

Ghost® X Indicator Upgrade Kit

⚠ WARNING: This product must be installed in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.

This procedure requires technical expertise and specialized tools. If you're unable to carry out the procedure to these requirements, contact an Authorized Service Center to undertake the work. Damage resulting from improper installation is not covered under warranty.

⚠ WARNING: Performing service or maintenance without first disconnecting the battery can cause product damage, personal injury, or death due to fire, explosion, electrical shock, or unexpected motor starting. Always disconnect the battery cables from the battery before maintaining, servicing, installing, or removing motor components.

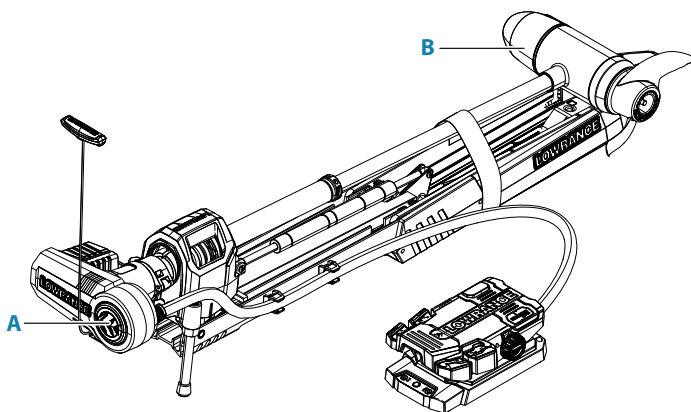
Take precautions to prevent electrostatic discharge in your work area, particularly when you are handling printed circuit board assemblies (PCBAs).

Overview

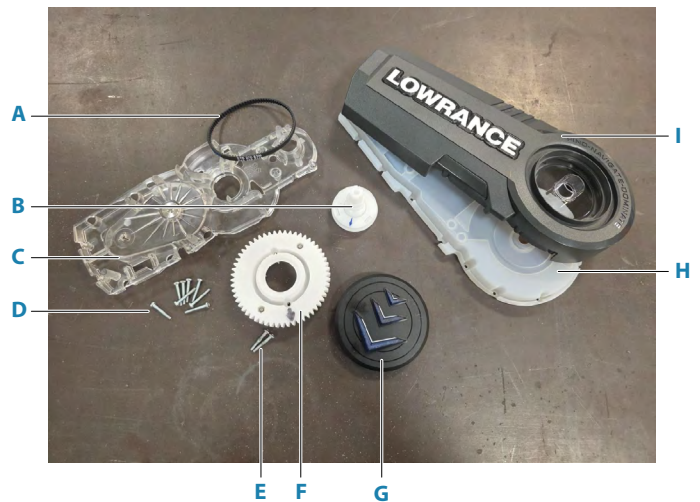
Use this Ghost X Indicator Upgrade Kit to upgrade the direction indicator on a 47", 52", or 60" Ghost trolling motor.

A Ghost trolling motor is shown below in its stowed position. When the trolling motor is in use, the direction indicator (A) on top of the head rotates to show the direction the lower unit (B) is pointing underwater.

→ **Note:** The direction indicator moves independently of the trolling motor head.



In the box



- A 1x direction indicator pulley belt
- B 1x direction indicator pulley assembly for Ghost X
- C 1x gear cover
- D 8x M3-0.5 x 20, pan, T10 Torx® screws (for gear cover)
- E 2x M3-0.5 x 20, pan, T10 Torx® screws (for main drive gear assembly)
- F 1x main drive gear assembly
- G 1x indicator cap assembly for Ghost X
- H 1x case seal
- I 1x upper housing assembly for Ghost X
- J 1x cable tie and heat shrink kit (not shown)

Tools needed

- T15 Torx® screwdriver or bit
- T10 Torx® screwdriver or bit
- 4 mm Allen key
- Small flat-blade screwdrivers, or pick set
- Blade to cut heat shrink and cable ties
- Heat gun for heat shrink
- Small torque wrenches. The range of torques required in this document is 27–90 cNm (2.4–8 in-lb).

Setting up

It is not necessary to take the trolling motor off the boat for this procedure, however, the boat should be on a trailer. You should not carry out this installation on the water, because parts or tools could fall in the water.

Before stowing the trolling motor, raise the lower unit so you will be able to access screws on the underside of the trolling motor head. Be careful of any transducers mounted to the trolling motor or its shaft as you raise the lower unit.

Stow the trolling motor in the **Prop in** position, that is, with the lower unit resting on its port (left) side. Be careful of any transducers mounted to the trolling motor or its shaft as you stow the trolling motor.



Disconnect the trolling motor power cable from the battery, or unplug the power cable if using a plug and receptacle.

Remove lower bezel

- 1 On the underside of the trolling motor motor head, use a T10 Torx® screwdriver or bit to remove the two screws securing the bezel to the head casting.



- 2 Remove the lower bezel by sliding it down over the shaft and wiring loom.



Remove upper housing and case seal

- 3 Use a T15 Torx® screwdriver or bit to remove the sixteen screws securing the upper housing to the head casting. Set the screws aside for reinstallation later.

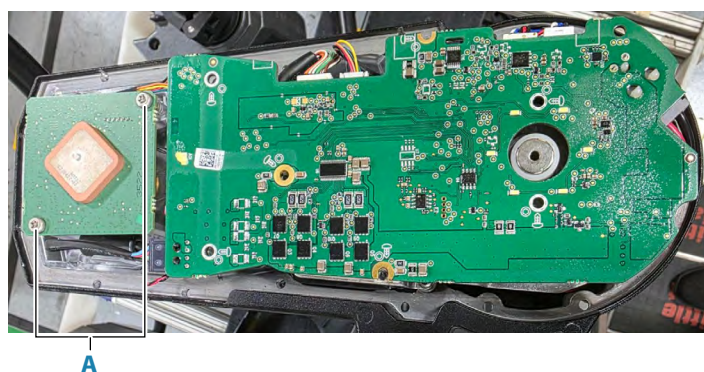


- 4 Lift away the upper housing. The indicator cap assembly and the silicone case seal are fitted in the upper housing.

