INSTALLATION GUIDE

RV ROOF ACCENT LED Light Kit

We realize there's a lot of reading here. We wish it was easier but if you want the best possible fit and finish (and you want your light system to last a long time), we urge you to take the time to read these directions as well as the wiring diagrams and related documents included with your order. You'll be happy you did.

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. 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). 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 RV. 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.

KIT OVERVIEW. This Boogey Lights® RV ROOF ACCENT LED light kit is designed to mount to the RV's roof with the LED lights shining up toward the awning cassette. Doing so illuminates the space between the roof and the awning cassette providing a straight-line glow of light on the roof's edge. These lights can be added to just the passenger's side or to both the passenger and driver sides. For driver's side application, there isn't typically an awning cassette on the driver's side of most motor homes but there is usually a fairing structure to match the look of the passenger's side. While it's not essential that the RV have the awning cassettes installed, we think it looks better. You could for example mount these lights to the roof of just about any RV or trailer shining upward. Without the structure of an awning cassette (or similar fairing) to reflect off of though, the look won't be as impressive in our view. This is a personal preference though. Also, nothing says you can't use these strips on top of a fifth wheel trailer, travel trailer or even a cargo or utility trailer.

This light kit includes at least two LED strips per side. Each LED strip will have a 5' to 15' power lead secured to one end. On longer motorhomes there will be three LED strips (per side). We include a 'CUT SHEET' with your order indicating the suggested layout, placement and lengths of these LED strips for your specific RV. Refer to that CUT SHEET for specifics on your order. Depending on where the awning cassettes are mounted to the roof, you may need to trim one of the LED strips to fit your specific RV. We include instructions on how to do this as well as the heat shrink necessary to properly seal any strips that need to be cut.

For those who want a more professional, polished look, we offer the option of ordering aluminum channel with plastic diffusers. If you ordered these channels, they will be included with your order. In terms of mounting, the aluminum channel is secured to the roof first using included 3M VHB tape + 3M Adhesion Primer and then the LED strip is mounted inside the aluminum channel with the plastic diffuser going on top. We suggest sealing the ends with Lexel or equiv.

CONSIDERATIONS BEFORE YOU BEGIN. The primary consideration is determining how you're going to route the power lead wires that attach to the LED strips to the inside of the RV where they connect to the LED controller (and a power source). Hopefully you've already done this before placing your order. Why? Because how you route the LED strip power lead wires will determine whether or not you need to add 120vac to 2vdc power converters to your order. Regardless, we suggest looking at the RV's roof to determine if you're going to access the RV through a hole in the front of the RV or the rear. Our comments about both options are below.

Front of RV Roof Access. If you're routing the power lead wires through a hole in the roof in the front of the RV, the next consideration is to examine the storage areas above the driver / passenger area. You're examining that area to determine a) if there is at least one 120vac electrical outlet in that area and b) if there is room in that area to mount both an LED controller and at least one 120vac to 12vdc power converter. In our experience, any RV in the 38'+ range will have both of these. The LED controller needs about 10" x 4" of room. The power converter needs 8" x 4". If you're powering RGBA or RGBW lights, you'll need room for two power converters. With regard to the 120vac outlet, we suggest making sure the circuit is at least a 15amp 120vac power outlet with 3 to 5amps of available room on the circuit (2 amps if one power adapter, 4 amps if two).

Rear of RV Roof Access. You'll need to examine the location where the wires will be entering the RV at the rear. In our experience, diesel pusher motor homes that have a full height engine bay are the easiest to deal with since the wires on the roof will drop directly into the engine bay area. Some motor homes will already have a wire chase installed making the job simple. If the space immediately under the roof in the rear of the RV empties into the master bedroom closet, you can still use this method to route the wires just that you'll need to drill another hole in the bedroom closet that allows the power lead wires to enter the engine bay area. Of course, anytime you're running wires into the engine bay compartment you're going to want to make sure you wrap those wires with split loom, and you keep the wires away from hot parts and/or moving parts.

