

PURKEYS

A MISSION CRITICAL ELECTRONICS BRAND

SOLAR BOLT

INSTALLATION GUIDE





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GENERAL INFORMATION

The Solar Bolt™ Charging System is an MPPT charge controller with automatic temperature compensation. One and two panel systems use a 15 amp controller and three panel systems use a 20 amp controller.

The Solar Bolt charge controller utilizes patent-pending technology that is designed to work in conjunction with the electrical system on a vehicle or trailer. The Solar Bolt provides three-stage charging for the batteries when the vehicle's primary charging system is not active. It senses when the primary charging system is active and matches the charge voltage. This enables the solar panel to deliver up to its full output capability to the batteries when the vehicle is running. The module's technology allows the Solar Bolt to provide power to the electrical system of the vehicle, which reduces the electrical load on the alternator and, in turn, reduces the mechanical load on the engine, thereby realizing fuel savings.

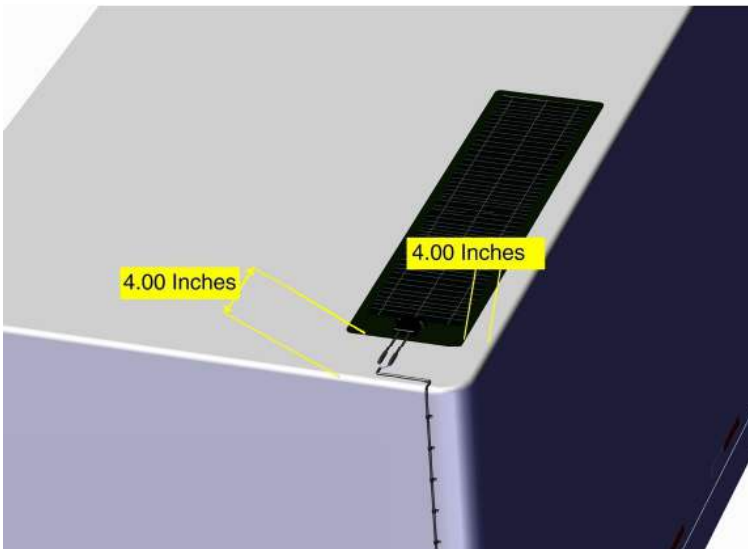
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SOLAR PANEL PLACEMENT

Place the solar panel a minimum of 4 inches from the side edge of the trailer and 4 inches from the front or rear edge of the trailer, allowing enough room for the edge tape to be applied. Avoid placing edge tape over trailer roof rivets to prevent water intrusion under the edge tape. Placement of panels in this manner will leave sufficient room so that more panels can be added in the future.

Do **not** adhere panel to trailer! Leave the panel sitting in place until the Solar Bolt main harness has been installed (see Step 5 in the Solar Bolt Main Harness section), in case slight adjustment to panel placement is needed.

Double check the length of wiring and placement of panel to ensure that the provided wire length is sufficient for the intended panel placement.



INSTALLATION PREPARATION

If the bond surface is wet or dirty, the solar panel may not completely bond. We do **not** recommend solar panel installations when surface temperatures are below 40 degrees Fahrenheit or where there is moisture on the bond surface. Any installs completed during the winter should be done in a heated shop where the bonding surface is warm and dry.

Purkeys is not responsible for failures caused from installs completed in non-recommended conditions.

Tools and Equipment Needed

Translucent Roofs

- 220 grit sand paper or Scotch-Brite pad (Maroon or Green)
- Isopropyl alcohol
- 3M 94 primer or equivalent
- Roof seal 4” bonding tape
- 3M VHB tape or equivalent
- Optional: Sikaflex 221 or 291
- Rags
- Zip ties
- Rubber gloves

Metal Roofs

- 220 grit sand paper or Scotch-Brite pad (Maroon or Green)
- Isopropyl alcohol
- Roof seal 4” bonding tape
- Optional: Sikaflex 221 or 291
- Rags
- Zip ties
- Rubber gloves

Note: Use proper Personal Protective Equipment (PPE), as needed.

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Step 1: Remove all loose material and clean the area where you are preparing to place the solar panel(s).

Step 2: Abrade the surface with 220 grit sand paper or Scotch-Brite to remove surface impurities (example of scuffed roof shown here).



Step 3: Set the panel(s) in the desired location and use a permanent marker to mark the location of each panel.

