PowerFilm SOLAR
ASSEMBLED IN THE USA

440W Freightliner Cascadia Fairing SuperFlex Solar Panel with Integrated Edge Seal Installation Instructions

SCAN THE QR CODE BELOW TO WATCH THE STEP-BY-STEP VIDEO

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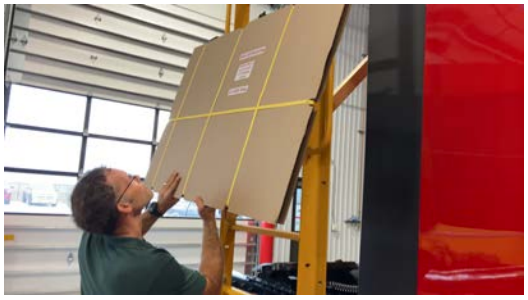
Prep Work

1. Carefully hand both packaged panels to the installation tech on the back of the fairing.



2. Clean the fairing with a >90% isopropyl alcohol and a **clean** towel or rag.

3. Mark the center of the fairing in the back (top) (about 5-6” from the back of the cab) and the front (bottom) (just in the inset). Depending on the fairing base color, use a black or silver Sharpie to mark the center of the fairing. You will use these marks to align the panels. If you’d like to use black cosmetic tape to cover the small slits between panels, continue. Otherwise, skip to “Solar Panel Installation” below.

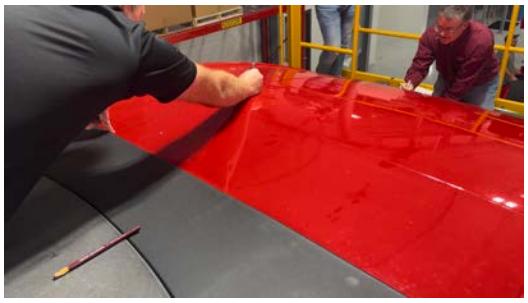
   Optional cosmetic procedure: Mark the center line of the fairing in the back and the front, then mark ½ the width of the provided black tape, about 1” off the center line on one side (the same side on both top and bottom). These marks will help apply the cosmetic tape down the center of the fairing between the two solar panels.

4. Use a string to stretch it between your two marks (15/16” off the centerline), then use a marker and apply marks where your string lays. This will help guide you when applying tape.

   Optional cosmetic procedure option #1: Tape Method. To apply the center tape strip, start at the back of the fairing (2-3 inches from the back edge), extend the black

cosmetic tape past where the front of the panel will stop (just past the inset)(**ONLY USE Black Permanent Gorilla All Weather tape**), and align the edge of your tape with your tape edge marks made in steps 3 and 4. It works best to unspool the needed tape first. Then, the technician at the back of the fairing starts setting the tape, and the technician in the front holds it up. Then, the technician in the front lowers the tape, aligning with the marks as they go. The cosmetic tape covers the center line running along the lines that are offset ~1 to ensure that the fairing's color underneath doesn't show through the panel's relief slits.

5. From the edge of the tape, mark 13 ¼" in each direction. Using a string like before, apply marks down the string. Note what side you measured from, as you need to apply the edge tape strips so they end up 13 ¼" from center to center.




6. Apply tape to these new marks, as in step 3. When complete, you should have a piece of black tape right down the center of the fairing and have a piece running parallel on each side of it that is 13 ¼" apart (center to center)


7. Using a J-roller or squeegee, ensure the tape fully bonds to the fairing without wrinkles.


8. Now, using a Sharpie marker (silver if you installed the black tape so that will show up), mark the center line of the fairing on the back (top) (about 5-6” in from the back of the cab) and the front (bottom) (just in the inset)

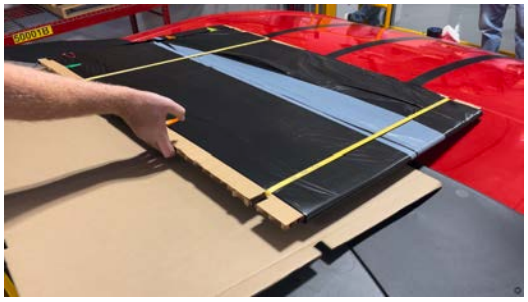
Solar Panel Installation

1. Pick up one of the two 220W solar panels packaged in cardboard with plastic tension straps. Place the box on the back of the fairing, oriented correctly (**THIS SIDE UP sticker shows**).

   IMPORTANT: Only cut the straps that are holding the ¼” cardboard that is sandwiching the panel. Once the straps are cut, never lift the panel off the fairing, as this can cause damage.

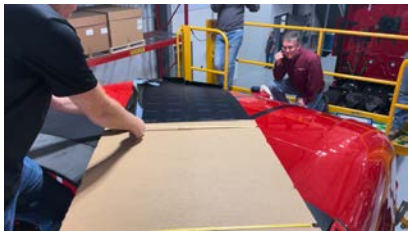

2. Cut the straps near the weld of the strapping. Pull on the welded portion of the strap so the strap's welded joint doesn't go under the panel.

