



THERMO KING

ThermoLite™ 36W Solar Panel Installation Guide

Install applications supported by this guide:

1. Heat King (all models)
2. SB Domestic Rail Container (DRC front skin mounted)
3. Precedent Domestic Rail Container (DRC front skin mounted)
4. Competitive Units (all models)
5. SB III (top mounted)

General Installation Precautions and Specifications



WARNING: Always wear safety glasses and protective gloves when working with batteries.

IMPORTANT: The solar panel, application surface and air temperature must all be above 45 F (1.3 C).

For best results when applying the panel adhesive, ensure the surface is completely clean using Isopropal alcohol or appropriate de-greasers. Ensure all cleaning residue is removed and the surface is dry.

- The adhesive backing is very aggressive and is difficult to remove once installed.
- Always ensure the solar panel fuse (located on the terminal connection harness) is removed during installation and service.
- Locate the charge controller near the unit electrical connection to avoid voltage loss in the cable.

Hardware Kit Guide



Heat King Unit Installation

1. Switch unit controls to the off position and disconnect the positive battery cable.
2. Temporarily remove the fuse from solar panel harness.
3. Ensure the top surface of the unit is clean and free of any dirt (**Figure 1**).
4. Peel back the top 4 inches of the backing paper and apply the top edge of the panel near the assembly bolts and the left side against the coolant cap cutout hole (**Figures 2 and 3**). The junction box should be facing toward the roadside of the unit.
5. With the panel properly positioned, remove the remainder of the backing paper and firmly press the panel down over the entire area. Repeat several times to ensure the entire panel is properly adhered to the sheetmetal skin. This is critical to prevent moisture between the surfaces.
6. Drill 5/32" holes at all panel grommet holes. Secure panel with #10-14 x 1/2" long thread forming screws (10 places).
7. Drill a 7/8" hole near the front roadside corner (**Figure 4**). To prevent drilling through overlapping sheetmetal (which will cause rust), it is advised to drill a pilot hole up from inside the unit. Drilling through the insulation is acceptable (**Figures 4 and 5**).



Figure 1



Figure 2

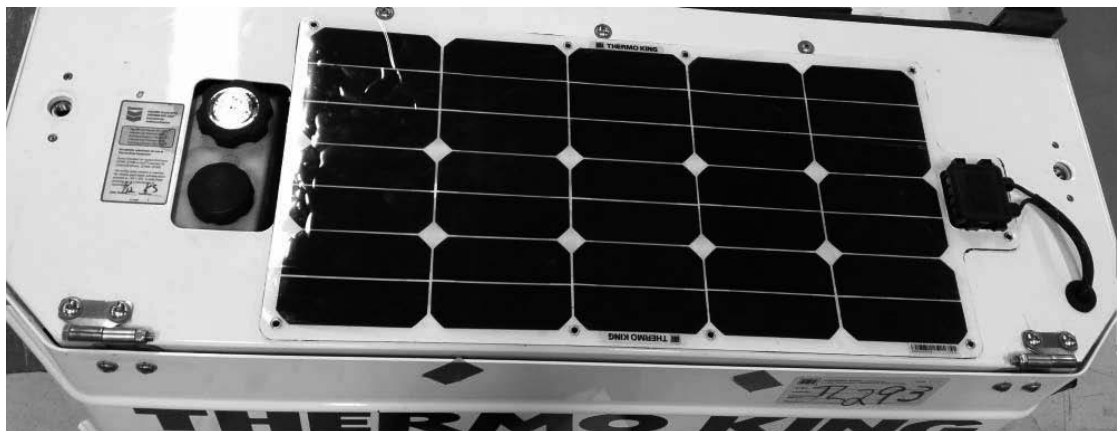


Figure 3

8. Cut a slit in the provided rubber grommet (330324) and place around the harness exiting the panel. Place the connector through the hole and place the grommet around the hole.

