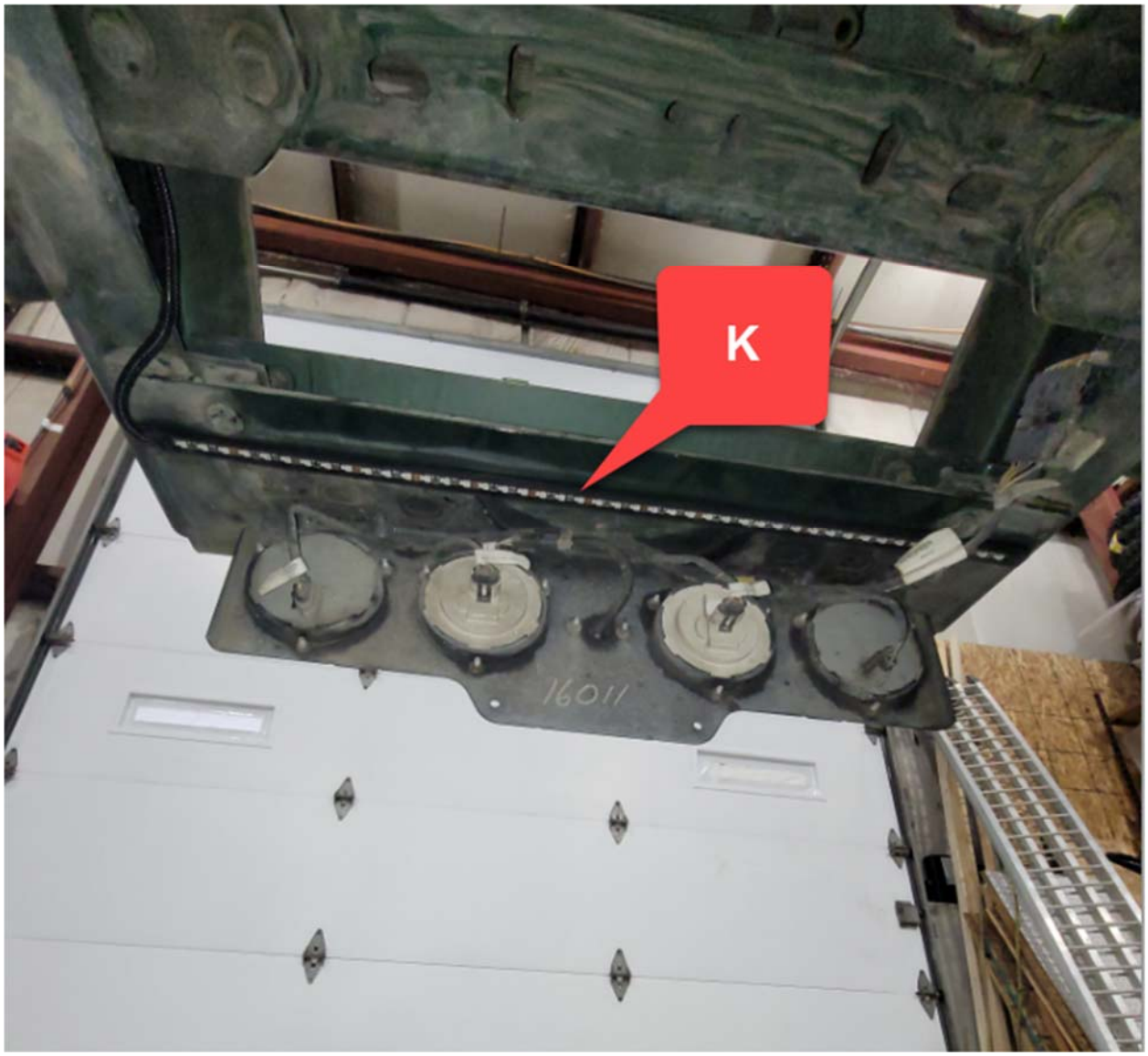

Under Step mounting location. LED Strip 'D'. The passenger's side uses plastic L channel.