3. Once the straps are removed, the cardboard sandwiching the panel can be removed. Gently slide out the bottom piece of cardboard while maintaining contact with the fairing.



4. Now, it's time to deploy the panel. Unfold the panel by grasping the ½" cardboard and the half banded to it. Always keep the non-banded portion of the panel resting on the fairing. Once the panel is fully unfolded and supported by the fairing, remove the remaining straps.

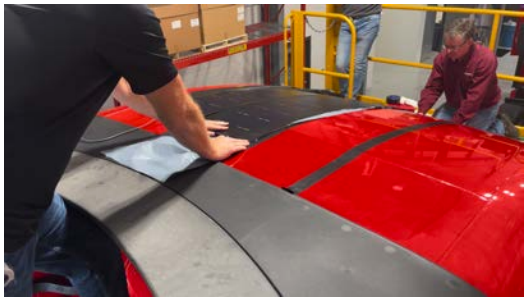
   IMPORTANT: Cut the remaining straps near the strap weld/joint, then grab and pull on the welded joint to remove the strap (we don't want the welded joint on the banding to pass under the panel). This will ensure that nothing is damaged on the panel's backside.

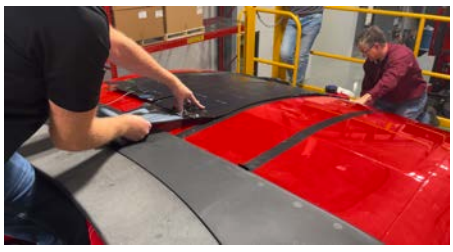

5. The panel should look like four individual panels tied together in the middle. At the back (top), two pieces of thin plastic are clipped over the panel; one is used to set the inner

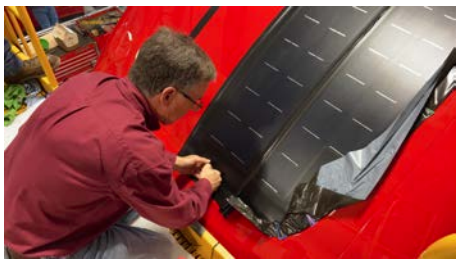
two panels (centerline of the fairing), and the other to set the outer two panels. We will install the inner two panels (along the centerline of the fairing) first. Slide the panel roughly in place, setting the front (bottom) edge about ⅜ to ½” inside the inset and next to your Sharpie mark. Then, at the back (top), bring it up to the Sharpie mark. Now, you can remove the plastic clips on the inner panels holding the thin plastic.

IMPORTANT: Leave the plastic clips that are on the outer half of the fairing in place for now.



6. **THIS STEP IS CRITICAL** to install the panel where intended. The technician at the back of the fairing will slowly pull the release liner, exposing a small portion of the butyl adhesive (~1”) on the front center strip of the panel near the bottom of the fairing. We will first set only the center strip of the panel. Leave the release liner on the outside strip of the solar panel until instructed to remove it later in these instructions. The technician at the front of the fairing will ensure the panel is appropriately tensioned and aligned (While aligning, the technician at the bottom needs to reach up the center of the inner panel and run their hand down to the bottom (shown in the image below) it to ensure the center of that section is against the fairing) and, when ready, set the panel’s exposed butyl portion on the fairing using the center Sharpie mark for alignment. Use a plastic felt-edged squeegee to install the panel and adhere it to the bottom edge.






IMPORTANT: Strokes for the squeegee should be in a V pattern, moving up the panel and toward the nearest edge of the panel in each direction, working out any bubbles.

7. Repeat the procedure by running your hand down the middle of the section to ensure the panel is aligned at the front and back. If the panel is flat and you don't see any puckers, you're ready to continue. After this point, you can not correct misalignment.

8. Start low (the set portion of the panel) and in the center with the solar cells and fiberglass. Then, work up and out along the integrated butyl adhesive border as the technician at the back pulls the release liner roughly 6-12 inches at a time. Fully adhere to each area before exposing the next section of butyl adhesive. At this point, the panel's position is permanently fixed, and there is no going back. **DO NOT** attempt to pull the panel up, or you will damage it.

9. While squeegeing, the technician in the front should lean close to the fairing and brace themselves with a hand on the integrated butyl adhesive border near the relief slit, ensuring they don’t press on the solar cells. Continue to press the panel down with the felt-tipped squeegee, working from the center outward.

10. Once the technician at the front can no longer safely reach the exposed portion of the panel, the technician at the top will use a J roller with an extension, bracing it against their shoulder to provide additional force, and slowly roll the panel down, working from the center outward. They will remove 6-12 inches of release liner and work their way up the fairing.

11. Once closer to the back of the fairing, the technician will use the same felt-tipped squeegee to work the panel from the center outward, ensuring a firm bond to the fairing.

12. Once complete, dispose of the release liner and continue to work out any potential air pockets under the panel and integrated edge tape exterior.

