GARMIN®

GMR™ xHD3

Field Service Manual

Important Safety Information

⚠ WARNING

See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

The high voltage capacitors in this product can hold a charge well after disconnecting power. While servicing the unit, take all necessary precautions against high voltage. High voltage electrocution can result in serious personal injury or death.

The magnetron in this product generates a strong magnetic field and may pose a danger to persons with implanted medical devices. If you have an implanted medical device, you should not perform service on this device, to avoid the risk of malfunction or failure of your medical device.

This product generates and transmits non-ionizing radiation. Exposure to electromagnetic radiation can result in serious health hazards. Before performing any bench test procedure, remove the antenna and install the antenna terminator (*Installing the Terminated Antenna*, page 5).

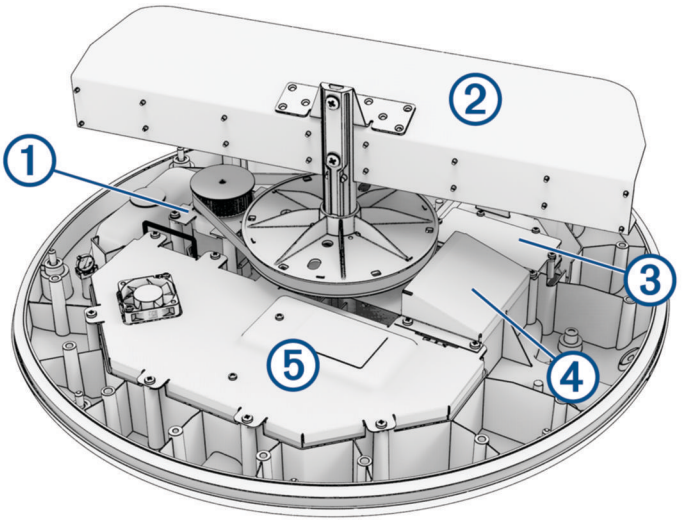
Repairing and performing maintenance on Garmin® electronics is complex work that can result in serious personal injury or product damage if not done correctly.

NOTICE

Garmin is not responsible for, and does not warrant, the work that you or a non-authorized repair provider perform on your product.

Use care when working near a magnetron with ferrous instruments. The strong magnetic force of the magnetron will attract ferrous instruments, risking damage to the magnetron. Use instruments made from non-ferrous materials such as stainless steel or titanium, or use cardboard or a similar material to shield the magnetron from potential damage.

Overview



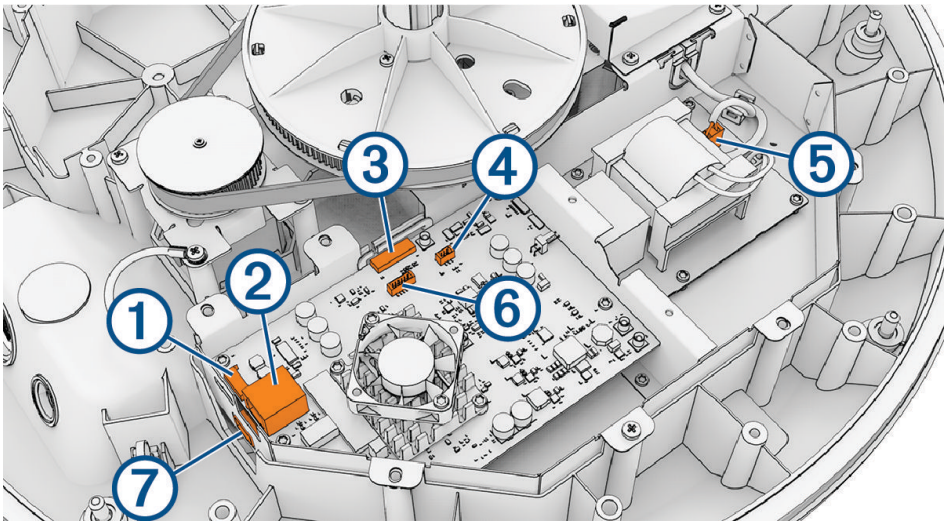
Item	Description	Instructions
1	Motor	*Replacing the Motor*, page 10
2	Antenna	*Replacing the Antenna*, page 6
3	Low-noise converter (LNC)	*Replacing the LNC*, page 9
4	Magnetron	*Replacing the Electronics Box and the Magnetron/Circulator Assembly*, page 6
5	Electronics box	*Replacing the Electronics Box and the Magnetron/Circulator Assembly*, page 6

Internal Connections

NOTICE

Before proceeding with service, take note of the connections in the electronics box and the cable routing to make sure you can reproduce it correctly when reassembling the radar. Failure to correctly reconnect the components of the radar could result in product malfunction.