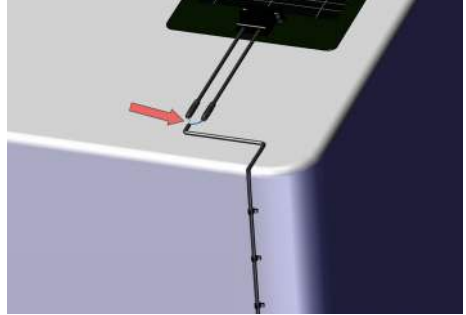
Step 4: Clean the area by applying isopropyl alcohol to the surface and wiping clean. Repeat this process until the area is clean and no additional residue is found on the rag or on the bonding surface.

Step 5: Let the area dry completely before bonding (10-15 minutes).

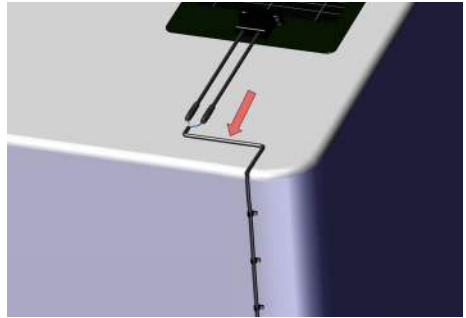
Note: When working on a translucent or fiberglass roof, apply 3M 94 primer or equivalent after area is dry.

SOLAR BOLT MAIN HARNESS INSTALLATION

Step 1: Connect the Solar Bolt main harness to the 100 watt solar panel(s). The solar connectors on the main harness are already installed and ready to attach to the solar panel positive and negative wires.



Step 2: Route the main harness along the edge of the trailer and over to the right side of the trailer. Secure the harness by using the supplied nylon clamps and #12 x 3/4" hex tek screws.



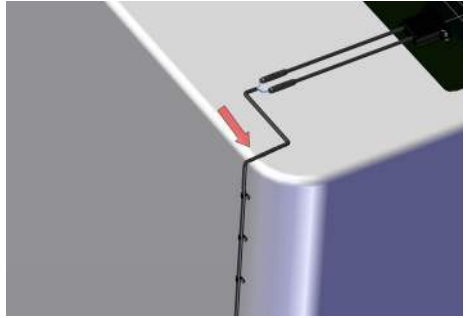
If mounting on the front edge of the trailer, keep the wire secure on the roof edge. E chain or conduit is recommended to be placed over the wire at the roof edge, not provided in the kit.

If mounting panel(s) at rear of trailer, use the hollow door post. This is the same side that the wiring going to the top rear clearance lights is routed through.

Important: Do not screw into the roof of the trailer. Make sure to screw into the framing of the trailer to prevent water intrusion.

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Step 3: If mounting on the front, route the main harness over the edge of the trailer. Secure the harness by using the supplied #12 x 1" washer head hex tek screws.



Important: Do not screw into the roof of the trailer. Make sure to screw into the framing of the trailer to prevent water intrusion.

Step 4: If mounting on the rear, route the main harness through the channel for trailer light wiring in the door frame, if possible, or route the main harness down the trailer wall. Secure it using the supplied nylon clamps and #12 x 3/4" hex tek screws.



Important: Place the supplied cable clamps along the 2-conductor jacketed main harness every 6 inches to ensure proper support for the cable. Avoid sharp edges and possible chaffing points.

Step 5: Refer to the “Bonding Solar Panels” section for details on panel installation.

SOLAR PANEL INSTALLATION

MECHANICAL FASTENING

Panels have six mounting grommets to provide mechanical fastening capabilities. If mechanical fastening will be used, please refer to the trailer or box OEM practices in regards to mechanically fastening to the roof.

BONDING SOLAR PANELS

Note: If completing an install in temperatures lower than room temperature, keep the panel and roof seal tape at room temperature until just before the installation.

Metal Roofs

Step 1: Partially remove the backing material from the mastic of the panel and place panel according to the alignment marks.

Step 2: Pull the backing off the mastic as the panel is laid down on the surface. The panel should be laid down by rolling the panel onto the bond surface; this will ensure there are no air bubbles under the panel.

Step 3: Apply pressure by rubbing the panel by hand, making sure the mastic meets the bond surface. Some trailer and box truck surfaces are not very flat, and you will need to take caution to make sure the panel is bonded down as the panel is rolled out.

