

PURKEYS

A MISSION CRITICAL ELECTRONICS BRAND

SELECT™ & DIRECT™ NOSEBOX

INSTALLATION GUIDE





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GENERAL INFORMATION

The Purkeys Select™ and Direct™ nosebox systems improve liftgate battery charging by utilizing a DC/DC converter to boost the voltage for optimal charging.

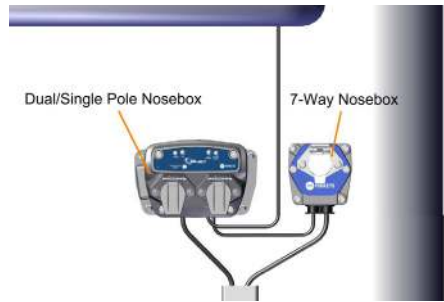
The boost in voltage overcomes the normal voltage drop caused by the extended distance between the liftgate batteries and the vehicle charging system. Also, in cold temperatures batteries require increased charging voltages to maintain a high state of charge. The DC/DC converter compensates for temperature by providing higher charging voltages in cold weather. The result is well-charged liftgate batteries that will last longer and have ample power for liftgate operation.

NOTE: Our liftgate charging systems are designed to work with flooded cell and AGM batteries. If you are using this system to charge any other type of battery, please contact us at 479-419-4800 before installation.

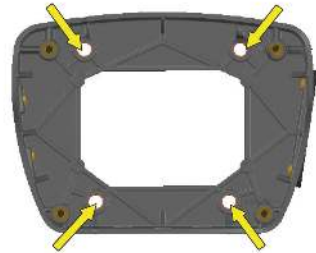
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DUAL/SINGLE NOSEBOX INSTALLATION

Step 1: Using the supplied mounting screws, mount the dual/single Select or Direct nosebox at the front of the trailer, near the 7-way nosebox, via the mounting holes on the plate.



Note: The mounting plate can be removed if space is an issue or if a standard bolt pattern is wanted. Simply remove the plate and mount the nosebox to the trailer using the supplied mounting screws and the standard bolt holes inside the nosebox.



Note: Do not block the LED status decal on the side of the Select/Direct when mounting the Nosebox.

| LED | STATUS |
|----------------|-----------------|
| ● Green Solid | Charging |
| ✱ Green Blink | Good Voltage |
| ✱ Orange Blink | Low Voltage |
| ✱ Orange Rapid | Fault |
| ● Orange Solid | Over-Temp Prot. |

This product is patented. Includes 3-year warranty.
NOTE: The warranty will be void if the unit has been drilled or modified. If you experience any problems with this unit, please call 800-219-1269 and we will gladly assist you.

Nosebox Mounting Complete.

AUX HARNESS INSTALLATION

Step 1: Route the jacketed aux and ground 2-conductor from the nosebox controller over to the 7-way nosebox.



Note: Place the cable clamps along the 7-way aux harness every 6 inches to ensure proper support for the cable. Avoid sharp edges and possible chaffing points.

Step 2: Position the 2-conductor harness so that it reaches the ground pin on the top of the 7-way receptacle and the aux pin in the center of the 7-way receptacle. Mark the cable, then cut to length.



Step 3: Slide the supplied red 1/4 inch heat shrink over the blue wire.

Slide the supplied black 1/4 inch heat shrink over the white wire.



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Step 4: Crimp the supplied 10 gauge #10 eyelets onto both the blue and white wires.



Step 5: Solder, then position the heat shrink over the crimps and apply heat to the 2 terminals.



Note: Place the cable clamps along the 7-way aux harness every 6 inches to ensure proper support for the cable. Avoid sharp edges and possible chaffing points.

Aux Harness Installation Complete.

7-WAY NOSEBOX TIPS

- Inspect circuits inside the 7-way box for excessive electrical resistance caused by overheating, corrosion, loose/poor connections, or undersized wiring.
- Check to see if the 7-way nosebox is equipped with circuit breakers (see Figure 1), as the problem may be a failing circuit breaker. Either replace circuit breaker with a new part or connect the blue wire from the nosebox controller to the unprotected side of the circuit breaker. Circuit protection is provided by the 30 amp fuse inside the nosebox controller.
- Ensure the 7-way or stinger cord has a tight fit and has good electrical contact at the tractor and trailer receptacles.