The electronics box contains the processor board, to which most of the components in the radar are connected, and the modulator board, to which the magnetron and the internal power cable are connected.



Item	Connection
①	Motor cable
②	Internal network cable
③	LNC data cable
④	Status Indicator Light cable
⑤	Magnetron power cable
⑥	Antenna Position Sensor Board data cable
⑦	Internal power cable

Service Kits

You can order the most common replacement parts and accessories at garmin.com/accessories/gmr_xhd3_radome.

To order the service kits listed in this manual, you can contact Garmin Support at support.garmin.com.

If you are a Garmin dealer, you should contact your Garmin representative to order service kits.

Service Kit Number	Description
S00-00700-27 (18 in. models) S00-00700-18 (24 in. models)	Top cover
S00-02112-00 (18 in. models) S00-02113-00 (24 in. models)	Bottom cover[1]
S00-00472-00 (18 in. models) S00-00488-00 (24 in. models)	Antenna
S00-00473-00	Antenna drive belt
S00-00476-00	Antenna position sensor PCB
S00-02116-00	Magnetron/Circulator Assembly and Electronics box[2]
S00-02118-00	LNC[3]
S00-02115-00	Motor assembly[4]
S00-03446-00	Internal Cables[5]
S00-00479-00	Internal power cable
S00-03447-00	Internal network cable
215-00007-00	Hall effect magnet
325-00382-04 (18 in. models) 325-00382-05 (24 in. models)	Status LED cable
320-01052-00	15 m (49.21 ft.) Garmin BlueNet™ Cable
T10-00114-00	Radar service kit[6]

Service Procedures

Before performing any service procedure, you should update the software (*Software Updates*, page 5).

1 Includes status LED.

2 Does not include electronics box cover or mounting screws.

3 Includes mounting screws. Does not include LNC wire harness.

4 Includes mounting screws.

5 Includes antenna position sensor cable, magnetron ground wire, motor ground wire, LNC wire harness.

6 Includes the terminated antenna (*Installing the Terminated Antenna*, page 5).

Restoring the Radar Settings to Factory Defaults

To restore the radar software to factory defaults, the radar must be powered on and connected to the chartplotter.

1. On the chartplotter, select **Settings** > **System** > **System Information**.
2. Select an option:
   - On a touchscreen chartplotter, touch and hold **Garmin Devices** for 6 seconds.
   - On a keyed chartplotter, select **Garmin Devices**, and press and hold the ENTER key for 6 seconds.
3. Select **Field Diagnostics** > **Radar** > **Factory Defaults**.
4. Select **Yes** to confirm.

Software Updates

You can go to garmin.com/support/software/marine to find information on the latest software updates for your Garmin marine devices.

Removing the Top Cover

⚠ WARNING

The internal components of this device hold high voltages that can persist even after power has been disconnected. You must observe the proper safety precautions before accessing the internal components.

1. Using a 5 mm ($^{3}/_{16}$ in.) hex key, loosen the captive screws on the underside of the radar.

   NOTE: There are eight captive screws securing the top cover on the 18 in. radome, and ten screws on the 24 in. radome.
2. Gently pry the dome loose and remove it from the bottom cover.

NOTICE

You should use a non-marring plastic pry tool to prevent damage to the top cover when prying it off.

Before proceeding with service, you should familiarize yourself with the internal components of the radar (*Overview*, page 2).

Reinstalling the Top Cover

1. Examine the gasket around the bottom cover, and make sure it is properly seated in its groove.
2. Place the dome over the bottom cover, aligning the marks on the edge of dome with the marks on the bottom cover.
3. Push the dome firmly against the bottom cover.
4. Using a 5 mm ($^{3}/_{16}$ in.) hex key, tighten the captive screws on the underside of the bottom cover.

   NOTE: There are eight captive screws securing the top cover on the 18 in. radome, and ten screws on the 24 in. radome.

