MINN KOTA®

SERVICE PROVIDER REPAIR MANUAL

BRUSHED TERROVA MOTOR REPAIR

KAYAK TERROVA 2025-PRESENT
TERROVA 2.5/RT TERROVA 2.5, ADV GPS EQUIPPED TERROVA 2023-PRESENT
TERROVA BT/RT TERROVA BT 2017-2023
TERROVA/RT TERROVA/RT ST 2007-2016

REVISED 20 May 2025

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NOTICES, CAUTIONS, AND WARNINGS

Minn Kota has over 1000 Authorized Service Providers, equipped to properly repair your Minn Kota Product. Repairs completed by Authorized Service Providers receive a 90-day warranty which covers the parts and labor of the necessary repair if the paid repair fails. Purchased parts have no warranty and cannot be returned. For additional details on Minn Kota parts warranty, see https://minnkota.johnsonoutdoors.com/us/support/warranty.
Johnson Outdoors Marine Electronics, Inc. disclaims all warranties, express and implied, except for those set forth at the above link.

NOTICE: You should only use this guide if:

1. The motor has no factory warranty. Improperly performing many of the operations suggested in this guide may void any remaining factory warranty on your Minn Kota product. If the product is within the factory warranty, the product should be delivered to an Authorized Service Provider for Repairs.
2. You have verified correct voltage and amperage to the product. This means more than just checking voltage. The deep cycle batteries must have been load tested and all connections must have been inspected and are clean and tight. Bad deep cycle batteries or loose or corroded connections may not prevent a voltmeter from obtaining a correct reading and those conditions may prevent your Minn Kota product working properly.
3. You have a complete understanding of and access to the necessary tools including a VOM/Volt Ohm Meter/Multi-meter, an Amp Meter capable of approximately 0.1-amp accuracy and reading up to 60 amps DC, and basic hand tools.

⚠ WARNING!

ALWAYS WEAR SAFETY GLASSES AND GLOVES. DISCONNECT ALL POWER TO THE MINN KOTA PRODUCT BEFORE BEGINNING AND WORK OR MAINTENANCE. JOHNSON OUTDOORS MARINE ELECTRONICS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE DUE TO IMPROPER RIGGING OR INSTALLATION. IF YOU DO NOT HAVE THE SKILLS, EXPERIENCE, AND TOOLS TO PERFORM THE LISTED OPERATIONS, SEEK THE HELP OF A MINN KOTA AUTHORIZED SERVICE PROVIDER.

⚠ CAUTION!

READ ALL PRODUCT MANUALS, SERVICE INSTRUCTIONS AND WARNINGS CAREFULLY BEFORE BEGINNING AND DETERMINE WHETHER OR NOT YOU UNDERSTAND AND ARE PREPARED TO COMPLETE THE OPERATION. MINN KOTA TECHNICAL SUPPORT STAFF ARE NOT ABLE TO ASSIST BEYOND THE INCLUDED INSTRUCTIONS. ATTEMPTING THESE REPAIRS AND THEN TAKING THE PRODUCT TO AN AUTHORIZED SERVICE PROVIDER MAY RESULT IN ADDITIONAL TIME FOR THEM TO DIAGNOSE AND REPAIR DISASSEMBLED PRODUCTS (WHICH WILL INCREASE THE COST OF REPAIRS).

Minn Kota and Cannon Parts available at https://motors.johnsonoutdoors.com.

Buy Parts Online

MOTOR SPECIFICATIONS

KAYAK TERROVA

MOTOR TYPE

Freshwater, Electric Steer
Brushed Lower Unit

VOLTAGE, THRUST, MAX AMP DRAW

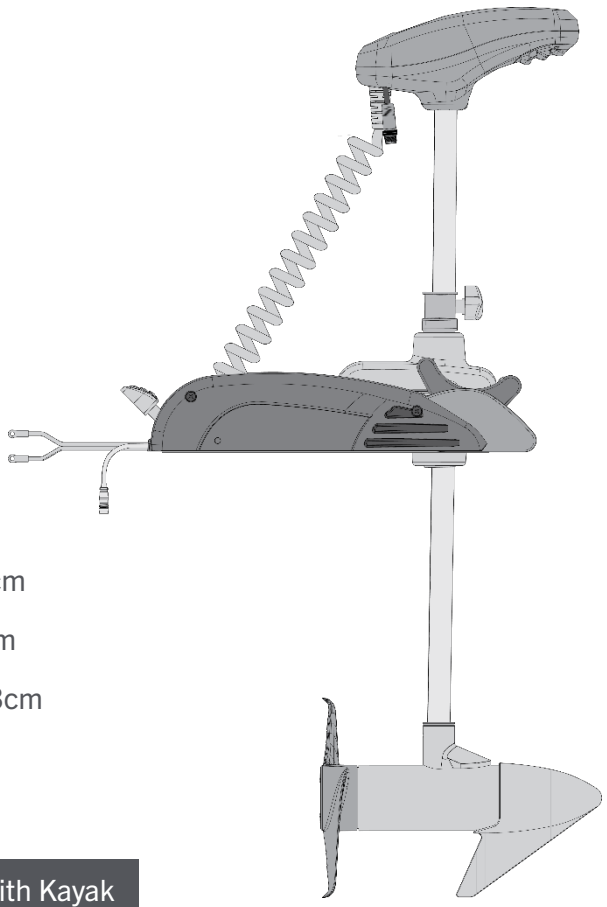
12 Volt, 55 Pounds of Thrust, 50 Amp max Draw

SHAFT LENGTHS

36”

PRODUCT DIMENSIONS

Height to Deck when Stowed:	9”/23cm
Base Width:	8-3/8”/21.3cm
Product Width (Prop to LU front):	15.5”/39.4cm
Base Length:	21-3/4”/55.3cm
Length (Skeg to top of Control Box):	48”/122cm
Weight:	38#/18kg



NOTICE: Safety Switch (Emergency Shut Off) is included with Kayak Terrova. The Safety Switch installs between the battery and the motor on the Motor Power Leads. The Safety Switch is not a substitute for a Circuit Breaker.

NOTICE

TROLLING MOTOR MUST ONLY BE USED WITH KAYAKS THAT HAVE BEEN MANUFACTURED TO ACCOMMODATE A TROLLING MOTOR. CONSULT YOUR KAYAK MANUFACTURER OR DEALER FOR PROPER USE AND APPLICATION.

CAUTION!

EXPECTED USE IS ON KAYAK OR OTHER SMALL CRAFT; ADVANCED GPS CONTROLLER SHOULD HAVE BOAT SCALE SET TO -2 TO AVOID RISKS CAUSED BY STEERING AND THROTTLE OVER-CORRECTIONS.

CONTROL

MOBILE APP CONTROL

Included Micro Remote (MR).

Advanced GPS System Boat Scale set to -2 from factory

Connection to many Humminbird Fishfinders via included 15’ Ethernet Cable

Compatible with the One Boat Network App.

- Full Controls and Updates using an Android or iOS Device.

ONE-BOAT NETWORK

Compatible with Terrova Foot Pedal (Purchased Separately)

Compatible with the “full” Advanced GPS Wireless Remote (WR) (Purchased Separately)

Compatible with Bluetooth Heading Sensor Assembly (Purchased Separately)

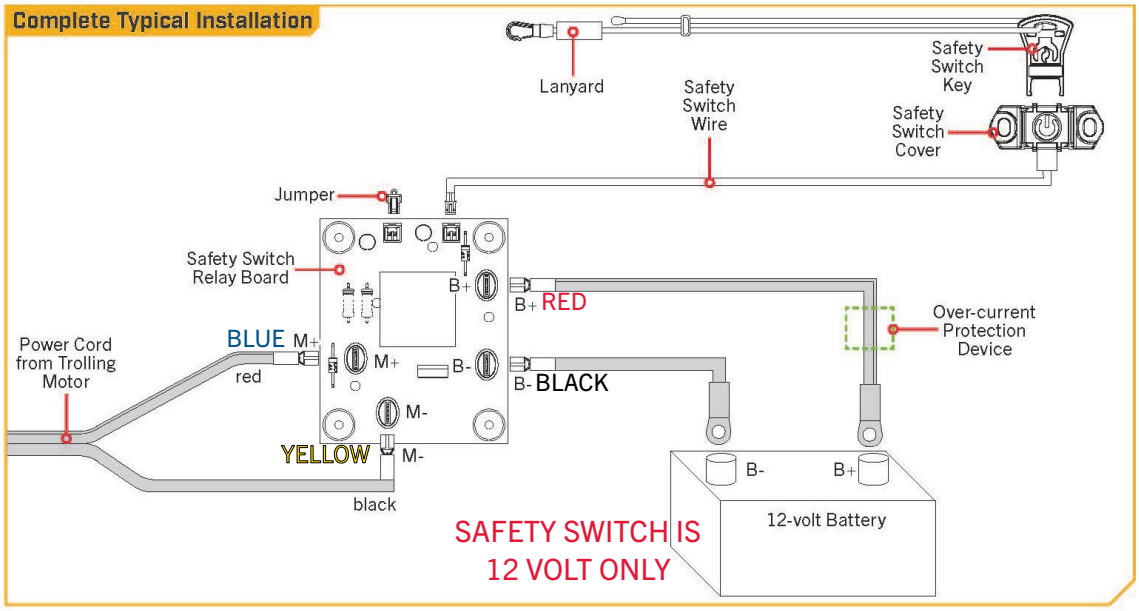
BUILT IN SONAR OPTIONS

No Built-in Sonar

PROPELLER

DESCRIPTION	SERVICE PART #	ACCESSORY ITEM #	
MKP-32 Weedless Wedge 2 Prop	1378131	1865017	Included
MKP-37 Power Prop	1378170	1865022	Optional

SAFETY SWITCH WIRING DIAGRAM



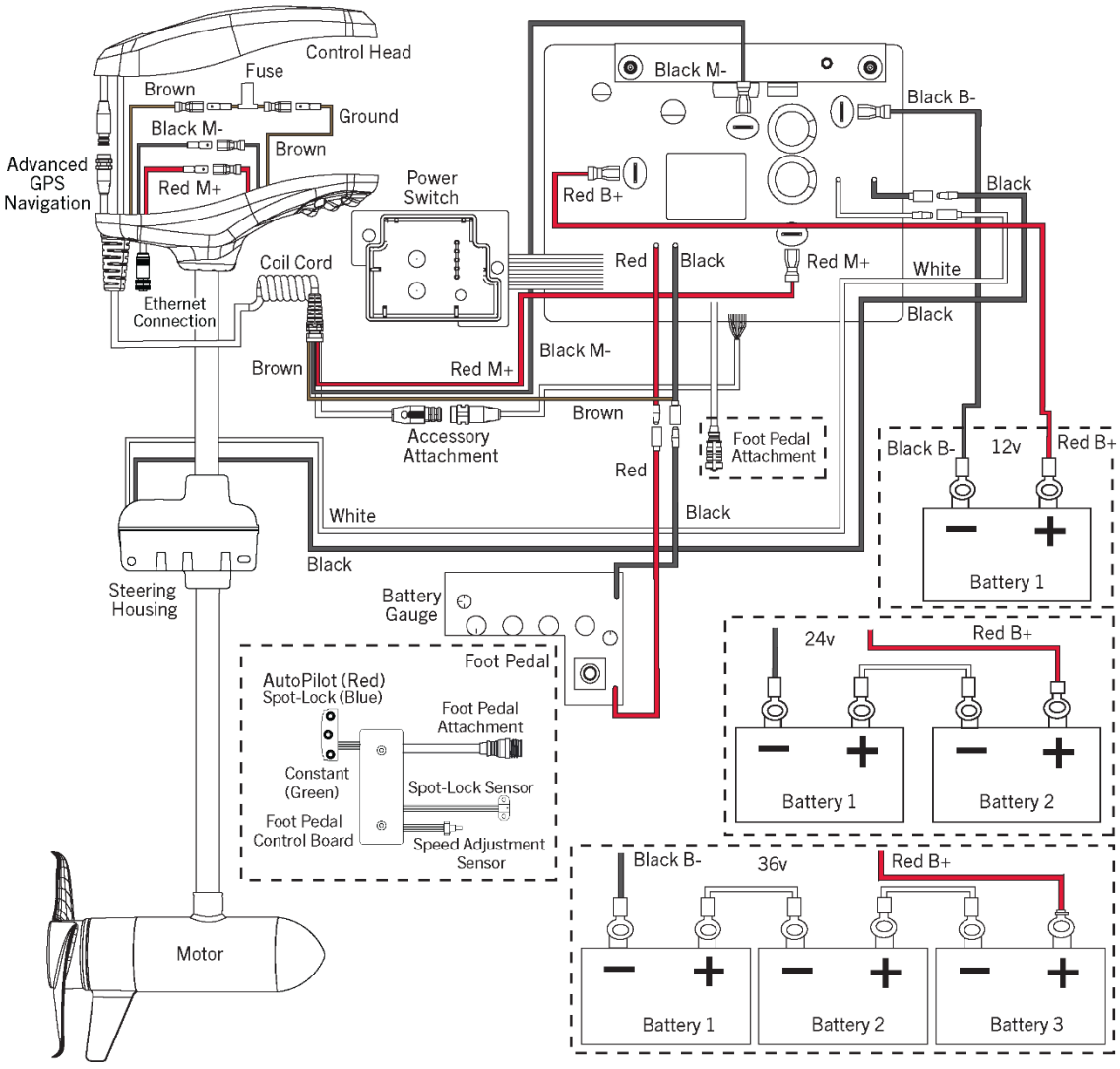
- This is a two input Safety Switch, both inputs must be "closed" for the Safety Switch to send power to the motor. The “Jumper” closes the unused input and must be properly installed for power to get to the motor.
- The Safety Switch Relay Board installs inline on the power wires; the safety switch wire is 80” long.