For rear of RV roof access, you'll also need to consider where you're going to mount the LED controller and get 12vdc power. If your house batteries are behind the axle(s), we suggest going to the house batteries and mounting the LED controller there. If, however your house batteries are forward of the drive/tag axles, you may want to consider pulling power from the starter batteries which are always close to the engine in the rear. We realize this advice is not without some risk. Generally speaking, we advise customers never to pull power from the starter batteries (aka 'chassis batteries') on motor homes. Always pull from the house battery bank. That way, you can't inadvertently drain your starter batteries to the point they can't start the engine.

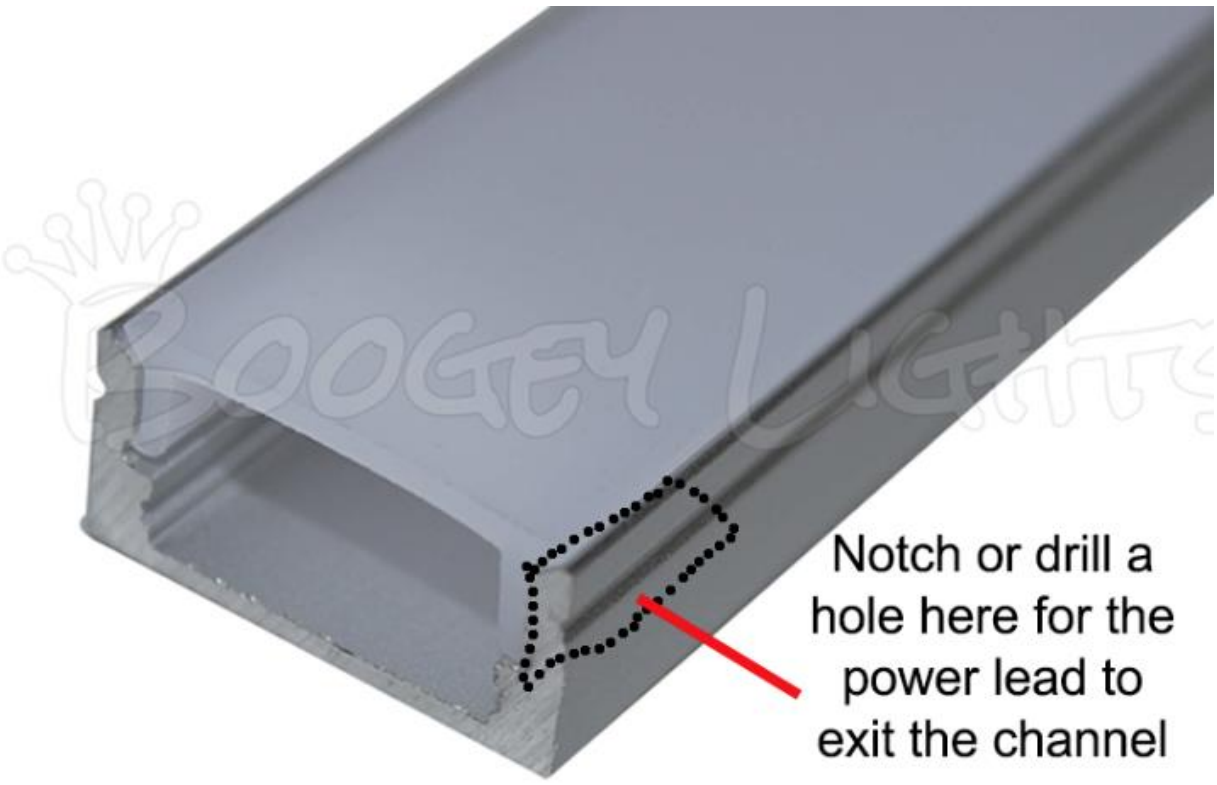
In situations where the house batteries aren't close to the engine bay, adding more copper wire into the circuit to reach those house batteries is problematic. Why? Because these roof light LED strips will already have 40' to 50' of power lead in the circuit just to get the power leads down to the engine bay area. Adding another 30', 40' or even 50' of power lead to reach forward mounted house batteries will a) add more resistance (higher amperage) and b) reduce the voltage that reaches the LED strips on the roof (noticeably less bright). Unless you want to spend the extra money to extend the 12vdc+ battery connection from the house batteries to the rear engine bay area (would require buying 30' - 50' of 2AWG or even 2/0 AWG copper wire with appropriately sized terminal block), the next best option is to power the roof lights from the starter battery bank which usually consists at least of two 12vdc, high cold cranking amp batteries in parallel. If you decide to power the roof lights with the starter batteries, just be mindful of the amperage draw of the roof lights. You might want to make sure your starter

