GMR™ 18/24 xHD and 18 HD+ Field Service Manual

⚠ WARNING

The GMR 18/24 xHD and 18 HD+ radar generates and transmits non-ionizing radiation. The radar must be turned off before approaching the scanner for service. Avoid looking directly at the scanner while it is transmitting, as the eyes are the most sensitive part of the body to electromagnetic radiation. Failure to properly turn off the radar may expose the service technician to harmful electromagnetic radiation that can result in personal injury or death.

The GMR 18/24 xHD and 18 HD+ radar contains high voltages. The scanner must be turned off before the covers are removed. While servicing the unit, be aware high voltages are present and take the necessary precautions. The high voltages in the scanner can take some time to decay. Failure to adhere to this warning can result in personal injury or death.

The GMR 18/24 xHD and 18 HD+ radar contains a magnetron. Persons with a cardiac pacemaker should not perform any service to the radar that may place them in close proximity to the magnetron. If a person with a cardiac pacemaker fails to adhere to the warning, there is a danger that the pacemaker may experience abnormal operation or failure.

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

Use care when working near a magnetron with ferrous instruments. The strong magnetic force of the magnetron will attract ferrous instruments, and any contact with the magnetron could damage the magnetron. If possible, use stainless steel or titanium instruments when working near the magnetron. If specialty instruments are not available, use cardboard or a similar material to act as a shield between the magnetron and a ferrous instrument.

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

Important Information Regarding Field Service of the GMR 18/24 xHD and 18 HD+ Radar

- Before performing any service to the radar, ensure that the system software is up to date. If it is not, go to www.garmin.com to download the latest software version and update the radar using an SD card. Proceed with the service only if the software update does not resolve the issue.
- Record the serial number of your radar. You will need the serial number when you order replacement parts.

Contacting Garmin Product Support

Replacement parts are available only through Garmin Product Support.

- For dealer specific support, call 1-866-418-9438
- Go to www.garmin.com/support and click **Contact Support** for in-country support information.
- In the USA, call (913) 397.8200 or (800) 800.1020.
- In the UK, call 0808 2380000.
- In Europe, call +44 (0) 870.8501241.

Table of Contents

Getting Started

Tools Needed

- Screwdrivers
  - Number 1 Phillips
  - Number 2 Phillips
  - 5 mm hex
  - 3 mm hex (preferably stainless steel or titanium to avoid damaging the magnetron)
- Digital Volt Meter (volt/ohm meter)
- Compatible chartplotter
- 12 to 32 Vdc power supply
- High viscosity, electronics-compatible RTV compound

Radar Software Update

Before using this manual to troubleshoot a problem, ensure that all Garmin devices on the boat, including the chartplotter and the GMR 18/24 xHD/18 HD+ radar, are operating on the latest-released software version. Software updates may resolve the problem.

Checking the Radar Software on a GPSMAP® 4000/5000/6000/7000 Series Chartplotter

1. Turn on the chartplotter.
2. Select **Configure** > **Communications** > **Marine Network**, and note the software version listed for the radar.
3. Go to www.garmin.com/support/software/marine.html and click on **See All Devices in this Bundle** under **Garmin Marine Network with SD Card** to see if your firmware is up-to-date.

Checking the Radar Software on a GPSMAP 7400/7600/8000/9000 Series Chartplotter

1. Turn on the chartplotter.
2. Select **Settings** > **Communications** > **Marine Network**, and note the software version listed for the radar.
3. Go to www.garmin.com/support/software/marine.html and click on **See All Devices in this Bundle** under **Garmin Marine Network with SD Card** to see if your firmware is up-to-date.

Checking the Radar Software on a GPSMAP 700 Series Chartplotter

1. Turn on the chartplotter.
2. Select **Configure** > **System** > **System Information** > **Garmin Devices**, and note the software version listed for the radar.
3. Go to www.garmin.com/support/software/marine.html and click on **See All Devices in this Bundle** under **Garmin Marine Network with SD Card** to see if your firmware is up-to-date.

Updating the Radar Software

1. Download the latest update.
2. Using an SD Card Programmer and a appropriately-sized SD card, run the update file downloaded from the Web site.
3. Turn on the chartplotter.
4. Insert the card in the chartplotter, and agree to the update.
5. After the radar software has been updated, determine whether the problem was corrected. If not, proceed to the applicable troubleshooting steps.

Radar Diagnostics Page

Some of the troubleshooting techniques require you to view the radar diagnostics page. This is available on 4000/5000/6000/7000/8000/9000 series chartplotters.

Opening the Radar Diagnostics Page on a 4000/6000 Series Chartplotter

1. From the Home screen, select **Configure** > **System**.
2. Hold **Menu** for four seconds.

   A menu item for **Radar** appears at the bottom of the list.
3. Select **Radar** to open the Radar Diagnostics page.

Opening the Radar Diagnostics Page on a 5000/7000 Series Chartplotter

1. From the Home screen, select **Configure** > **System**.
2. Hold the free space immediately to the left of **Simulator** for at least four seconds.

   A menu item for **Radar** appears at the bottom of the list.
3. Select **Radar** to open the Radar Diagnostics page.

Opening the Radar Diagnostics Page on a 7400/7600/8000/9000 Series Chartplotter

1. From the Home screen, select **Settings** > **System** > **System Information**.
2. Hold the upper left corner of the system information box (where it shows the software version) for about three seconds.

   The Field Diagnostics menu will appear in the list on the right.

3 Select Field Diagnostics > Radar.

Viewing a Detailed Error Log on a 8000/9000 Series Chartplotter

The GMR 18/24 xHD/18 HD+ radar keeps a log of reported errors, and this log can be accessed from an 8000 or 9000 series chartplotter. The error log contains the last 20 errors reported by the radar. If possible, it is recommended to view the error log while the radar is installed on the boat where the problem is encountered.

1. On an 8000 series chartplotter, open the radar diagnostics page.
2. Select **Radar** > **Error Log**.

Troubleshooting

Errors on the GMR 18/24 xHD/18 HD+ radar are reported on the chartplotter as an error message. When the radar reports an error, it may stop, go into standby mode, or continue operating, depending on the severity of the error. When an error is encountered, note the error message and perform the universal troubleshooting steps before proceeding with error-specific troubleshooting.

Universal Troubleshooting Steps

You must perform these troubleshooting steps prior to performing error-specific troubleshooting. You should perform these steps in order, and check to see if the error remains after performing each step. If the error remains after completing all of these steps, you can proceed to the topic for the error message you receive to resolve the issue.

1. Update the Garmin Network software (page 2).
2. Examine the radar power cable and connections on the radar and on the battery or fuse block.
   - If the cable is damaged or a connection is corroded, replace the cable or clean the connection.
   - If the cable is sound and the connections are clean, test the radar with a known good power cable.
3. Examine the Garmin Marine Network cable and connections on the radar and the chartplotter or GMS™ 10
   - If the cable is damaged or a connection is corroded, replace the cable or clean the connection.
   - If the cable is sound and the connections are clean, test the radar with a known good Garmin Marine Network cable.

Radar Satus LED

A status LED is located on the product label and can help troubleshoot installation problems.

Status LED Color and Activity	Radar Status
Solid red	The radar is getting ready for use. This should only stay red briefly before changing to flashing green.
Flashing green	The radar is operating properly.
Flashing orange	The radar software is being updated.
Flashing red	The radar has encountered an error. Check a connected chartplotter to see if an error message is shown.