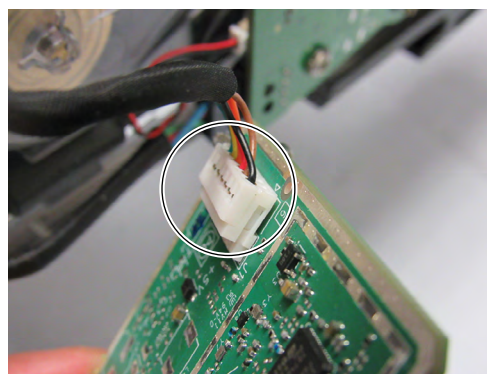


Remove GPS PCBA and head controller PCBA

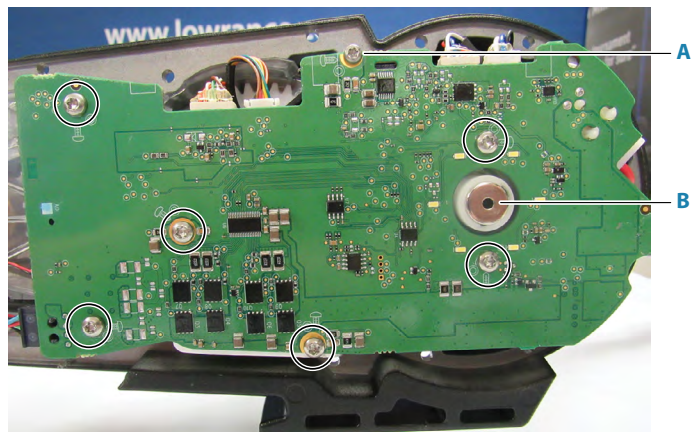
- 5 Inside the head, use a T15 Torx® screwdriver or bit to remove the two screws (A) that secure the GPS printed circuit board assembly (PCBA) to the gear cover underneath it.



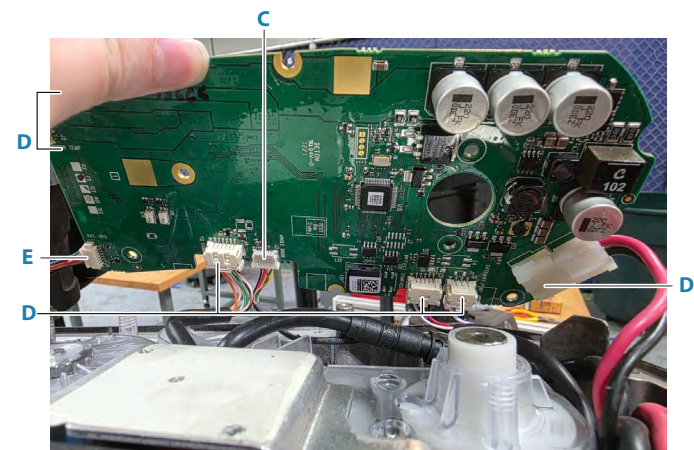
- 6 Carefully turn over the GPS PCBA, and release the friction connector to disconnect the cable from the corner. Set the GPS PCBA and screws aside for reinstallation later.



- 7 Use a T15 Torx® screwdriver or bit to remove the six self-tapping screws (circled) that secure the head controller PCBA onto the gear cover.
 - 8 Use a T10 Torx® screwdriver or bit to remove the single grounding machine screw (A).
- **Note:** (B) is the shaft of the direction indicator pulley.



- 9 Carefully lift the head controller PCBA a small distance from the head casting.
 - **Note:** Use a small screwdriver or pick to carefully lever the circuit board off the sticky thermal pad underneath it.
- 10 Unplug seven cables (C, D) from the underside of the PCBA. Take care with the connection for the head sensor (C), it is especially fragile.
 - **Note:** Cable E goes to the GPS PCBA. It should not need to be disconnected here, because it was disconnected at the GPS PCBA.



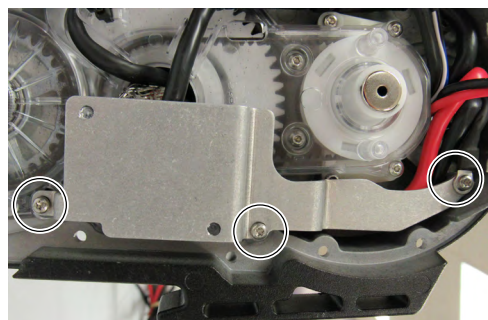
- 11 Lift away the head controller PCBA, and set it aside with the screws for reinstallation later.

Remove thermal spreader

After removing the head controller PCBA, the thermal spreader is visible inside the head casting.

- **Note:** A thermal pad (not shown in the following photo) is on the thermal spreader.

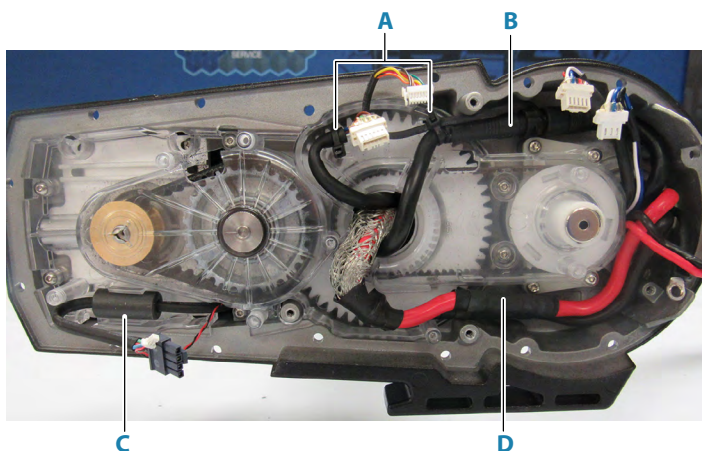
- 12 Use a T10 Torx® screwdriver or bit to remove the three M3 x 10 machine screws that secure the thermal spreader to the head casting.



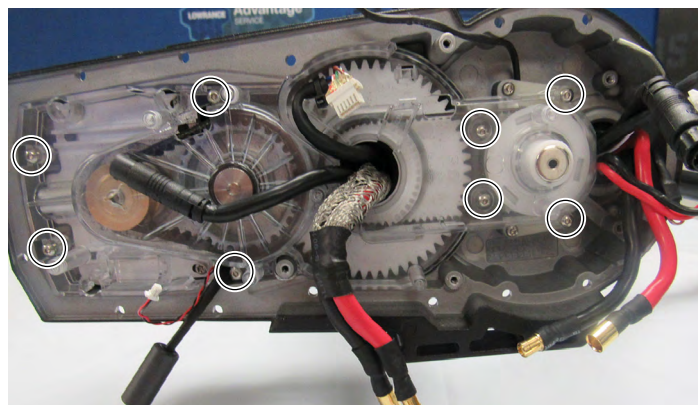
- 13 Lift the thermal spreader out of the head casting. Set the thermal spreader and screws aside for reinstallation later.