MOTOR WIRING DIAGRAM

MOTOR WIRING DIAGRAM

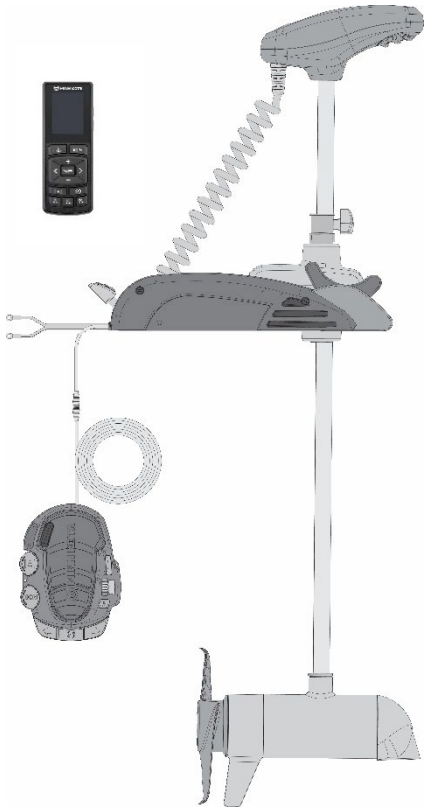
TERROVA

The following Motor Wiring Diagram applies to all Terrova models preinstalled with Advanced GPS Navigation.



NOTICE: This is a multi-voltage diagram. Double-check your motor's voltage for proper connections. Over-Current Protection Devices are not shown in this illustration.

TERROVA 2.5 ADV GPS EQUIPPED TERROVA 2023-PRESENT



MOTOR TYPE
Freshwater, Electric Steer

OPERATING VOLTAGE/THRUST
12 volt, 55 pounds of thrust
24 volts, 80 pounds of thrust
36 volts, 112 pounds of thrust

SHAFT LENGTHS
45”, 60”, 72”

CONTROL
Included Wireless Remote (WR).

Included Terrova Foot Pedal

Connection to many Humminbird Fishfinders via included 30’ Ethernet Cable

Compatible with the One Boat Network App.

- Full Controls and Updates using an Android or iOS Device.

Compatible with the Micro Remote (MR) (Purchased Separately)

Compatible with Bluetooth Heading Sensor Assembly

PROPELLER

DESCRIPTION	SERVICE PART #	ACCESSORY ITEM #	
MKP-32 Weedless Wedge 2 Prop	1378131	1865017	Included
MKP-37 Power Prop	1378170	1865022	Optional

BUILT IN SONAR OPTIONS
DSC (Dual Spectrum Chirp)(Humminbird Transducer, works with other brands via adapter cable)

MDI (Mega Down Imaging)(Exclusively works with Humminbird)

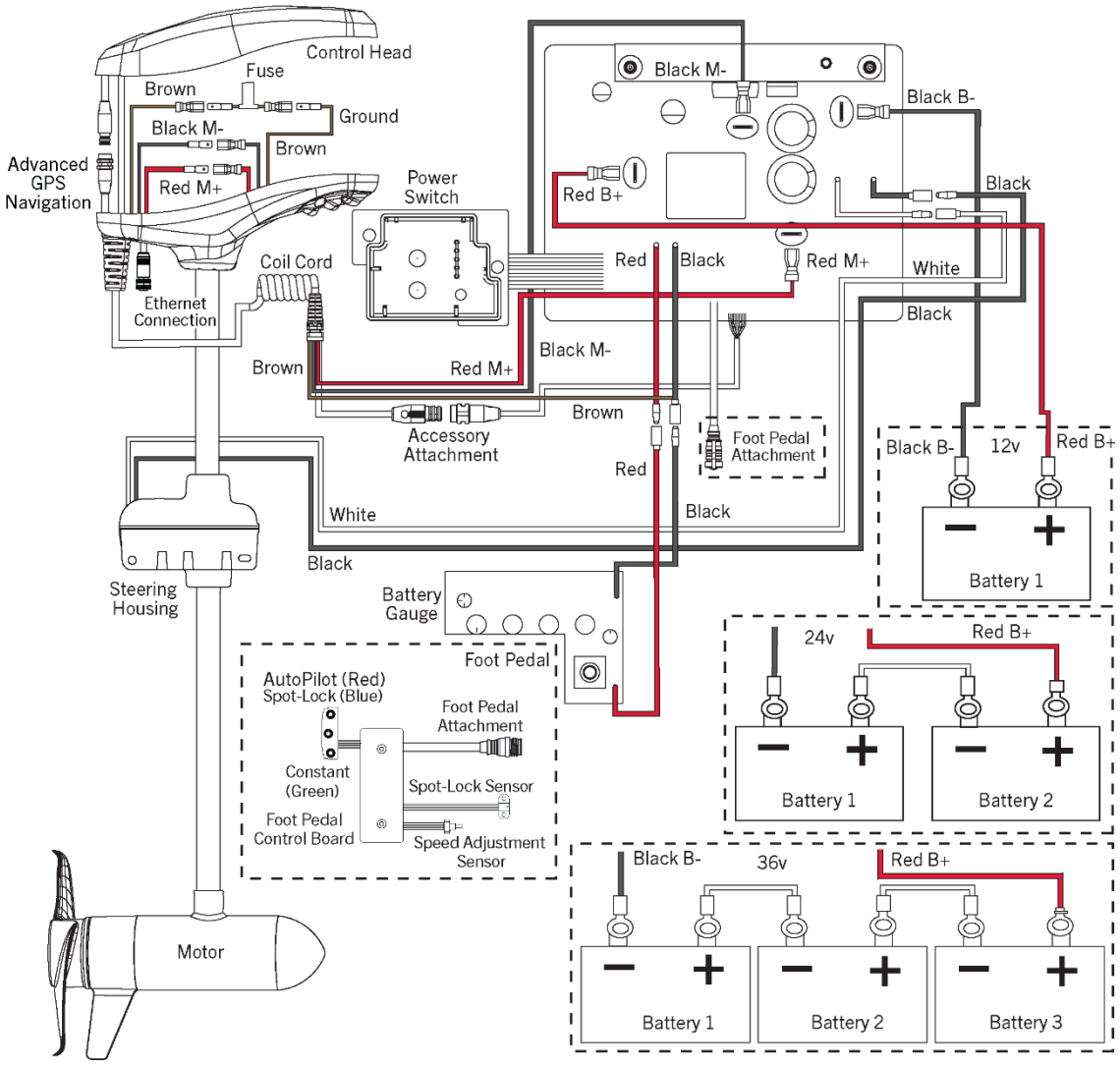
SCAN OR CLICK FOR DSC COMPATIBILITY PAGE

WIRING DIAGRAM

MOTOR WIRING DIAGRAM

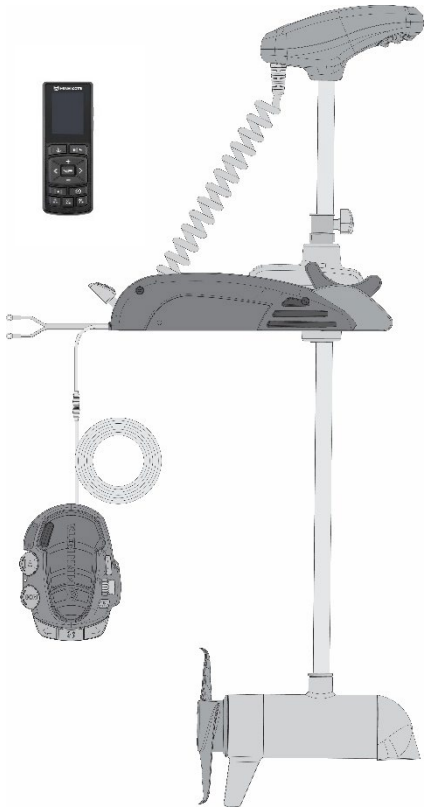
TERROVA

The following Motor Wiring Diagram applies to all Terrova models preinstalled with Advanced GPS Navigation.



NOTICE: This is a multi-voltage diagram. Double-check your motor's voltage for proper connections. Over-Current Protection Devices are not shown in this illustration.

RIPTIDE TERROVA 2.5 ADV GPS EQUIPPED TERROVA 2023-PRESENT



MOTOR TYPE
Saltwater, Electric Steer

OPERATING VOLTAGE/THRUST
12 volt, 55 pounds of thrust
24 volts, 80 pounds of thrust
36 volts, 112 pounds of thrust

SHAFT LENGTHS
54”, 60”, 72”, 87”

CONTROL
Included Wireless Remote (WR).

Optional Terrova Foot Pedal Accessory (Purchased Separately)

Connection to many Humminbird Fishfinders via included 30’ Ethernet Cable

Compatible with the One Boat Network App.

- Full Controls and Updates using an Android or iOS Device.