Error Codes and Messages

Major warning and severe error codes for the GMR 18/24 xHD/18 HD+ radar are displayed on the chartplotter screen. These codes and messages are a good place to start when troubleshooting the radar. In addition to the major warning and severe error codes, all error and diagnostic codes are stored in an error log. You can view the log on a 7400/7600/8000/9000 series chartplotter (page 2).

To troubleshoot an error code from the radar, you can locate the code below and follow the troubleshooting steps as directed.

1002 - Hardware FPGA Interface Fault
1003 - Hardware FPGA Program Fault

1. Perform the universal troubleshooting steps (page 3).
2. If the problem persists, replace the processor PCB (page 11).

1004 - Input Voltage Low

1. Perform the universal troubleshooting steps (page 3).
2. Check the input voltage level, and make sure it meets the specification for the radar.

   NOTE: The voltage specification for the GMR 18/24 xHD/18 HD+ radar is from 10 to 32 Vdc.
3. If the input voltage is in spec, perform the universal troubleshooting steps (page 3).
4. If the problem persists, replace the modulator PCB and magnetron (page 11).
5. If the problem persists, replace the processor PCB (page 11).

1005 - Input Voltage High

1. Perform the universal troubleshooting steps (page 3).
2. Check the input voltage level, and make sure it meets the specification for the radar.

   NOTE: The voltage specification for the GMR 18/24 xHD/18 HD+ radar is from 10 to 32 Vdc.
3. If the input voltage is in spec, perform the universal troubleshooting steps (page 3).
4. If the problem persists, replace the processor PCB (page 11).

1006 - Heater Voltage Low
1007 - Heater Voltage High
1009 - High Voltage High
1011 - Transmit Current High

1. Perform the universal troubleshooting steps (page 3).
2. If the problem persists, replace the modulator PCB and magnetron (page 11).

1013 - System Temperature High

1. Perform the universal troubleshooting steps (page 3).
2. Check the temperature in the installed location, and make sure it meets the specification for the radar.

   NOTE: The temperature specification for the GMR 18/24 xHD/18 HD+ radar is from -15 to 70°C (from 5 to 158°F).
3. If the input voltage is in spec, perform the universal troubleshooting steps (page 3).
4. If the problem persists, replace the processor PCB (page 11).

1015 - Modulator Temperature High

1. Perform the universal troubleshooting steps (page 3).
2. Check the temperature in the installed location, and make sure it meets the specification for the radar.

   NOTE: The temperature specification for the GMR 18/24 xHD/18 HD+ radar is from -15 to 70°C (from 5 to 158°F).
3. If the input voltage is in spec, perform the universal troubleshooting steps (page 3).
4. If the problem persists, replace the modulator PCB and magnetron (page 11).

1017 - Modulator Status Fault, Modulator is Not Responding

1026 - Modulator Power Fault, Could Not Power Up the Modulator

1. Perform the universal troubleshooting steps (page 3).
2. Remove the dome (page 9).
3. Open the processor and modulator boxes (page 11).
4. Remove the cable between P8000 on the processor PCB and J200 on the Modulator PCB (page 13).
5. Remove the cable between P2001 on the processor PCB and P101 on the Modulator PCB (page 13).
6. Examine the cables and connectors for damage, and check the continuity of the cables with a volt/ohm meter.
7. Select an option:
   - If damage is present, replace the cable or PCB.
   - If no damage is present, replace the modulator PCB and magnetron (page 11).

1018 - Heater Status Fault, Heater Current Low

NOTE: This message may not appear on the chartplotter, and may be included in the error log instead (page 2).

1. Perform the universal troubleshooting steps (page 3).
2. Remove the dome (page 9).
3. Open the modulator box (page 11).
4. Remove the magnetron (page 10).
5. Examine the cables and connectors from the magnetron to the modulator PCB.
6. Select an option:
   - If a cable from the magnetron to the modulator PCB is loose, secure the cable.
   - If damage is present in the ground cable from the magnetron to the modulator PCB, replace the cable.
   - If no damage is present, and the connection is secure, replace the modulator PCB and magnetron (page 11).

1023 - AFC Calibrate Time Out, Did Not Complete AFC Calibration

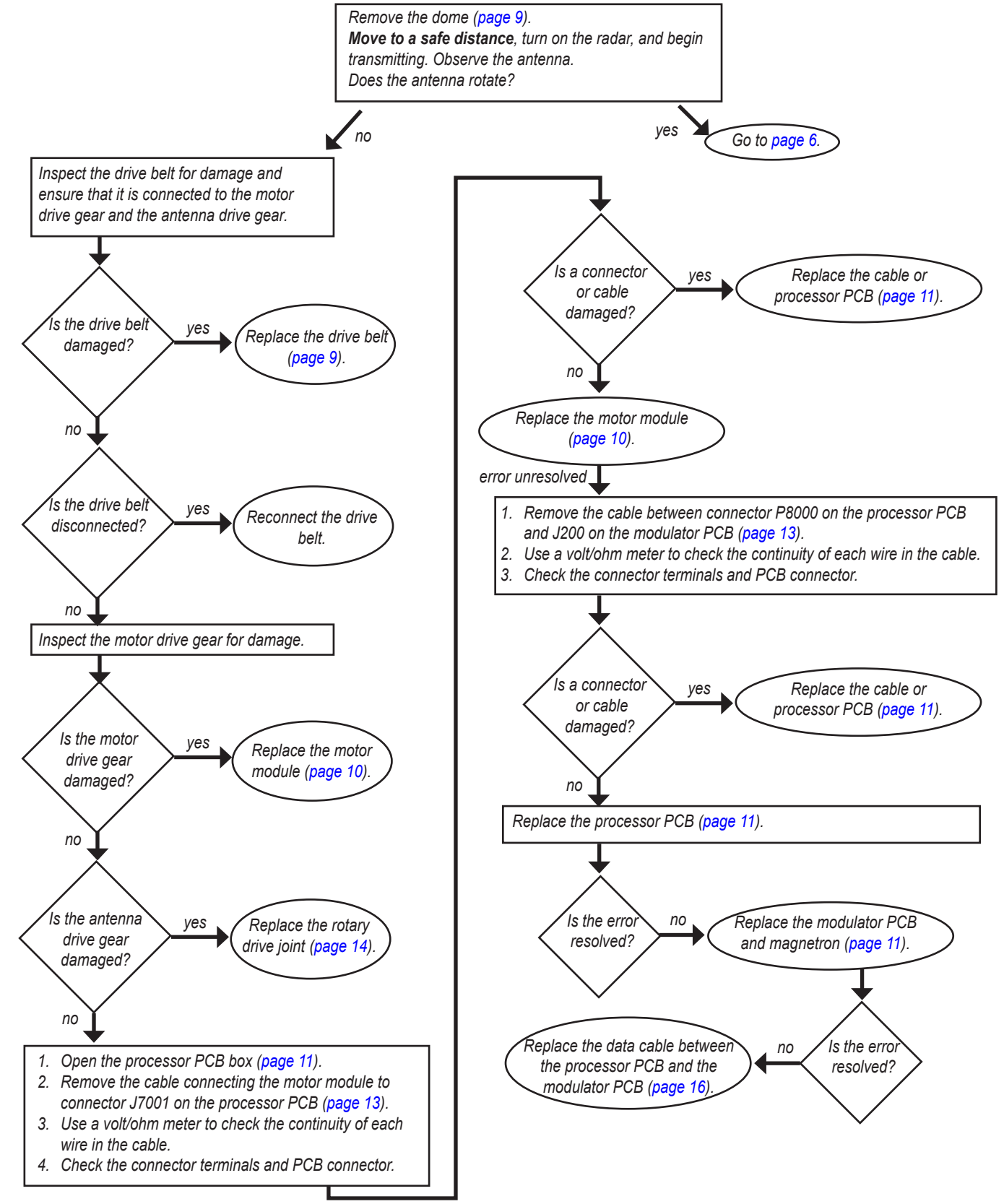
1024 - AFC Calibrate Failed, Could Not Complete AFC System