Remove gear cover and direction indicator pulley

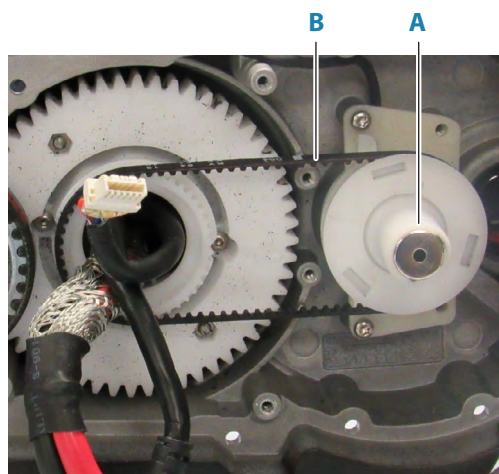
- **Note:** On some parts lists, the gear cover is called "cover, belt-gear drive."
- 14 Carefully cut away any cable ties (B) securing the cable to the gear cover.
 - 15 Unplug the sonar cable (A).
 - 16 Unclip the ferrite (C) on the motor cable and ease it out of the gear cover.
 - 17 Carefully use a blade to cut the heat shrink tube (D) from the power cable, and separate the power cables.



- 18 Use a T10 Torx® screwdriver or bit to remove the eight screws securing the plastic gear cover to the head casting.

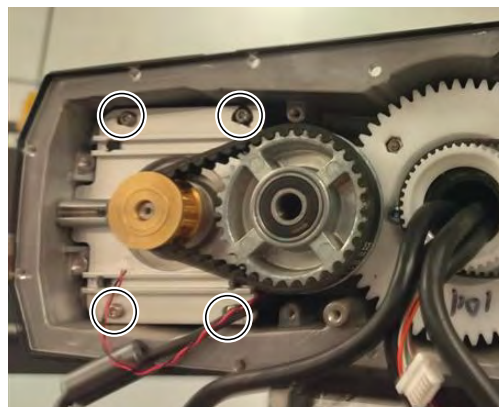


- 19 Lift the gear cover away from the head casting.
- **Note:** There may be resistance from the bearing pin on the idler gear as you lift the gear cover.
- 20 Remove the direction indicator pulley belt (B) and direction indicator pulley (A).



Remove motor belt and idler gear

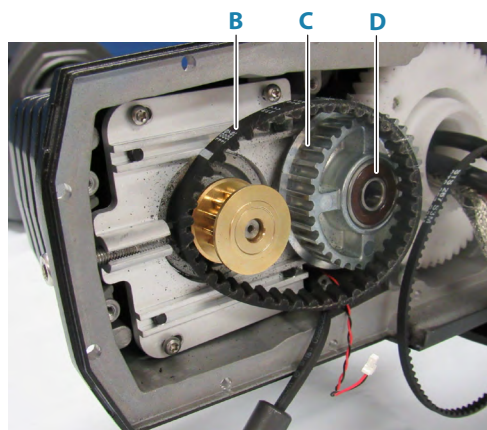
- 21 Use a T10 Torx® screwdriver or bit to loosen the four steering motor screws.
- **Note:** You need to loosen these screws before you access the motor belt tension screw and the motor belt, however, you do not need to remove these four screws.



- 22 On the outside of the head casting, use a 4 mm Allen key to loosen the motor belt tension screw (A) and its O-ring.

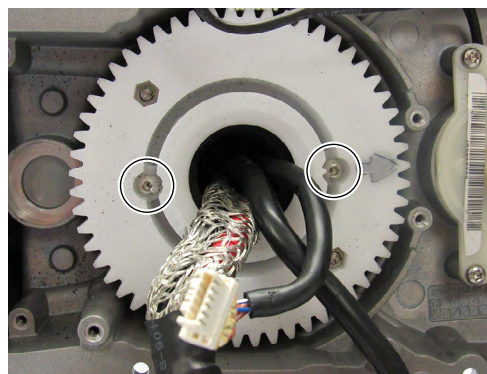


- 23 Remove the motor belt (B) and set it aside for reinstallation later.
- 24 Pull the idler gear (C) out of the head casting, and set it aside for reinstallation later.
- **Note:** The idler gear is a snug fit and may take some time to work loose. Do **not** use tools to pry it out because this could damage the components.
- **Note:** A bearing (D) is pressed into the top of the idler gear. An identical bearing, not visible below, is pressed into the head casting under the idler gear. These two bearings do not need to be removed.

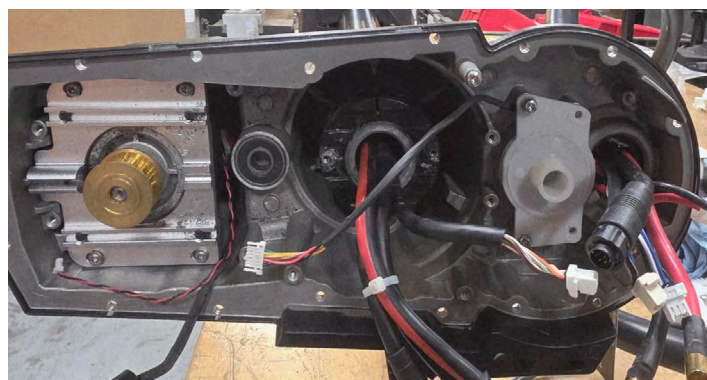


Remove main drive gear assembly

- **Note:** On some parts lists, the main drive gear is called the "slip gear" or "shaft gear."
- 25 Use a T10 Torx® screwdriver or bit to remove the two screws attaching the main drive gear assembly to the trolling motor shaft assembly.



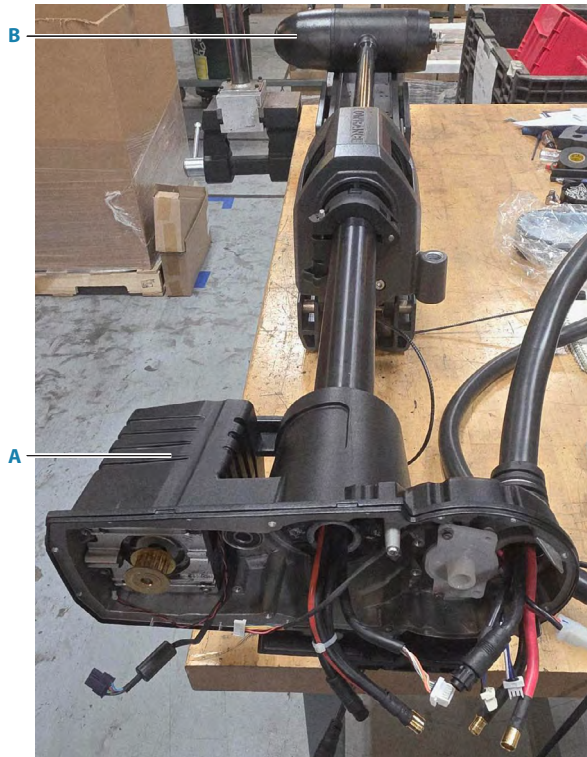
- 26 Lift the main drive gear assembly out of the head casting. Carefully pull it over the cables emerging from the shaft. The inside of the head casting appears as below.