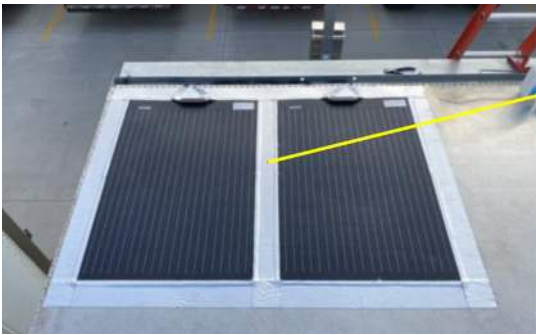


Step 4: After the panel mastic is bonded to the surface sufficiently, prepare for the edge seal by lightly abrading the edge of the solar panel and the adjacent metal surface with Scotch-Brite. Do NOT abrade any of the actual solar cells.

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Step 5: Clean the edge by adding isopropyl alcohol to the cleaning rag, wiping the edge bonding surface. Make sure all loose material and residue from sanding prep is removed. Be careful not to oversaturate the edge of the solar panel where the mastic is exposed. Allow the isopropyl alcohol to completely dry (10-15 minutes) before applying the edge seal.

Step 6: Using the 4” roof seal edge tape, drape it over the panel about 1/2” without covering any solar cells. Do NOT cover the actual solar cells with the tape. The tape seal should be applied from back to front of the trailer to allow overlapping edges to be covered and not be exposed to the wind as much as possible. The front edge will be applied last and two layers should be applied to assure the wind will not pry up the edges of the front of the panel. Apply with good pressure from hands or a rubbing tool.



Example of proper panel spacing when installing multiple panels

Step 7: An alternate edge seal is to use Sikaflex 221 or 291 by applying a liberal bead around the edge of the panel to seal from moisture and keep the wind from pulling the edges of the panel up. If this method is used, the Sikaflex will need at minimum 24 hours at room temperature (70 F) to cure before service. It is the responsibility of the customer to verify the edge seal is sufficiently cured before putting the trailer or box truck in service.

NOTE: Purkeys is not responsible for solar panel failure if the truck or trailer was put into service before Sikaflex edge seal is cured.

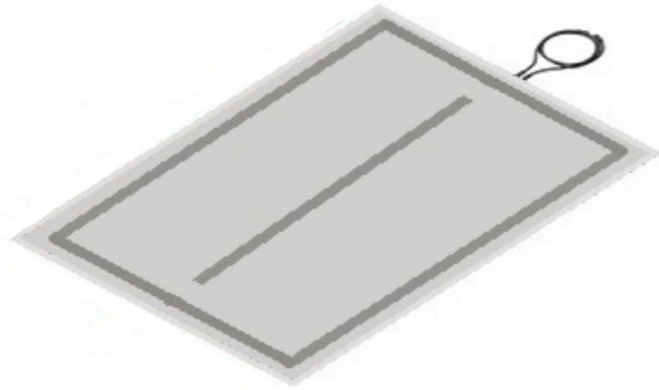
Step 8: Install cables and properly attach wires per customer requirement. It is recommended that panel wires are installed running off the back of the trailer, using the supplied clamps if possible. Keep in mind that cables are exposed to potentially harsh conditions such as being hit by tree limbs, snow, rain etc.

Translucent Roofs

Step 1: Paint the location for the panels with 3M 94 primer, or equivalent, and let dry.

NOTE: You may need to remark the panel location(s) after the primer dries.

Step 2: Apply 3M VHB, or equivalent, double-sided tape to the back of the panels around the perimeter of the panel, 2" in from the edge, with a strip down the middle of the panel lengthwise.



Step 3: Place the panels in their previously marked locations.

Step 4: Press firmly on the panel to ensure the tape is adhered to the roof.

Step 5: Clean the edge by adding isopropyl alcohol to the cleaning rag, wiping the edge bonding surface. Make sure all loose material and residue from sanding prep is removed. Be careful not to oversaturate the edge of the solar panel where the mastic is exposed. Allow the isopropyl alcohol to completely dry (10-15 minutes) before applying the edge seal.