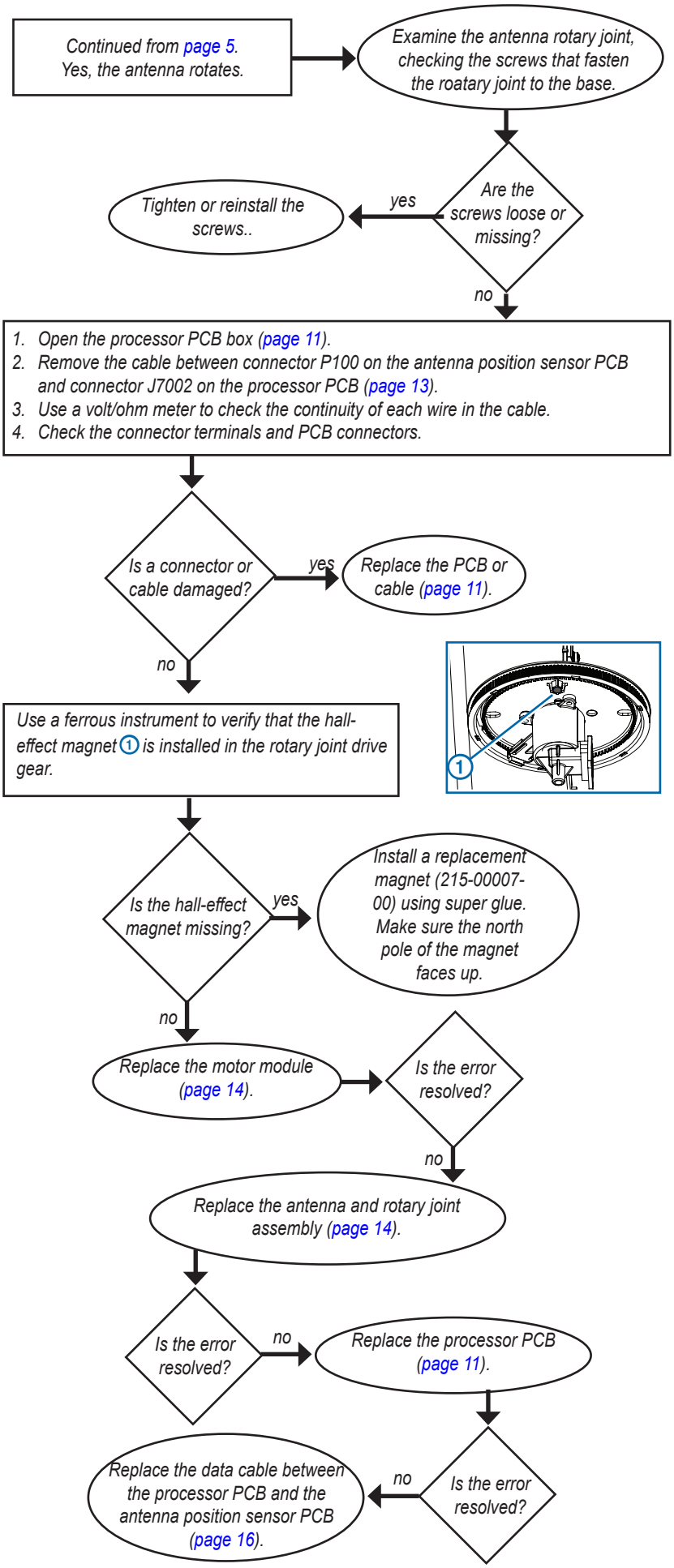
1. Perform the universal troubleshooting steps (page 3).
2. Remove the dome (page 9).
3. Open the modulator box (page 11).
4. Remove the magnetron (page 10).
5. Examine the cables and connectors from the magnetron to the modulator PCB.
6. Select an option:
   - If a cable from the magnetron to the modulator PCB is loose, secure the cable.
   - If damage is present in the ground cable from the magnetron to the modulator PCB, replace the cable.
   - If no damage is present, and the connection is secure, replace the modulator PCB and magnetron (page 11).
7. If the problem persists, replace the processor PCB (page 11).

1019 - Spin Up Time Out, Speed Did Not Reach Specified RPMs
1025 - Transmit Speed Lost, Could Not Maintain Rotation Speed