Reassembly

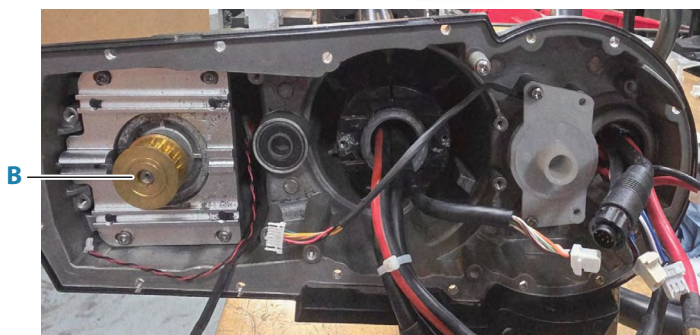
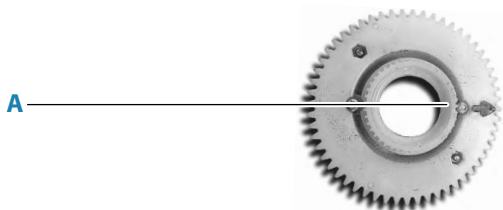
Align lower unit to head

Before fitting the new main drive gear assembly into the head casting, make sure the trolling motor head and trolling motor lower unit are parallel to each other. The steering motor, (A), should be above the lower unit nose cone (B).



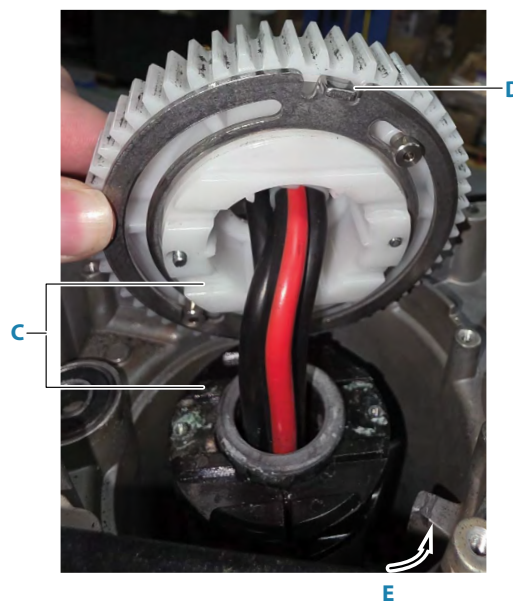
Install new main drive gear assembly

- 1 Orient the new main drive gear assembly with the arrow (A) on its upper side pointing 180 degrees away from the gold-colored shaft on the steering motor (B).

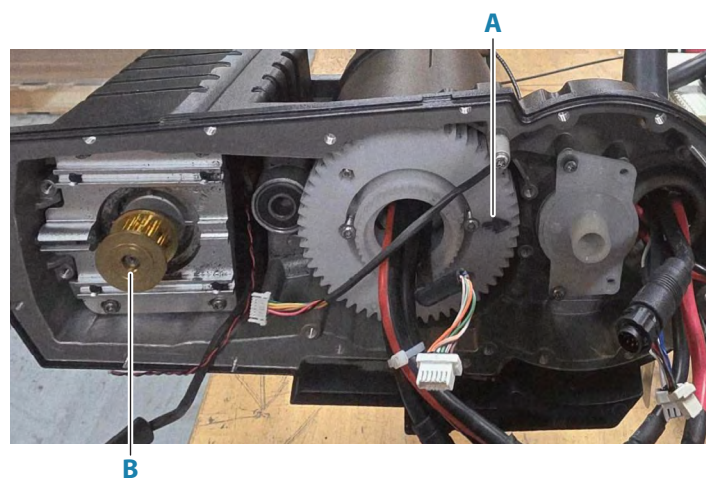


- 2 Carefully bring the wires out of the shaft and through the hole in the new main drive gear assembly.

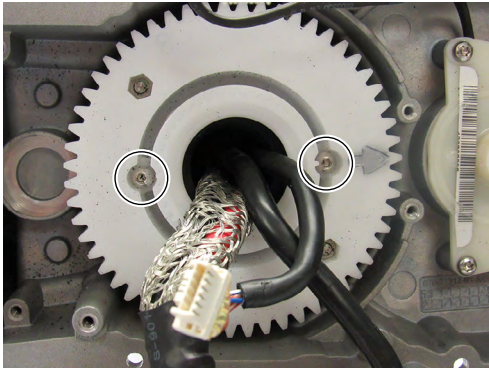
- 3 Fit the main drive gear assembly inside the head casting. The widest track on the underside of the drive gear assembly fits into the corresponding ridge (C) on the shaft clamp. Make sure the tab on the slip plate (D) is on the left side of the hard stop (E).



- 4 With the main drive gear assembly in the correct position, the arrow (A) on its upper side should point 180 degrees away from the gold-colored shaft on the steering motor (B).

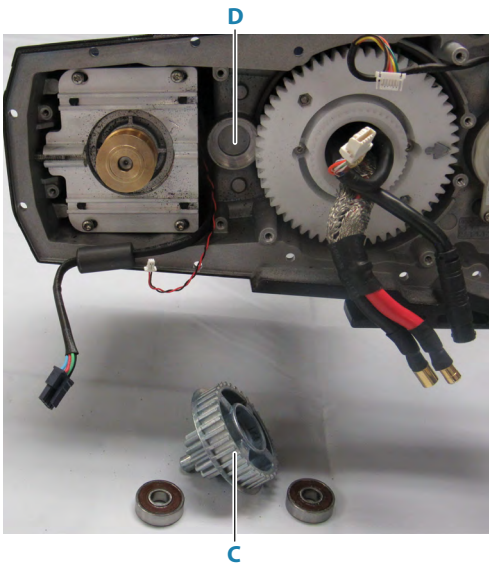


- 5 Use a T10 Torx® screwdriver or bit to install two new M3-0.5 x 20, pan head screws (supplied), securing the main drive gear assembly to the shaft clamp underneath it. Tighten the screws little by little to ensure the assembly is fully seated. Tighten to torque 68 cNm (6 in-lb).