Figure 1: 7-Way Nosebox

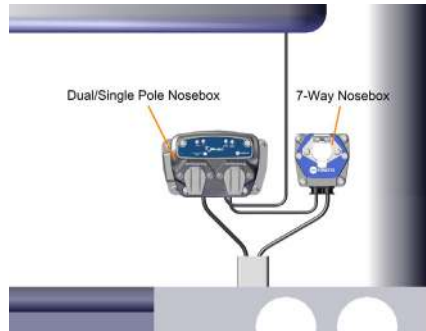


SERVICE TIP - Purkeys offers the Liftgate Double Check tool, which can simplify the diagnosis of liftgate charging system problems caused by excessive voltage drop. For more information on the tool, please call 1-800-219-1269 or visit our website at www.purkeys.net.

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MAIN HARNESS INSTALLATION

Step 1: Route the 4-conductor jacketed DC/DC converter main harness behind the front plate, then behind the header plate through the air/electrical tube to the center channel.



Step 2: Route the jacketed 4-conductor main harness in the center channel toward the back of the trailer. Secure with wire ties or cable clamps as you go.



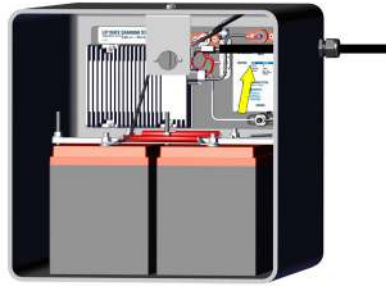
Place the cable clamps along the 4-conductor jacketed wire every 6 inches to ensure proper support for the cable. Avoid sharp edges and possible chaffing points.

Step 3: Once you are near the liftgate battery box, begin routing the 4-conductor main harness into the liftgate battery box through a dome nut or rubber grommet.



Note: Ensure that the 4-conductor jacketed wire enters the liftgate battery box through a dome nut or rubber grommet to prevent chaffing the wire, which could result in possible electrical short in the system.

Step 4: Position the 4-conductor main harness so it will reach the 2-stud strip and all the slack has been taken up. Mark the wire so it can be taken back out of the battery box to be terminated.

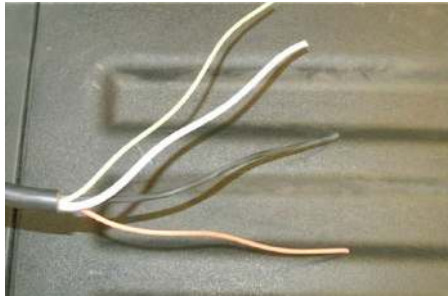


Note: If your battery box includes a slide-out tray, include enough slack to allow the tray to fully extend without tugging the wire connections.

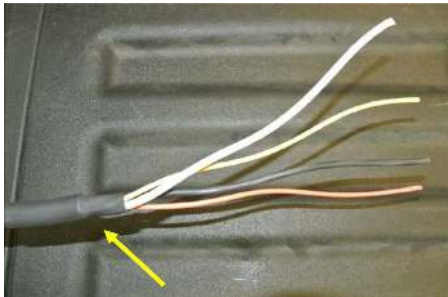
Step 5: Pull the conductor out of the box (easier to work on), and cut off the excess at the mark.



Step 6: Cut about 8 inches off the jacketed portion off the conductor.

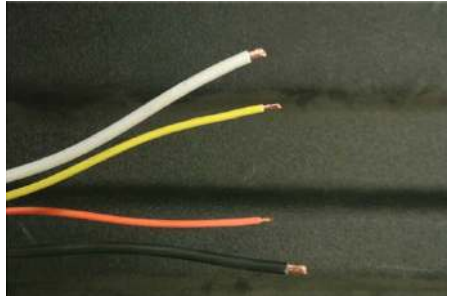


Step 7: Apply the supplied $\frac{3}{4}$ inch black heat shrink where the jacket was stripped off.

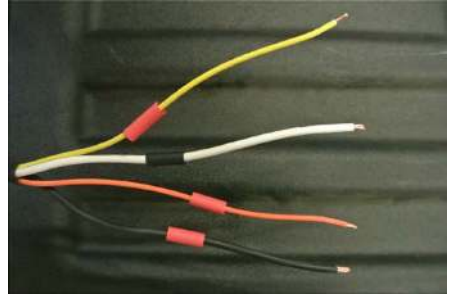


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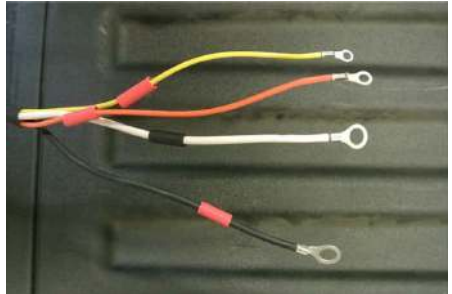
Step 8: Strip 3/8 inch of insulation off all 4 wires.