Heat King Unit Installation (continued)

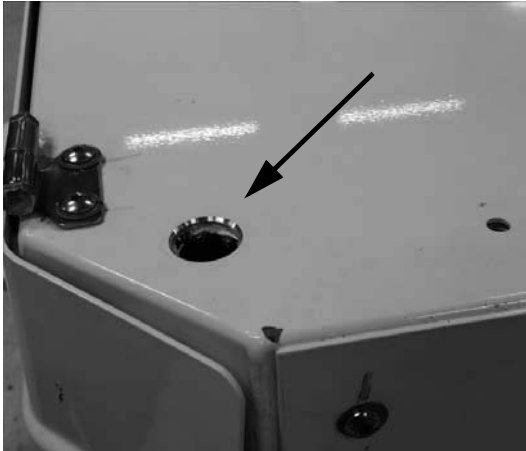


Figure 4



Figure 5

9. Attach the charge controller harness and route it down the roadside corner frame.
10. Drill $\frac{1}{4}$ " holes into the vertical frame member on either side of the charge controller.
11. Secure the charge controller to the frame on both sides using bandwraps through the $\frac{1}{4}$ " holes and around the charge controller cables (**Figure 6**).
12. Attach the battery terminal harness to the charge controller and route the white/red lead to the B+ positive terminal on the back of the alternator (**Figure 7**), add the small brass washers on each side of the harness ring terminal on the B+ stud and torque to 6.0 N•m (44-53 lb-in)
13. Attach the black wire to the negative ground cable (**Figure 8**) or to other secure chassis ground mounting hardware. Verify 0 ohms resistance to ground using a multi-meter.

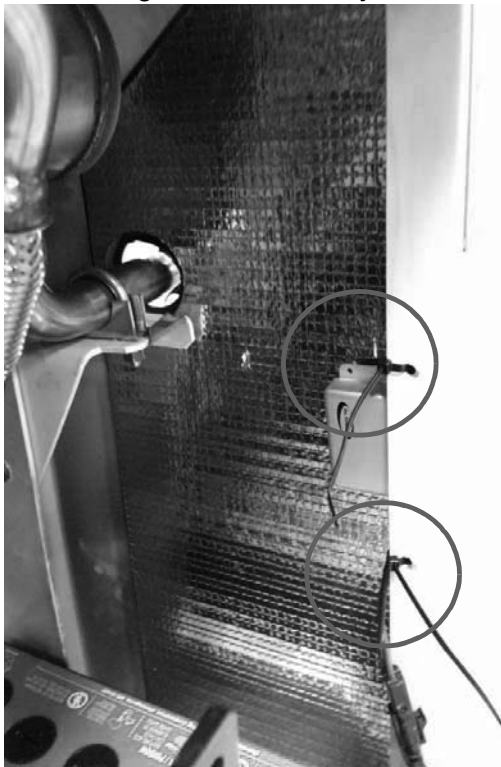


Figure 6

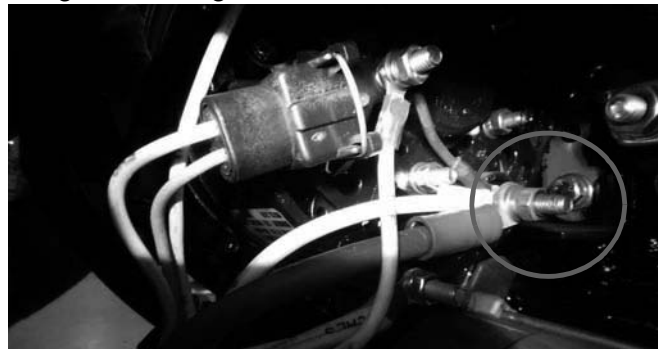


Figure 7



Figure 8

14. Ensure the harness has a drip loop to prevent water from running down onto the terminals
15. Apply sealant to the outer skin hole to prevent excess water from entering the unit during service.
16. Install fuse and return the unit to service.