Compatible with the Micro Remote (MR) (Purchased Separately)

Compatible with Bluetooth Heading Sensor Assembly (Included)

BUILT IN SONAR OPTIONS
No Built-in Sonar

PROPELLER

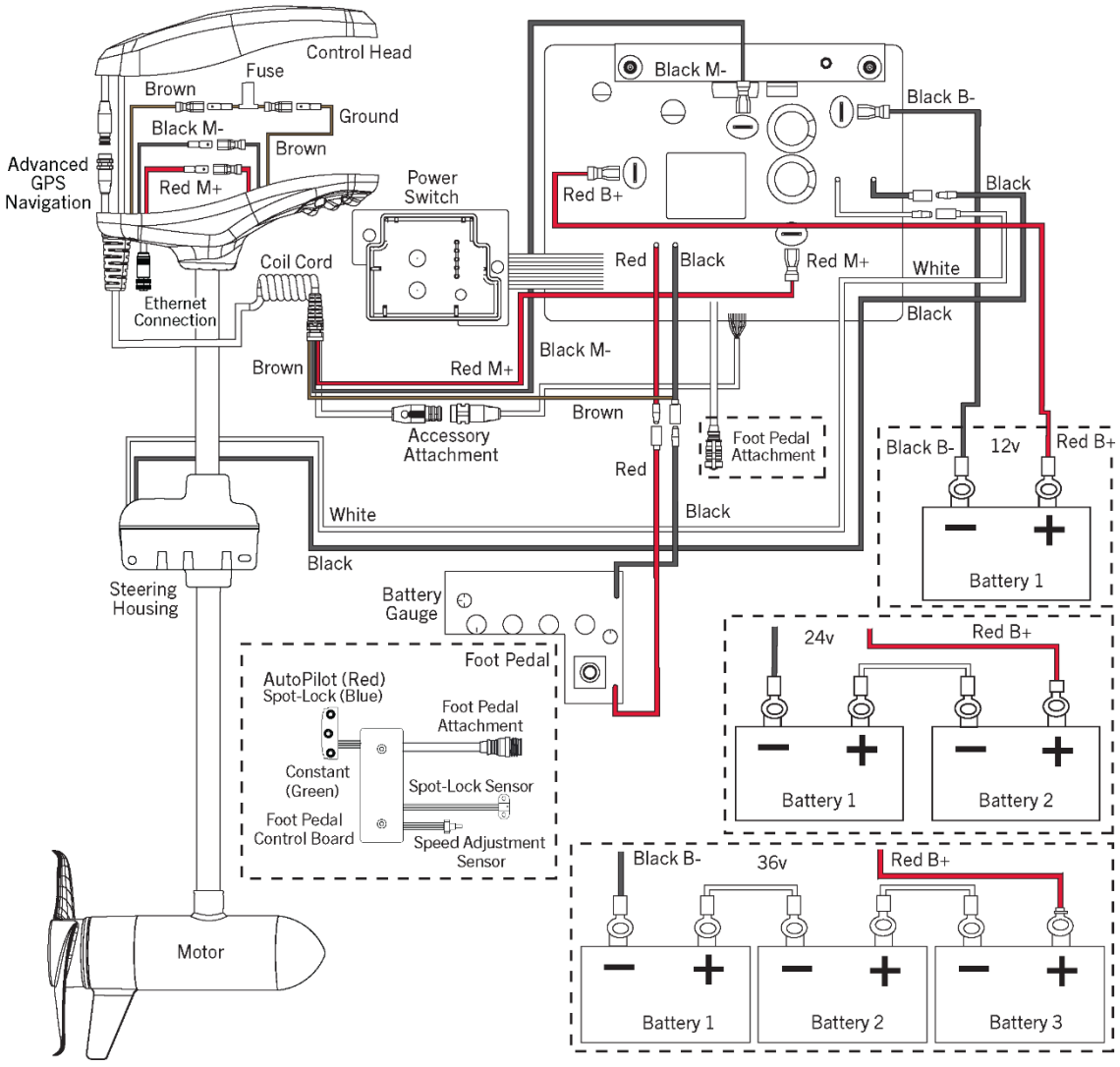
DESCRIPTION	SERVICE PART #	ACCESSORY ITEM #	
MKP-32 Weedless Wedge 2 Prop	1378131	1865017	Included
MKP-37 Power Prop	1378170	1865022	Optional

WIRING DIAGRAM

MOTOR WIRING DIAGRAM

TERROVA

The following Motor Wiring Diagram applies to all Terrova models preinstalled with Advanced GPS Navigation.



NOTICE: This is a multi-voltage diagram. Double-check your motor's voltage for proper connections. Over-Current Protection Devices are not shown in this illustration.

TERROVA BT 2017-2023

MOTOR TYPE

Freshwater, Electric Steer, with Lift Assist

OPERATING VOLTAGE/THRUST

12 volt, 55 pounds of thrust
24 volts, 80 pounds of thrust
36 volts, 112 pounds of thrust

SHAFT LENGTHS

45”, 60”, 72”

CONTROL

i-Pilot Link:

- Color Touchscreen i-Pilot Link Remote
- Included Terrova Foot Pedal
- Connection to many Humminbird Fishfinders via included 30’ Ethernet Cable
- i-Pilot Link App. (basic controls only)
- Compatible with the Micro Remote (MR) (Purchased Separately)
- Compatible with Bluetooth Heading Sensor Assembly

i-Pilot

- Remote, black and white screen, button controls only
- Included Terrova Foot Pedal
- i-Pilot App (basic controls only)
- Compatible with Bluetooth Heading Sensor Assembly

PROPELLER

DESCRIPTION	SERVICE PART #	ACCESSORY ITEM #	
MKP-32 Weedless Wedge 2 Prop	1378131	1865017	Included
MKP-37 Power Prop	1378170	1865022	Optional

BUILT IN SONAR OPTIONS

US2 (Universal Sonar 2)

- 87kHz/200kHz Transducer with Temperature probe
- Compatible with many depth finder brands via Adapter Cable

MDI (Mega Down Imaging) (Exclusively works with Humminbird)

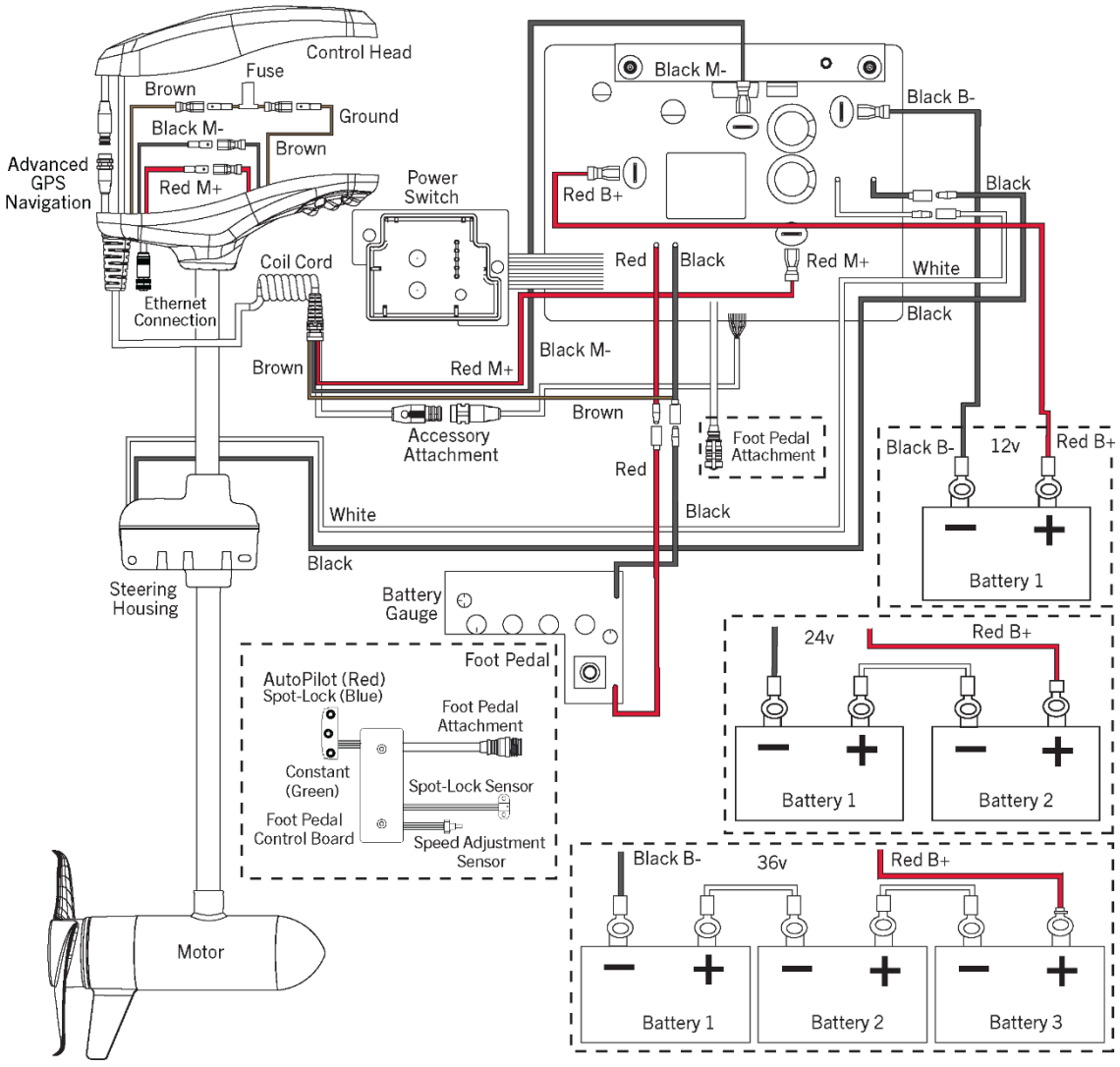
SCAN OR CLICK FOR US2 COMPATIBILITY PAGE

WIRING DIAGRAM

MOTOR WIRING DIAGRAM

TERROVA

The following Motor Wiring Diagram applies to all Terrova models preinstalled with Advanced GPS Navigation.



NOTICE: This is a multi-voltage diagram. Double-check your motor's voltage for proper connections. Over-Current Protection Devices are not shown in this illustration.

RIPTIDE TERROVA BT 2017-2023

MOTOR TYPE
Saltwater, Electric Steer, with Lift Assist

OPERATING VOLTAGE/THRUST
12 volt, 55 pounds of thrust
24 volts, 80 pounds of thrust
36 volts, 112 pounds of thrust

SHAFT LENGTHS
54”, 60”, 72”, 87”

CONTROL

i-Pilot Link:

- Color Touchscreen i-Pilot Link Remote
- Optional Terrova Foot Pedal (Purchases Separately)
- Connection to many Humminbird Fishfinders via included 30’ Ethernet Cable
- i-Pilot Link App. (basic controls only)
- Compatible with the Micro Remote (MR) (Purchased Separately)
- Compatible with Bluetooth Heading Sensor Assembly

i-Pilot

- Remote, black and white screen, button controls only
- Optional Terrova Foot Pedal (Purchased Separately)
- i-Pilot App (basic controls only)
- Compatible with Bluetooth Heading Sensor Assembly

CoPilot

- Remote, “key fob” sized remote, no screen.
- Optional Terrova Foot Pedal (Purchased Separately)