Installing the Terminated Antenna

⚠ WARNING

This product generates and transmits non-ionizing radiation. Before performing any bench test procedure, remove the antenna and install the terminated antenna provided in the Radar Service Kit (*Service Kits*, page 4). Exposure to electromagnetic radiation can result in serious health hazards.

1. Remove the antenna (*Removing the Antenna*, page 6).
2. Install the terminated antenna the same way you install a standard antenna (*Reinstalling the Antenna*, page 6).

Replacing the Antenna

Removing the Antenna

The antenna is mounted to the bottom cover with three screws under the antenna gear.

1. Disconnect the antenna position sensor board cable from the antenna position sensor board on the underside of the antenna gear.
2. Rotate the antenna to expose the head of one of the mounting screws through the hole in the antenna gear.
3. Using a #1 Phillips screwdriver, remove the first mounting screw.
4. Rotate the antenna to expose and remove the other two antenna rotary joint mounting screws.
5. Gently lift the belt off the antenna gear, and slowly rotate the antenna to release the belt from the gear.
6. Lift the antenna up, and remove it from the bottom case.

Reinstalling the Antenna

1. Holding the belt around the antenna rotary joint, between the antenna and the antenna gear, insert the antenna into its slot, with the waveguide opening on the bottom facing the magnetron.
2. Place the belt around the motor drive gear.
3. Hold the other side of the belt to the antenna gear, and slowly rotate the antenna until the belt snaps onto the gear.
4. Rotate the antenna to expose the boss for one of the antenna rotary joint mounting screws.
5. Install the first antenna rotary joint mounting screw.
6. Rotate the antenna to expose the remaining two bosses and install the remaining mounting screws.
7. Reconnect the antenna position sensor board cable to the antenna position sensor board on the underside of the antenna gear, near the motor.

Replacing the Electronics Box and the Magnetron/Circulator Assembly

NOTICE

The components in the electronics box must be tuned at the factory to work with the magnetron in each unit, so both parts are supplied as a pair. Replacing only the magnetron or only the electronics box causes product malfunction.

Removing the Electronics Box and the Magnetron/Circulator Assembly

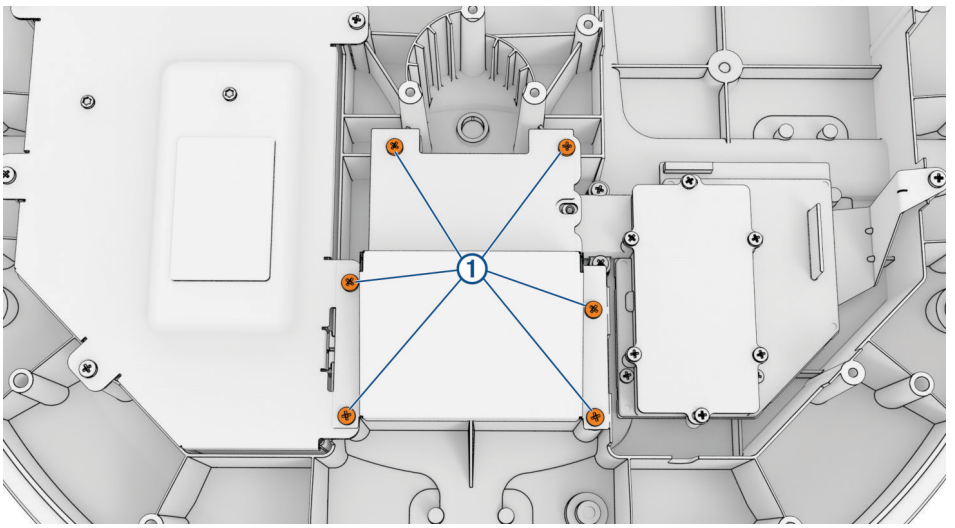
⚠ WARNING

The high voltage capacitors in this product can hold a charge well after disconnecting power. While servicing the unit, take all necessary precautions against high voltage. High voltage electrocution can result in serious personal injury or death.

Before performing service on the magnetron and the electronics box, you should familiarize yourself with the connections in the electronics box (*Internal Connections*, page 3).