SB DRC Unit Installation

1. Turn off the unit and disconnect the positive battery cable.
2. Temporarily remove fuse from solar panel harness.
3. Ensure the front surface of the top door skin is clean and free of any dirt (**Figure 1**).
4. Peel back the top 4 inches of the backing paper and apply the top edge of the panel centered under the Thermo King Crest (**Figure 2**) with the junction box facing toward the curbside of the unit.
5. With the panel properly positioned, remove the remainder of the backing paper and firmly press the panel into the plastic skin over the entire area of the panel. Repeat several times to ensure the entire panel is properly adhered to the skin and conforms to the curve of the top door.
6. Drill 3/16" holes at each panel grommet. Insert Christmas tree fasteners (10 places). Alternate method, drill 5/32" hole at each grommet and secure with #10-14 x 1/2" long thread forming screws.
7. Drill a 7/8" hole approx 1" to the left of the edge of the panel (**Figure 3**).
8. Cut a slit in the provided rubber grommet (330324) and place around the harness exiting the panel. Place the connector through the hole and place the grommet around the hole (**Figure 4**).
9. Connect the extension harness and attach the harness near the top of the curbside frame member using the provided p-clamps. Ensure the harness routes over the door gas shock and has adequate slack to allow for the door to open and close without interference (**Figure 5**).
10. Attach the charge controller harness to the extension harness and route it down the curbside frame post to the angle power pack tube and along the frame front tube to the starter.
IMPORTANT: Do not route the harness together with the fuel lines.
11. Attach the battery terminal harness to the charge controller and attach the white/red wire to the positive terminal on the starter solenoid (terminal with the battery cable). Attach the black wire to the CH terminal on the throttle solenoid.
12. Secure the charge controller to the bottom frame member on both sides using p-clamps (**Figure 6**).
13. Secure harness as required with bandwraps and bandwrap anchors. **NOTE: Avoid drilling holes in the plastic bulkhead.**
14. Apply sealant to the outer skin hole to prevent excess water from entering the unit during service.
15. Install fuse and return the unit to service.



Figure 1



Figure 2



Figure 3

SB DRC Unit Installation (continued)



Figure 4

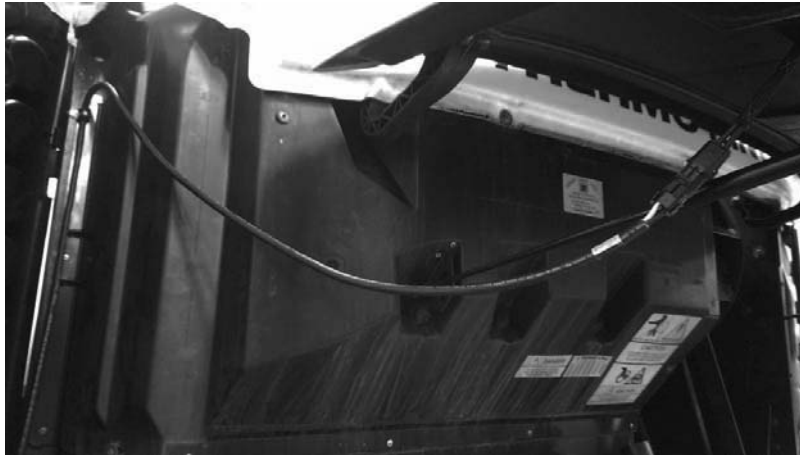


Figure 5



Figure 6

Precedent DRC Installation

1. Turn off the unit and disconnect the positive battery cable.
2. Temporarily remove fuse from solar panel harness.
3. Ensure the front surface of the top door skin is clean and free of any dirt.
4. Peel back the top 4 inches of the backing paper and apply the top edge of the panel to the middle door skin just under the Thermo King Crest (**Figure 1**) with the junction box facing toward the roadside of the unit. The curbside edge should be just inside the curbside door edge.
5. With the panel properly positioned, remove the remainder of the backing paper and firmly press the panel into the plastic skin over the entire area of the panel. Repeat several times to ensure the entire panel is properly adhered to the skin and conforms to the curve of the top door.
6. Drill $3/16$ " holes at each panel grommet. Insert Christmas tree fasteners (10 places). Alternate method, drill $5/32$ " hole at each grommet and secure with #10-14 x $1/2$ " long thread forming screws.



