RYOBI OUTDOOR PRODUCTS GROUP

Models RYRM8006 / RYRM8007

ELECTRIC RIDERS

80V Tractor Mower Troubleshooting Guide

80V HP High Performance. Advanced Technology.

Table of Contents

THIS MATERIAL IS INTENDED ONLY FOR TECHNICIANS TRAINED IN ELECTRICITY!

Technicians should wear personal protective equipment, such as rubber gloves, safety glasses, and hearing protection.

Dangerous voltages / currents are present.

EXERCISE CAUTION AT ALL TIMES!

This guide assumes knowledge of basic electrical equipment such as a DMM (Digital Multi Meter) to measure voltage, current, resistance, continuity, and diodes.

Using this Document

- Any *blue* text can be clicked on to jump directly to the page of that topic. (This document is also printer-friendly, so you can have it in front of you while servicing the mower.) If you print this document, we recommend printing it in *landscape mode* and in color

- A *Block Diagram* shows the general flow to visualize how the mower is connected and a chart shows general symptoms/solutions for repairs.

- *Electronics tips*, *Terminology*, and *Using a Digital Multi-Meter (DMM)* are included for the technician familiar only with gas machines.

Mower Overview

The RYOBI Tractor is completely electrical, consisting of **3** (42”) and **4** (46”) *brushless* motors (one for each blade and one for transaxle) and a controller for each motor.

RYRM8006

RYRM8007

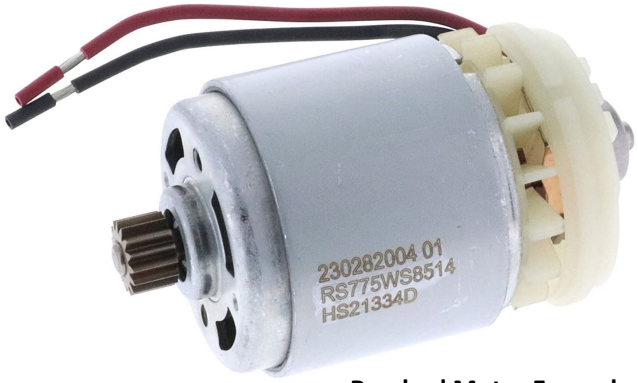
OP801720
80v 10Ah Battery

OP80RM
80v Super Charger

Brushless Motors Overview

Brushless motors operate quite differently than brushed motors with which you may be used to working. (e.g., a starter motor).

A *brushed* motor, like the one pictured to the right, can be quickly tested by applying voltage to the two terminals.



Brushed Motor Example

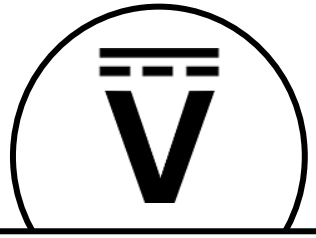
Brushless Motor Example
(Not actual motor in ZTRs)

Brushless motors can be recognized by 3 wires. These 3 wires require a *controller* to operate them and to "fire" these 3 phases in a precise fashion, like spark plugs firing a 3-cylinder gas motor.

Applying a voltage directly to these phases will cause damage.

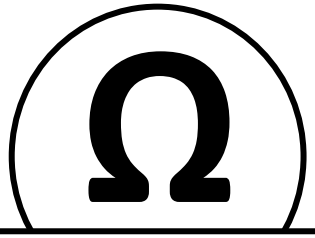
Digital Multimeter (DMM)

A DMM is a standard diagnostic tool that serves as a voltmeter, ammeter, and ohmmeter. We use this tool for various tests throughout this guide.

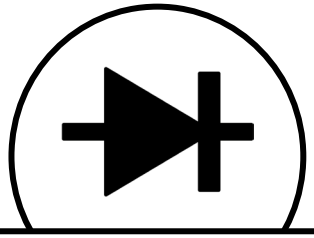


VOLTAGE is potential energy. For the purposes of this guide, we only deal with DC voltage, so make sure your DMM is set to the appropriate symbol.

When measuring **DC Voltage**, touch the **BLACK** probe to the ground and touch to the **RED** probe to voltage being measured.