BUILT IN SONAR OPTIONS
No Built-in Sonar

PROPELLER

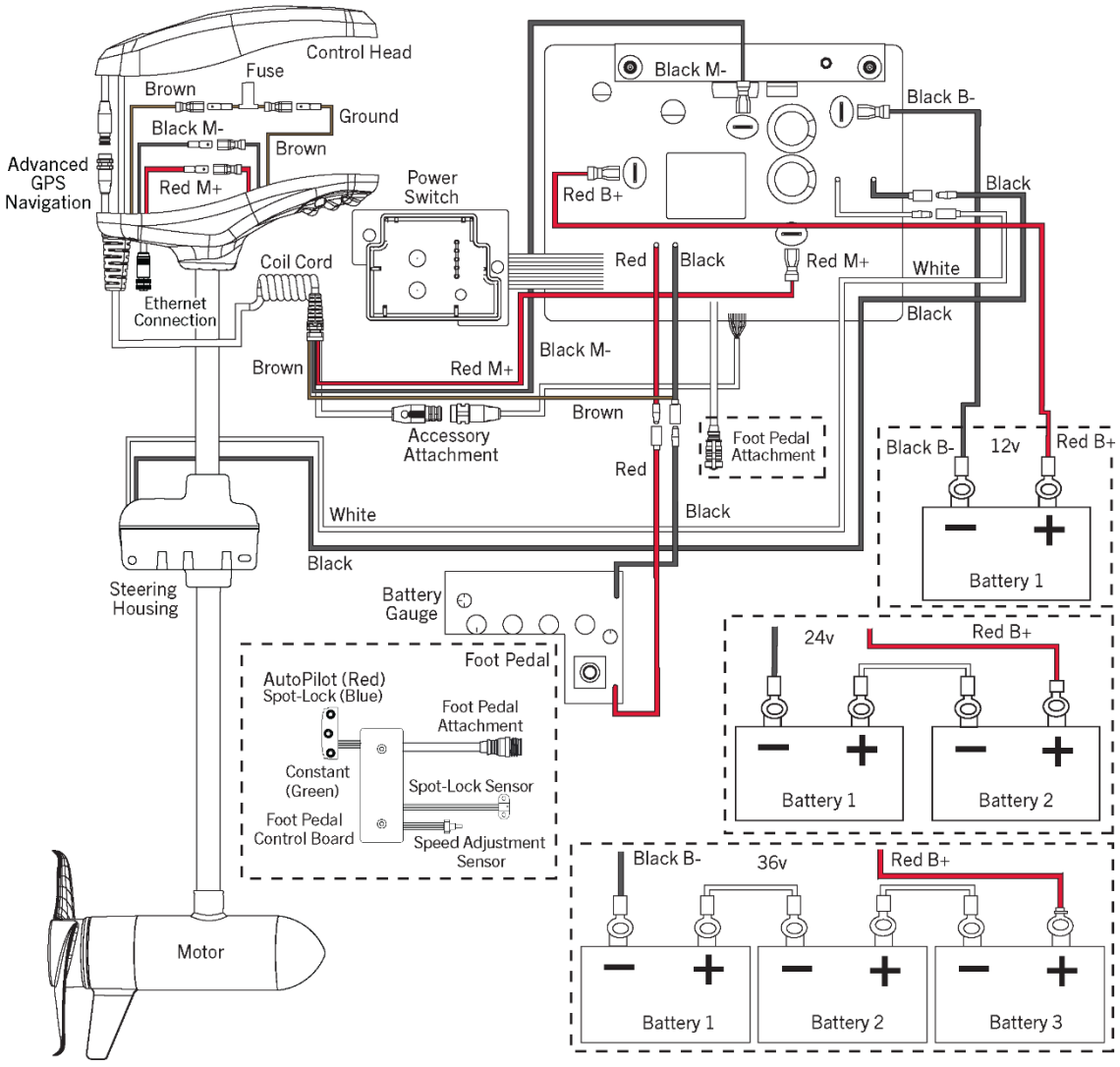
DESCRIPTION	SERVICE PART #	ACCESSORY ITEM #	
MKP-32 Weedless Wedge 2 Prop	1378131	1865017	Included
MKP-37 Power Prop	1378170	1865022	Optional

WIRING DIAGRAM

MOTOR WIRING DIAGRAM

TERROVA

The following Motor Wiring Diagram applies to all Terrova models preinstalled with Advanced GPS Navigation.



NOTICE: This is a multi-voltage diagram. Double-check your motor's voltage for proper connections. Over-Current Protection Devices are not shown in this illustration.

TERROVA AND RT TERROVA 2007-2017.

Abbreviated Section, most parts are no longer available for these motors.

MOTOR TYPE

Freshwater or Saltwater, Electric Steer

OPERATING VOLTAGE/THRUST

12 volt, 55 pounds of thrust
24 volts, 80 pounds of thrust
36 volts, 112 pounds of thrust 2012-2017, 101 pounds of thrust 2007-2012

SHAFT LENGTHS

45”, 54”, 60”, 72”

CONTROL

i-Pilot Link:

Color i-Pilot Link Remote

Optional Terrova Foot Pedal (FW Included, RT Purchased Separately)

Connection to many Humminbird Fishfinders via included 30’ Ethernet Cable

i-Pilot

Remote, segmented LCD black and white screen, button controls only

Optional Terrova Foot Pedal (FW Included, RT Purchased Separately)

CoPilot (Optional on Freshwater, only Installed from factory on RT Models)

Remote, “key fob” sized remote, no screen.

Optional Terrova Foot Pedal (FW Included, RT Purchased Separately)

Foot Pedal Only Models (Freshwater Motors)

Included Terrova Foot Pedal

CoPilot, i-Pilot, or i-Pilot Link as added Accessory (Purchased Separately)

BUILT IN SONAR OPTIONS

No Built-in Sonar on RT Motors

US2 (Universal Sonar 2)

87kHz/200kHz Transducer with Temperature probe
Compatible with many depth finder brands via Adapter Cable

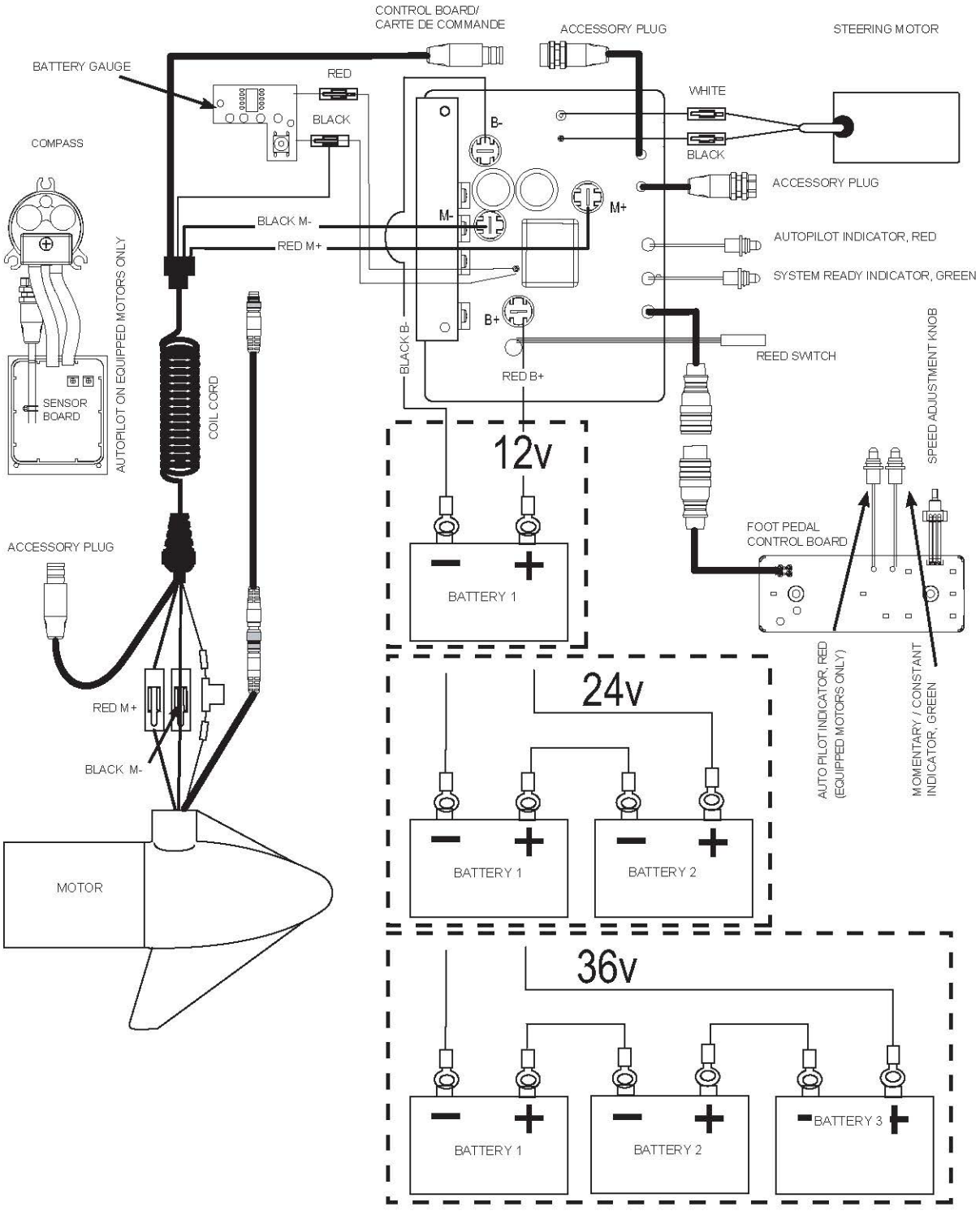
SCAN OR CLICK FOR US2 COMPATIBILITY PAGE

PROPELLER

DESCRIPTION	SERVICE PART #	ACCESSORY ITEM #	
MKP-32 Weedless Wedge 2 Prop	1378131	1865017	Included
MKP-37 Power Prop	1378170	1865022	Optional

WIRING DIAGRAM

THIS IS A UNIVERSAL MULTI-VOLTAGE DIAGRAM. DOUBLE CHECK YOUR MOTORS VOLTAGE FOR PROPER CONNECTIONS



REPAIR OPERATION

FOOT PEDAL CLEANING

Step 1. Turn the foot pedal upside down and remove the two screws shown in FIGURE 1 with a #2 Phillips screwdriver.

FIGURE 1

Step 2. Flip foot pedal over and lift heel/toe pedal off. (FIGURE 2)

FIGURE 2

Step 3. Check for rocks, twigs, sand, or other debris that may be lodged under buttons or button arms (FIGURE 3). The foot pedal is waterproof and can be sprayed off or submerged in water to remove any foreign objects such as sand and rocks. (FIGURE 4)

FIGURE 3

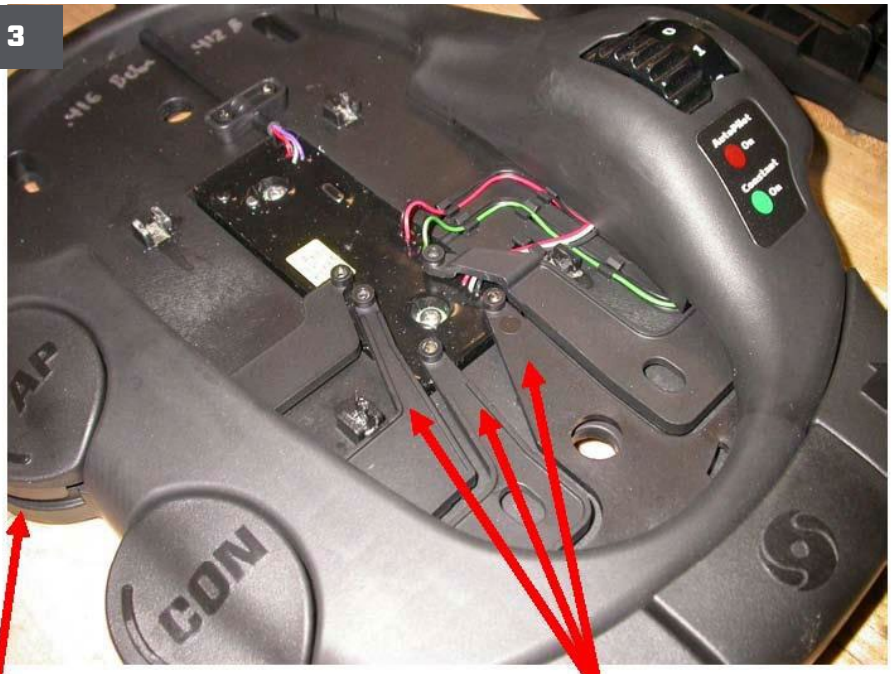
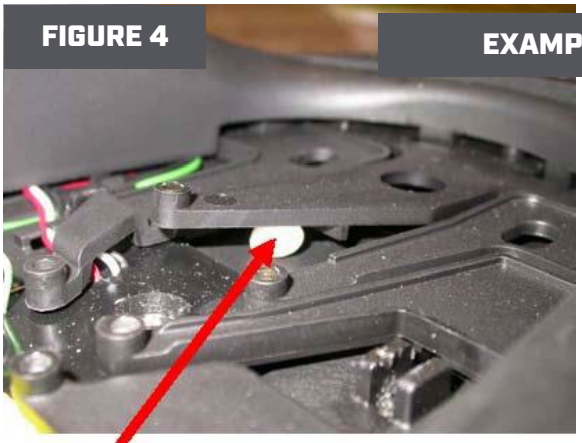


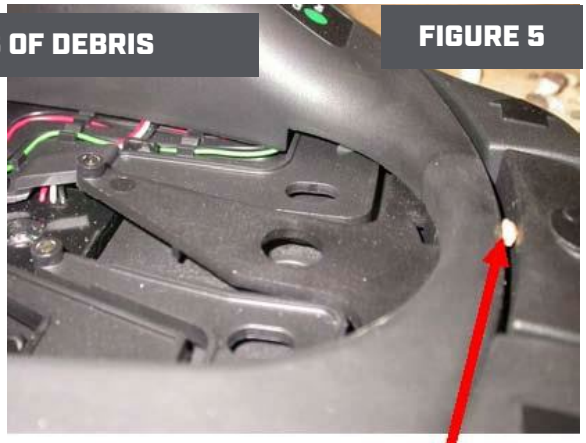
FIGURE 4



ROCK STUCK UNDER BUTTON ARM

EXAMPLES OF DEBRIS

FIGURE 5



ROCK STUCK BETWEEN BUTTON AND COVER

Step 4. Once the foot pedal is clean the heel/toe pedal can be reinstalled with the original springs and Phillips screws

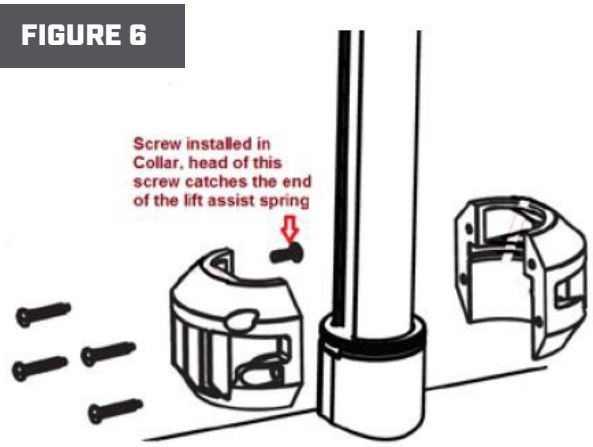
LIFT ASSIST REPLACEMENT ON TERROVA BT (2017-2024)

NOTICE: These instructions assume the motor is disconnected from its power source and that the control box cover and control box have been removed from the upper end of the shaft.