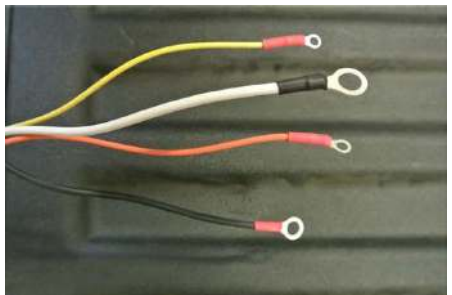
Step 9: Slide the supplied red 1/4 inch heat shrink over the orange, yellow, and black wires. Slide the supplied black 1/4 inch heat shrink over the white wire.



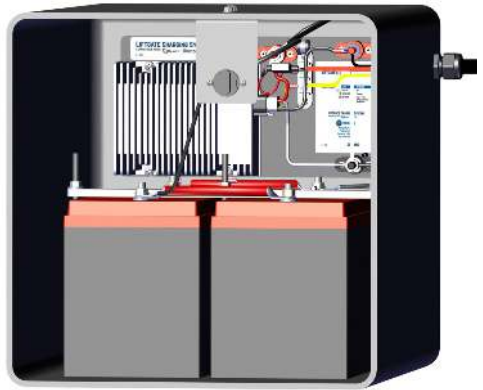
Step 10: Crimp terminals onto the 4 wires. The white and black 8-gauge wires use the 3/8 ring terminals, and the orange 14-gauge wire and yellow 16-gauge wire use the #10 ring terminals.



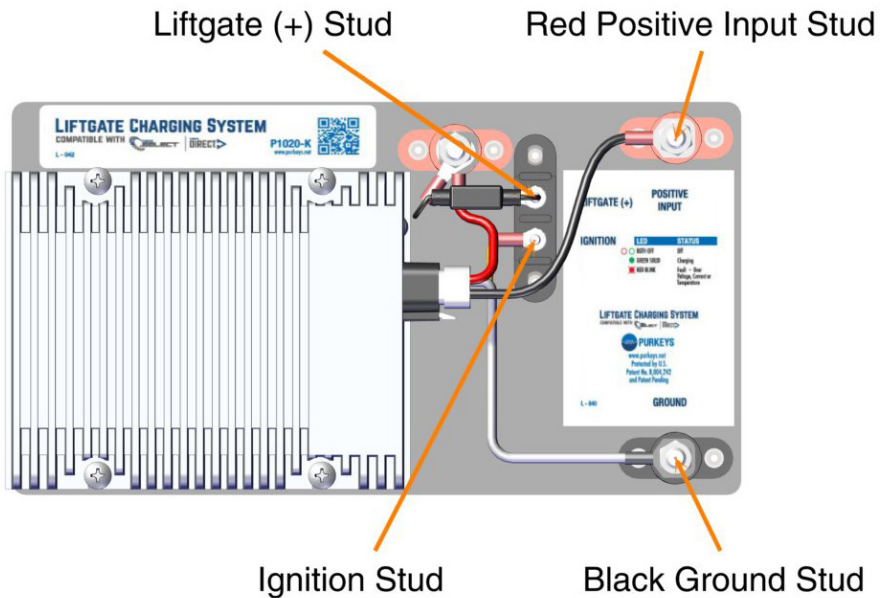
Step 11: Position the heat shrink over the crimps and apply heat to the 4 terminals.



Step 12: Re-route the jacketed wire back into the battery box.



- Connect the 8-gauge black wire to the red positive Input Stud.
- Connect the 8-gauge white wire to the black ground stud.
- Connect the 14-gauge orange wire to the Liftgate (+) stud.
- Connect the 16-gauge yellow wire to the Ignition stud.



Main Harness Installation Complete.

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INTERIOR LIGHT INSTALLATION WITHOUT SEVERE SERVICE

These interior light instructions apply if you are installing the Purkeys interior light harness (Purkeys Part Number H-00522: 50 ft Interior Light Harness) to power interior lights off of the liftgate or auxiliary battery.

Note: The Purkeys interior light harness (Purkeys Part Number H-00522: 50 ft Interior Light Harness) is sold separately as it is an optional device.