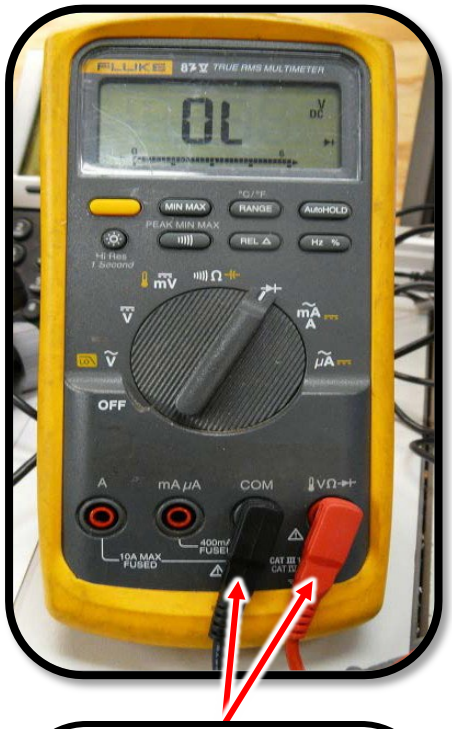


RESISTANCE is the opposition to flow of current. We will use resistance when measuring the **continuity** of a wire or connection for breaks.



A **DIODE** is a device that allows current to flow in only one direction and blocks flow in the other direction. This mode is used to test diodes.

When measuring **Resistance**, **Continuity**, or a **Diode**, touch the **BLACK** probe to one point and touch to the **RED** probe to the other point.

