TT210 Solar Panel Replacement Guidelines

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1 TT210 Solar Panel Replacement Guide

This document provides general guidelines to successfully remove and replace the solar panel assembly for the Omnitracs Trailer Tracks 210 Unit (TT210).

ATTENTION Replacing the solar panel assembly will void the TT210 warranty.

![Solar Panel Assembly Image]

CAUTION: Electrostatic Discharge Control (ESD)—Devices are susceptible to damage by electrostatic discharge.

The solar panel replacement shall be performed at an effective ESD control work station in accordance with EIA JESD-625 "Requirements for Handling Electrostatic Discharge-Sensitive (ESDS) Devices" or equivalent.

CAUTION: Use of eye and hands protective wear is recommended.

CAUTION: For the re-assembly process, protective eye goggles and leather gloves are recommended to safely remove broken glass.

NOTE: Use of electric or power driver during re-assembly process may result in damage to unit.

The recommended process is to hand-tighten the screws with a hand torque driver. The use of electric torque drivers are permitted provided the user complies with the stated torque values or damage to the housing screw threads will result and the housing become unusable.

NOTE: Discard fasteners. Screws will be replaced during the re-assembly process.
1.1 Required Tools:
   - Approved ESD work station
   - Torx T10 driver bit
   - Hand screw driver for torx bit
   - Adjustable torque driver
   - Cleaning wipes
   - Isopropyl alcohol
   - Cotton swabs
   - Gloves
   - Brush
   - Putty knife

1.2 Required Materials:
   - Solar Panel Replacement Kit, TT210, 65-J8159-1
TT210 Assembly Diagram

NOTE: Components are removed for clarity in this exploded view.
1.3 Disassemble: Battery and Bottom Cover

**NOTE:** Before performing any rework operation on the unit, remove the battery pack to avoid danger of an electric short and possible damage to the circuit board.

1. Open the trap access door. Untighten the (5) captive-screws using a screw driver with Phillips tip type.

![Fig. 1. Trap Access Door](image)

2. Carefully unseat the battery from the holder.

![Fig. 2. Battery Pack](image)
3. Unplug the battery connector from the unit.
4. Press the connector locking tab as shown in Fig. 3 and simultaneously pull the connector away.

![Fig. 3. Unplug Battery Connector](image)

5. Place both the trap access door and battery aside to reuse them in a later sequence.
6. Place the unit upside down.
7. Remove the bottom cover’s (8) screws, shown in Fig. 4 below. Use a screw driver with torx bit #10.

![Fig. 4. Bottom Cover Screws](image)
8. Slowly lift the bottom cover from the housing. The pressed gasket is the only thing holding the bottom cover in place at this point. Once detached, set the bottom cover aside.

![Fig. 5. Detach Bottom Cover from Housing](image)

9. Hold the bottom cover with your hand and push screws up with your fingers. Take out and discard the screws.

![Fig. 6. Removing Screws from Bottom Cover](image)
10. Place the bottom cover down with the side opposite to the screw locations on top.
11. Remove the gasket located along the edge over the raised guide.
12. Remove the one piece gasket without leaving any gasket particles and discard. Save the bottom cover to be reused later.

![Gasket Removal Diagram](image)

13. Inspect the bottom cover component/rib side. Make sure all the screw mountings are not broken or cracked. It should be totally free of debris or foreign particles. There should be no moving or loose parts.

14. Verify the (2) foam protectors for the coax connectors are in place and in sound condition.

**NOTE:** If the foam is pushed in with the connector shape it is acceptable.

![Inspect Foam Protectors](image)

15. Verify the bottom cover is in a clean and undamaged condition.

This completes the bottom cover disassembly sequence.
1.4 Dis-Assemble: Main CCA (Circuit Card Assembly)

1. Place the housing in front of you. Identify the (6) cables connected to the CCA. Unplug all connectors:
   a. Lift the coax connector J4 and J5 by firmly pulling up the connector body with your fingers.
   b. Unlock J19 and J9 by removing the connector upper notch, as shown in Fig. 9, b.
   c. Unlock J16 and J23 by pushing down the lock while removing the connector from the CCA, as shown in Fig. 9, c.
   d. Pull each coax connector straight up while holding the square body on top
CAUTION: Do not attempt to unplug the connectors by pulling the wires, this may damage the cable. Unlock each connector by pressing gently but firmly by its lock bar or tab, as shown in Fig. 9, b-d.