View of passenger's side fuel tank mounting. Important the black plastic L channel be mounted further back on the tank strut as shown so the LED strip itself can't be seen from the side.


View of LED Strip G (and H further back) mounted to the bottom of the frame rail shining downward.


LED strip O mounted to frame rail.
View of driver's side LED strip R mounted to the bottom of the DEF tank.


J
L


K
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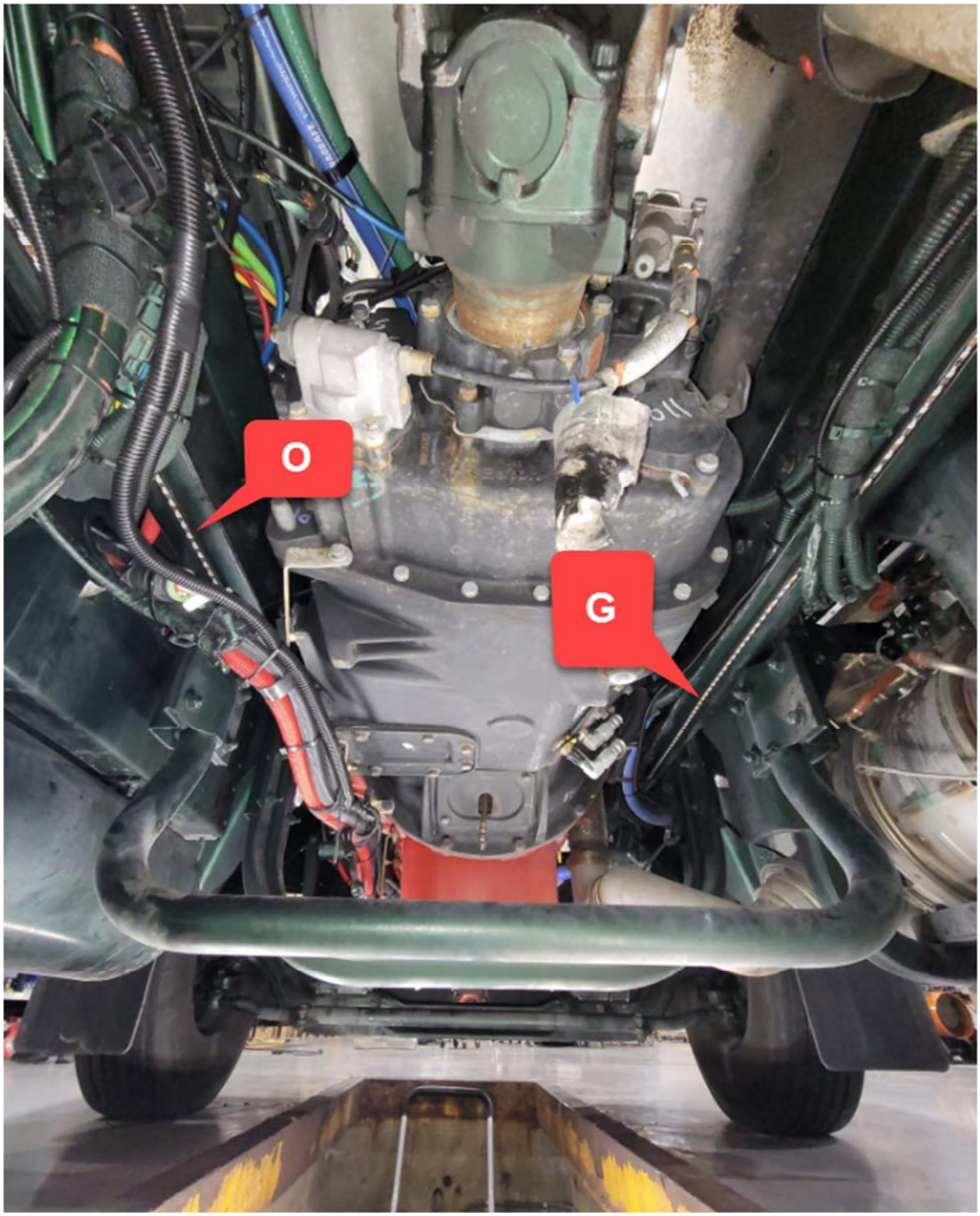
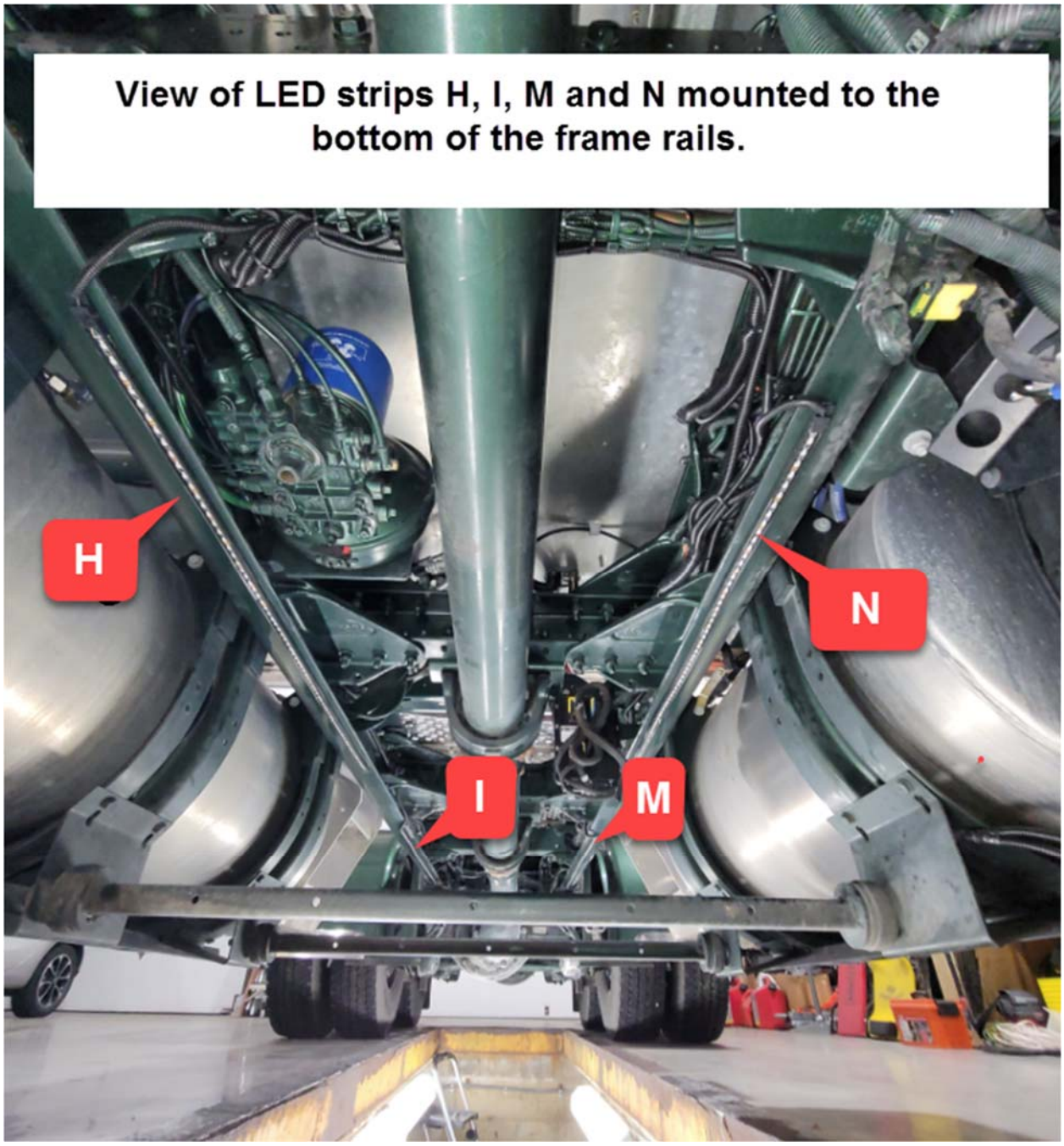