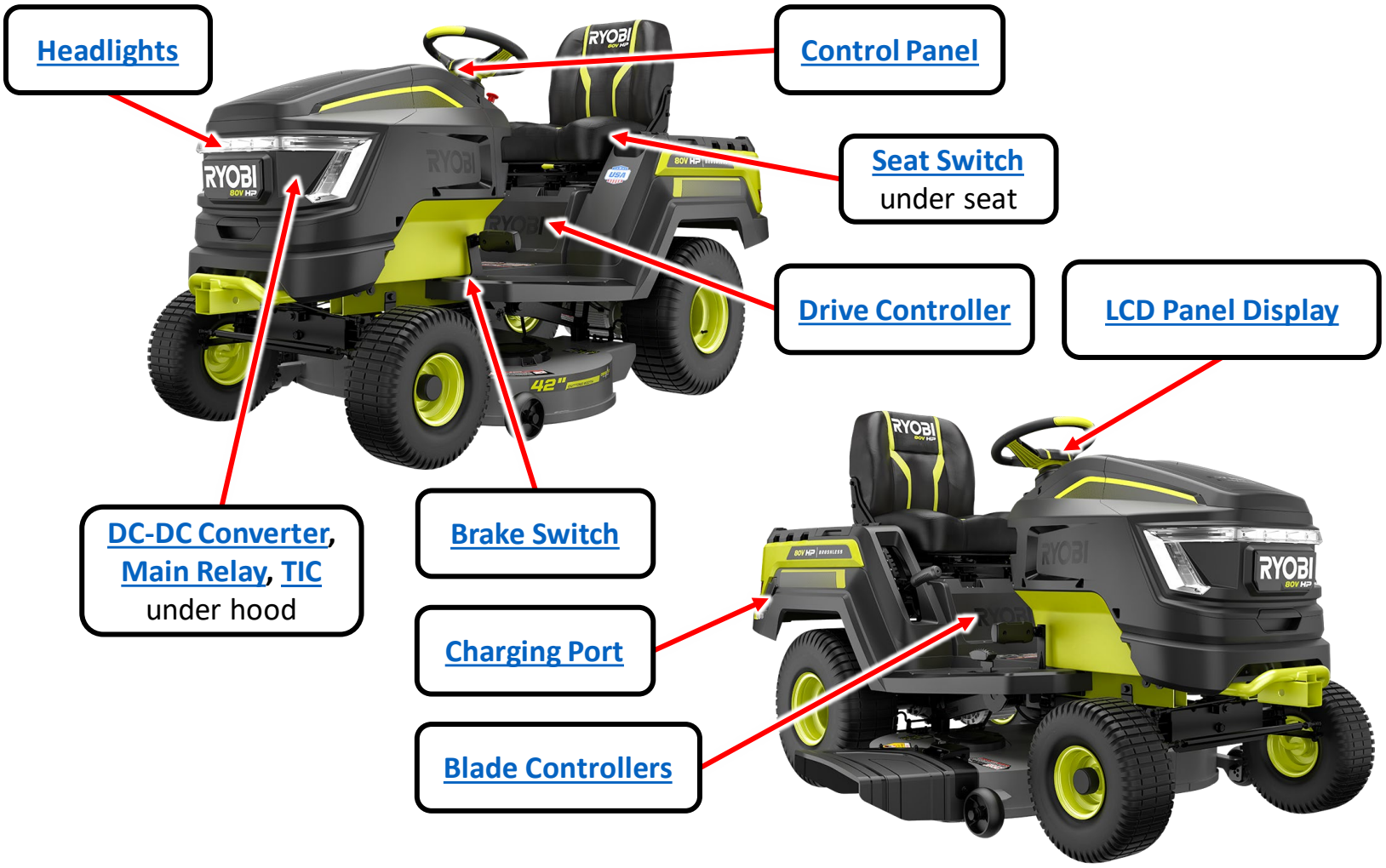


Please note where the **RED** and **BLACK** test leads are plugged in on the picture to the right.

COMPONENT LOCATIONS

Component Locations

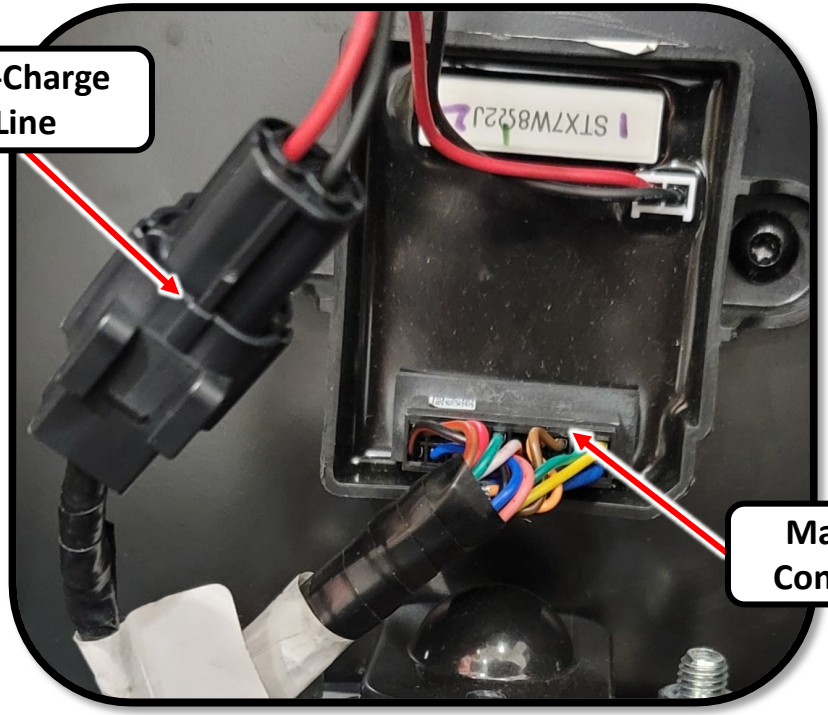
RYRM8060 42” Tractor
RYRM8070 48” Tractor