1 Perform the universal troubleshooting steps (page 3).

2 If the problem persists, use this flow chart for further troubleshooting:

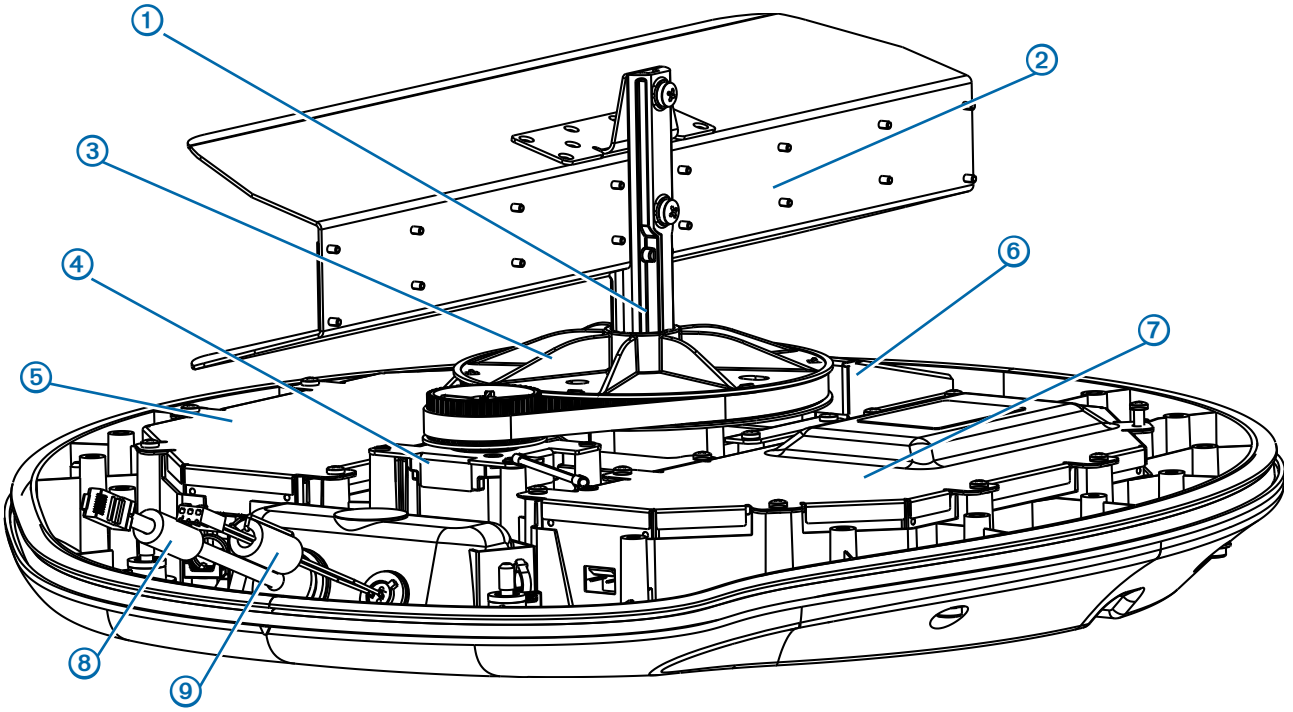



Continued from page 5.
Yes, the antenna rotates.
Examine the antenna rotary joint, checking the screws that fasten the roatary joint to the base.
Are the screws loose or missing?
yes
Tighten or reinstall the screws..
no
1. Open the processor PCB box (page 11).
2. Remove the cable between connector P100 on the antenna position sensor PCB and connector J7002 on the processor PCB (page 13).
3. Use a volt/ohm meter to check the continuity of each wire in the cable.
4. Check the connector terminals and PCB connectors.
Is a connector or cable damaged?
yes
Replace the PCB or cable (page 11).
no
Use a ferrous instrument to verify that the hall-effect magnet ① is installed in the rotary joint drive gear.
1
Is the hall-effect magnet missing?
yes
Install a replacement magnet (215-00007-00) using super glue. Make sure the north pole of the magnet faces up.
no
Replace the motor module (page 14).
Is the error resolved?
no
Replace the antenna and rotary joint assembly (page 14).
Is the error resolved?
no
Replace the processor PCB (page 11).
Is the error resolved?
no
Replace the data cable between the processor PCB and the antenna position sensor PCB (page 16).

Failure With No Error Code

Symptom	Possible Cause	Determination
Radar does not appear on the chartplotter network list	1. Network connection	Inspect network cable from the radar for damage at both ends. If possible, check the cable for continuity. If damaged, repair or replace as needed. If a GMS 10 is installed, watch the GMS 10 LEDs for activity. If there is no activity, check network cable from the chartplotter to the GMS 10. Repair or replace as needed. Inspect internal network cable and connectors. Repair or replace as needed.
	2. Power connection	With the radar off, check the fuse in the system cable. If blown, replace with a 6 A slow-blow fuse. Check cable and connectors. Repair, replace, or tighten. Verify voltage (10–34 Vdc) at the internal power cable. Check connector or conductor continuity. If voltage is not present, repair or replace harness as needed. Check the internal power connection. Remove the dome (page 9) and make sure that the internal power cable is connected to the modulator PCB (page 8). If the bracket used to secure the cable to the base of the radar is not attached, re-attach it using a two-part epoxy or other strong adhesive.
	3. Processor PCB	Connect the radar to a known good chartplotter, and turn on the chartplotter. If the radar does not appear on the network list, replace the processor PCB.
No radar picture and no errors displayed	1. Setup or configuration settings	Return the radar to factory default settings on the chartplotter.
	2. Antenna	Replace the antenna.
“Radar Service Lost” reported by chartplotter	1. Power and network connections	Ensure all connections are tight.
	2. Main supply voltage	If power wires have been extended, verify that the wire gauge is correct for the distance. The voltage drop may be too large.
	3. Processor PCB	Verify that the network and the main supply cables and connections to the processor PCB are good. If all of the cables and connections are OK, then replace the processor PCB.
Poor sensitivity and sensitivity differences between ranges	1. Setup or configuration settings	Return the radar to factory default settings on the chartplotter.
	2. Antenna	Replace the antenna.
	3. Magnetron	Replace the magnetron.
	4. Processor PCB	Replace the processor PCB.

Major Component Locations



Item	Description
1	Antenna rotary joint
2	Antenna
3	Antenna drive gear
4	Motor
5	Processor PCB housing
6	Magnetron cover
7	Modulator PCB housing
8	Network cable
9	Power cable

Notes

- Do not disconnect the antenna from the antenna rotary joint. To remove the antenna, remove the antenna/rotary joint/drive gear assembly by following the disassembly procedures on page 9.
- You must remove the magnetron cover before you can access the magnetron (page 10).
- You must remove the magnetron cover before you can access the PCB housings.

Radar Disassembly

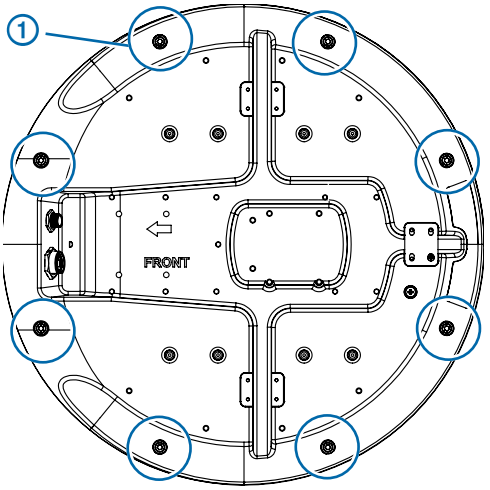
Removing the Dome

NOTICE

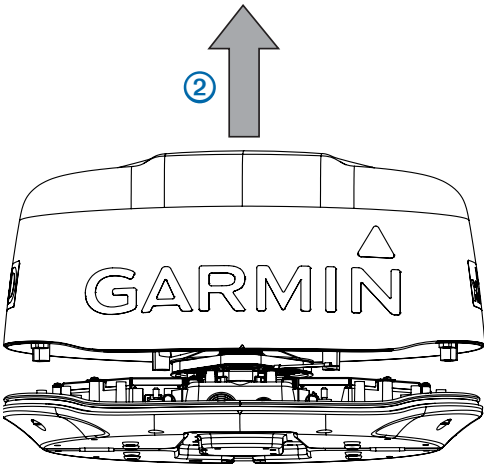
Take care not to damage the rubber gasket when removing the dome. If you damage the rubber gasket, then you will need to replace it when you reassemble the radar.

1. Loosen the 6 mm hex screws ① on the bottom of the radar.

   The GMR 18 xHD/18 HD+ radar has eight screws, and the GMR 24 xHD radar has ten screws.

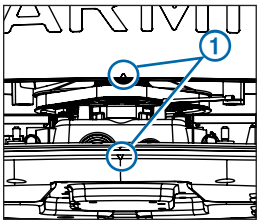


2. Pull directly up on the dome ② to remove it from the bottom of the radar.



Reinstalling the Dome

1. After service is complete, ensure that all components are correctly reinstalled.
2. Turn on the radar in standby mode and ensure that no error appears on the chartplotter.
3. Turn off the radar.
4. Examine the rubber gasket on the radar housing.
   - If the gasket is damaged, replace it.
   - If the gasket is out of place, make sure it is installed correctly in the radar housing.
5. Align the marks on the dome and the radar housing ①, and place the dome on top of the radar housing.