Step 6: Using the 4" roof seal edge tape, drape it over the panel about 1/2" without covering any solar cells. Do NOT cover the actual solar cells with the tape. The tape seal should be applied from back to front of the trailer to allow overlapping edges to be covered and not be exposed to the wind as much as possible. The front edge will be applied last and two layers should be applied to assure the wind will not pry up the edges of the front of the panel. Use a soft roller to ensure the tape conforms to the roof.

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Example of proper panel spacing when installing multiple panels

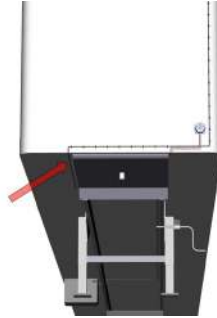
Step 7: An alternate edge seal is to use Sikaflex 221 or 291 by applying a liberal bead around the edge of the panel to seal from moisture and keep the wind from pulling the edges of the panel up. If this method is used, the Sikaflex will need at minimum 24 hours at room temperature (70 F) to cure before service. It is the responsibility of the customer to verify the edge seal is sufficiently cured before putting the trailer or box truck in service.

NOTE: Purkeys is not responsible for solar panel failure if the truck or trailer was put into service before Sikaflex edge seal is cured.

Step 8: Install cables and properly attach wires per customer requirement. It is recommended that panel wires are installed running off the back of the trailer, using the supplied clamps if possible. Keep in mind that cables are exposed to potentially harsh conditions such as being hit by tree limbs, snow, rain etc.

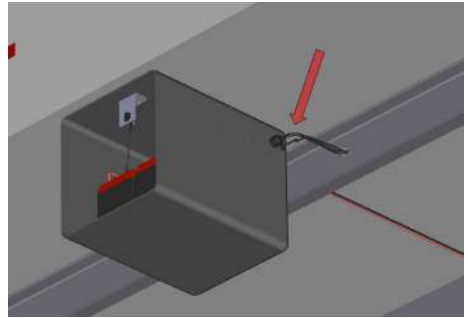
CABLE ROUTING

Step 1: Route main harness toward the liftgate batteries. Secure with wire ties or cable clamps as you go.



Important: Place the supplied cable clamps along the 2-conductor jacketed cable every 18 inches to ensure proper support for the cable. Avoid sharp edges and possible chaffing points.

Step 2: Once the cable is routed to the battery box, feed the Solar Bolt main harness into the battery box through a dome nut or a grommet. DO NOT cut the harness until the mounting location for the Solar Bolt controller is determined.

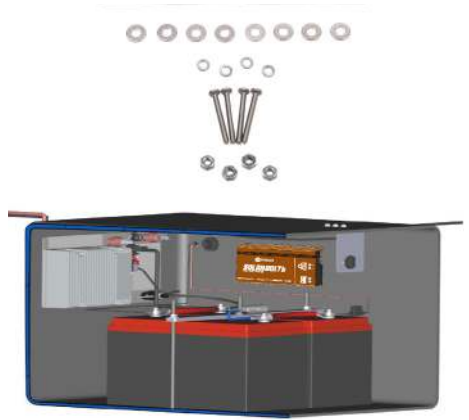


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SOLAR BOLT CONTROLLER INSTALLATION

Step 1: Mount the Solar Bolt controller to the liftgate battery box by using the supplied hardware (hardware kit shown here). A drop of blue Locktite can be placed on the screw next to the nut for added security.

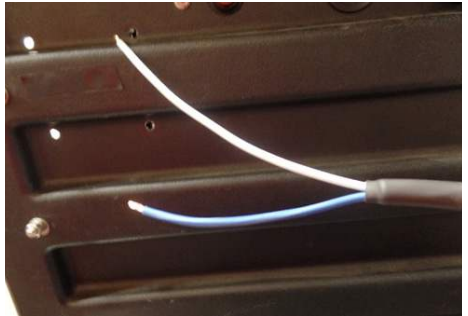
Be sure to place the controller where the LED lights can be easily seen from the battery box opening.



NOTE: DO NOT use screws to mount the controller. Only use supplied hardware.

NOTE: ONLY mount the unit on a side or back wall. Mounting it in any other location may result in damage to the unit.

Step 2: Determine the appropriate amount of cable needed to make the connections to the Solar Bolt controller, then cut excess cable. Strip off jacketed insulation from the Solar Bolt main harness to approximately 2 inches. Strip the insulation on both wires.



Step 3a: On the 15 amp controller, connect the blue wires together and the white wires together using the supplied butt splices. Crimp, solder, and heat shrink.