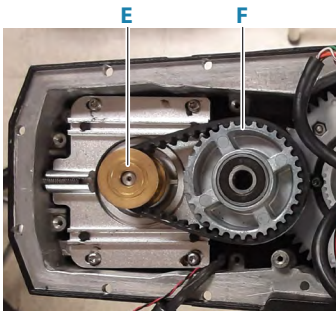


Reinstall idler gear and motor belt

- 6 If the two idler gear bearings have come out, reinstall them. Press one bearing into the head casting at (D). Press the other bearing into the top of the idler gear (C).
- 7 Insert the idler gear (C) into position (D) on top of the bearing.

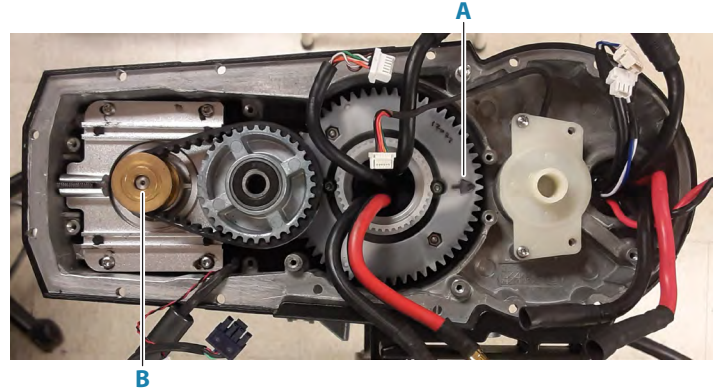


- 8 Install the motor belt, fitting it around the shaft of the steering motor (E) and the idler gear (F).
- **Note:** Do **not** tighten the motor belt tension screw yet.

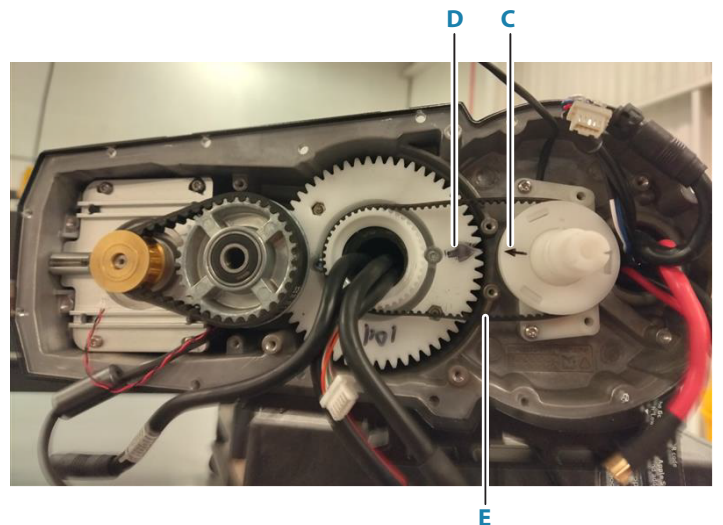


Install new direction indicator pulley

- **Note:** It is very important to align the direction indicator pulley correctly to the main drive gear. A misalignment of even one gear tooth will lead to an offset between the direction indicator and the lower unit.
- 9 Before inserting the new indicator pulley, confirm alignment. Position the main drive gear by taking hold of the trolling motor lower unit and rotating the lower unit so that marker on the main drive gear (A) is pointing directly away from the gold-colored steering motor shaft (B).



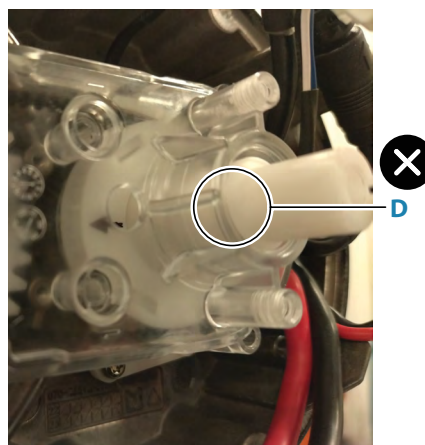
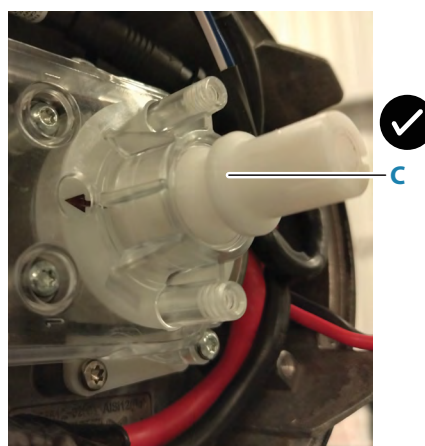
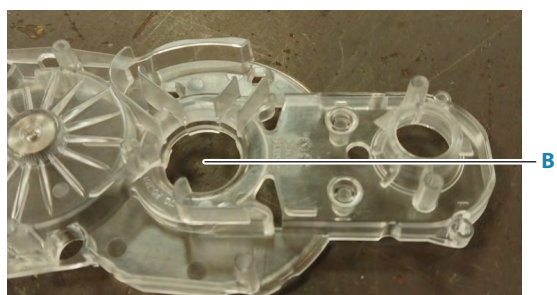
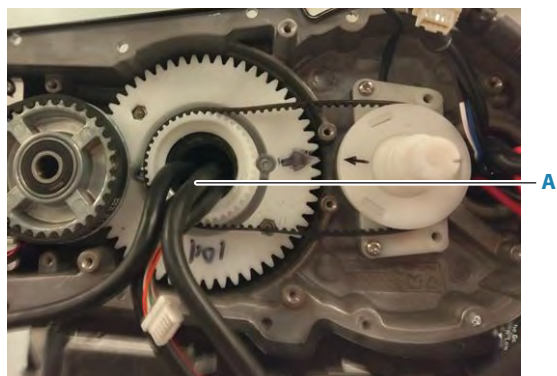
- 10 Insert the new direction indicator pulley (C) on top of the head sensor. Align the arrow on the direction indicator pulley (C) with the arrow marked on the main drive gear (D). This results in the arrow on the direction indicator pulley pointing in the same direction as the trolling motor nosecone.
- **Note:** If these arrows are not aligned, the direction indicator on the top of the trolling motor head will not be perfectly aligned to the trolling motor lower unit.
- 11 Install the new indicator pulley belt (E). Put one side of the indicator pulley belt onto the direction indicator pulley, then the other side of the indicator pulley belt onto the teeth of the main drive gear.