Batteries Locations

RYRM8060 42” Tractor Mower
RYRM8070 46” Tractor Mower

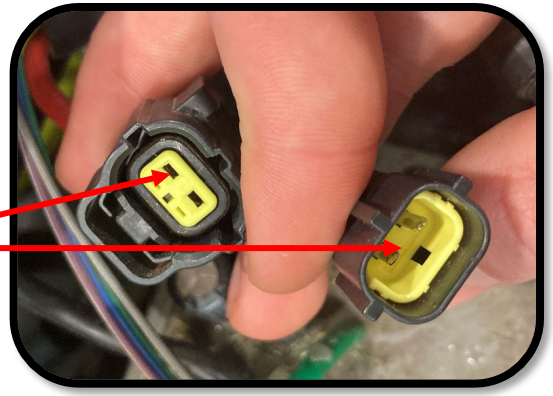
TIC Connections



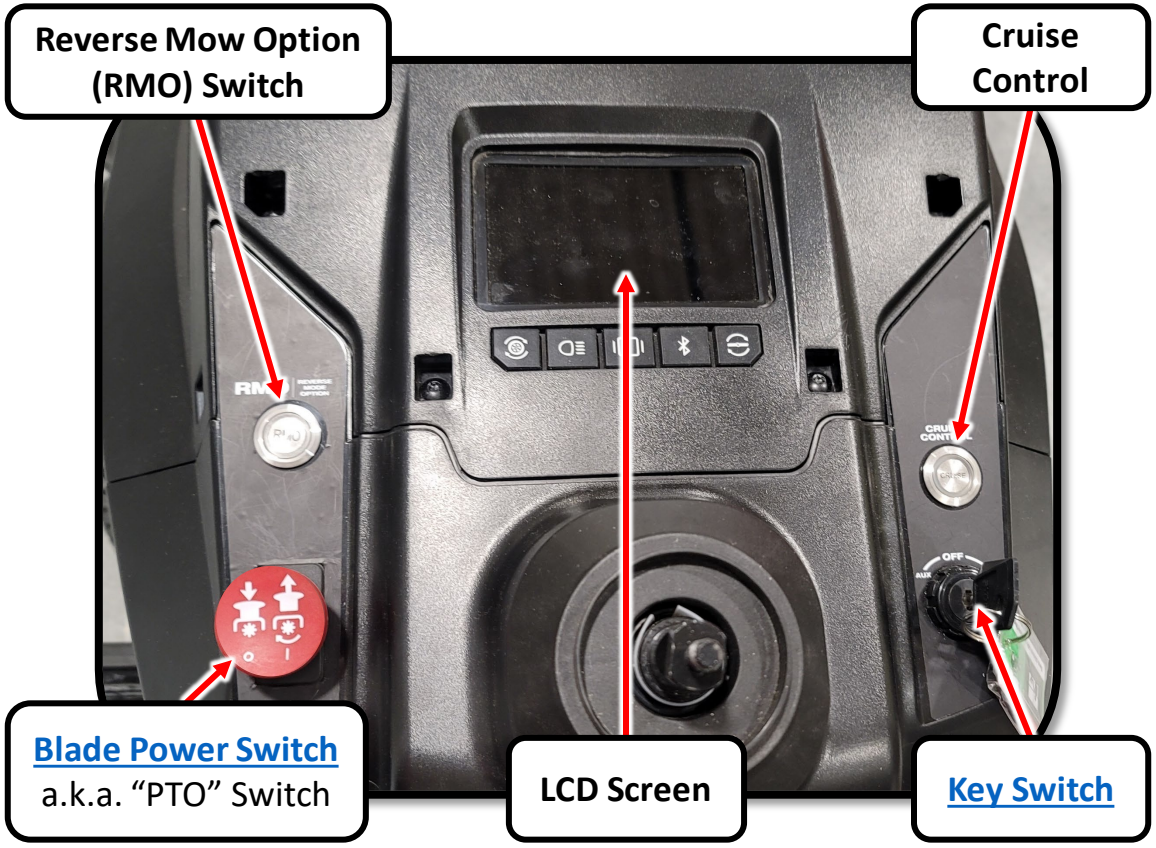
The TIC has 2 connections to the mower.

HELPFUL TIP

There are 2 yellow tabs in the Pre-Charge Line Connectors. These can fall out during repair. Make sure they are reinserted correctly if they do fall out.