batteries are fresh and charging properly. Helps too if your motor home has a bonding switch that will allow you to bond the house batteries to the starter batteries in the event you do run down your starter batteries.

LAYOUT AND WIRING. The maximum length of a single high performance 12vdc Boogey Lights® LED strip is 16' (300 or 400 LEDs depending on the LED type). *They cannot be daisy chained.* To cover longer distances, we use multiple LED strips. Typically, RVs that are 35'- 38' or longer will require three LED strips to provide full roof coverage (two 16' + one shorter length). Shorter RVs only require two LED strips. The 'CUT SHEET' referenced above will list the number and lengths of LED strips for your specific order.

On the following pages you'll see two diagrams showing the typical layout for both scenarios (2 or 3 led strips per side). Obviously, use the layout that is specific to your RV. For the passenger's side mounted LED strips, the power leads attached to these LED strips are secured to the back of the awning cassette housing with zip ties (hole drilled in the overhang lip on the back for the zip tie). For driver's side installations, the power leads are secured to the fiberglass fairing/facade using rivets and cable clamps.

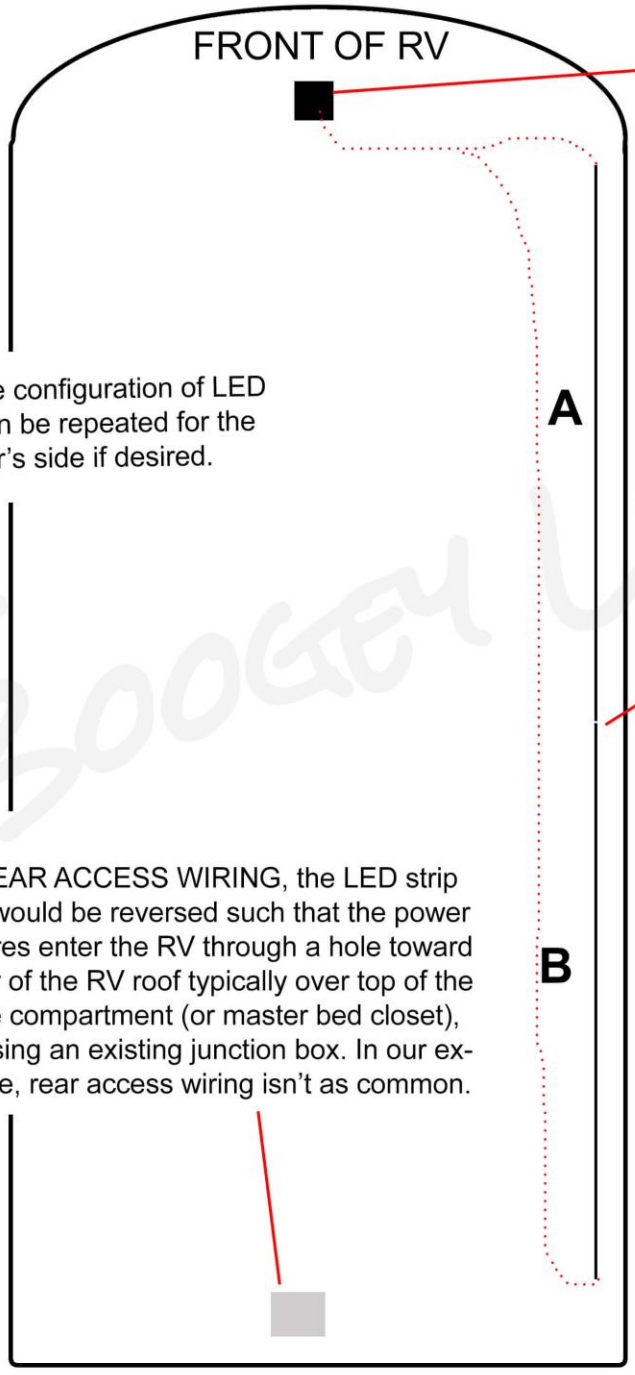
Aluminum Channels? If you are using the aluminum channel option and your RV requires three LED strips per side, you'll need to notch out a hole in the aluminum channel for LED STRIP B (see layout diagram) to allow the power lead to exit the channel. This way you can position LED strips A and B as close together as possible.