Step 1. Place the motor in the stowed position. This limits the distance the spring will travel and the damage it can cause if you would happen to lose control of it.

Step 2. With one hand, maintain pressure on the two collar halves so they do not release when the four screws holding the collar together are removed. Remove the four screws that hold the collar halves together. (FIGURE 6)

FIGURE 6



Step 3. Gently allow the collar halves to separate and allow the back collar half (the part that is connected to the lift spring) to retract until it is resting against the bottom edge of the steering housing.

Step 4. Deploy the motor. Pull the spring out 6-8 inches, firmly grasp the spring, remove the lower collar from the spring by pushing it up until the screw head moves from the narrow portion of the keyhole slot to the open area (FIGURE 7). Then disconnect the spring from the screw/collar, and attach your lift spring assembly tool (p/n 2888800) to the spring by positioning the post of the tool into the keyhole slot. (FIGURE 8)

NOTICE: The tool will install from the side of the spring assembly opposite from the side the collar was attached. The raised/offset portion of the tool will be oriented away from the shaft when properly attached.

FIGURE 7

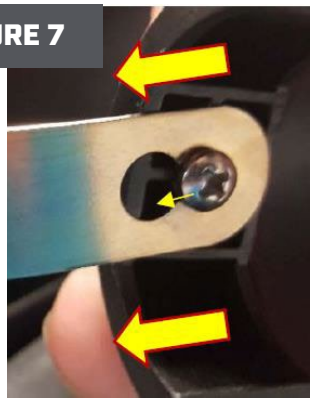
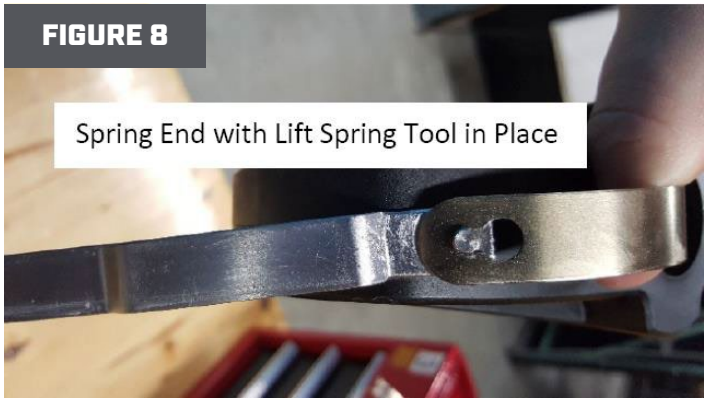


FIGURE 8

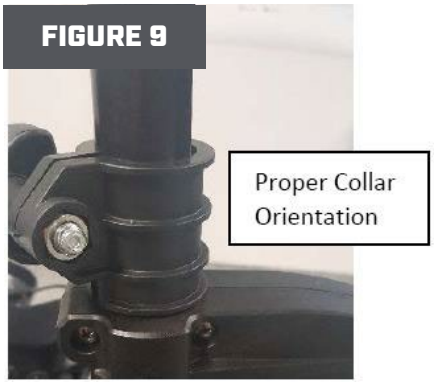


Step 5. Position the tool flat against the flat side of the Terrova Shaft. If the tool was installed correctly, the post of the tool will be facing out with the flat surface of the tool against the shaft.

Step 6. Allow the tool to slide up through the steering housing until there is no pressure on it.

Step 7. Support the motor's lower unit (if it is not contacting the floor) then remove the depth collar. Note the orientation of the collar for proper reassembly later (the steering "drive" portion of the depth collar goes down against the mating "drive" of the Lift Assist Spring Assembly). (FIGURE 9)

FIGURE 9



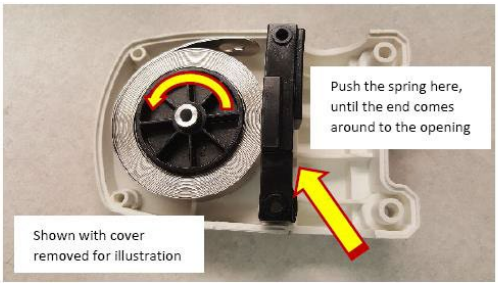
Step 8. Slide the Lift Assist Spring Assembly and the tool up and then off of the shaft. (FIGURE 10)

FIGURE 10

Step 9. Prepare the replacement Lift Assist Spring Assembly: The spring usually has 3-4 inches of spring extending from the housing, but due to vibration when shipping it may be fully retracted inside the housing. If it is fully retracted, you will need to gain access to the spring by reaching into the shaft opening from the bottom end and pushing upward on the spring assembly until the end comes around to the opening. Once the end is at the opening it will be possible to use the lift spring assembly tool (or a hook-shaped pick tool) to hook the end of the spring and pull it out of the housing. (As of October 2020, all Lift Assist Housings will be black in color. A material change was implemented to improve impact resistance and reduce damage from misuse, the new material is not available in white. After careful review it was decided the

benefit of the new material was worth the cosmetic change to the motor.) (FIGURE 11)


FIGURE 11



Step 10. Place the handle end of the tool against the flat side of the Terrova Shaft with the raised portion/offset oriented away from the shaft. (FIGURE 12)

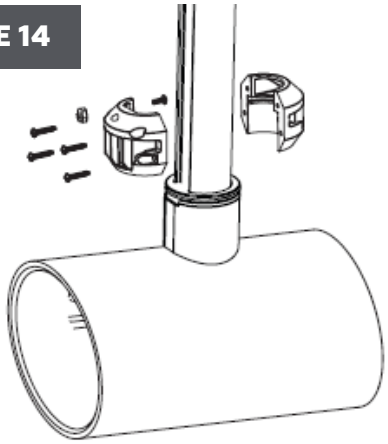
FIGURE 12

Step 11. Slide the tool down the shaft, keeping it tight to the shaft and guiding the tool through the steering housing. As the top of the tool reaches the top of the shaft, guide the lift spring housing onto the flat of the motor shaft. (FIGURE 13)


FIGURE 13

Step 12. Prepare the lower collar: Install the machine screw through the rear collar and into the nyloc nut. Verify that the screw in the inside diameter of the back half of the lower collar is installed with nyloc nut and that there is enough of a gap between the screw and collar to catch the keyhole slot at the end of the spring assembly in the next step. (FIGURE 14)

FIGURE 14



Step 13. Pull the handle of the lift spring tool down toward the lower unit until 4-5 inches of the lift spring is extended beyond the bottom of the steering housing. Firmly grasp the lift spring, remove the lift spring tool from the end of the lift spring, and attach the back half of the lower collar to the end of the lift spring. Use a #2 Phillips Screwdriver to tighten the machine screw that passes through the keyhole slot in the lift spring, through the rear collar, then into the nyloc nut. (FIGURE 15)

FIGURE 15

Step 14. Allow the back collar half to rest against the bottom of the steering housing. Stow the motor.

Step 15. With the motor stowed, place the front collar half against the motor bung so that the raised detail on the inside diameter of the collar is in the groove of the motor bung (groove is

located at the top of the bung, just below the plastic bung cap). (FIGURE 16)

FIGURE 16

Step 16. Pull the back collar half and spring down from the steering housing and place the collar half on the motor bung so it aligns with the front collar half. Install and tighten the four screws that secure the lower collar in place. (FIGURE 17)

FIGURE 17

Step 17. Complete the installation by reinstalling the depth collar, control box, and control box cover.

Step 1.

SHAFT REPLACEMENT

The “D” shaped Shaft used on Terrova is glued into the Lower Unit Center Section using a process that must be done at the factory. If the Shaft needs to be replaced use a Shaft/Center Section assembly and transfer the Plain/Sonar End, Brush End, and internal components from the old Center Section, or use a Shaft/Lower Unit Assembly.

On 55# Thrust Freswater Motors, and 80# Thrust Motors with Built-in MDI it is not possible to route the wires after the shaft is installed, any Shaft or Transducer Replacements on these motors will require Shaft and Lower Unit replacement.

GENERAL REPAIR SCENARIOS

MOTOR IS NON-FUNCTIONAL / ALL FUNCTIONS DEAD.

NOTICE: Safety Switch (Emergency Shut Off) is included with Kayak Terrova. If the Safety Switch is installed see NO OUTPUT FROM SAFETY SWITCH ASSEMBLY (KAYAK TERROVA) on Page 25 prior to continuing with this repair scenario.

Step 1. A 2017 and later Terrova motor must be switched ON and deployed for full function (System Ready Light lit and the motor in a vertical position). 2016 and earlier motors are automatically powered ON when deployed. A 2017 and later i-Pilot or i-Pilot Link equipped motor will prevent steering or prop function when the motor is in the stowed position.

Step 2. Check to ensure proper voltage and polarity at battery. Inspect all battery connections, trolling motor plug (if installed), and any butt splice connections in battery leadwire for corrosion and security. Visually check to see that all wires are attached to the proper control board terminals. Consult the appropriate wiring diagram for the model and board being tested. The "Push-to-Test" battery meter can be used to verify polarity and voltage to the motor. Clean / rewire, if necessary.

Step 3. **(For 2017 and later motors)** Remove the center cover from over the control board, remove the screws that secure the battery meter and power button in the center cover to directly access the power button and verify that it is correctly installed.

(For 2016 and earlier motors) The "ON" function is controlled by the reed switch connected to the board and installed in the right side of the extrusion. A magnet in the release handle cover actuates the reed switch; confirm that the magnet is not staying too close to the reed switch by holding the release handle all the way down for a fewseconds, if the system ready light comes on disassemble the release handle inspecting for any bent components.

a. Cut the two white leads going to the reed switch. If the system ready light comes on replace the reed switch using part number 2884050 reed switch repair kit and test motor for proper operation.