Step 3b: On 20 amp controller connect the blue wire from the main harness to the red wire on the controller and the white wire from the harness to the black wire on the controller. Crimp solder and heat shrink.

Step 4: Connect the white wire from the Solar Bolt main harness to the black negative wire with butt connector on the Solar Bolt controller. Crimp, solder and heat shrink.



Step 5: Connect the positive wire from the Solar Bolt controller to the liftgate battery positive terminal.



Step 6: Connect the ground wire from the Solar Bolt controller to the liftgate battery negative terminal.



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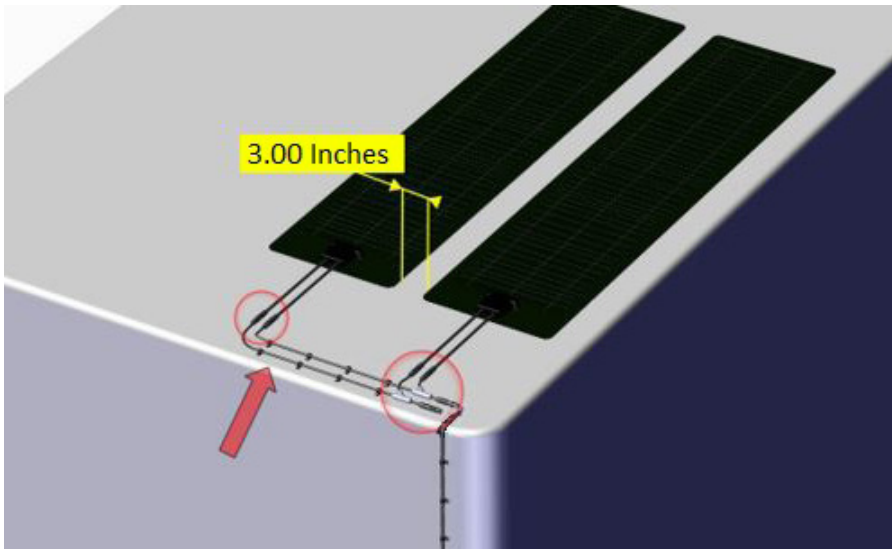
SOLAR PANEL CONFIGURATIONS

When adding additional panels, follow the following configuration instructions:

The first solar panel (100 Watt) should be placed a minimum of 4 inches from the side edge of the trailer and 4 inches from the front or rear edge of the trailer.

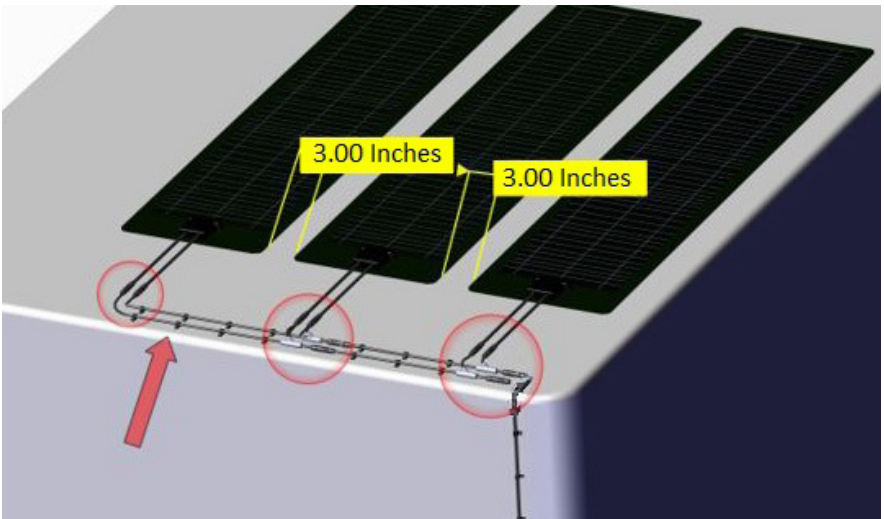
200 Watt (2 Solar Panels)

1. Place the second solar panel no more than 3 inches away from the first solar panel.
2. Connect the supplied Solar Bolt Y Splitter input side to the Solar Bolt main harness (Positive-Positive, Negative-Negative).
3. Connect the Solar Bolt Y Splitter outputs to the two solar panels (Positive-Positive, Negative-Negative).
4. Clamp the Solar Bolt Y Splitter to the edge of the trailer.