2. Remove (6) screws from CCA, using a screw driver with Torx bit #10. Make sure the Torx bit is fully seated into the screw’s socket before removing the screw. Discard used screws.

![Fig. 10. Remove CCA Screws](image)

CAUTION: Before you remove the CCA from the housing, be aware that it is critical for the CCA to be re-installed in this very same housing. Note that the housing bears the same Serial Number stored in the CCA that is used in the TT210 application software.

3. Use both hands to unseat the CCA from the housing. Note that the CCA is retained in place by two guide pins. Lift the CCA firmly and set aside on an ESD safe surface.

![Fig. 11. Guide Pins](image)

This completes the Main CCA disassembly sequence.
1.5 Removal and Disposal of Solar Panel Assembly.

NOTE: Be careful while handling a broken solar panel. Use leather gloves to avoid injury.

1. Remove (8) screws from solar panel, using a screw driver with torx bit #10. Discard used screws.

2. Holding from each side, unseat the solar panel assembly from the housing. Lift the solar panel and gasket up slightly until you feel it release from the guide pins.

Fig. 12. Remove Solar Panel Screws

Fig. 13. Unseat the Solar Panel
3. Carefully discard the window and gasket with the broken glass pieces of the solar panel into a safe container. Push the parts away from the unit over a trash container.

![Fig. 14. Discard Broken Solar Panel and Parts](image1)

4. Use a brush to clear the plate and its foam pad of glass residue. Inspect the foam pad and make sure it is in good condition.

![Fig. 15. Brush off Broken Glass from Plate](image2)
5. Clean the entire area of the plate with isopropyl alcohol.

Fig. 16. Clean Solar Panel Plate

This completes the solar panel removal sequence.

1.6 Solar Panel Assembly Sequence

For the next assembly sequence, use the Solar Panel Assembly kit, which includes the following components:

- Solar Panel Window, 50-J7681-P1
- Solar Panel, CV90-J8001-P1
- Solar Panel Window Gasket, 50-J7676-P1
- Screw M3x10, 552-53058-0010 (22)
- Bottom Gasket, 50-7672-P1
- Gore Vent, 557-45294-0007 or -0009
- Alcohol Pad, 800-01788-1182 (2)
- Instructions Guide, 80-J862-1
- TT210 Re-install Kit, 65-J8023
  - Silent Block, Gasket, Cover (6)
  - Screw, Captive, Phillips (5)
  - Gasket, Foam
  - Rivet Kit Duraplate
Rivet Kit Non-duraplate

1. Retrieve the Solar Panel Assembly P/N CV90-J8001-P1 as supplied in the replacement kit. Verify the window, glass panel, and cable are intact and clean.

2. Carefully remove the plastic window to inspect the solar panel with the gasket installation for proper fit, shape, and orientation.

3. Before mounting the solar panel on the plate, place both parts so that the solar panel cable orientation matches the plate's foam side and feed the cable through the opening.

4. Take the cable with your hand and insert the connector through the aluminum plate opening.
5. Ensure the solar panel is seated on the top of the aluminum plate (the bottom side is stamped on the plate). Wires should not be routed over the foam and should stay routed between the solar panel and the plate.

6. Position the solar panel over the plate making sure the cable feeds through the plate's opening.

7. Gently hold the solar panel over the plate and move it carefully to be as centered as possible.

8. Ensure the solar panel wires are not oriented over the blue foam pad or this will cause the solar panel to prematurely crack.

9. Ensure the solar panel is free of any dust, lint, or finger prints or the solar panel will prematurely fail. Do not clean the solar panel surface with alcohol or other solvents. Wipe surface with lint free cloth or dry wipes.
10. Position the Window P/N 50-J7681-P1 over the solar panel to complete the solar panel assembly. The window has leaned mounting supports that must match to the housing's shape for a proper fit. Match the window mounting supports with the leaned housing wall, as shown.