Step 4. Replace the Control Board

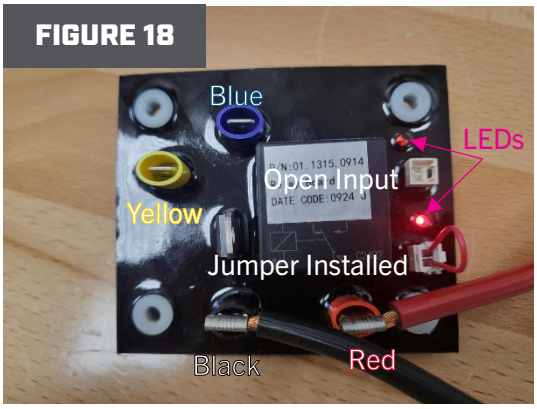
NO OUTPUT FROM SAFETY SWITCH ASSEMBLY (KAYAK TERROVA)

Solving for no output voltage from Safety Switch Relay Board. Reference the SAFETY SWITCH WIRING DIAGRAM on Page 6. In figure 18 the terminals with Blue and Yellow Surrounds are the outputs. If you find voltage across these terminals but the motor still will not power on see MOTOR IS NON-FUNCTIONAL / ALL FUNCTIONS DEAD. On Page 25

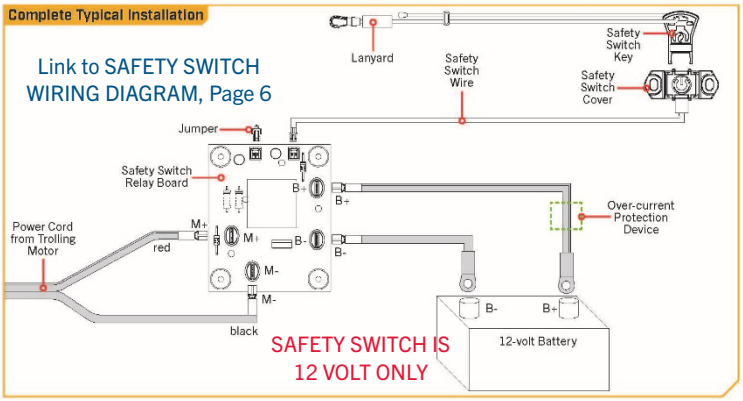
Step 1. Check for 12 volts across the input terminals. In Figure 18 the input terminals have Red and Black Surrounds and have wires installed on them. If there is no voltage at the input, there is an interruption of voltage between the Battery and the Safety Switch; do not proceed to Step 2 until input voltage is confirmed.

Step 2. There are two inputs on the relay board. In Figure 18 the lower input has a Jumper installed, the upper input is closed. Used as directed in the installation manual one input should have the Safety Switch Wire plugged into it, the other input will have a Jumper plugged in, it does not matter which input is used for the Safety Switch Wire. The Relay Board for the Safety Switch has indicator LEDs for

each input, the LED will illuminate as long as that input is closed and 12 volts is provided to the relay board. Observe the indicator LEDs, if both LEDs are illuminated and no output is observed across the Output Terminals (the Blue and Yellow Surrounds in Figure 18) replace the Safety Switch Relay Board. If input voltage exists but one or both Indicator LEDs do illuminate:



a. The Jumper is always closed, whenever the Jumper is properly installed and 12 volts is supplied to the relay board, the LED adjacent to the Jumper should be illuminated as shown in Figure 18. If the Jumper is installed but the adjacent LED is not illuminated replace the Jumper.



b. The reed switch at the end of the Relay Switch Wire closes when a magnet is nearby. The Safety Switch Key has an embedded magnet—when placed near the end of the Safety Switch Wire, it should cause the adjacent LED to light up. If the LED doesn't turn on when the Key is close or doesn't turn off when the Key is removed, replace the Safety Switch Wire

c. If one LED illuminates but the other does not when it should, reverse the connectors.
   i. If the same LED will not illuminate replace the Safety Switch Relay Board.
   ii. If the same component, Jumper or Safety Switch Wire, does not have the LED next to it illuminate replace that component.

THE MOTOR RUNS AT FULL SPEED WHEN SWITCHED "ON" REGARDLESS OF THE SPEED SETTING. MOTOR WILL ALSO RUN AT FULL SPEED WHEN THE SPEED CONTROL IS AT "0" OR "OFF".

Cause: This is an indication of a control board failure requiring replacement of the control board assembly. However, if the board was just replaced and the new board being tested is found to be running at full speed when switched "on", the cause could be the inadvertent reversal of the black battery negative (B-) wire and the black motor negative (M-) wire. If these two wires are accidentally reversed when installing the new replacement board the motor will run at 100% (full power) when switched "on". If this occurs, re-check the wiring by comparing it to the diagram included with the replacement control board. Correct any wiring mistakes and re-test the motor for proper operation.

Corrective Action: The corrective action for the motor running at full speed when switched "on" is replacement of the main control board assembly located base extrusion. Be sure to follow the wiring diagram

and any special instructions for the board installation that are included with the replacement control board. Test run the motor to confirm proper operation.

FOR MOTORS 2017 AND LATER WITH ADVANCED GPS NAVIGATION, i-PILOT, OR i-PILOT LINK INSTALLED - MOTOR RUNS (PROP SPINS) WHEN THE MOTOR IS IN THE STOWED POSITION.

Cause: When the Terrova motor is in the stowed position the propeller should be disabled. The prop spinning while the motor is stowed indicates a failure with the i-Pilot or i-Pilot Link controller (head assembly).

Corrective Action: Replace the Controller/"Head" (Advanced GPS, i-Pilot, or i-Pilot link, whichever was installed)

TERROVA MOTOR FUNCTIONS ARE INTERMITTENT/WORK ERRATICALLY

NOTICE: Erratic operation may be the result of varying power getting to the motor. Verify the power supply prior to initiating any repair. Load test the battery and check connections. Test the motor on a known good power supply.

Step 1. Check all network accessory plug connections (foot pedal, AutoPilot, and/or CoPilot – depending on how motor is equipped) for security and full engagement of the male/female plug ends. Examine the plug pins and sleeves. Pins should be straight and neither pins nor sleeves should show signs of corrosion.

NOTICE: Be sure to cycle power to motor when disconnecting and reconnecting network accessory plugs. Some accessories on some Terrovas are only connected at power up, making those connections without cycling power to the motor will result in erratic performance or no response from the accessory.

Step 2. Test network accessories one at a time to determine which component may be faulty.

a. Disconnect power to motor or, if it is a 2017 or later model, switch it OFF to disable / turn off the system ready LED. Disconnect the network accessories from the main control board (foot pedal, AutoPilot, and CoPilot – if motor is so equipped). Connect known good (test) foot pedal and reconnect power or deploy motor to enable / turn on the system ready LED. Test for proper operation.
    i. If motor fails to function properly, main control board is faulty and needs to be replaced.
    ii. If motor works properly with test pedal, proceed to Step 2b.

b. Disconnect power to motor or switch it OFF to disable / turn off the system ready LED. Disconnect test pedal and connect customer's pedal to motor. Reconnect power or deploy motor and retest for proper operation.
    i. If motor now malfunctions with customer foot pedal, pedal is faulty and needs to be replaced, but first check for foreign debris per the Foot Pedal Cleaning Procedure at the end of this chapter.
    ii. If motor functions check okay, suspect a faulty network accessory (AutoPilot or CoPilot depending on how motor is equipped). Proceed to Step 2c.

c. Disconnect power to motor or switch motor OFF to disable / turn off the system ready LED. If the motor is AutoPilot equipped (see PRE-2017 MOTORS ONLY - AUTOPILOT IS NONFUNCTIONAL. (LIQUID-FILLED COMPASS MODELS ONLY, DOES NOT APPLY TO AUTOPILOT FUNCTION OF ADVANCED GPS NAVIGATION SYSTEM OR ANY i-PILOT ACCESSORY.) on page 36 to determine or confirm that motor is AutoPilot equipped), connect

> **NOTICE:** If there are two network plug leads from the main control board they are common / either lead can be connected to AP or CoPilot accessory.

the AutoPilot network accessory plug to the network plug from the main control board. Reconnect power or deploy motor to enable / turn on the system ready LED and test motor for proper operation.

i. If motor AutoPilot functions do not operate, go to TERROVA MOTOR FUNCTIONS ARE INTERMITTENT/WORK ERRATICALLY on Page 27 pertaining to AutoPilot malfunction.
ii. If some other motor function now fails to operate suspect network interference from a faulty AutoPilot network accessory. Replace AutoPilot compass control board and retest.
iii. If motor functions properly and it is CoPilot equipped, proceed to Step 2d.

d. Disconnect power to motor or switch motor OFF to disable / turn off the system ready LED. Connect the CoPilot network accessory to the network plug from the main control board, if motor is so equipped. Reconnect power or switch motor ON to enable / turn on the system ready LED and test motor for proper operation with foot pedal.

i. If motor now fails to respond to foot pedal commands or malfunctions in some other way, the CoPilot receiver board is causing network interference and needs to be replaced.
ii. If motor functions properly with foot pedal but fails to function or respond to the remote transmitter see MOTOR DOES NOT STEER RIGHT/LEFT. on Page 28

MOTOR DOES NOT STEER RIGHT/LEFT.

Step 1. Check motor with known good test foot pedal.

a. If test pedal properly steers motor:

i. On the Consumer's Foot Pedal inspect the actuators on the underside of the Foot Pedal for sand/dirt/grit. FOOT PEDAL CLEANING on Page 18 and remove debris while also inspecting for missing magnets.
ii. If cleaning the customer's pedal doesn't correct steering, replace Foot Pedal.

b. If test pedal does not properly steer motor, check the drive housing.

i. Terrova/ST motors use drive housings that are specific to the voltage of the motor. For example, a Terrova 55/ST 55 uses a 12-volt drive housing, a Terrova 80/ST 80 uses a 24-volt drive housing, and a Terrova 101 & Terrova 112/ST 101 & ST 112 use a 36-volt drive housing. To properly test the drive housing apply the voltage appropriate for the model directly to the drive housing leads while observing the drive housing amp draw. The amp draw under bench test, no load, conditions should be less than 2 amps for a 12-volt drive housing, and less than 1.5 amps for 24-volt and 36-volt drive housings. (NOTE: Reverse the polarity at the drive housing leads to check amp draw in both clockwise and counterclockwise rotation.) If the drive housing amp draw exceeds the values listed (2 amps for 12-volt drive housings or 1.5 amps for 24-or 36-volt drive housings) suspect that the drive housing has taken out the steering circuit on the main

control board. (NOTE: When this has occurred the drive housing must be repaired or replaced prior to replacing the main board. If the higher than normal amp draw of the drive housing is not corrected the steering circuit on the new/replacement main control board will also fail.)

ii. To repair the drive housing open the drive housing case by removing the six screws on the underside of the drive housing, separate the case halves, and inspect the steering motor, drive gears, and bearings/bushings for binding, rust/corrosion, or lack of lubrication. We have seen instances where the black, molylube grease "migrates" into the steering motor contaminating the motor brushes and commutator causing intermittent high amp draw. (If the grease is green/blue this should not be an issue.) If you notice the black grease, please clean out as much of the grease as possible, replace the steering motor, and re-lube the steering housing with the recommended Bel Ray grease (p/n 3397709). If the sealed bearings on the output shaft are dry, rough, binding, or rusty replace them with p/n 2327308. (NOTE: Current production Riptide Terrova drive housings use bushings in place of bearings on the output shaft.)

iii. After servicing the drive housing to correct any malfunction, retest the drive housing amp draw. Only after verifying that the amp draw of the repaired drive housing falls within the values indicated in Step 1, b-i should the drive housing be connected to the main control board and tested for steering function. If steering function does not operate in one or both directions the steering circuit of the main control board has failed (or been damaged by the drive housing) and needs to be replaced. See the following information on main board replacement.

MOTOR STEERS PROPERLY, BUT MOTOR LOWER UNIT DOES NOT RUN.

Step 1. Check for proper voltage and polarity at the control board input terminals. Visually check to see that all wires are attached to proper control board terminals. Consult appropriate wiring diagram for the model and board being tested. Check for corroded connections. Clean/rewire properly, if necessary.

Step 2. Check motor with known good test foot pedal.

a. If test pedal properly controls all motor functions the original foot pedal is faulty. Replace foot pedal.

b. If motor lower unit does not run properly with test pedal proceed to Step 3.

Step 3. Check to see if lower unit runs properly.

a. Connect 12 volts directly to the red and black brush leads at the top of the motor shaft (in the control box). The motor should run. If not, a problem exists in the lower unit. Check the lower unit for voltage at the brushes, water in the lower unit, worn brushes, or an open or shorted armature. Repair as necessary. If the motor operates properly, proceed to Step 4.