Installation Connections Inside the Nosebox:

Step 1: Route the Interior light input harness from the liftgate/aux battery to the nosebox and cut to length.

Note: Do NOT connect to the batteries until the interior light installation is complete. Doing so may result in coming in contact with a live wire.

Step 2: Terminate the positive input with a #10 ring terminal and connect to the Interior light input power stud inside the nosebox (see Figure 1).

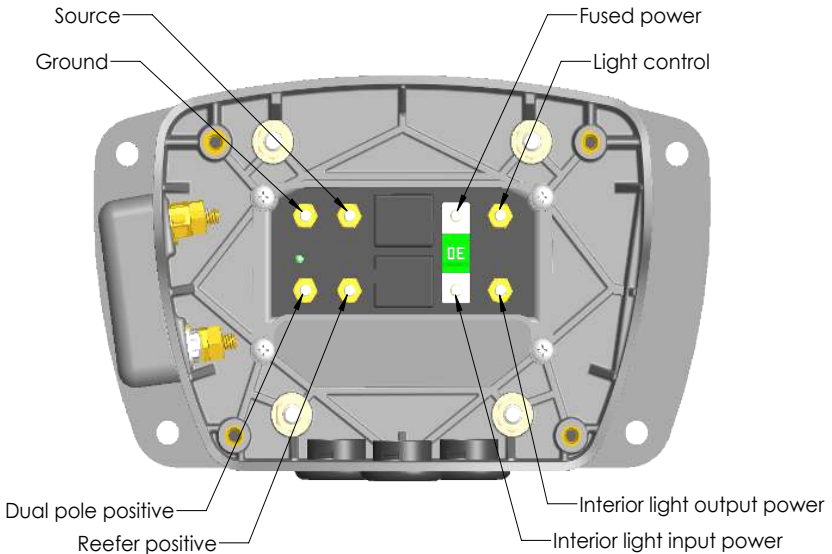


Figure 1

Step 3: Terminate the negative input with a #10 ring terminal and connect to the Ground pin inside the nosebox (see Figure 1).

INTERIOR LIGHT INSTALLATION WITH SEVERE SERVICE

These interior light instructions apply if you are installing the Purkeys severe service kit (Direct Max only).

Step 1: Inside the nosebox, connect the severe service positive terminal to the interior light input power terminal (see Figure 2) using a 10 gauge wire.

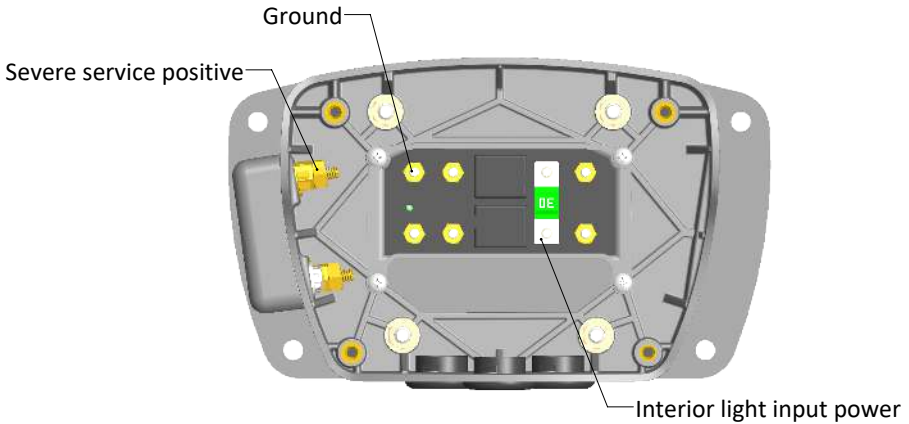


Figure 2

Step 2: Terminate the Interior light positive wire with a #10 ring terminal and connect to the Interior light input power (see Figure 2).

Step 3: Terminate the Interior light negative wire with a #10 ring terminal and connect to Ground (see Figure 2).