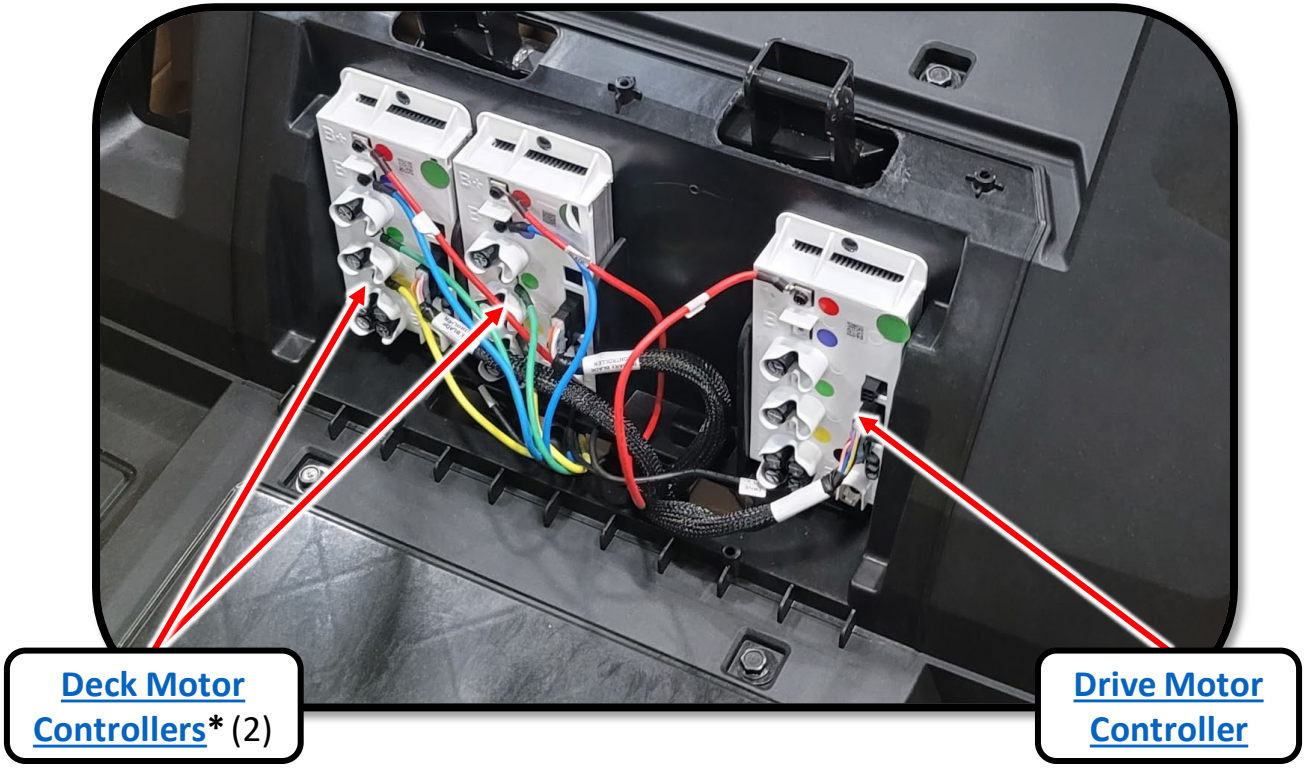


Control Panel



Controller Locations

RYRM8060 42” Tractor Mower
RYRM8070 46” Tractor Mower