Step 4. If Steps 1, 2, and 3 test okay, the main control board is faulty and needs to be replaced.

AUTOPILOT TURNS ITSELF OFF SHORTLY AFTER IT IS TURNED ON.

Step 1. Suspect corroded bearings in the drive housing that may be causing the steering motor to draw excess amperage. Open the drive housing for inspection and repair/replace, as necessary.

NOTICE: The AutoPilot is designed to shut off after approximately 6 seconds of continuous steering in one direction. (This is so the coil cord will not wrap around the shaft of the motor. Actual "on-the-water" use should never result in continuous steering in one direction.)

MOTOR DOES NOT STOW/LATCH PROPERLY.

NOTICE: On 2017 and later models the handle presses straight down to release the motor into the deployed position. On pre-2017 models the handle had to be pressed in and then down to deploy the motor.

Step 1. Try stowing the motor in the opposite direction. (Propeller to the port or starboard side.) If this corrects the issue the bung on the lower unit may have been welded a little offset to one side. You will need to replace the Shaft and Center Section or Shaft and Lower Unit assembly to correct this issue.

Step 2. Lubricate the composite shaft with a water based silicone spray (Pledge® or Armor All® are common household examples of water based silicon products).

Step 3. Ensure there is no debris under the steering housing that is restricting the pivot travel of the stowed steering housing.

Step 4. Inspect release handle and verify that it is not bent or otherwise damaged. On pre-2017 models inspect the handle follower pin. Remove the follower pin and inspect; if it is bent you should assume the handle is also bent. This condition is usually from forcing the handle down (or stepping on the release handle) rather than pushing in and then down.

Step 5. Inspect the motor ramps. Move ramps through an arc between the stowed and deployed positions, watching for straight travel. Replace parts, as necessary.

Step 6. Check the release arms (both left and right) to ensure they are flat. They should run parallel with the base extrusion. Replace arms, if needed.

THE MOTOR (LOWER UNIT) IS LOOSE WHILE IN THE STOWED POSITION.

Step 1. If the lower unit movement is forward and back as indicated by the arrows in FIGURE 19 AND FIGURE 20 or a range of twisting movement as indicted in Picture 6 then install shim kit p/n 2881721. (instructions are included with shim kit)

FIGURE 19

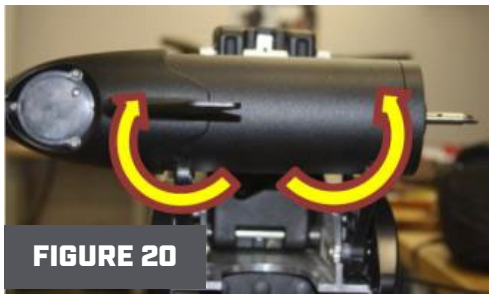


FIGURE 20

TERROVA MOTOR EQUIPPED WITH COPILOT, BUT COPILOT DOESN'T WORK.

Step 1. Remove right motor sideplate and inspect network connection from CoPilot receiver board to main control board. Check to ensure that the plug pins are not bent and that the plug connection is fully engaged and properly seated. NOTE: When fully engaged, no yellow space will be seen between the plug ends and the plug connection will "snap" twice as they are pushed together. Reconnect power to motor or switch motor ON to turn on the system ready LED and enable the system. Test for motor function using CoPilot remote transmitter. If motor does not function proceed to Step 2.

Step 2. Test motor with known good corded foot pedal. If motor functions properly with test pedal, the CoPilot remote transmitter may be faulty. Disassemble the transmitter to check battery voltage (battery is 3-volt lithium coin cell). Replace battery if voltage is low. Inspect the gold plated switch contacts on the transmitter circuit board for corrosion. If any corrosion is noted, replace the transmitter. Clean the

conductive rubber contacts on the transmitter switch pads with rubbing alcohol. Reassemble and retest.

a. If motor still does not respond to the remote transmitter try “relearning” the receiver to the transmitter.
b. If motor still does not respond, then reprogram/relearn the receiver to a known good remote transmitter.
c. If the CoPilot responds properly, the customer’s transmitter is faulty and needs to be replaced.
d. If, after “learning” or programming the receiver to the “test” transmitter it still does not function, the
e. CoPilot receiver board is faulty and needs to be replaced.

GPS NAVIGATION REPAIR SCENARIOS (ADVANCED GPS NAV, i-PILOT/i-PILOT LINK)

MOTOR IS MAKING ERRATIC CORRECTIONS WHEN UNDER GPS NAVIGATION SYSTEM CONTROL (SPOT LOCK, AUTOPILOT, ETC.)

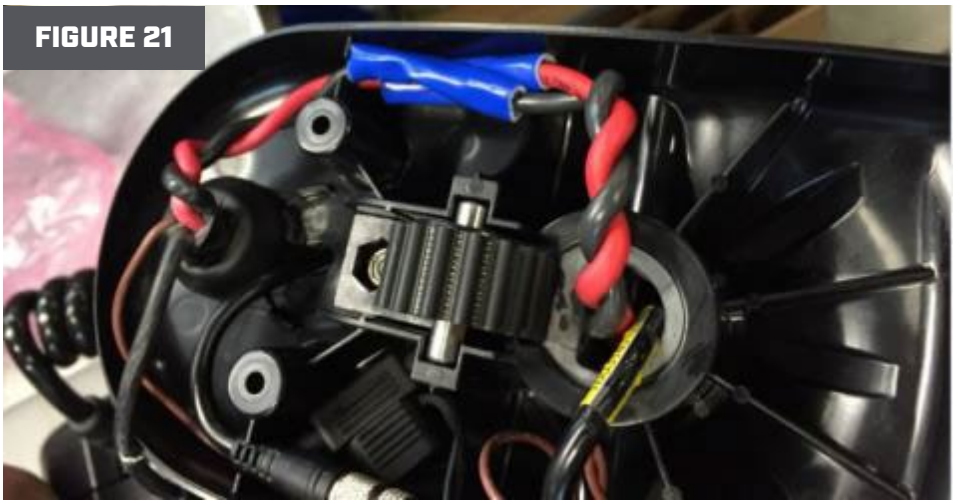
Step 1. Check all electrical connections and battery condition to ensure that the proper voltage is supplied to the motor. Consistent voltage is critical to ensure the built-in compass is working correctly. (The i-Pilot system uses an internal compass to know which direction the controller and GPS receiver is pointing.) A load test of the battery should be performed to verify the battery(s) condition; a simple voltage check is not diagnostic.

Step 2. Be sure to keep all ferrous metallic objects away from the i-Pilot Controller as they will have an impact on the built-in compass. Such objects include anchors, metal framework, etc.…

Step 3. Check to ensure proper motor leadwire routing in control box.

A. The red and black motor leads in the control box should be routed on the coil cord half of the control box. (Away from the compass of the i-Pilot controller.)
B. The red and black motor leads in the control box should be twisted around each other to cancel out the magnetic field created around these wires when the motor is running.
    a. If the motor shaft was shortened, the brush leadwire should also be cut back the same length.
    b. If the motor shaft was shortened and the motor has a built-in transducer, the extra transducer cable should be routed out of the control box and down the coil cord.

FIGURE 21



NOTICE: The red/black wires should be twisted three times on both the coil cord and brush leadwire sides and then the insulator or shrink tube is slid in place over the spade connectors. This picture shows an Ulterra, but the wire routing is similar and critical for all motors with i-Pilot, i-Pilot Link, or Advanced GPS Navigation. See Figure 21.

Step 4. The i-Pilot GPS-based functions are dependent on having good GPS signals (Advanced AutoPilot, Spot-Lock, Track to Start/End). Check to make sure that a good signal is being received and that the GPS signal strength indicator on the i-Pilot remote is showing at least one (1) bar. See THE I-PILOT/GPS-BASED FEATURES DROP OUT WHEN THE MOTOR SPEED SETTING IS INCREASED. On Page 34

Step 5. If the motor with i-Pilot being serviced is a 2017 or later model (Bluetooth version):

A. If motor has a separate Heading Sensor, it is very important that the Heading Sensor is properly installed and has gone through the calibration and offset procedures. While the Heading Sensor is there to help with navigation performance; if it is not properly installed/calibrated it can have a negative influence.
   a. Temporarily remove power from the Heading Sensor and see how Spot-Lock performance is impacted. If performance is improved, suspect that the Heading Sensor was improperly installed. (The Heading Sensor contains a compass that detects a magnetic field so it should not be installed near ferrous metals or wires that handle large currents, such as batteries,power cables, or speakers.) The Heading Sensor will not lose it pairing to the i-Pilot system when it is powered down.

B. Boat Scale can be adjusted on the i-Pilot remote.
   a. Ideal installation for a trolling motor is to have the proper amount of thrust for the size of the boat. If the motor thrust is not properly matched to the boat size, Boat Scale can be used to compensate for the mismatch. The default is zero, assuming that the boat and trolling motor thrust are properly matched. For an installation where the motor thrust is undersized for the boat, increase the Boat Scale. For installation where the motor thrust is oversized for the boat, decrease the Boat Scale.

Step 6. If, after following the previous steps, the problem of erratic steering persists replace the i-Pilot Controller.

THE BOAT DOESN'T SEEM TO KEEP CLOSE ENOUGH TO THE RECORDED SPOT-LOCK LOCATION.

Step 1. Verify the trolling motor batteries are sufficiently charged.

Step 2. Check for weeds wrapped around and under the prop.

Step 3. In more extreme wind and current conditions, the boat will tend to stabilize a little downwind from the intended location. Relock the location the same distance upwind and expect that the boat will drift some in the downwind direction.

Step 4. See MOTOR IS MAKING ERRATIC CORRECTIONS WHEN UNDER GPS NAVIGATION SYSTEM CONTROL (SPOT LOCK, AUTOPILOT, ETC.) on Page 31

WHEN IN ADVANCED AUTOPILOT IN STRONG WINDS, THERE IS QUITE A BIT OF BACK AND FORTH MOVEMENT IN THE BOAT.

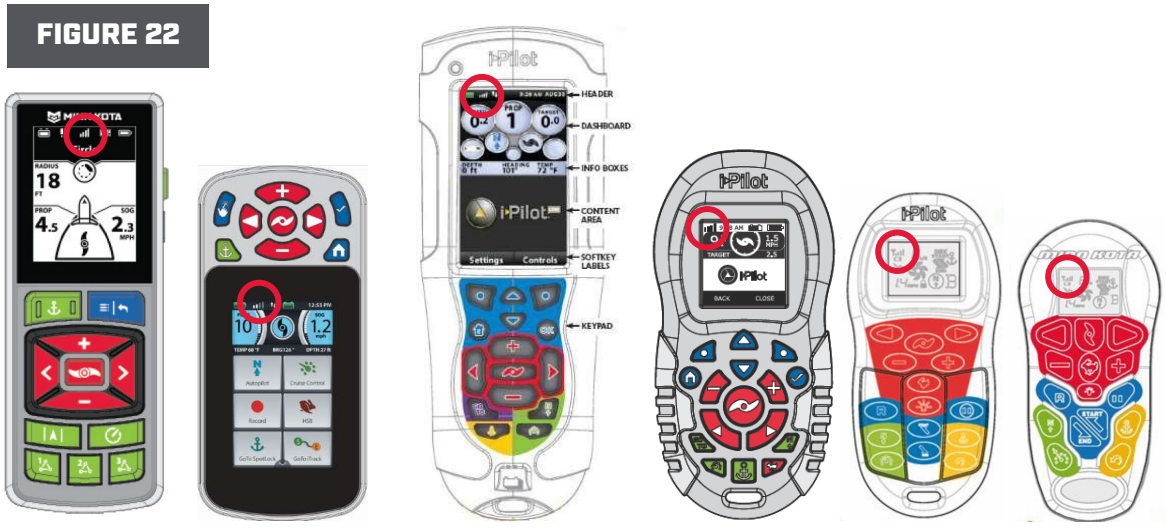
Step 1. While Advanced AutoPilot will keep your boat on a true heading, it may be at the expense of the boat having to continuously move to get back on the correct course. In these extreme conditions you may be better off using Legacy AutoPilot and correcting for the wind manually.