Fill with Lexel or similar once installed to stop water intrusion.

RV ROOF ACCENT LIGHT LAYOUT

Assumes 2 LED Strips (per side)



LED strip power lead wires enter the RV in the front using an existing wire chase that typically includes wiring that also services a satelite dish, solar panels, antenna, a/c unit, etc.

The same configuration of LED strips can be repeated for the driver's side if desired.

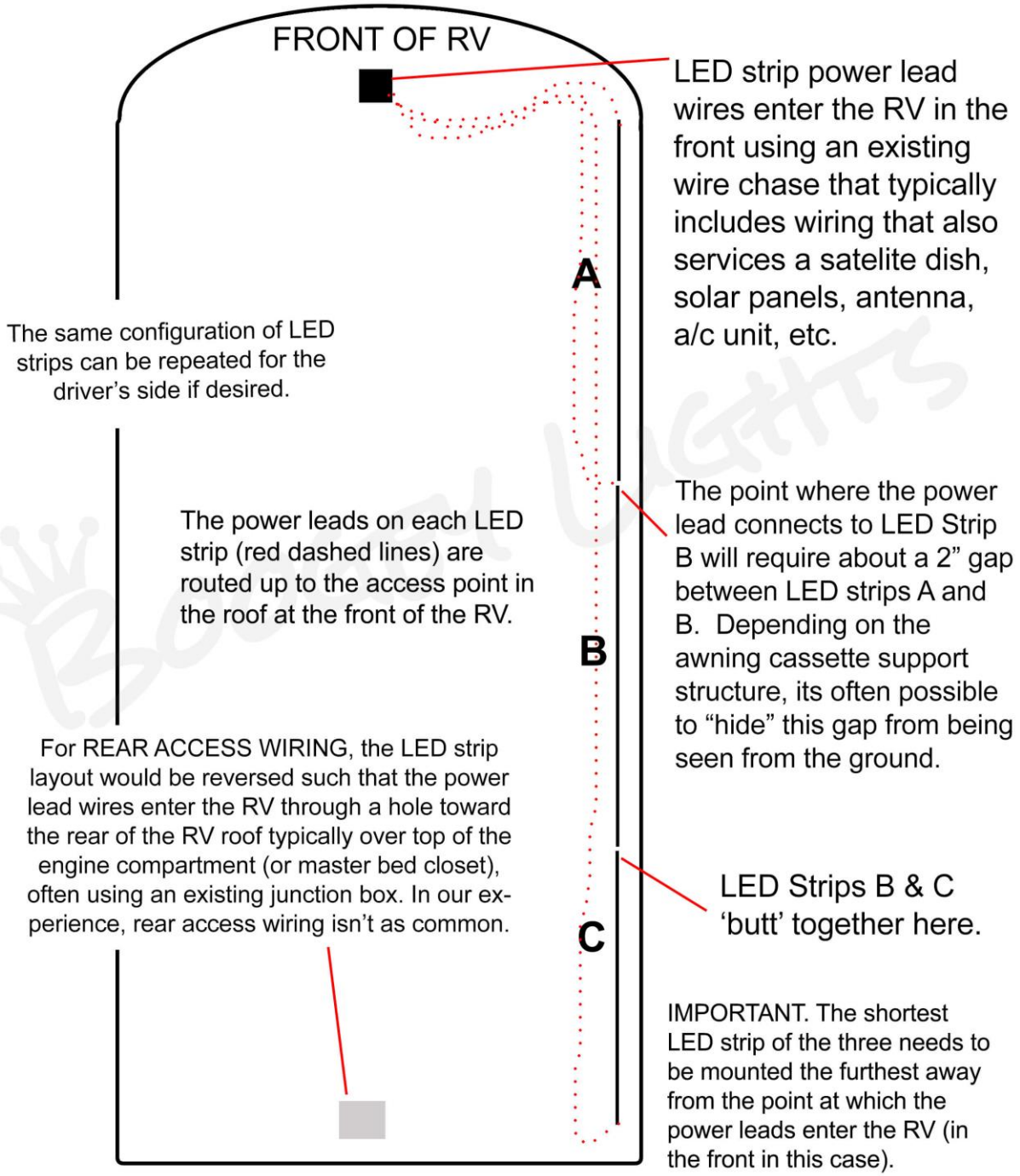
LED Strips A & B 'butt' together in the middle giving the illusion of a single LED strip down the roof edge.