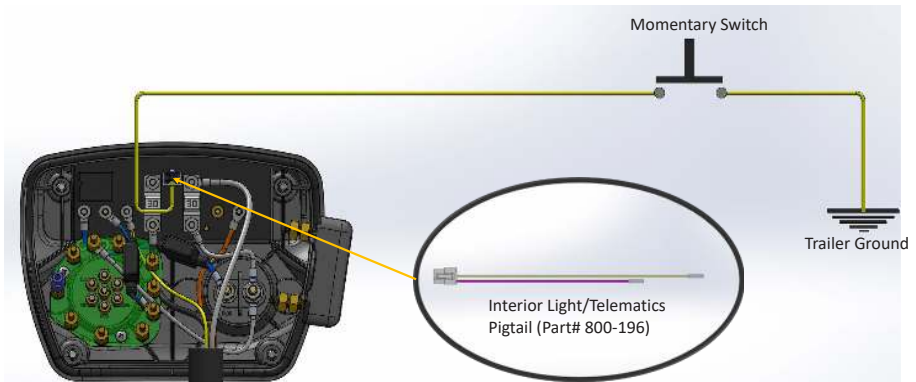
Interior Light with Severe Service Installation Complete.

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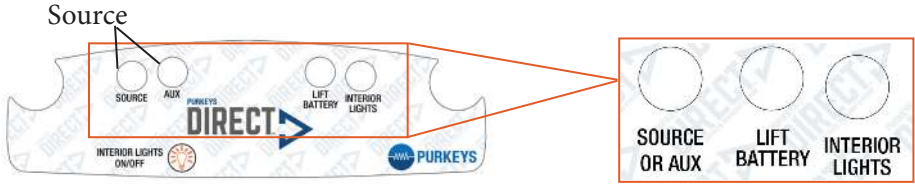
MOMENTARY SWITCH (OPTIONAL)

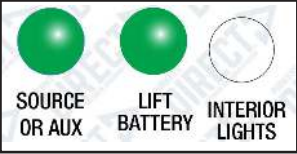
If your trailer is being spec'd with a momentary switch at the back of the trailer (the momentary switch is not included in the Purkeys kit), wire the circuit as shown below using the supplied pigtail harness shown in the drawing below (Purkeys Part Number 800-196).

If you are using the pigtail harness for interior lights, but not for telematics, trim off and heat shrink the purple telematics wire.

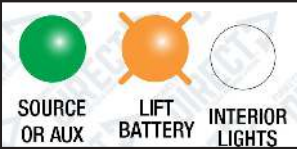
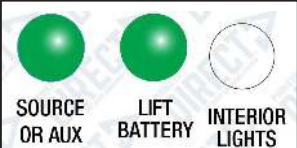
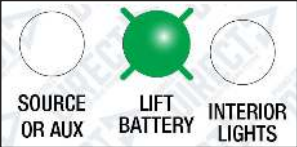


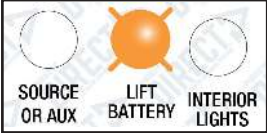
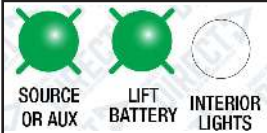
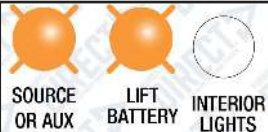
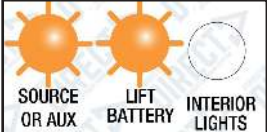
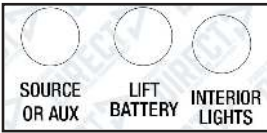
LED LOGIC



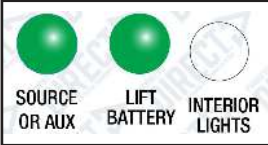
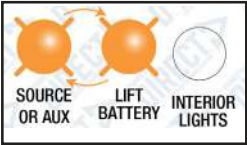
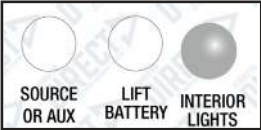
| LED STATUS | LOGIC |
|--|--|
|  <p>Solid Green on Lift Battery and Source</p> | <p>Charging State – Source voltage is greater than 13.8 volts. DC/DC converter is on. Tractor must be running and alternator good to achieve 13.8 volts. A battery’s surface charge cannot reach this value. Applies to all charging sources.</p> <p>Note: The turn-on voltage is 13.2 volts after 5 minutes or 13.8 volts immediately. This is because, in Dual Pole in Parallel state, the DIRECT input is now connected to liftgate batteries via the dual pole cables. If the liftgate batteries had been charging using the DC/DC converter, that voltage would be above 13.2 volts, so the DIRECT would turn on and continue to charge even if the tractor was shut off.</p> |