Figure 1



Figure 2

7. Drill a $7/8$ " hole approx 1" to the left of the edge of the panel.
8. Cut a slit in the provided rubber grommet (330324) and place around the harness exiting the panel. Place the connector through the hole and place the grommet around the hole (**Figure 2**).
9. Connect the extension harness and route the harness near the top of the roadside door hinge. Secure using band wraps and ensure the door does not bind when closing (**Figure 3**).



Figure 3

10. Route the harness down the roadside wall next to the condenser wall and following existing wires to starter (**Figure 4**). Ensure that the wire does not touch hot copper tubing and that it is properly band tied to solid structures or other harnesses. Coil excess cable as shown (**Figure 5**).

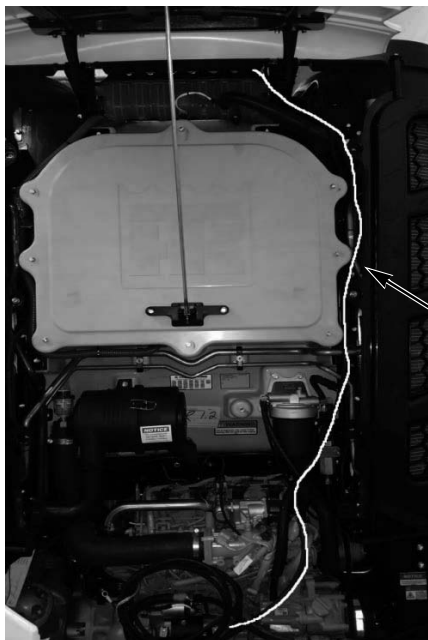


Figure 4

Harness Routing Path



Figure 5

11. Attach the white/red wire to the positive terminal on the starter solenoid (terminal with the positive battery cable (**Figure 6**)). Attach the black wire to the engine block ground stud behind the oil filter (**Figure 7**).

12. Coil up the extra harness length in front of the starter and secure with bandwraps (**Figure 8**).

13. Install fuse and return the unit to service.

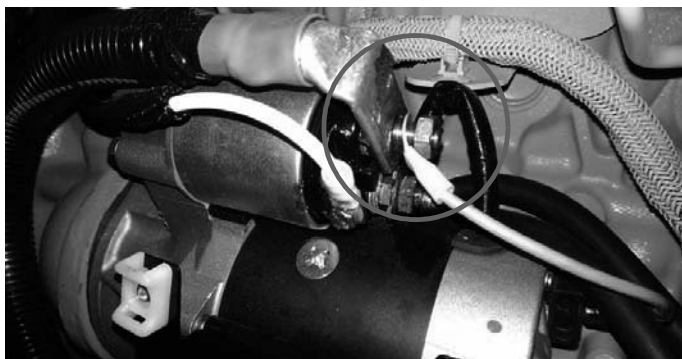


Figure 6

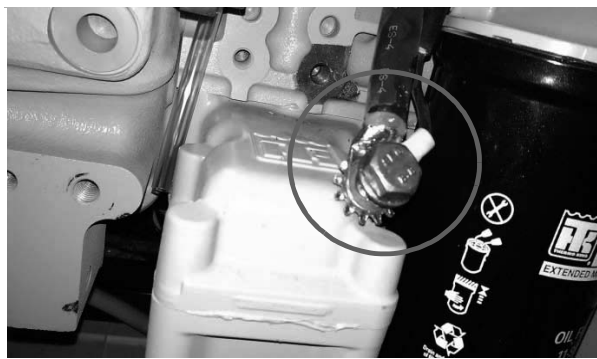


Figure 7

Coil and secure excess harness.