For REAR ACCESS WIRING, the LED strip layout would be reversed such that the power lead wires enter the RV through a hole toward the rear of the RV roof typically over top of the engine compartment (or master bed closet), often using an existing junction box. In our experience, rear access wiring isn't as common.

The power leads on each LED strip (red dashed lines) are routed up to the access point in the roof at the front of the RV.

RV ROOF ACCENT LIGHT LAYOUT

3 LED Strips (per side)



LED strip power lead wires enter the RV in the front using an existing wire chase that typically includes wiring that also services a satelite dish, solar panels, antenna, a/c unit, etc.

The same configuration of LED strips can be repeated for the driver's side if desired.

The power leads on each LED strip (red dashed lines) are routed up to the access point in the roof at the front of the RV.

The point where the power lead connects to LED Strip B will require about a 2" gap between LED strips A and B. Depending on the awning cassette support structure, its often possible to "hide" this gap from being seen from the ground.

For REAR ACCESS WIRING, the LED strip layout would be reversed such that the power lead wires enter the RV through a hole toward the rear of the RV roof typically over top of the engine compartment (or master bed closet), often using an existing junction box. In our experience, rear access wiring isn't as common.

LED Strips B & C 'butt' together here.

IMPORTANT. The shortest LED strip of the three needs to be mounted the furthest away from the point at which the power leads enter the RV (in the front in this case).

SECURING LED STRIP POWER LEADS. For the passenger's side mounted LED strips, the power leads attached to the LED strips are secured to the back of the awning cassette housing with zip ties. We typically will drill a hole in the overhang lip of the awning housing (sheet metal) for the zip tie to go through. That 'lip' has just enough room for a hole the size of a zip tie. For driver's side installations, we secure the power leads to the fiberglass fairing/facade using rivets and cable clamps. Since there isn't an awning cassette on that side, it's easy enough to do. In some cases, we'll use additional 3M VHB tape (with 3M adhesion primer) to secure the power lead cable to the roof. Each install will be a little different in this regard. The key is making sure the power leads are not able to move when the RV is going down the road.

ALUMINUM CHANNEL OPTION. Before making the decision on adding Aluminum Channel to your RV roof accent light installation, we strongly suggest taking a close look at your RV's roof structure. In particular, examine how water is directed off the roof. Why does this matter? Because if your RV's roof doesn't have a well-designed gutter system that directs water on the roof to the corners of the coach (or similar), using Aluminum Channels isn't ideal. The reason is that mounting aluminum channel to an RV roof without a well-designed gutter drainage system will force water to pool behind the aluminum channel which will in almost all cases allow water to intrude inside the diffuser / channel seams. Once that happens, water will become trapped inside the channel/diffuser with the LED strip. The LED strip will - sooner or later - short out because it is sitting / submerged in water. These LED strips are not marine grade LED strips and they will fail prematurely in this situation (not covered under warranty). If your RV doesn't have adequate gutter drainage and you still want to use the aluminum channels, we suggest only using RGB LEDs (don't use RGBA or RGBW because those LED strips make it difficult to get a good seal in the channel due to their extra width) and then to carefully - and thoroughly - seal all plastic diffusers and channel seams using Lexel or similar. The goal is to keep water out of the aluminum channels. If you're unsure about this, give our technical support team a call and we'll be happy to discuss our installation experience with you.