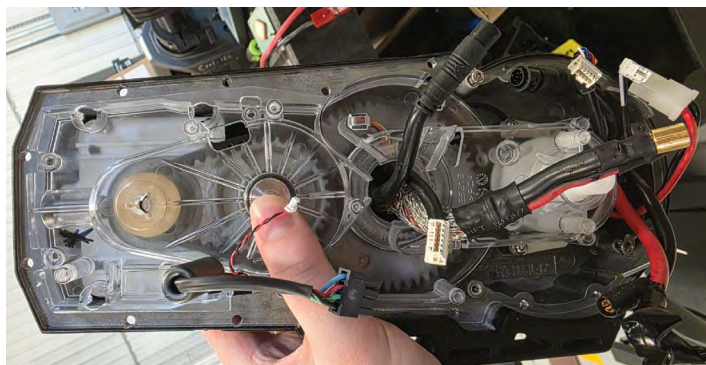
Install new gear cover

The gear cover, supplied, fits over the gears and pulleys in the orientation shown.

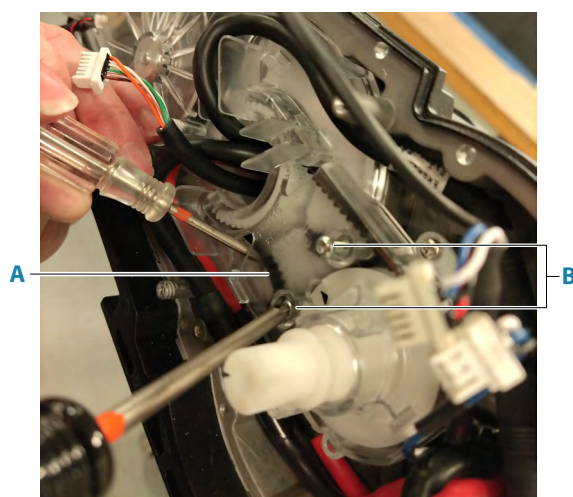
- 12 Feed all the wires (A) from the trolling motor shaft through the hole in the gear cover (B).



- 13 Fit the new gear cover into place. Press it down by applying pressure above the bearing pin as shown in the image.

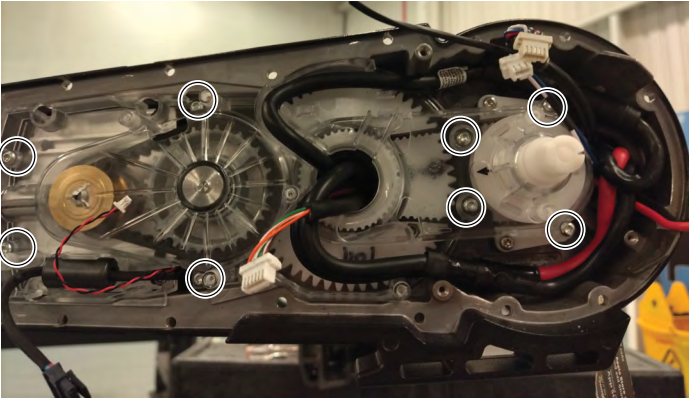


- 14 Use a T10 Torx® screwdriver or bit to place eight new M3-0.5 x 20 screws (supplied) into the gear cover. Use a small flat head screwdriver or pick to pull the belt inward (A) as you tighten the screws (B) on the gear cover.

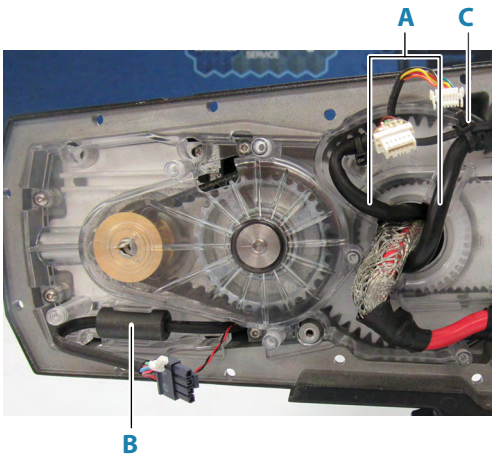


- Make sure the gear cover fits correctly over the direction indicator pulley, so that the ridge on the pulley shaft (C) is visible above the gear cover. In (D), the gear cover is not properly seated.
- Ensure wires and cables aren't pinched, and the direction indicator pulley can rotate without friction.
- Use a small flat head screwdriver or pick to guide the direction indicator pulley belt into the belt tension guides on the underside of the gear cover.

- 15 Reconfirm the placement of the gear cover is correct before fully tightening all eight gear cover screws to torque 68 cNm (6 in-lb).



- 16 Reconnect the sonar cable.
 17 Place the sonar cable and the motor communication cable in the gear cover slots (A).
 18 Clip the steering motor cable ferrite (B) into the gear cover.
 19 Secure the cables with cable ties (supplied).
 → **Note:** The heading sensor cable should be secured by the same cable tie (C) as the sonar cable.



- 20 Put a piece of heat shrink tubing, supplied, over each of the red (positive) and black (negative) insulated power cables. Fit the two red cables together, and fit the two black cables together. Slide the heat shrink tube over the connections, and apply heat.

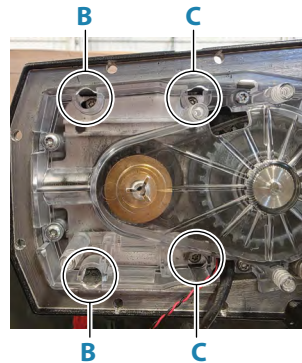
- 21 Use a 4 mm Allen key to tighten the motor belt tension screw (A) and its O-ring from the outside of the head casting. Tighten to torque 27 cNm (2.4 in-lb).

→ **Note:** A torque wrench that can be set to 27 cNm (2.4 in-lb) is highly recommended. If your torque wrench cannot measure values that small, follow the steps below:

- Tighten the screw to torque 136 cNm (12 in-lb).
- Use the Allen key to loosen the screw exactly one rotation ($1 \times 360^\circ$).



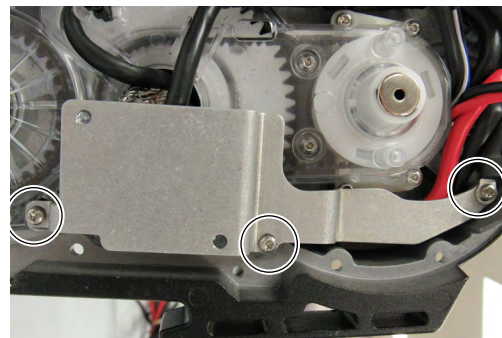
- 22 Insert a T10 Torx® screwdriver or bit through the holes in the plastic gear cover, and tighten the two steering motor plate screws at the end of the head (B) first. Tighten to torque 90 cNm (8 in-lb). Then tighten the two steering motor plate screws toward the center of the head (C) to torque 90 cNm (8 in-lb).