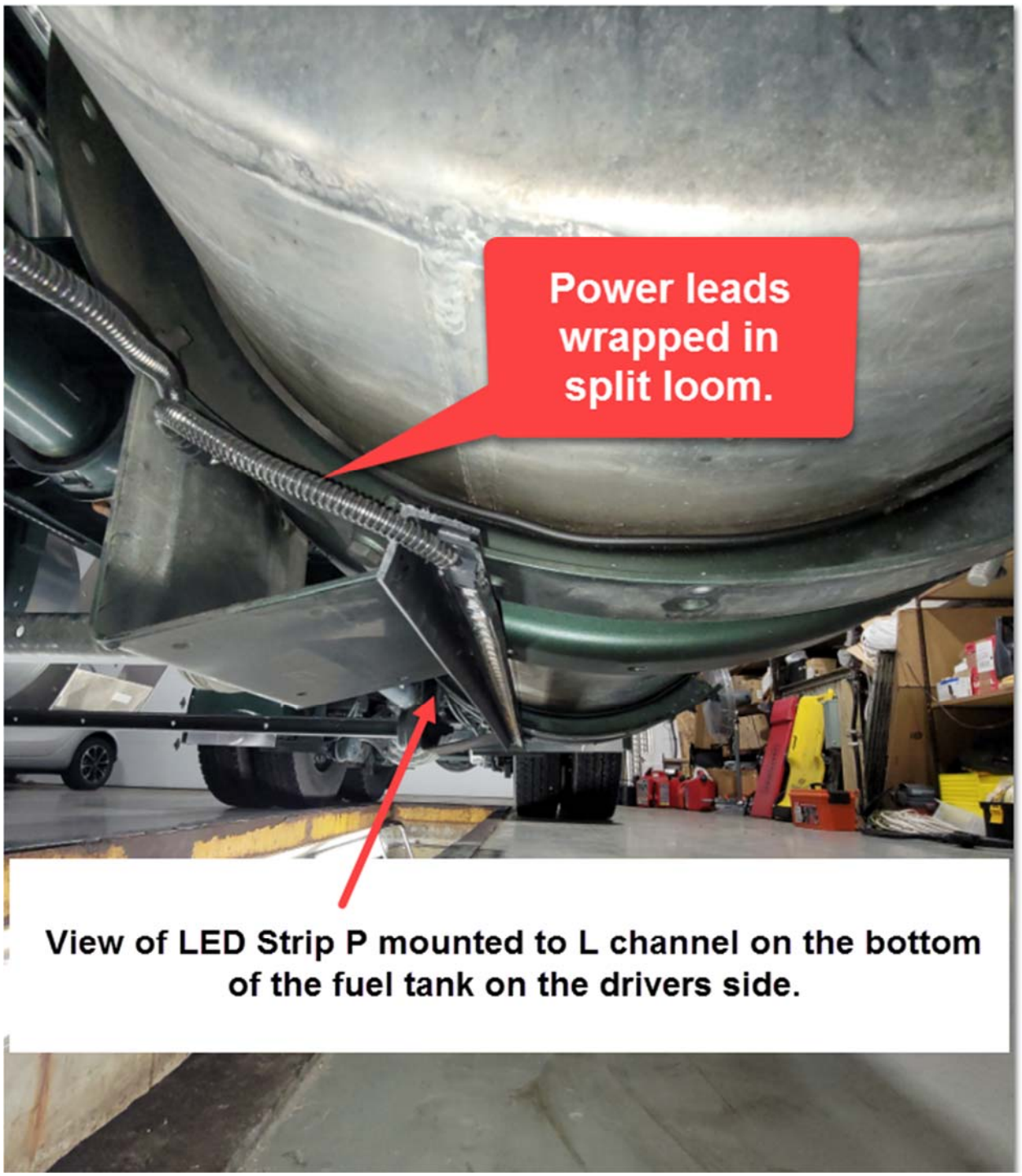

O
G


View of LED strips H, I, M and N mounted to the bottom of the frame rails.
H
I
M
N


Power leads wrapped in split loom.
View of LED Strip P mounted to L channel on the bottom of the fuel tank on the drivers side.