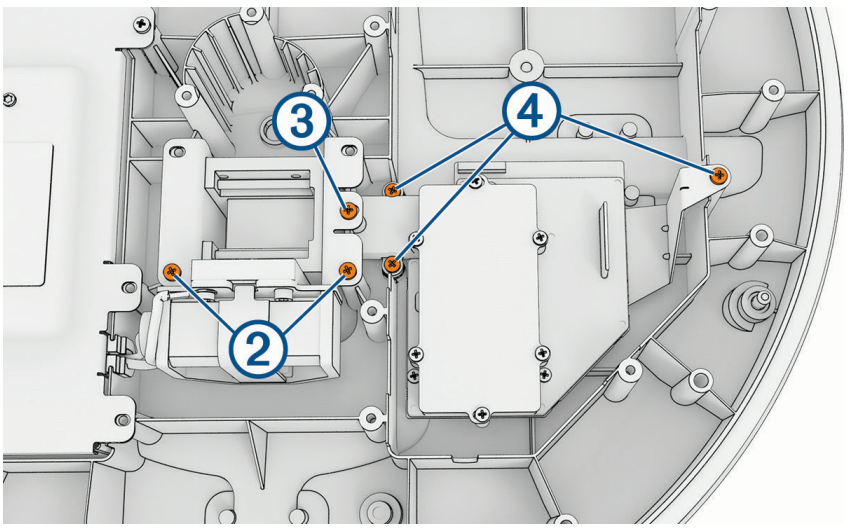
1. Remove the antenna (*Removing the Antenna*, page 6).
2. Carefully cut the cable tie securing the ferrite beads on the internal power cable and the internal network cable to the bottom cover.
3. Disconnect the internal power cable from the electronics box.
4. Disconnect the motor cable from the electronics box.
5. Using a flat screwdriver or prying tool, lift the retaining latch on the under side of the internal network connector and disconnect it from the electronics box.

6 Using a #2 Phillips screwdriver, remove the six screws ① securing the magnetron cover and the magnetron.



7 Remove the magnetron cover.

8 Using a #2 Phillips screwdriver, remove two screws ② securing the circulator to the bottom cover.



9 Using a #1 Phillips screwdriver, remove the screw ③ securing the circulator to the LNC waveguide.

10 Using a #2 Phillips screwdriver, remove the three screws ④ securing the LNC to the bottom cover.

11 Using a #1 Phillips screwdriver, remove the two small screws in the middle of the electronics box cover.

12 Using a #2 Phillips screwdriver, remove the screw securing the motor ground wire to the electronics box.

13 Using a #2 Phillips screwdriver, remove the remaining six screws around the perimeter of the electronics box.

14 Remove the electronics box cover, and set it aside.

15 Disconnect the antenna position sensor cable and the status LED cable from the circuit board inside the electronics box by pulling up on their connectors.

16 Disconnect the LNC cable from the board inside the electronics box, by pulling its connector parallel and away from the board.

TIP: Use a prying tool to gently pry the connector off the board, if necessary.

17 Disconnect the magnetron power cable from the board inside the electronics box.

18 Using a #1 Phillips screwdriver, remove the screw securing the magnetron ground wire to the electronics box.

19 Cut the cable tie holding the magnetron power cable and ground wire to the electronics box.

20 Lifting the LNC waveguide out of the way, lift and remove the magnetron/circulator assembly from the bottom cover.

21 Remove the electronics box from the bottom cover.

Reinstalling the Electronics Box and the Magnetron/Circulator Assembly

1 If necessary, secure the forked end of the magnetron ground wire to the top left screw securing the magnetron to the circulator, using a 3 mm ($^{7}/_{64}$ in.) hex wrench.

2 Place the rubber grommet around the magnetron power cable and ground wire.

3 Place the new electronics box in its slot on the bottom cover.

4 Place the new magnetron/circulator assembly in its slot in the bottom cover, making sure the rubber grommet protecting the magnetron wires is properly inserted over the matching cut-outs on the electronics box housing and the bottom cover.

5 Lift the magnetron slightly, and place the LNC in its slot in the bottom cover.

The open wave guide on the side of the LNC rests directly against the magnetron/circulator assembly.

6 Using a #2 Phillips screwdriver, install the three screws securing the LNC to the bottom cover.

7 Loop a cable tie through the cable tie holder next to the modulator board in the electronics box.

8 Using a #1 Phillips screwdriver, secure the ring end of the magnetron ground wire to the board in the electronics box.

9 Connect the magnetron power cable to the port on the modulator board.

10 Form a loop in the excess magnetron cable and ground wire, and secure it to the electronics box using the cable tie you prepared earlier.