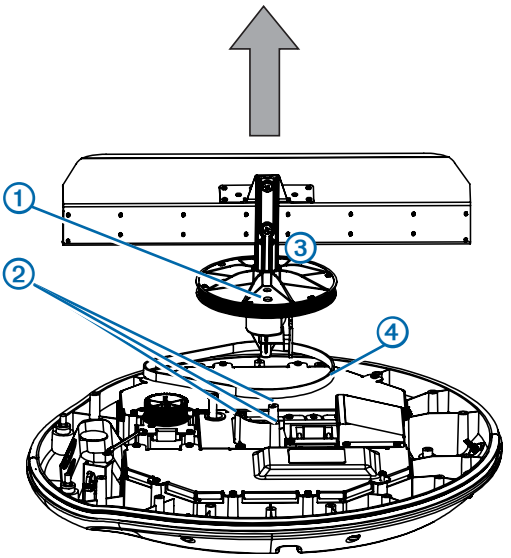


6. Tighten the 6 mm hex screws on the bottom of the radar.

   The screws stop turning when fully tightened. You cannot overtighten the screws.

Removing the Antenna

1. Remove the dome (page 9).
2. Locate the antenna mounting access hole ① on the rotary drive gear



3. Rotate the antenna by hand to access the screws through the antenna mounting access hole, and remove the three #2 Phillips screws ② that connect the antenna to the radar housing.
4. Disconnect the cable from connector P100 on the antenna position sensor PCB, located under the rotary drive gear (page 13).
5. Lift up on the antenna to remove the antenna assembly ③ and the antenna drive belt ④.

Reinstalling the Antenna

1. Place the antenna drive belt around the rotary drive gear.
2. Lower the antenna into the radar housing.
3. Connect the cable to connector P100 on the antenna position sensor PCB, located under the rotary drive gear (page 13).
4. Rotate the antenna by hand to access the antenna mounting locations, and secure the antenna to the radar housing using the three #2 Phillips screws you disconnected to remove the antenna.
5. Connect the antenna drive belt to the motor.

Replacing the Magnetron

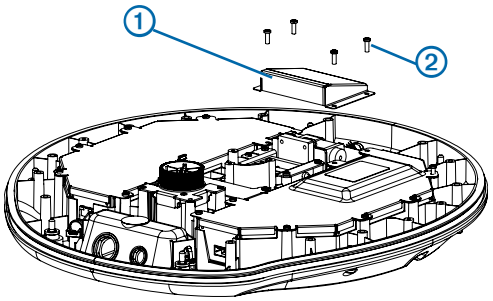
NOTICE

Use care when working near a magnetron with ferrous instruments. The strong magnetic force of the magnetron will attract ferrous instruments, and any contact with the magnetron could damage the magnetron. If possible, use stainless steel or titanium instruments when working near the magnetron. If specialty instruments are not available, use cardboard or a similar material to act as a shield between the magnetron and a ferrous instrument.

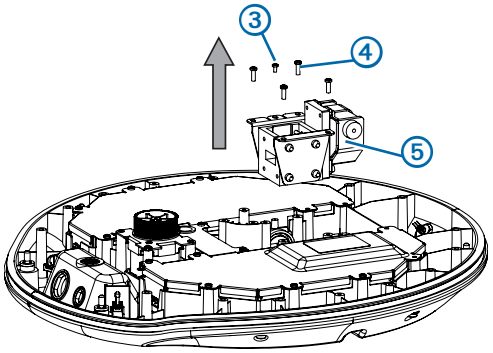
Before you can replace the magnetron, you must first remove the magnetron/circulator assembly, then disconnect the magnetron from the circulator.

Removing the Magnetron/Circulator Assembly

1. Remove the dome (page 9).
2. Remove the antenna (page 9).
3. Remove the magnetron cover ① by removing the four #2 Phillips screws ② that connect it to the radar housing.



4. Remove the one #1 Phillips screw ③ and four #2 Phillips screws ④ that connect the magnetron/circulator assembly ⑤ to the radar housing.

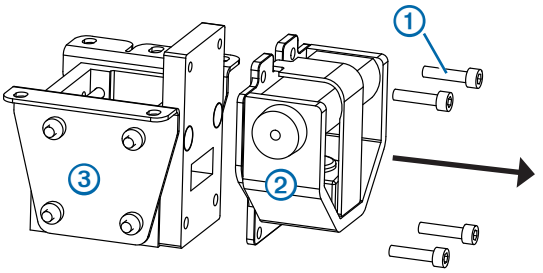


NOTE: The single #1 Phillips screw is not included in a replacement kit. Take care to keep this screw.

5. Loosen the ground cable on the magnetron.
6. Remove the modulator PCB cover (page 11).
7. Disconnect the cable that connects the magnetron to P204 on the modulator PCB (page 13).

Disassembling the Magnetron/Circulator Assembly

1. Remove the magnetron/circulator assembly (page 10).
2. Remove the four 4 mm hex bolts ① that connect the magnetron ② to the circulator ③.



3. Pull the magnetron away from the circulator.

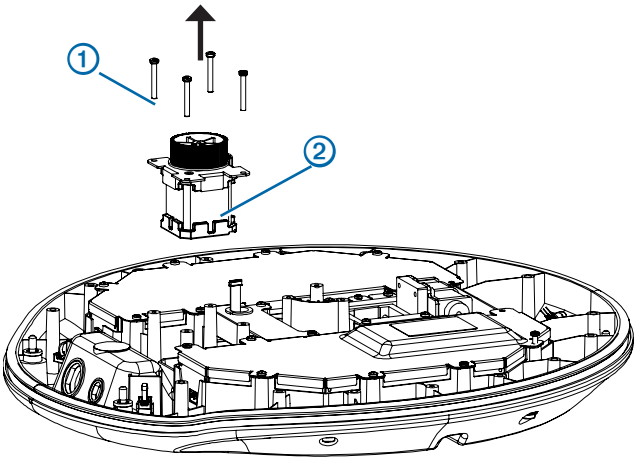
Installing a New Magnetron

A replacement magnetron is paired with a modulator PCB at Garmin before it is shipped. When you install a new magnetron, you must also install the paired modulator PCB. Failure to install both components may result is poor radar performance once the repair is complete.

1. Remove and disassemble the magnetron/circulator assembly (page 10).
2. Connect a new magnetron to the circulator assembly.
3. Install the modulator PCB paired with the new magnetron (page 11).
4. Connect the magnetron/circulator assembly to the radar housing.
5. Reinstall the magnetron cover.
6. Reinstall the antenna (page 9).
7. Reinstall the dome (page 9).

Replacing the Motor

1. Remove the dome (page 9).
2. Remove the antenna (page 9).
3. Remove the processor PCB cover (page 11).
4. Unplug the motor cable from connector J7001 on the processor PCB (page 13).
5. Remove the two #2 Phillips screws ① that connect the motor ② to the radar housing.