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| LED STATUS | LOGIC |
|--|--|
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Solid Green on Source Slow Flashing Orange on Lift Battery</p> <p>Charging State – Tractor connected and running. DC/DC converter is operating, but the liftgate batteries are defective or below 12.8 volts.</p> <p>Applies to all charging sources.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Solid Green on Lift Battery and Source</p> <p>Extend State – Source voltage drops below 13.8 volts. DC/DC converter is on for 1 hour. Every two minutes the controller turns off the DC/DC converter, so there is no current flow (no voltage drop) and measures the battery voltage on the tractor batteries. If over 12.4 volts, the controller turns on for another two minutes. This will repeat until 60 minutes has expired, or the voltage drops below 12.4 volts for 30 seconds. The DIRECT will then look for next available source.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>No Source LED Lift Battery LED Slow Flashing Green</p> <p>Static State – No tractor connected to the trailer and the liftgate batteries are more than 12.4 volts.</p> |

| LED STATUS | LOGIC |
|---|--|
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>No Source LED Lift Battery LED Slow Flashing Orange</p> <p>Static State – No tractor connected to the trailer and the liftgate batteries are less than 12.4 volts.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Slow Flashing Green on Lift Battery and Source</p> <p>Off State – Source voltage below 13.8 volts and extend period is over. Voltage at the lift batteries and the source is above 12.4 volts. Voltage at source must achieve 13.8 volts to go into Charging State.</p> <p>Applies to all charging sources.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Slow Flashing Orange on Lift Battery and Source</p> <p>Off State (Low Voltage) – Lift battery and source voltage below 12.4 volts. DC/DC converter is off. Voltage at source must achieve 13.8 volts to go into Charging State.</p> <p>Applies to all charging sources.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Rapid Flashing Orange on Lift Battery and/or Source</p> <p>Off State (Fault) – Voltage between 2 and 9 volts. Check fuses and wiring.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>No LED</p> <p>Off State (Fault) – Open circuit in lift battery or source circuit. This could also be caused by the liftgate battery voltage being below 6 volts.</p> |

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| LED STATUS | | LOGIC |
|---|---|--|
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> |  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Excessive Voltage Drop – Tractor is running and the voltage is above 13.8 volts. The controller turns on the DC/DC converter and current starts to flow. If the voltage drops below 9 volts, the controller will tell the DC/DC converter to turn off. What the operator will see is the Source and Lift Battery go Solid Green. Both LEDs will toggle orange for a few seconds. The cycle then repeats.</p> <p>NOTE: Low voltage shut off in the first 5 minutes is 9.5 volts.</p> |
|  <p>SOURCE OR AUX LIFT BATTERY INTERIOR LIGHTS</p> | <p>Solid White on Interior Lights</p> | <p>The interior lights in the trailer will turn off either via a timer (which can be set to 15, 30, 60, or 90 minutes) or if the liftgate batteries drop to a low state of charge.</p> |

Interior Light Control

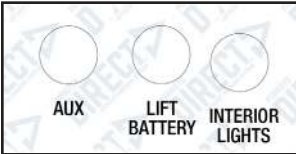
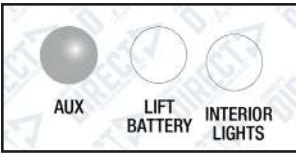
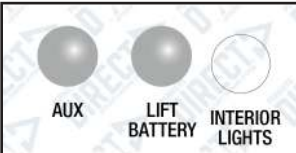
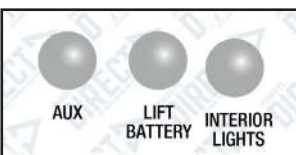
The interior light timer defaults to 60 minutes. However, it can be changed to 15, 30, 60, or 90 minutes. To change the timer length:

Press the “ON/OFF” button 10 times within 10 seconds

All LEDs will flash white once, then display current timer setting (see table below)

Press the “ON/OFF” button to toggle to the desired timeout period (see table below)

Timer set mode will exit 10 seconds after the last button press (setting will be saved as the most recent setting entered by user)

| LED STATUS | LOGIC | |
|--|---|-----------------------------------|
|  | No LED | 15 minute timer is enabled/active |
|  | Solid White on Aux | 30 minute timer is enabled/active |
|  | Solid White on Aux and Lift Battery | 60 minute timer is enabled/active |
|  | Solid White on Aux, Lift Battery, and Interior Lights | 90 minute timer is enabled/active |

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NOTES

NOTES

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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 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.

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.

This warranty does not apply if, in sole judgement 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. 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 supersedes all previous Warranty Policies issued by Purkeys and any of its suppliers.



WATT Keeps You Trucking