11 Place the oblong rubber grommet in the cut-out on the electronics box near the processor board.

12 Route the LNC cable, the antenna position sensor cable, and the status LED cable through the oblong rubber grommet, and connect them to the appropriate ports on the processor board.

13 Connect the motor power cable to its port near the edge of the processor board.

TIP: You should use a flat screwdriver to push the motor power cable connector and make sure it is fully seated.

14 Place the electronics box cover on the electronics box, making sure the rubber grommet protects the LNC cable, the antenna position sensor cable, and the status LED cable from friction with the electronics box and the electronics box cover.

15 Using a #1 Phillips screwdriver, install the two small screws securing the cover on the electronics box.

16 Using a #2 Phillips screwdriver, install the screw securing the motor ground wire to the electronics box.

17 Using a #2 Phillips screwdriver, install the remaining electronics box screws, except the two screws adjacent to the magnetron.

18 Using a #1 Phillips screwdriver, install the small screw securing the magnetron/circulator assembly to the LNC.

19 Using a #2 Phillips screwdriver, install the two screws closest to the magnetron, securing the magnetron/circulator assembly to the bottom cover.

20 Place the magnetron cover over the magnetron/circulator assembly.

21 Using a #2 Phillips screwdriver, install the six screws securing the magnetron cover.

22 Reinstall the antenna (*Reinstalling the Antenna*, page 6).

23 Reconnect the internal power cable and the internal network cable to the ports on the side of the electronics box.

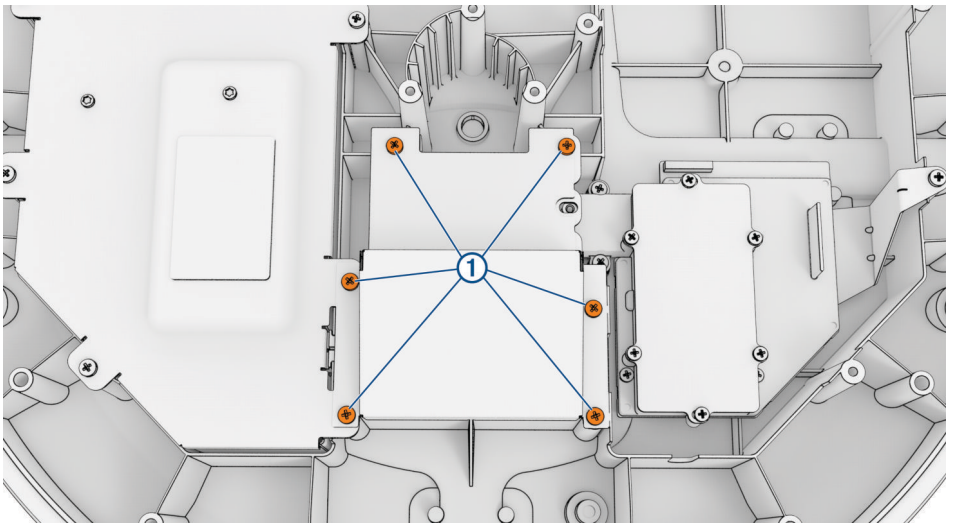
24 Install a new cable tie securing the ferrite beads on the internal power cable and the internal network cable to the bottom cover.

Replacing the LNC

NOTE: Removing the LNC requires removing the magnetron mounting screws so that you can lift the magnetron out of the way to remove the LNC from the radar.