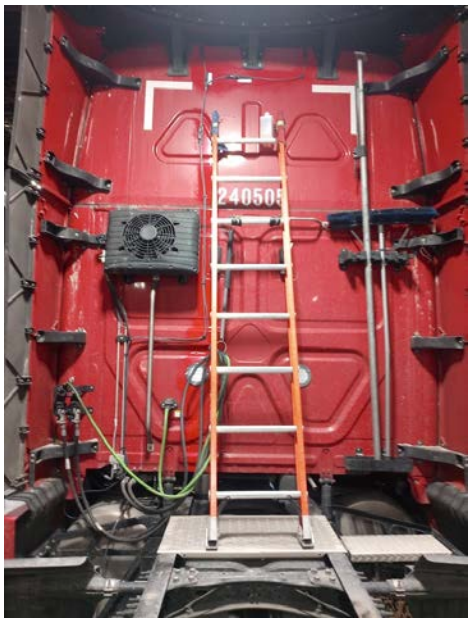
13. Repeat this process for the outer half of the 220W panel, ensuring the relief slits in the middle of the panel line up without overlapping. With your hand halfway up the panel, bring your hand down the center of that section, ensuring the panel is against the fairing. Once you reach the bottom (leading edge), the bottom edges of the inner and outer sections of the panels should be close to touching. Then, you can set the leading edge and work up the panel as described in instructions 6-12.

14. Repeat the same process for the other 220W Fairing solar panel, which is aligned against the 220W panel previously installed.

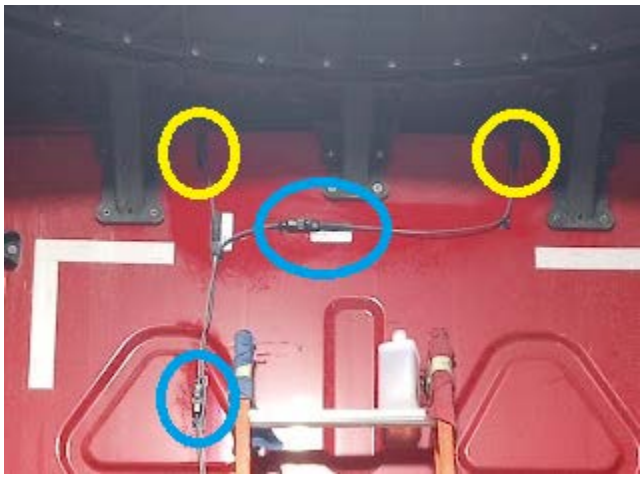
15. **IF COSMETIC TAPE WAS USED:** Once both 220W sides are installed, gently cut the extended cosmetic tape using a box cutter and slowly pull the tape away from the fairing on the center, passenger, and driver sides to ensure a clean look.

16. **Optional cosmetic procedure option #2: Paint Method.** After the panels are installed, use a black paint pen to cover any areas where the fairing color is visible in the slits of the panel.

Cable Routing and Charge Controller Connection



1. Loosen bolts holding the fairing extender and run panel cabling under the fairing extension to the back of the tractor. Retighten bolts on the fairing extension



2. We recommend placing the two charge controllers in the driver's side compartment. This can be done by:
    a. Use a step drill to drill a XX” hole in the bottom rear of the compartment for the cables to exit the cab.
    b. Fasten the charge controller to the rear wall of the compartment using the provided self-drilling screws.
    c. Run the battery and panel extension cables out of the hole and fit the provided grommet around the wires as they exit the compartment.

3. Remove the fuse from the battery extension cable and run the battery cable to the desired battery box. We recommend connecting one controller to the tractor batteries and one to the EPU batteries.

4. Connect the charge controllers to the batteries.

5. Replace the fuse in each of the battery extension cable fuse holders.

6. Check each charge controller to ensure a light comes on, indicating that it is connected to a battery and that the fuse is in place. A green light indicates that it is connected and the battery voltage is normal. An orange light indicates the battery voltage is low.

7. Ensure the battery cables are routed loosely so they do not rub against anything and wear out over time. Support them as needed with zip ties.

8. Run the solar extension cables under the cab and up the back of the cab to connect to the solar panel pigtails. When routing the cables, ensure they are not too tight and will not rub against anything that could wear a hole in the cable.

9. Connect the extension cable to the solar panel pigtails and secure a zip tie over the connector locks as a secondary lock. To provide additional strain relief, support each connector side with a zip tie mounting block or a self-adhesive fiberglass plate.

10. Use zip ties and self-adhesive zip tie mounting blocks to run cable in an orderly fashion down the back of the truck. Clean the area where the mounting blocks will be stuck with isopropyl alcohol and let it dry before sticking the block in place.

11. The cabling can sometimes be zip-tied directly to another cable or line on the back of the truck or under the cab rather than a mounting block.

12. Do not pull the wire tight around the corner on the bottom of the cab. Leave it a little loose so it does not rub and wear through the protective insulation.

13. Check each charge controller once it is outside in good sunlight. A second green LED light should flash, indicating the system is charging. This indicates that the system is functioning properly and has been installed correctly.