6. Remove the motor from the radar housing.
7. Place the new motor in the radar housing, and secure it using the two #2 Phillips screws that you removed in step 5
8. Connect the motor cable to connector J7001 on the processor PCB (page 13).
9. Reinstall the processor PCB cover.
10. Reinstall the antenna (page 9).
11. Reinstall the dome (page 9)

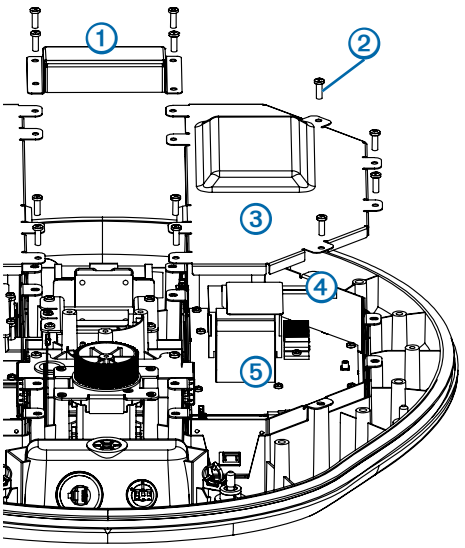
Replacing a PCB

You can replace two PCBs on the GMR 18/24 xHD/18 HD+ radar: the processor PCB and the modulator PCB. To identify the processor PCB housing, locate internal Garmin Marine Network cable. The network cable connects to the processor PCB.

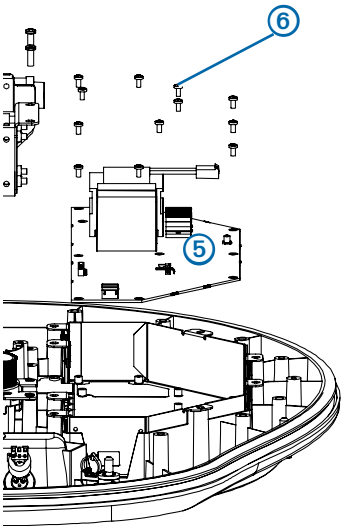
Replacing the Modulator PCB

A replacement modulator PCB is paired with a magnetron at Garmin before it is shipped. When you install a new modulator PCB, you must also install the paired magnetron. Failure to install both components may result is poor radar performance once the repair is complete.

1. Remove the dome (page 9).
2. Remove the antenna (page 9).
3. Remove the magnetron cover ① (page 10).



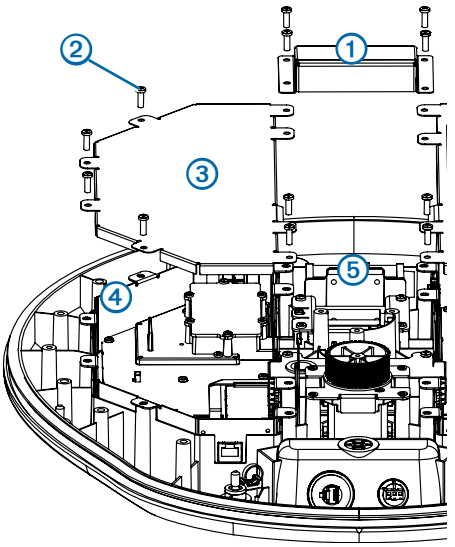
4. Remove the six #2 Phillips screws ② that fasten the modulator PCB cover ③ to the modulator PCB housing ④, and remove the modulator PCB cover.
5. Disconnect the cables connected to the modulator PCB ⑤.
6. Remove the eleven #1 Phillips screws ⑥ that fasten the modulator PCB to the modulator PCB housing, and remove the modulator PCB from the housing.



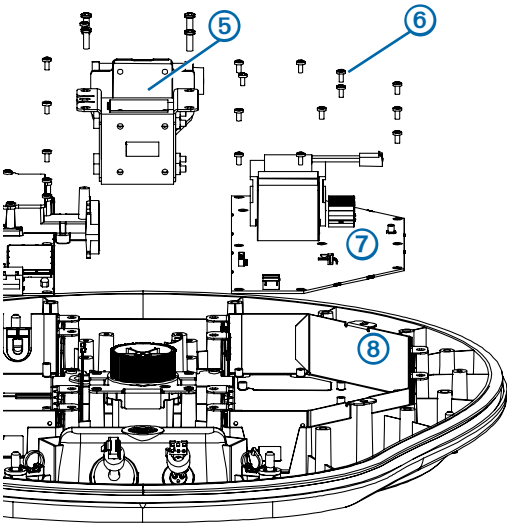
7. Place the new modulator PCB into the housing.
8. Fasten the new modulator PCB to the housing using the eleven #1 Phillips screws you removed in step 6
9. Connect the cables you disconnected in step 5
10. Apply a high viscosity, electronics-compatible RTV compound to the cable connectors.
11. Reinstall the modulator PCB cover, and fasten it to the modulator PCB housing using the six #2 Phillips screws you removed in step 4
12. Reinstall the magnetron cover.
13. Reinstall the antenna (page 9).
14. Reinstall the dome (page 9).

Replacing the Processor PCB

1. Remove the dome (page 9).
2. Remove the antenna (page 9).
3. Remove the magnetron cover ① (page 10).



4. Remove the six #2 Phillips screws ② that attach the processor PCB cover ③ to the processor PCB housing ④.
5. Remove the magnetron/circulator assembly ⑤ (page 10).



6 Remove the processor PCB cover and disconnect the cables connected to the processor PCB.

7 Remove the seven #1 Phillips screws ⑥ that attach the processor PCB ⑦ to the processor PCB housing ⑧, and remove the processor PCB.

8 Place the new processor PCB into the housing.

9 Fasten the new processor PCB to the housing using the seven #1 Phillips screws screws you removed in step 7

10 Connect the cables you disconnected in step 6

11 Apply a high viscosity, electronics-compatible RTV compound to the cable connectors.

12 Reinstall the processor PCB cover, and fasten it to the processor PCB housing using the six #2 Phillips screws you removed in step 5

13 Reinstall the magnetron/circulator assembly.

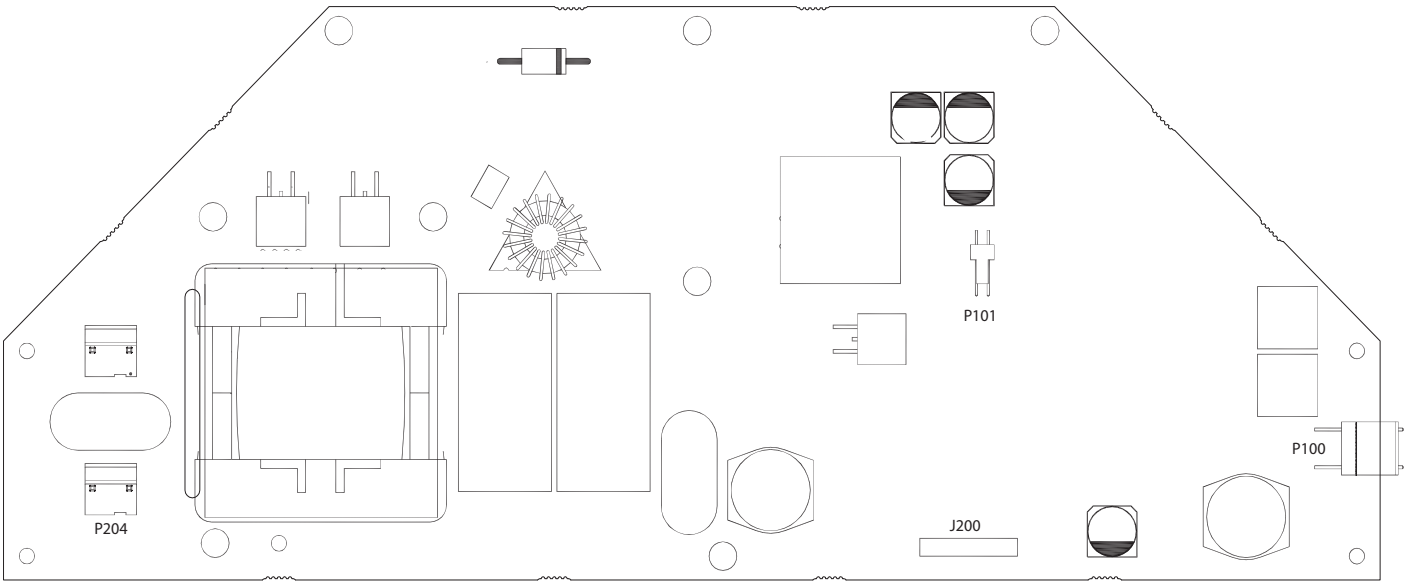
14 Reinstall the magnetron cover.