Reinstall thermal spreader

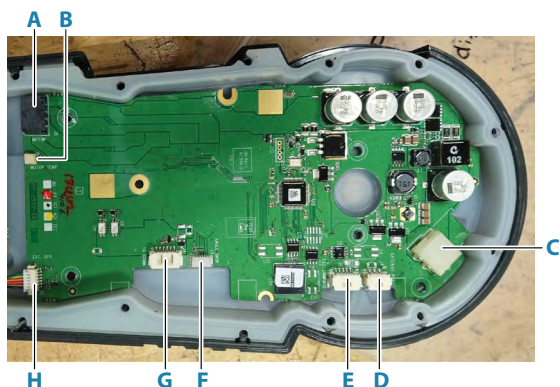
- 23 Apply medium-strength threadlocker to the three M3 x 10, pan head machine screws (not supplied) that secure the thermal spreader to the head casting. Use a T10 Torx® screwdriver or bit to install the screws. Tighten to torque 90 cNm (8 in-lb).

→ **Note:** A sticky thermal pad (not shown) will be visible on the upper face of the thermal spreader.

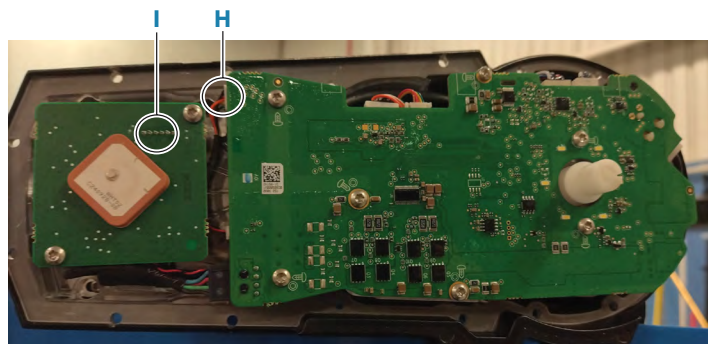


Reinstall head controller PCBA and GPS PCBA

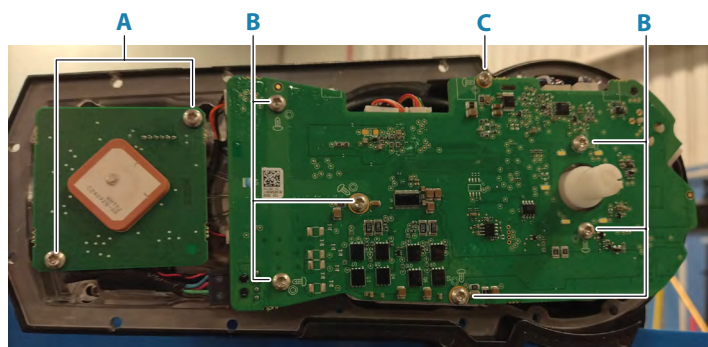
- 24 Match cables from the trolling motor head to the connectors **A–G** on the underside of the head controller PCBA.



- 25 Turn the head controller PCBA the right way up and place it in position with the hole fitting over the direction indicator pulley.
- 26 Connect the cable (**H**) from the head controller PCBA into the corner of the GPS PCBA.
- 27 Position the GPS PCBA in the head casting as shown below, with the row of six pins in the circuit board (**I**) at the top right.

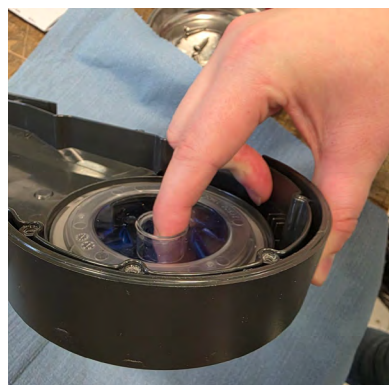
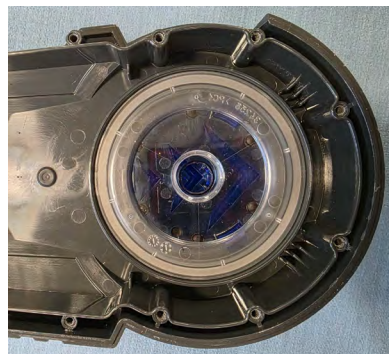


- 28 Use a T15 Torx® screwdriver or bit to reinstall two #6 x 3/8, pan head screws (**A**) in two corners of the GPS PCBA. Tighten to torque 68 cNm (6 in-lb).
- 29 Use a T15 Torx® screwdriver or bit to reinstall the six #6 x 3/8, pan head screws (**B**) screws that secure the head controller PCBA onto the gear cover. Tighten to torque 68 cNm (6 in-lb).
- 30 Use a T10 Torx® screwdriver or bit to reinstall the single M3-0.5 x 20, pan head, grounding machine screw (**C**). Tighten to torque 68 cNm (6 in-lb).

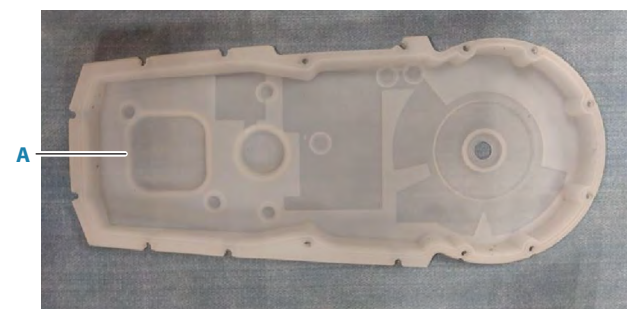


Fit new case seal and upper housing

- 31 If the direction indicator cap came fitted into the new upper housing, remove it by carefully pressing down on the underside of the direction indicator cap. (It will be reinstalled to align with the direction indicator pulley in a later step.)



- 32 Fit the new silicone case seal (supplied, **A**) into the inside of the new upper housing (supplied, **B**).



- 33 Fit the upper housing onto the head casting. You may need to support it until you have fitted the screws. Ensure that no wires are pinched between the edges of the head casting and the upper housing.