***NOTE**

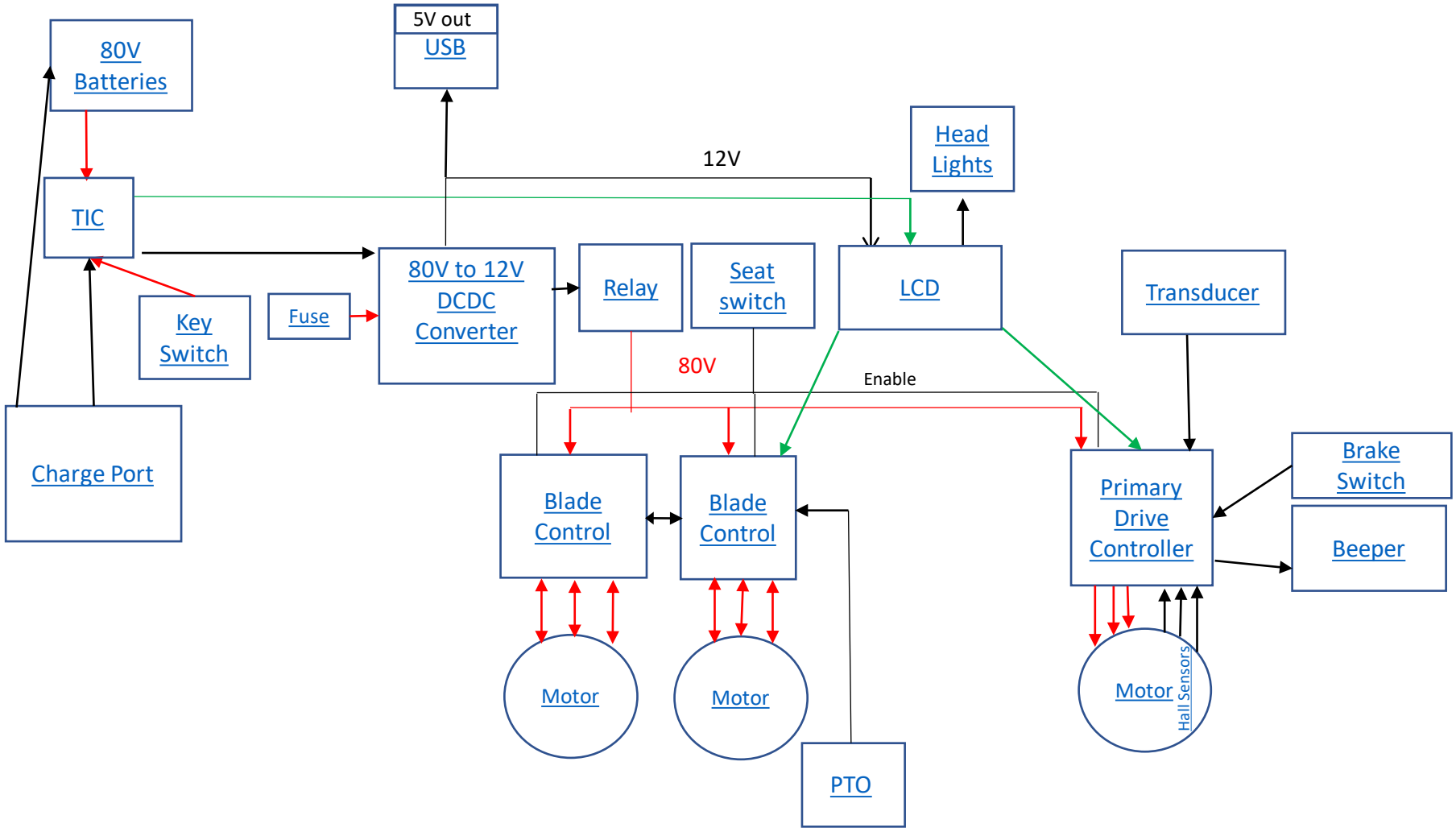
The **RYRM8070** has (3) **Deck Motor Controllers**, not (2)