15 Reinstall the antenna (page 9).

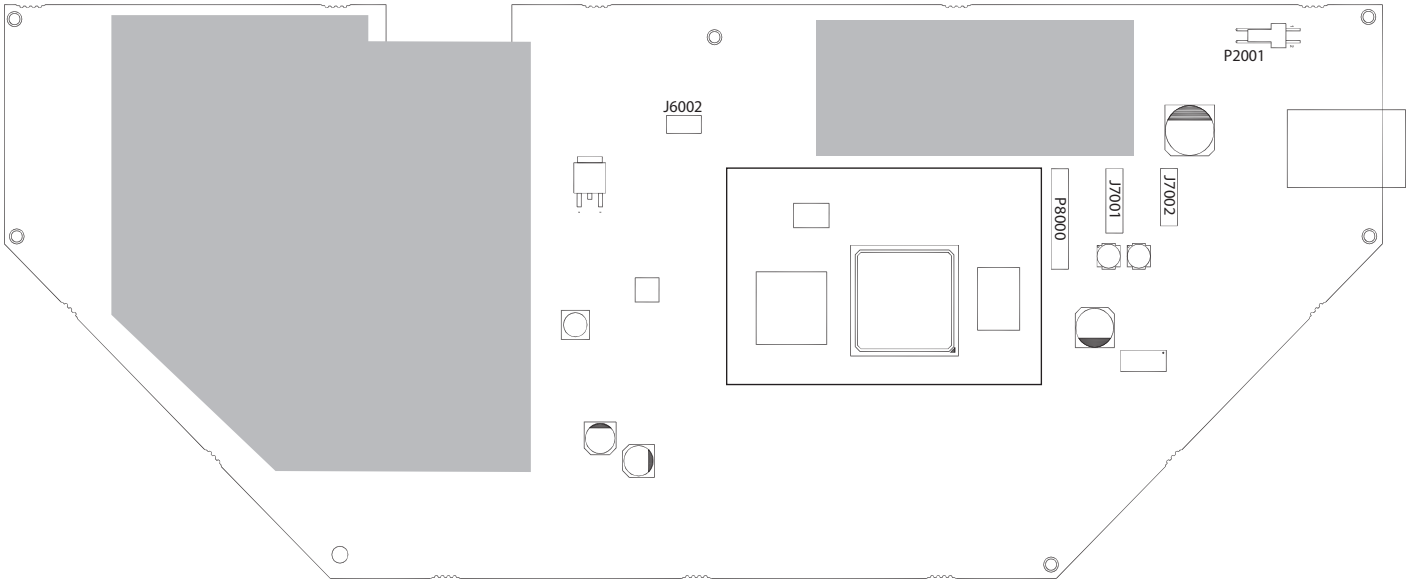
16 Reinstall the dome (page 9).