300 Watt (3 Solar Panels)

1. Place the third panel no more than 3 inches away from the second solar panel.
2. Connect the second Solar Bolt Y Splitter input side to the longest output from the first Solar Bolt Y Splitter (Positive-Positive, Negative-Negative).
3. Connect the outputs of the second Solar Bolt Y Splitter to the second and third solar panels.
4. Clamp the Solar Bolt Y Splitter to the edge of the trailer.



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LED LOGIC

Verify operation of the system by viewing the LED lights. Both lights should be solid and not flashing.

Check the battery voltage. It should be increasing so that the voltage is higher than it was before the Solar Bolt was connected.



LED	Status	Function
Left Red LED Solar Indicator	Off	Solar voltage too low
	On	Solar panel voltage good
	Slow flash	System is charging
	Double flash	Batteries fully charged
	Fast flash	Fault over temp or current
Right Red LED Battery Indicator	Off	Battery not connected
	On	Working correctly
	Fast flash	Battery discharged

Note: for additional assistance please contact our technical support at 479-419-4800.

NOTES

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NOTES

LIMITED COMMERCIAL WARRANTY POLICY

MCE Purkeys FE, LLC (hereafter “Purkeys”), warrants each product to be free of defects in material or workmanship under normal use and service. This warranty is for the benefit of Original Equipment Manufacturers, Dealers, Warehouse Distributors, Fleets, or other End Users (hereafter “Customers”) and covers products manufactured and/or branded by Purkeys and sold new to Customers either directly by Purkeys or by its authorized dealers, distributors, or agents. The length of the Warranty Period is 36 months. Products from other manufacturers, that are branded by said manufacturer, will carry the manufacturer’s original stated warranty.

The warranty period commences on the in-service or install date and is not transferable. Failure to provide the in-service or install date on the warranty claim form will cause the warranty period to begin on the date the part was manufactured, or date of sale recorded on the original sales invoice, whichever is earlier.

A completed warranty claim form should accompany all parts submitted to Purkeys for consideration for repair or replacement under warranty. The submitted claim form should contain all of the information required. Lack of a properly or fully completed claim form will result in delay or denial of warranty claim. Claims must be submitted no later than 30 days after part is removed. An RMA# should be requested prior to returning any product for warranty consideration. Please contact the Purkeys’ Warranty Department to request an RMA# at warranty@purkeys.net and to provide your warranty claim information.

This warranty does not apply if, in sole judgment of Purkeys, the product has been damaged or subjected to accident, faulty repair, improper adjustment, improper installation or wiring, neglect, misuse, or alteration or if the product failure is caused by defects in peripheral vehicle components or components attached to the Product or failure of a part not manufactured by Purkeys.

This warranty shall not apply if any Purkeys product is used for a purpose for which it is not designed or is in any way altered without the specific prior written consent of Purkeys. ANY product alleged by a Customer to be defective must be inspected by Purkeys as a part of the warranty claims process in order to confirm that the part has failed as a result of a defect in material or workmanship.

Transportation for products and parts submitted to Purkeys for warranty consideration must be prepaid by Customer. Repaired or replaced products and or components will be returned to Customer pre-paid by Customer or “freight collect” to the address provided by Customer in the warranty claim form. No charge will be made for labor or material in effecting such repairs.

The Warranty provided by Purkeys hereunder is specifically limited to repair or replacement of the Product as Purkeys deems most appropriate in its sole discretion. No labor reimbursement will be provided. Purkeys neither assumes nor authorizes any other person to assume on its behalf any other warranty or liabilities in connection with Purkeys products. The Warranty does not apply to fuses or other “consumable” or maintenance items which are or may be a part of any Purkeys product.

THIS WARRANTY DOES NOT APPLY TO LOSS OF VEHICLE OR EQUIPMENT, LOSS OF TIME, INCONVENIENCE, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. PURKEYS SPECIFICALLY DISCLAIMS AND SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES arising out of or from the use of Purkeys products by the Customer.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, INCLUDING COMMON LAW WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, AND ANY OTHER EXPRESS OR IMPLIED WARRANTIES. ALL OTHER SUCH WARRANTIES ARE SPECIFICALLY DISCLAIMED.

This Limited Commercial Warranty Policy supersedes all previous Warranty Policies issued by Purkeys.

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