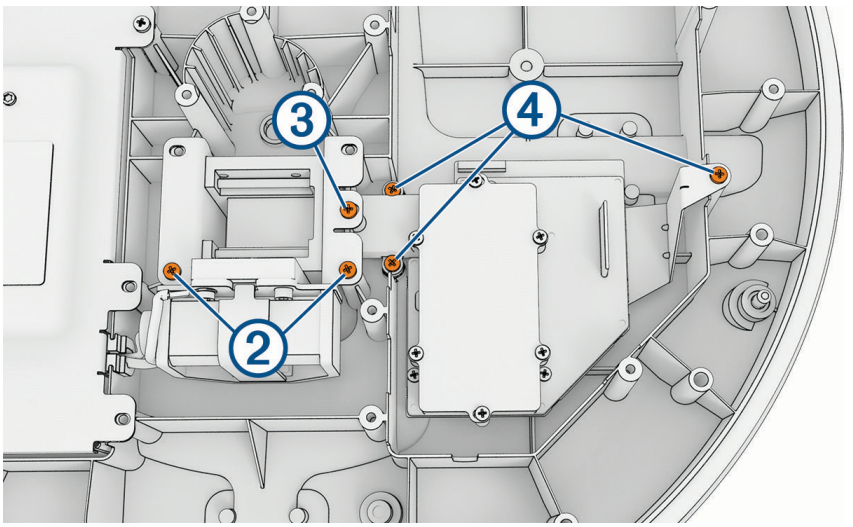
1 Remove the antenna (*Removing the Antenna*, page 6).

2 Using a #2 Phillips screwdriver, remove the six screws ① securing the magnetron cover and the magnetron.



3 Remove the magnetron cover.

4 Using a #2 Phillips screwdriver, remove two screws ② securing the magnetron to the bottom cover.



5 Using a #1 Phillips screwdriver, remove one screw ③ securing the magnetron to the LNC waveguide.

6 Using a #2 Phillips screwdriver, remove the three screws ④ securing the LNC to the bottom cover.

7 Lift the magnetron assembly out of the way and remove the LNC from the bottom cover.
Take care not to snag the status indicator light cable when removing the LNC.

8 Lift the magnetron assembly out of the way and place the new LNC in its slot.

9 Reinstall the three LNC screws ④.

10 Reinstall the screw securing the circulator to the LNC ③.

11 Reinstall the two screws securing the magnetron circulator to the bottom cover ②.

12 Reinstall the protective cover over the magnetron and secure it using the six screws ①.

13 Reinstall the antenna (*Reinstalling the Antenna*, page 6).

Replacing the Motor

1. Remove the antenna (*Removing the Antenna*, page 6).
2. Disconnect the motor power cable from the electronics box.
3. Using a #2 Phillips screwdriver, remove the screw securing the motor ground wire to one of the motor mounting bosses.
4. Using a #2 Phillips screwdriver, remove the other three screws securing the motor to the bottom case.
5. Lift the motor out of the bottom cover.
6. Make sure the new motor is fully seated in the rubber pad on the bottom of the motor.
7. Place the new motor in the mounting location.
8. Reinstall the first motor mounting screw holding the ground wire on top of the motor mounting bracket.
9. Reinstall the remaining three motor mounting screws.
10. Connect the new motor power cable to the electronics box.

    TIP: You should use a flat screwdriver to push the motor power cable connector and make sure it is fully seated.
11. Reinstall the antenna (*Reinstalling the Antenna*, page 6).

Replacing the Internal Power Cable

1. Carefully cut the cable tie securing the internal power and network cables to the bottom cover.
2. Pull the internal power cable connector to disconnect it from the electronics box.
3. Using a 21 mm ($^{13}/_{16}$ in.) socket wrench, remove the nut that secures the connector on the outside of the pedestal housing.
4. Remove the cable.
5. Examine the O-ring on the threaded end of the new internal power cable and make sure it is fully seated into its groove.
6. Feed the threaded end of the cable through its slot, and install the locking nut.
7. Connect the cable to the electronics box.
8. Secure the internal power and network cables to the bottom cover with a new cable tie.

    NOTE: The cable tie helps to prevent the internal cables working themselves loose over time.

Replacing the Internal Network Cable

1. Carefully cut the cable tie securing the internal power and network cables to the bottom cover.
2. Using a flat screwdriver or prying tool, lift the retaining latch on the under side of the internal network connector and disconnect it from the electronics box.

    NOTE: The internal network cable connector is a standard water-resistant RJ45 connector.
3. Using a 16 mm ($^{5}/_{8}$ in.) socket wrench, remove the nut that secures the connector on the outside of the pedestal housing.
4. Remove the cable.
5. Examine the O-ring on the threaded end of the new internal network cable and make sure it is fully seated into its groove.
6. Feed the threaded end of the cable through its slot, and install the locking nut.
7. Connect the cable to the electronics box.
8. Secure the internal power and network cables to the bottom cover with a new cable tie.

    NOTE: The cable tie helps to prevent the internal cables working themselves loose over time.