Figure 8

Carrier Installation

1. Turn off the unit and disconnect the positive battery cable.
2. Temporarily remove fuse from solar panel harness
3. Ensure the Carrier Adapter bracket is clean and free of any dirt.
4. Peel back the backing paper and apply the panel to the adapter bracket. Smooth over the entire area of the panel pressing firmly. Repeat several times. The included thread forming screws should be used in addition to the adhesive to provide added assurance. Fasten the panel to the bracket by drilling 5/32" pilot holes and running the self drilling screws through the grommets on the panel.
5. Position the panel and bracket onto the top of the Carrier unit and center it (**Figure 1**).

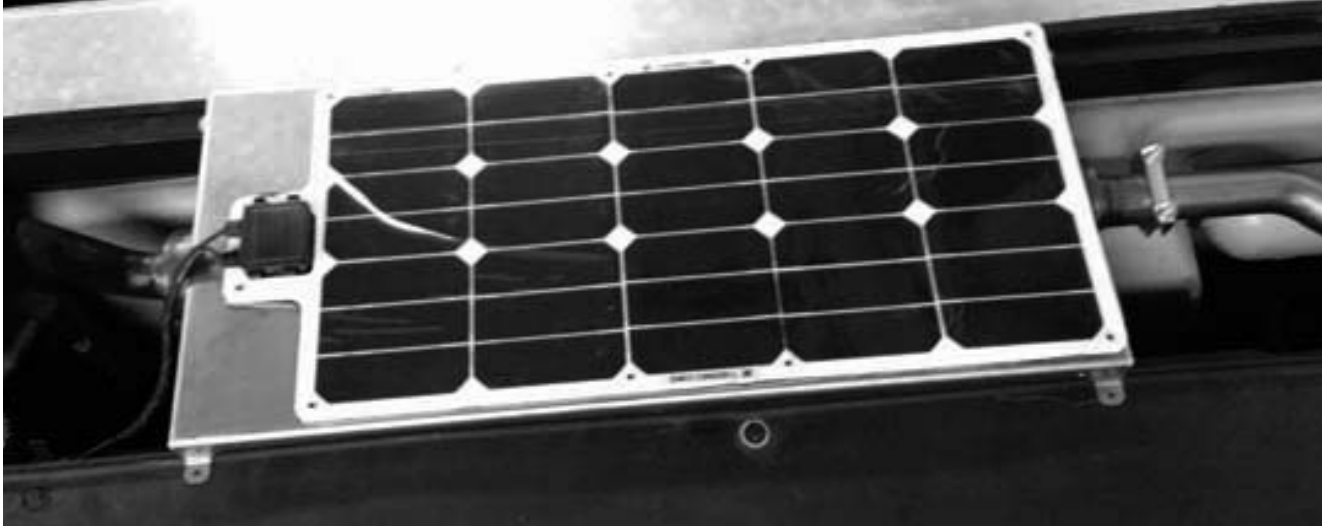


Figure 1

6. Ensure that there is no overlapping metal under the plastic skin where the mounting holes will go. Drilling through multiple layers of metal can result in rust between the joints.
7. Using the larger self drilling #12-14 x 1-1/4" long screws, attach the panel down to the unit metal frame on the four corners starting on the rear frame along the trailer front wall.
8. Using the provided p-clamp and #10-16 x 3/4" long self drilling screw, secure the harness coming out of the panel to the Carrier adapter bracket (**Figure 2**). This will ensure it does not touch the exhaust pipe.
9. Connect the extension harness and attach the harness near front curbside frame member using the provided p-clamps and #10-16 x 3/4" long self drilling screws. Route the harness down the side of unit, ensuring the secure the harness using p-clamps and band wraps (**Figure 3 and 4**).
10. Attach the charge controller harness to the extension harness and secure it in the front of the unit (**Figure 5**). **IMPORTANT: Do not route the harness together with fuel lines**
11. Attach the battery terminal harness to the charge controller and attach the white/red wire to the positive terminal on the starter solenoid (terminal with the battery cable). Attach the black wire to ground stud near the starter (**Figure 6**).
12. Secure harness as required with bandwraps.
13. Install fuse and return the unit to service.