Fig. 20. Position Plate Over Solar Panel

Housing and Window leaned shapes must align with each other.
11. Install (8) screws 552-53058-0010 to secure the solar panel to the housing. Use a screw driver with torx bit #10, set Torque value to 6.5 in-lbs., and follow the sequence shown in Fig. 21.

![Fig. 21. Install Solar Panel Over the Housing](image)

This completes the solar panel installation sequence.

### 1.7 Assemble Main CCA on Housing

1. Turn over the TT210 unit making sure the solar panel rests over a soft flat surface.
2. Hold the CCA by the edges as it is subject to ESD or physical damage.
3. In the CCA area on the housing, locate the two guide pins you will need to position the CCA in place. See Fig. 22 where guide pins area indicated.
4. Position the CCA over the housing guide pins and carefully place the CCA over the guide pins until they are aligned exactly onto the CCA.
5. Install (6) CCA screws 552-53058-0010 to secure the CCA to the housing. Use a screw driver with torx bit #10, set torque value to 10 in-lbs., and follow the sequence shown in Fig. 23. Make sure to properly seat the bit inside the screw’s socket before starting to drive the screw in.

**CAUTION:** Lower the torx bit with care over the screws and avoid any contact with components.

6. Make all (6) cable connections to the CCA. Hold each connector by its body and avoid pulling or pushing directly over the wires.

7. Install coax connectors J4 and J5 by pressing the mating cable on to the CCA connectors in a vertical position. You should feel and hear the connectors locking in place.
Fig. 24. Plug Coax Connectors

8. Connect cables at J9 and J19 on the CCA. The Connector orientation is made with the locking bar on top. Hold the connector by its body and push it in place until locks and stops.

Fig. 25. Plug J9 and J19 Connectors

9. Connect the solar panel cable at J16 on the CCA. Locate the connector lock tab that goes on top. Push the connector in place until the locking tab is secured beyond the connector locking feature.

Fig. 26. Plug J23 Connector
10. Connect the battery cable at J23 on the CCA. Locate the connector lock tab that goes on top. Push the connector in place until the locking tab is secure beyond the connector locking feature.

![Fig. 27. Plug J5 Connector](image)

11. Verify all cable connections were made correctly. Each connector must be completely flush against its mating connector in the CCA.

![Fig. 28. Verify CCA Installation](image)

This completes the CCA installation sequence.
1.8 Bottom Cover Assembly

1. Retrieve the bottom cover set aside in a previous sequence.

2. Take new Gasket P/N 50-7672-P1 and place it in its fully dressed form next to the bottom cover so that you can validate the gasket and cover guide match. If the gasket flips out of shape, you can redress it gently and it will regain its original form.

3. Place the gasket over the bottom cover gasket guide and make sure both match in shape and dimensions before you start mounting the gasket over its guide with your fingers.

4. Place the unit on a soft flat surface with the solar panel facing down.
5. Carefully place the bottom cover over the housing opening. Note the cover shape and the position of the outer screw mounting for correct orientation.

![Fig. 31. Position Bottom Cover in Place](image1)

6. Gently but firmly push the bottom cover down evenly so that it seats in place over the housing's gasket guide.

![Fig. 32. Holding Bottom Cover in Place](image2)

7. Install (8) screws to secure the bottom cover on the housing. Use a screw driver with torx bit #10, set torque value to 6.5 in-lb., and follow the sequence shown in Fig. 33.

**CAUTION:** Do not over torque screws or they will strip the housing threads.

8. Ensure the gasket is not exposed or pinched around housing bosses or the electronics compartment will not seal and allow water ingress.
1.9 Battery Cover Assembly

1. Replace battery pack in unit. Plug the battery connector to the battery cable by approaching both connectors with their locking tabs on top.

2. Firmly push the connectors forward until they are fully mated and the tabs lock in place with the usual click sound.

3. Place the battery pack into place making sure it seats completely and it is held by the battery clips at both sides.
4. Route the battery cable to the right side and make sure it is not pulled or jammed under the battery.

5. Slide the battery mating connectors into the retained slot on the housing.

6. Verify the trap access gasket is properly located around the access opening.

7. Place the trap access door in position over the housing access opening.

8. Tighten the (5) captive-screws using a screwdriver with Phillip’s tip to 1 in-lbs. according to the installation sequence.
This completes the battery installation sequence.