Step 2. See MOTOR IS MAKING ERRATIC CORRECTIONS WHEN UNDER GPS NAVIGATION SYSTEM CONTROL (SPOT LOCK, AUTOPILOT, ETC.) on Page 31

GPS FEATURES (ADVANCED AUTOPILOT, SPOT LOCK, RECORD A TRACK) WILL NOT ENGAGE.

Step 1. Verify that the GPS signal strength icon on the remote's LCD shows at least one bar. If there are no bars, the system will not allow these GPS-based features to be enabled.

FIGURE 22



NOTICE: GPS signal strength is indicated by 1-4 bars on screen (Circled on each remote diagram). If no bars are displayed all GPS functions will be disabled. See Figure 21.

A. Ensure that the motor has a clear view of the sky so it can obtain GPS reception. (Motor cannot be indoors or under a roof, bridge, or tree canopy.)
B. Ensure the minimum voltage requirements at the motor are met.
C. Replace the Controller (Head).

THE I-PILOT/GPS-BASED FEATURES DROP OUT WHEN THE MOTOR SPEED SETTING IS INCREASED.

Voltage to the system is dropping based on amp draw of the motor. This is not an issue within the motor. Load Test the batteries, check the connections. In operation the voltage to the Motor must not drop more than 5%.

LEGACY REPAIR SCENARIOS (MOTORS BUILT PRIOR TO 2017)

PRE-2017 MOTORS ONLY - SYSTEM READY LED IS ON WHEN THE MOTOR IS STOWED.

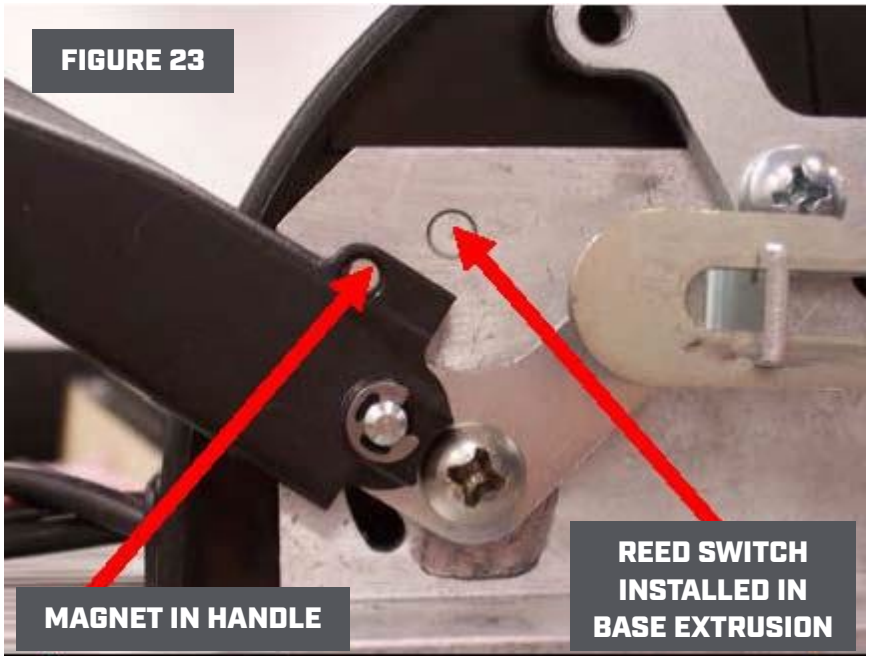
NOTICE: 2017 and later motors, with a power button on the base of the motor, may be powered on while in the stowed position. When powered on the System Ready LED should be illuminated

Step 1. Ensure the release handle is fully latched and locked into the stowed position.

Step 2. Check to ensure the system ready reed switch (small plastic cylinder with two wires going to control board) is positioned in the side of the base extrusion. (Remove the right sideplate for viewing.) (see Picture 1, below)

Step 3. Inspect the release handle cover, p/n 2320215, for the presence of the magnet. Replace handle cover if magnet is missing.

Step 4. If the reed switch and magnet are in place, but system ready LED remains lit when the motor is stowed, the reed switch is faulty. You can verify this by bypassing the reed switch (cut off the reed switch and connect the wires together). If the reed switch is determined to be faulty, replace the reed switch with Minn Kota p/n 2884050. (FIGURE 23)



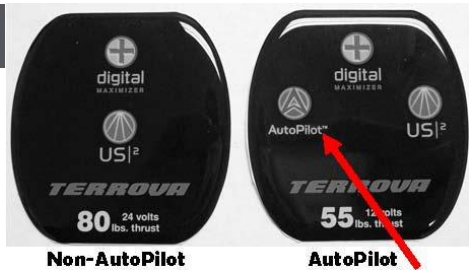
PRE-2017 MOTORS ONLY - AUTOPILOT IS NONFUNCTIONAL. (LIQUID-FILLED COMPASS MODELS ONLY, DOES NOT APPLY TO AUTOPILOT FUNCTION OF ADVANCED GPS NAVIGATION SYSTEM OR ANY i-PILOT ACCESSORY.)

Step 1. Determine if the motor is AutoPilot equipped. Not all Terrova motors are AutoPilot models, but all Terrova motors (whether they have AutoPilot or not) share the same foot pedal, CoPilot remote, and main control boards (12-v or 24/36-v). This means that all Terrova motors have an AutoPilot button on the foot pedal and CoPilot remote, as well as an AutoPilot red LED on the motor base, but unless it has the AutoPilot compass control board (network accessory) installed in the control box at the top of the shaft it is not AutoPilot equipped.

NOTICE: Advanced GPS Navigation, i-Pilot and i-Pilot Link motors do add AutoPilot function; for troubleshooting autopilot issues on i-Pilot and i-Pilot Link equipped motors please reference the i-Pilot and i-Pilot Link repair manual chapters

a. All 2016 and earlier Terrova motors that leave the factory with the AutoPilot feature installed will indicate this on the control box cover decal. (see Picture 2) All Terrova motors made after 2009 will indicate their model information on the serial number decal, this will be the best indicator on 2017 and Later motors. (FIGURE 24)

FIGURE 24



Non-AutoPilot AutoPilot

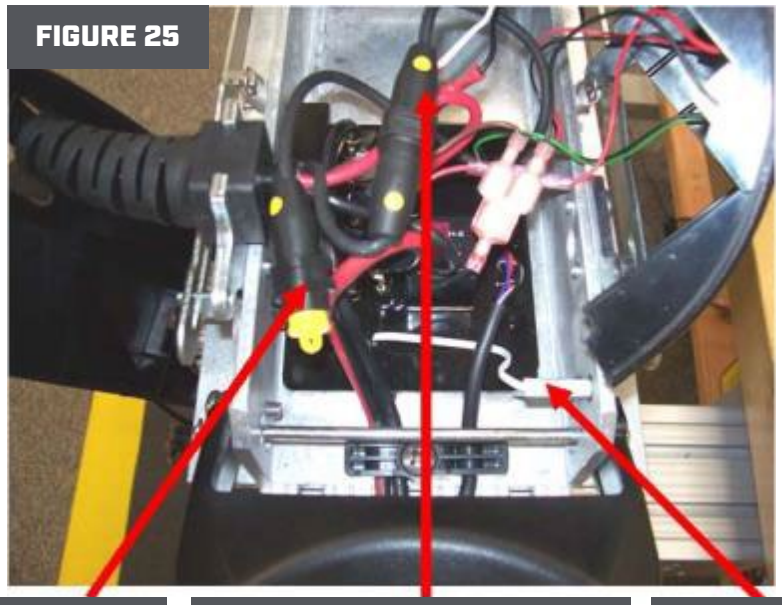
b. Because all Terrova motors are AutoPilot capable (with the addition of the AutoPilot compass control board to the network), a Terrova motor that originally left the factory as a non-AutoPilot model can be converted to AutoPilot at a later date. (AutoPilot accessory is being sold as a marine accessory “upgrade kit”.) A Terrova motor converted to AutoPilot would not have the AutoPilot icon on the cover decal. To determine if the motor is AutoPilot equipped, remove the control box cover to see if an AutoPilot compass control board is installed.

Step 2. Test with known good foot pedal. If AP button on test pedal works correctly then inspect the customer’s pedal per the Foot Pedal Cleaning Instructions at the end of this chapter, replace foot pedal if necessary.

Step 3. If it was determined in Step 1a or 1b that the motor is AutoPilot equipped check to ensure that the network accessory plugs for the AutoPilot compass control board (in the control box at the top of the motor shaft) and at the main control board (on the motor base plate) are clean, show no signs of corrosion, have no bent pins, and are fully engaged and properly seated together. (see FIGURES 25 & 26)

Step 4. Reconnect motor to power and/or deploy motor to turn on the system ready LED (this allows the main board microprocessor to “recognize” the AutoPilot network accessory). Check for AutoPilot function. If AutoPilot still fails to operate then replace the AutoPilot compass control board assembly. NOTE: The compass may not work when it is not covered as the optical sensors can be overloaded by sunlight or bright fluorescent lighting.

FIGURE 25



Unused Network Plug

Network Plug Connected to Coil Cord/AutoPilot

Reed Switch System Ready Switch

NOTICE: Starting In 2014 some control boards only have 1 network cable plug. Picture 3 is showing 2 network cables coming off control board. In this case, one is connected to the compass board network plug and the other is not being used. (No CoPilot attached, so yellow cap still on plug.) If there are 2 network plug leads from the main control board they are common and either lead can be connected to either accessory.

FIGURE 26

Network Plug, Connected to AutoPilot Board

NOTICE: Picture 4 shows a Control Box with AutoPilot Compass Board Installed.

PRE-2017 MOTORS ONLY - AUTOPILOT FUNCTION IS ERRATIC AND DOESN'T MAINTAIN A HEADING. (LIQUID-FILLED COMPASS MODELS ONLY, DOES NOT APPLY TO AUTOPILOT DERIVED FROM ADVANCED GPS NAVIGATION OR ANY i-PILOT ACCESSORY)

Step 1. Make sure motor is mounted within 5 degrees of level (the compass card with the graduated markings must be floating level) and there are no ferrous metal objects near the motor that may be affecting the compass (including screws/nuts). While maintaining a level compass, spin the control box and observe the compass card. The card should remain stationary (i.e. card should not have lost its system ready north reference) as the control box is turned. If the compass card sticks or "hangs up" it is faulty, and the compass assembly needs to be replaced.

a. Inspect oil level in compass capsule looking for a leaky capsule. NOTE: Examine the red compass grommets. If the compass has leaked fluid the grommets will be swollen almost double their normal size.
b. If any sign of compass fluid leakage is evident, replace the compass control board assembly.

Step 2. Check motor for excessive vibration. Inspect propeller and propeller shaft for damage. (Excessive vibration can cause the AutoPilot compass to oscillate causing erratic operation.)

Step 3. Check for proper voltage to motor while motor is under load. AutoPilot steering is susceptible to erratic operation in low voltage situations. (Use wire of adequate gauge in boat or for any leadwire extension to avoid voltage drop/low voltage to the motor. Also check for an inadequate or a corroded battery leadwire plug / plug receptacle.) Correct any low voltage issues and retest.

Step 4. If the complaint is that the motor steers a few degrees while the motor speed is being adjusted (small direction changes with speed changes are normal), you can twist the red and black motor leads in the control box a few times to minimize the magnetic field around these wires that may be affecting the compass.

Step 5. If in previous steps no problems were noted, but AutoPilot still does not function properly then replace the compass control board assembly.

APPENDIXES

MINN KOTA ONE BOAT NETWORK AND i-PILOT VIDEOS

MEGA Down Imaging
w/Jason Halfen

Built in MEGA Imaging
w/Chris Zaldain

Built in MEGA Side Imaging
w/Jason Halfen