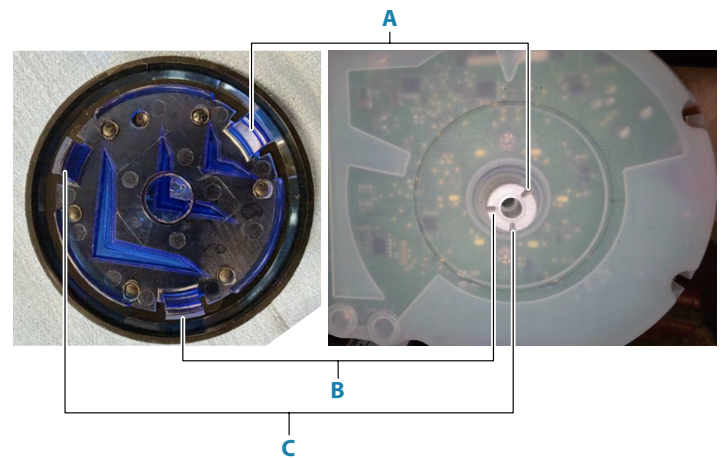


- 34 Underneath the upper housing, use a T15 Torx® screwdriver or bit to reinstall the sixteen #6 x 3/4, pan head, thread cutting screws securing the upper housing to the head casting. Tighten to torque 90 cNm (8 in-lb).



Install new direction indicator cap

- 35 Examine the inside of the new direction indicator cap.
- The three tabs on the inner rim of the cap match to the three notches on the direction indicator pulley.
 - Tab A is in line with, and behind, the three arrows on the arrow cap. Tabs B and C are near the feet of the largest arrow.



- 36 Outside the upper housing, orient the direction indicator cap to match the notches on the direction indicator pulley. Fit the direction indicator cap by pushing on its center.

→ **Note:** If you hear a loud plastic squeak during steering, the direction indicator cap is not pushed on all the way.

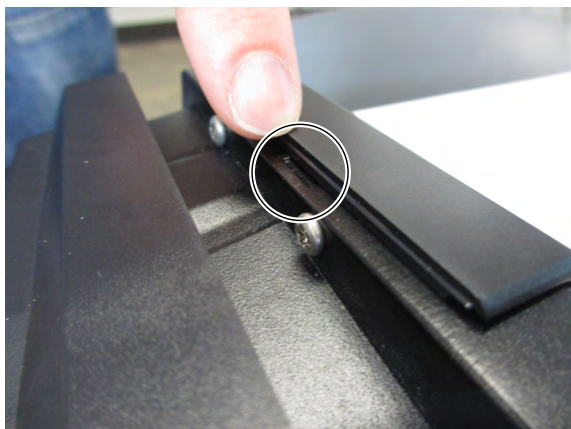


Reinstall lower bezel

- 37 Slide the lower bezel over the shaft and the wiring loom, towards the head casting.



- 38 Make sure that the clips on the bezel mate with the grooves in the upper housing.



- 39 Reconnect the lower bezel to the head casting using a T10 Torx® screwdriver or bit and the two M3 x 10, pan head screws. Tighten to torque 68 cNm (6 in-lb).



The upgrade is complete.

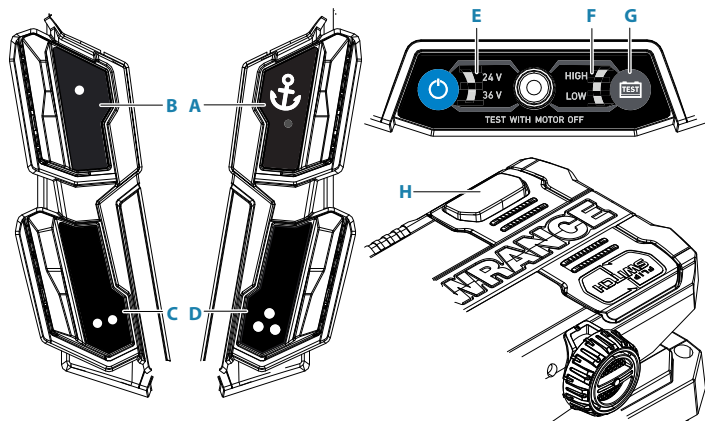


⚠ IMPORTANT: Before using the trolling motor, a foot pedal calibration and bow offset calibration must be carried out. Refer to the end of this installation guide for instructions.

Testing and calibration

Reconnect power to the trolling motor for functional testing. You must calibrate the foot pedal after this procedure. You can calibrate the foot pedal with the trolling motor off the boat.

After the trolling motor is reinstalled on the boat, you must calibrate the bow-mount offset.



- A Anchor key
- B Configurable key 1
Default function: none
- C Configurable key 2
Default function: none
- D Configurable key 3
Default function: none
- E Power LEDs
- F Battery status LEDs
- G Battery test key
- H Momentary switch

Calibrate foot pedal

Activate service configuration mode

Press and hold both the Anchor key and Configurable key 1 (A and B) until the battery LEDs start to blink. The direction indicator flashes twice and two long beeps sound.

Pedal calibration

- 1 Press and hold both the Anchor key and Configurable key 3 (A and D) until the anchor status LED starts blinking. The direction indicator flashes twice and two long beeps sound.
- 2 Press the toe end of the pedal fully down.
- 3 Press the heel end of the pedal fully down.
- 4 Align the shaft (by hand) so it is centered in the mount.
- 5 Press and hold both the Anchor key and Configurable key 3 (A and D) until the Anchor status LED stops blinking. The direction indicator flashes three times and three long beeps sound.

Exit service configuration mode

Press and hold both the Anchor key and Configurable key 1 (A and B) until the battery LEDs stop blinking. The direction indicator flashes three times and three long beeps sound.

Calibrate bow-mount offset

Activate configuration mode

Press and hold both Configurable keys 2 and 3 (C and D) until the Power LEDs (E) start blinking. The direction indicator on the upper unit flashes twice and two long beeps sound.

Bow-mount offset calibration

→ **Note:** Before starting the calibration, raise the lower unit as high as is safely possible, to allow you to see the direction of the lower unit.

- 1 While watching the lower unit, use the foot pedal to align the lower unit parallel to the centerline of the boat.
- 2 When the lower unit is parallel to the centerline of the boat, press and release the Anchor key (A) to calibrate the bow-mount offset. The direction indicator flashes three times and three long beeps sound.

→ **Note:** Misalignment between the lower unit and the heading sensor after calibration will cause poor performance in automatic steering modes.

Exit configuration mode

Press and hold both Configurable keys 2 and 3 (C and D) until the Power LEDs (E) stop blinking. The direction indicator on the upper unit flashes three times and three long beeps sound.