For roof lighting, we use 3M VHB tape + 3M Adhesion Primer (both are provided with the kit if the aluminum channel option). Always treat the mounting surface with 3M Adhesion Primer before mounting the channel with 3M VHB tape. Mount the aluminum channel to the RV roof first. It's important that the entire channel be secured to the roof. The 3M tape needs to run the entire length of the channel. The kit includes enough 3M VHB tape to do this. Be sure to use rubbing alcohol or similar to clean the roof first before applying the 3M Adhesion primer (do the same for the back of the aluminum channel). Then, attach the 3M VHB tape to the aluminum channel. At this point you're ready to mount the aluminum channel with 3M VHB tape on the back to the RV roof. You only get one opportunity to do this, so we recommend putting down some painter's tape (or similar) to make sure the aluminum channel is properly positioned on the roof. The instant the 3M VHB tape touches a surface that has been treated with 3M Adhesion Primer, a bond is created. It's instant. You will not be able to move the aluminum channel after that. Note that you may need to cut the aluminum channel to make it fit your RV's roof structure. If so, the aluminum is easy to cut with a coping saw, hand saw or metal saw blade. Same with the plastic diffuser.

Once the aluminum is secured to the roof, the LED strips will fit nicely into the channel using the 3M tape already affixed to the back of Boogey Lights LED rolls. Be sure to treat the aluminum first with 3M Adhesion primer. The diffuser completes the installation by snapping into the channel. For rv roof installations we advise adding some Lexel / silicone to the ends of the channel to seal it. Note that if you purchased RGBW or RGBA LEDs (vs RGB or Single-Color LEDs), the LED strip is 2 mm wider, so the fit is

more snug inside the aluminum channel – but they'll fit. Just don't put too much pressure on the LED strip when inserting into the channel.

MOUNTING THE LED STRIPS. Whether you're mounting the LED strips directly to the RV's roof or inside the aluminum channel, 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.

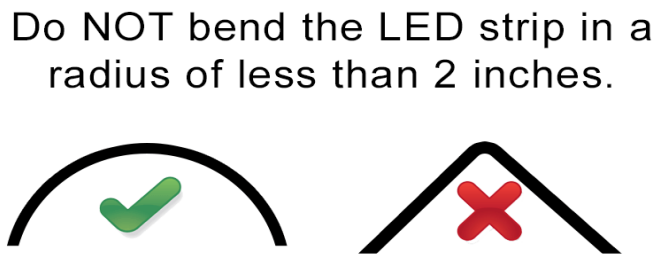
- Use rubbing alcohol to clean the area where you are going to mount the LED strip. Be sure to let the alcohol dry completely before proceeding to the next step. (Note: Do not use acetone or similar cleaner).

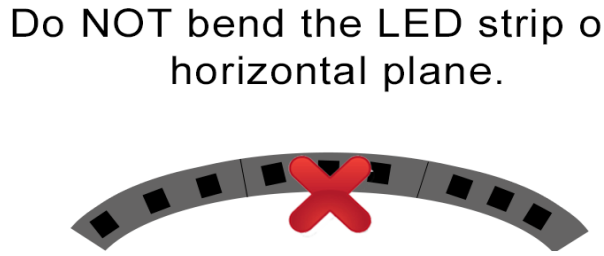
- If the area is especially greasy, you'll need to clean it with a degreaser or similar solvent. IF you do, be sure to use rubbing alcohol on the surface next to completely remove any left-over residue from the degreaser.

- 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.





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 roof lights on and you wired your lights to the starter batteries of the RV (vs 120vac to 12vdc power converter)0, 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.