Carrier Installation (continued)

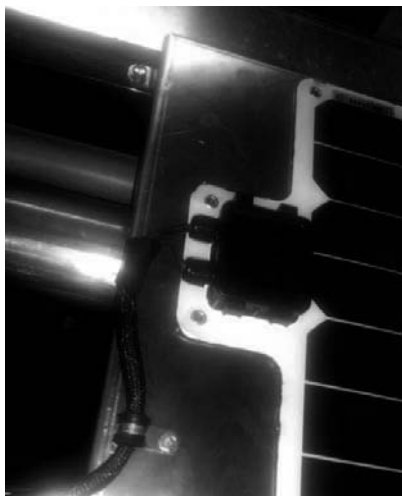


Figure 2



Figure 3



Figure 4

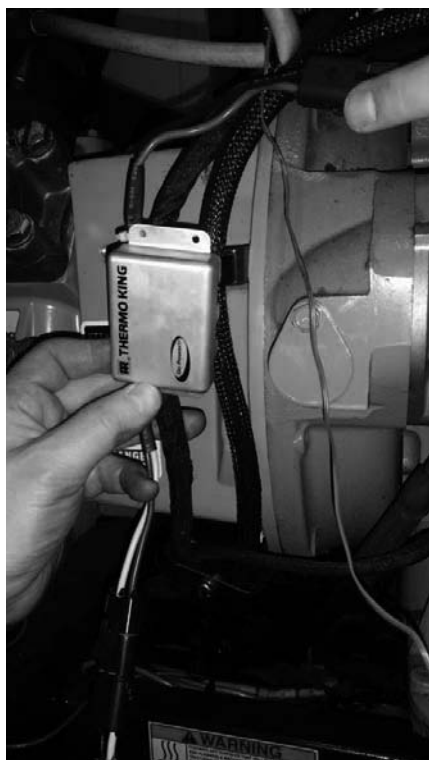


Figure 5



Figure 6

SB III Installation

1. Turn off the unit and disconnect the positive battery cable.
2. Temporarily remove fuse from solar panel harness
3. Ensure the top surface of the unit bulkhead where the panel will be positioned is clean and free of any dirt (**Figure 1**).
4. Peel back the backing paper and apply to the plastic bulkhead. Ensure the panel will be minimally shaded from any of the outer skins.
5. Drill 5/32" holes at all panel grommet holes. Secure panel with #10-14 x 1/2" long thread forming screws (10 places).
6. Attach the extension harness and route down the curbside corner frame.
7. Attach the charge controller and ring terminal harness to the extension harness.
8. Attach the white/red wire to the positive terminal on the starter solenoid (terminal with the battery cable). Attach the black wire to ground stud near the starter (**Figure 2**).
9. Install fuse and return the unit to service.