Additional Note:

Color of controller housing/casing may vary; typically, between black, gray, and white.

DIAGRAM

Block Diagram: Control Flow

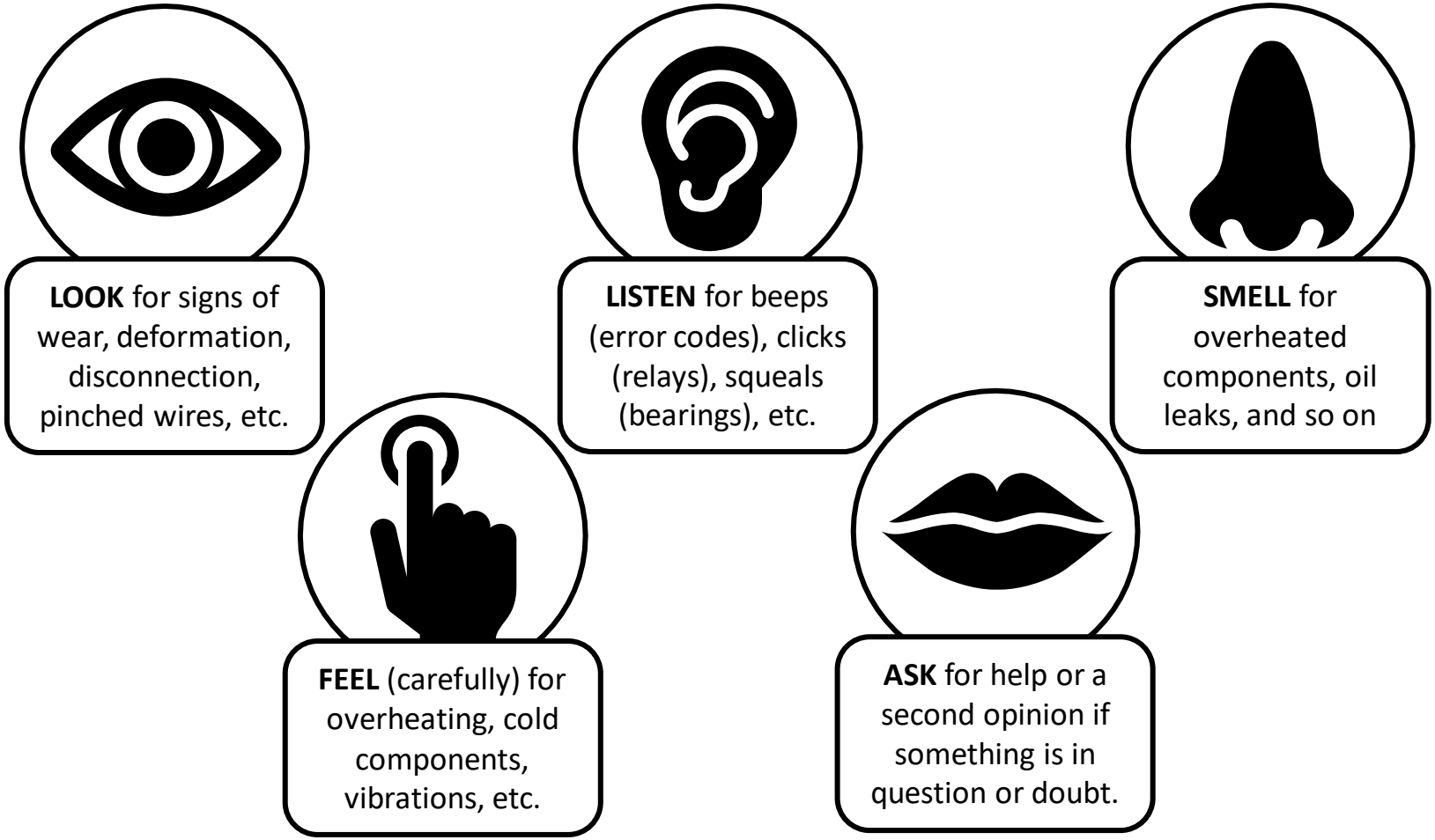


TROUBLESHOOTING

Troubleshooting: Introduction

A service person who has spent many years working on gas mowers may feel uneasy when working on the new generation of electric mower. If this sounds like you, fear not, you're not alone. This section is for you.

Keep in mind you were *born* with the most powerful troubleshooting tools:



Pre-Repair/Post-Repair Checklist

1. Set **Parking Brake** & jack rear tires approx. 2” off the ground & support securely w/ jack stands.
2. Sit on mower to trigger the **Seat Switch**.
3. Release the **Parking Brake**.
4. Turn **Main Power Key** to the ON position.
5. The **LCD Screen** should display the RYOBI logo followed by the user interface.
6. Pull **PTO** knob up. The **Blade Motors** should run.
7. Push the **PTO** knob down and ensure **Blade Motors** stop.
8. Press **Drive Speed** button. The **Drive Speed** should change between high, medium, and low.
9. Press **Blade Speed** button. The **Blade Speed** should change between high, medium, and low.
10. Press **Headlights** button. Button should light and both **Headlights** should come on.
11. Check that **USB** has power by verifying blue indicator light is on.
12. Remove yourself from mower seat. Beeping should begin after 1 minute or less.
13. Connect **Charger** and verify charging indication is working with the **LCD** displaying charging.
14. Sit on mower to trigger the **Seat Switch**.
15. Attempt to start mower and drive away with **Charger** connected. This should not be possible.

Troubleshooting: Basics

- Follow the Block Diagram on the previous page.
- **CHECK FOR LOOSE AND/OR BAD CONNECTIONS.**
- Test the easiest components first, such as **Power**, **Key Switch**, **DC-DC Converter**, etc.
- Mower should be fully charged, if possible.
- **BEFORE** disassembly:
  - Attempt to power on the mower.
    - Click here if the mower won't turn on.
  - Attempt to drive the mower.
    - Click here if the mower won't drive.
  - Check if the USB Indicator and Headlights are functional.
    - This tests the 80V-12V converter.
- Remove Control Panel cover.
  - Test Key Switch.
  - Check all other connections while panel is removed.

Troubleshooting: Detailed

Use the block diagram as a guide.

Also refer to the beep diagnostic code chart.

1. Test Charger by plugging it into the Charging Port on the mower and checking if batteries charge.
   a. If necessary, further test the Charger and Charging Port. Replace if needed.
2. Test the Key Switch by turning the key. It should have a tactile “click” when turned on or off. Replace if needed.
   a. When you turn the mower on, you should hear an audible “click” from the Main Relay. If not, test and replace as necessary.
3. Check the LCD Display to ensure it activates when the mower is turned on.
   a. If the LCD Display doesn’t activate, check the LCD connections. Replace if necessary.