Connector Locations

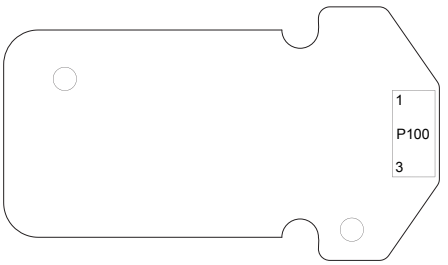
Modulator PCB



Processor PCB

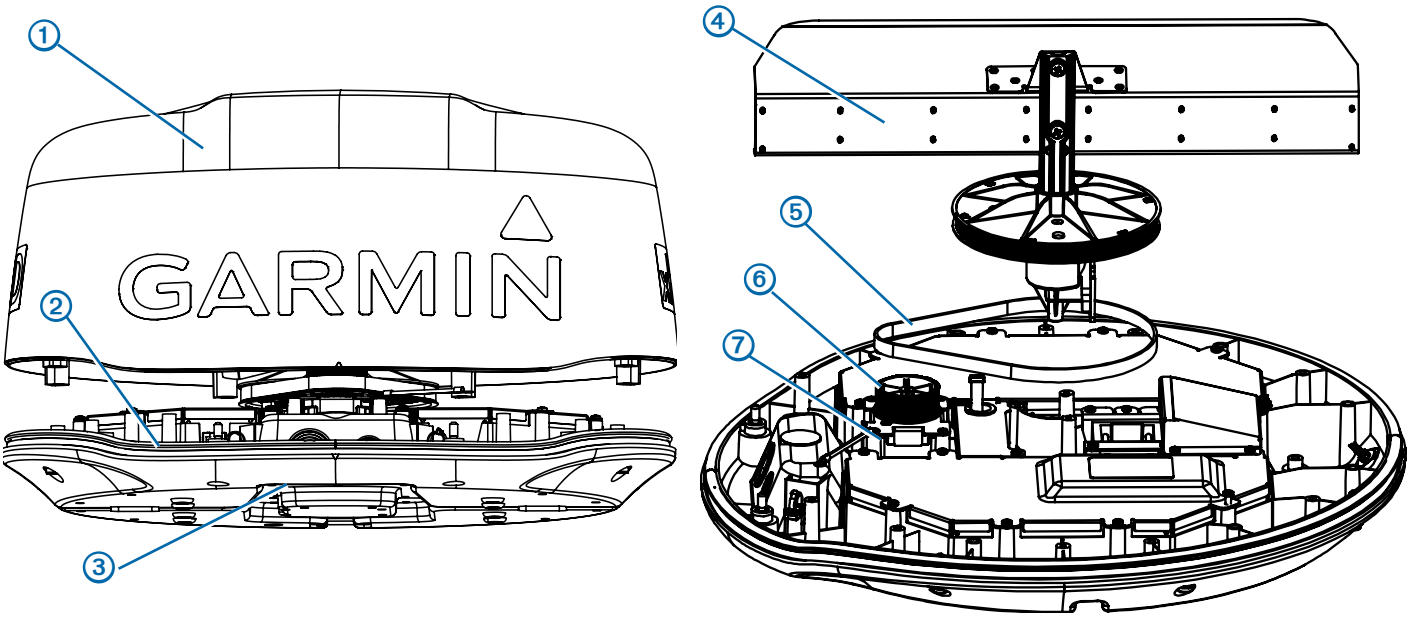


Antenna Position Sensor PCB



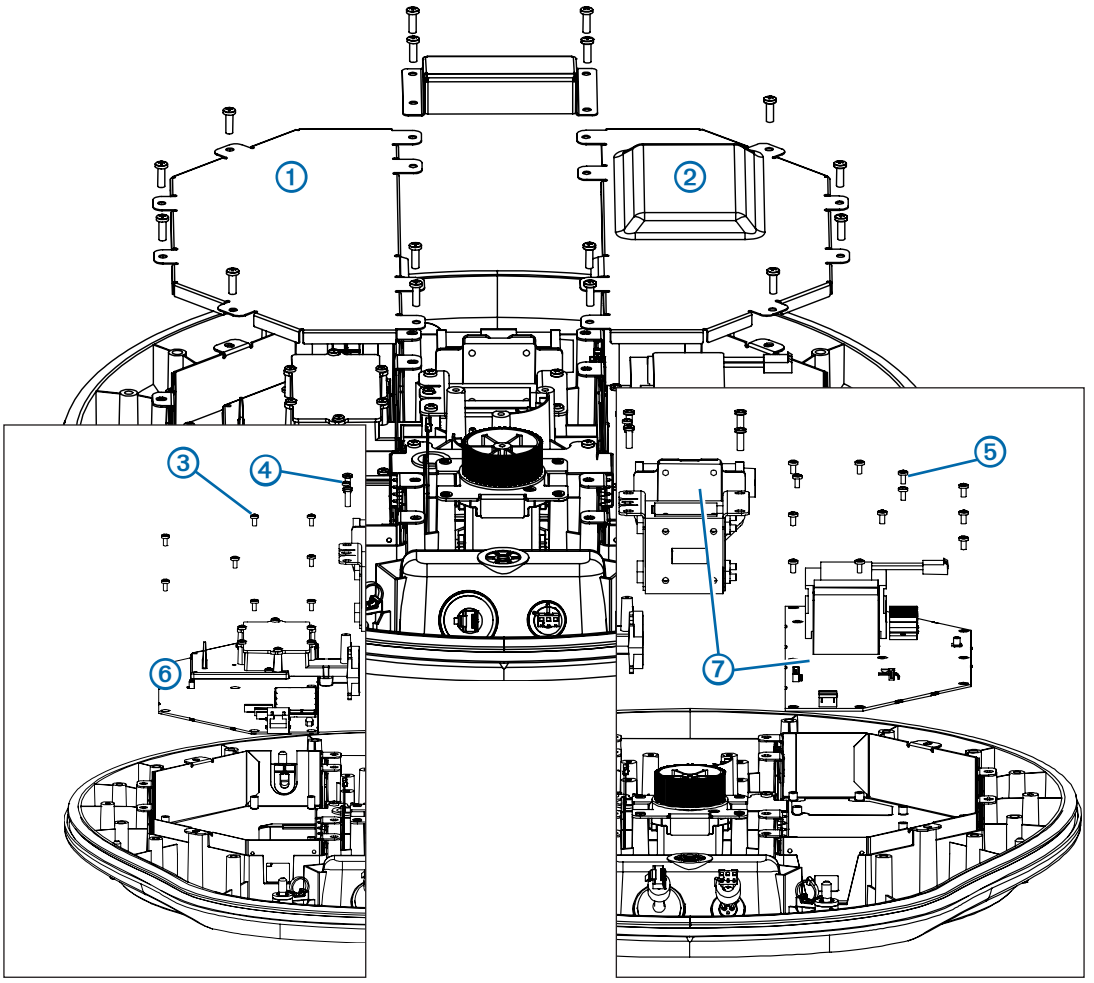
Service Parts

Dome and Antenna



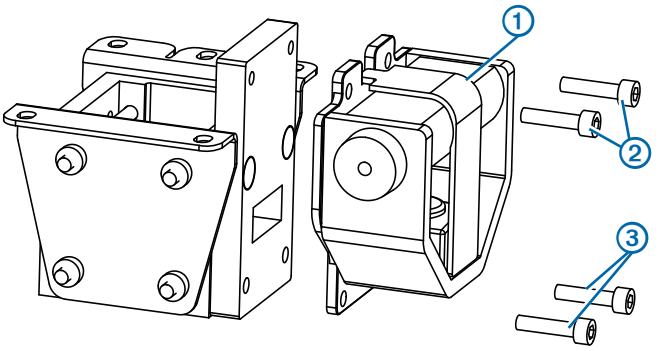
Item Number	Description	Kit Number		
		GMR 18 HD+	GMR 18 xHD	GMR 24 xHD
1	Top cover (dome)	S00-00800-02	S00-00470-00	S00-00486-00
2	Bottom	S00-00800-01	S00-00471-00	S00-00487-00
3	Rubber housing gasket	S00-00481-00	S00-00481-00	S00-00489-00
4	Antenna/rotary joint	S00-00472-00	S00-00472-00	S00-00488-00
5	Drive belt	S00-00473-00	S00-00473-00	S00-00473-00
6	Motor gear	S00-00474-00	S00-00474-00	S00-00474-00
7	Motor module	S00-00475-00	S00-00475-00	S00-00475-00
	Antenna position sensor PCB (under antenna drive gear, not shown)	S00-00476-00	S00-00476-00	S00-00476-00
	Extra screw for radar bottom and hydrophobic patch (not shown)	S00-00484-00	S00-00484-00	S00-00484-00
	Replacement LED cable (not shown)	S00-00485-00	S00-00485-00	S00-00490-00

PCB-Related Parts



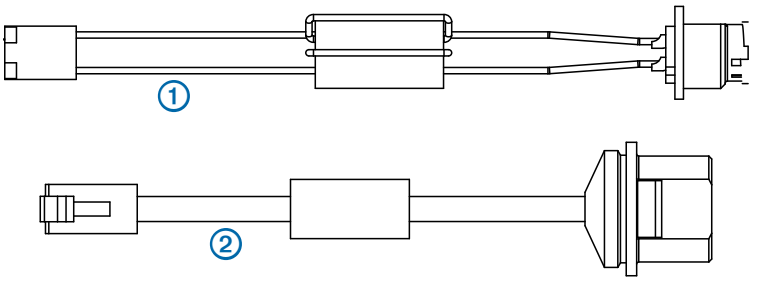
Item Number	Description	Kit Number		
		GMR 18 HD+	GMR 18 xHD	GMR 24 xHD
①	Processor PCB housing (two parts)	S00-00483-00	S00-00483-00	S00-00483-00
②	Modulator PCB housing (two parts)	S00-00482-00	S00-00482-00	S00-00482-00
③	#2 Phillips screw	Extra screws are included in the processor PCB kit		
④	#1 Phillips screw	Extras not included. Take care to save this screw.		
⑤	#2 Phillips screw	Extras are included in the modulator PCB kit.		
⑥	Processor PCB	S00-00800-03	S00-00478-00	S00-00478-01
⑦	Modulator PCB (and paired magnetron)	S00-00477-00	S00-00477-00	S00-00477-00

Magnetron



Item Number	Description	Kit Number - All Models
1	Magnetron (and paired modulator PCB)	S00-00477-00
2	Hex drive screw (M4)	Not Included in the modulator PCB/ magnetron kit. Take care to save these screws.
3	Hex drive screw (M4)	Not Included in the modulator PCB/ magnetron kit. Take care to save these screws.

Cables



Item Number	Description	Kit Number - All Models
1	Internal power cable	S00-00479-00
2	Internal network cable	S00-00480-00

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