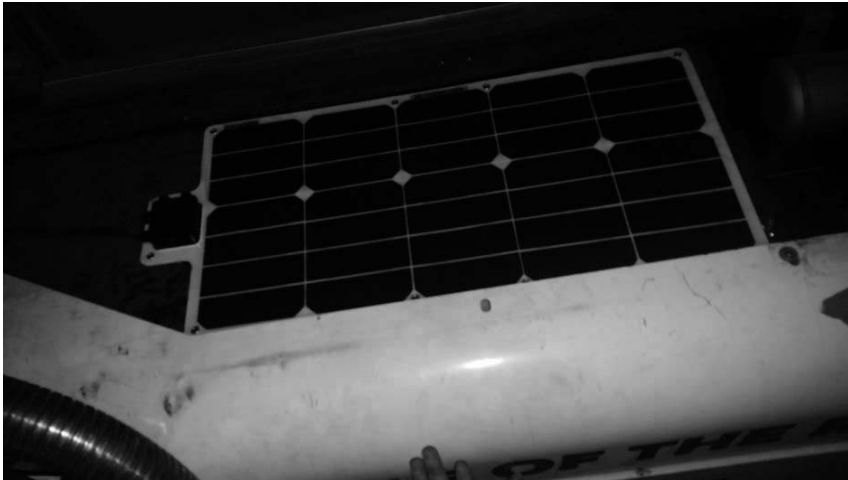


Figure 1

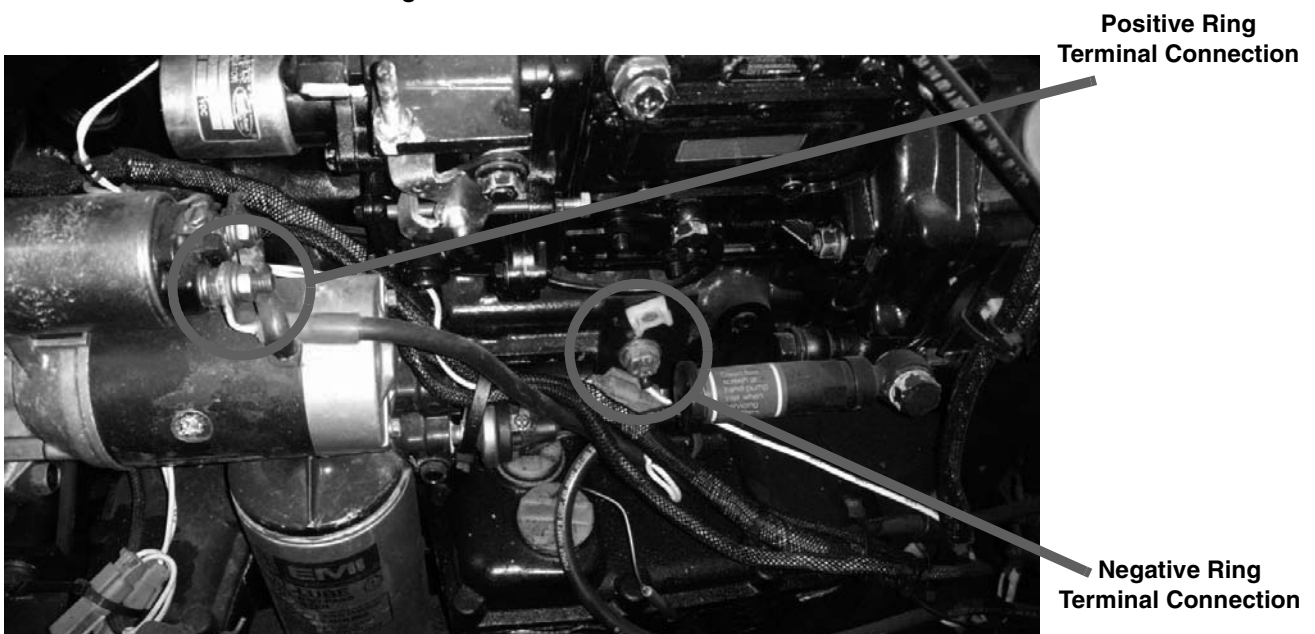


Figure 2

TEST PROCEDURE

To properly test the solar output you must have the following items:

- Halogen lamp (500W or greater) or be outdoors in the daylight.
- Voltage meter
- Amp clamp or ammeter

1. Put voltmeter on the battery and measure the voltage.
 - Voltage must be less than 12.8V for the solar panel controller to turn on.
 - If battery voltage is not less than 12.8V then put a 12V load on the battery.
2. If indoors, put at least a 500W halogen lamp approximately 24" above the solar panel and turn it on.
3. Put voltmeter on the battery.
4. Put amp clamp around the positive cable from the solar panel.

Voltage reading should begin increasing or stay the same.

Amperage reading should be greater than .300 mA

The solar panel controller may take up to a minute to turn on. The solar panel must be connected to the battery in order to turn on the charge controller.