Troubleshooting: Detailed

Use the block diagram as a guide.

Also refer to the beep diagnostic code chart.

4. Check if the mower will drive. If not, check the following, in order, testing drive function after each step:
   a. Make sure the Seat Switch is functional and activated. Replace if necessary.
   b. Test the Brake Switch. Replace if necessary.
   c. Test the Drive Motor Controller. Replace if necessary.
   d. Test the Drive Motor and Hall Sensor. Replace if necessary.
5. Check if the blades engage. If not, turn off blades and check the following, in order, testing function after each step:
   a. Make sure the Seat Switch is functional and activated. Replace if necessary.
   b. Test the Deck Motor. Replace if necessary.
   c. Test the Deck Motor Controller. Replace as a set if either is found bad.
6. Press Headlights button. If headlights don't work, check the following, in order, testing function after each step:
   a. Test Headlights. Replace if necessary.
   b. Check LCD Display connections. Replace LCD Display if necessary.

- **LIKELY CAUSES: 80v Batteries; TIC**

(Main Relay doesn't click)

- Testing Steps: (check function after each step)

1. Turn mower off
2. Unplug all 80v Batteries
3. Insert (1) battery and attempt to turn mower on
4. Repeat step 3. with each battery to test each battery
    a. Replace any batteries found non-functional
5. Replace the TIC
6. Test DC-DC Convertor; replace if necessary
7. Test Main Relay; replace if necessary
8. Visually inspect wiring for any obvious loose connections
9. Check fuses for continuity
    a. 4A fuse is located next to DC-DC Convertor

Mower Drive Non-Functional

(Mower will turn on)

- **LIKELY CAUSES: Drive Motor Controller**
  (Especially if mower beeps every once every two seconds when trying to drive)
- Testing Steps: (check function after each step)

1. Test Angular Transducer
2. Test Drive Motor Controller
3. Test Drive Motor

NOTE: Color of controller housing/casing may vary; typically, between black, gray, and white.

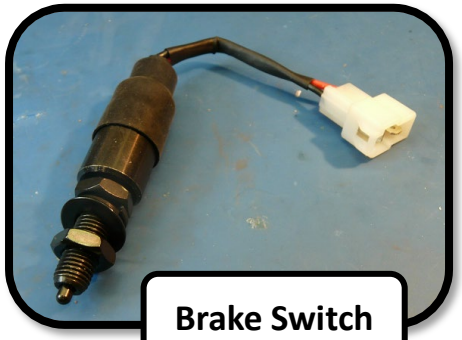
Park / Neutral Light Malfunction

- **LIKELY CAUSES: Drive Motor Controller**
- Testing Steps: (check function after each step)

1. Ensure connections and wiring are secure
   a. Check **Brake Switch** connection
   b. Check **Neutral Switch** connection
   c. Check **LCD Panel** connection
2. Replace **Drive Controller**

Drive Motor Controller

NOTE: Color of controller housing/casing may vary; typically, between black, gray, and white.



Brake Switch

Checking Fuses

- **Testing DC-DC Convertor Fuse (4A Automotive)**
  IMPORTANT: If fuse is blown, find source of problem before replacing the fuse.

- Testing Steps:

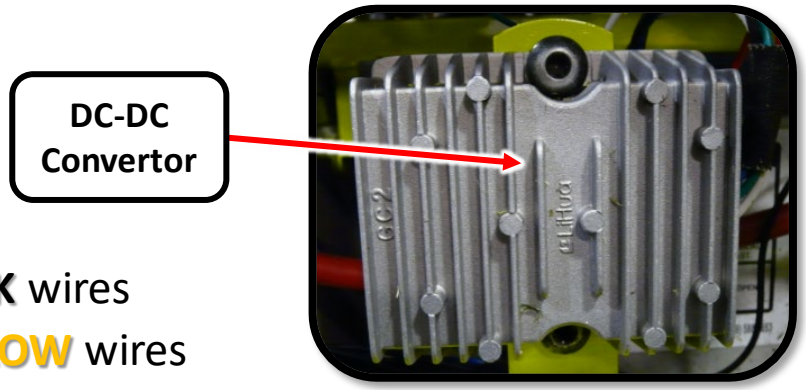
1. Remove rubber cap
2. Set **DMM** to **Resistance**
3. Test for **continuity** at the points indicated

DC-DC Convertor Fuse Testing Points

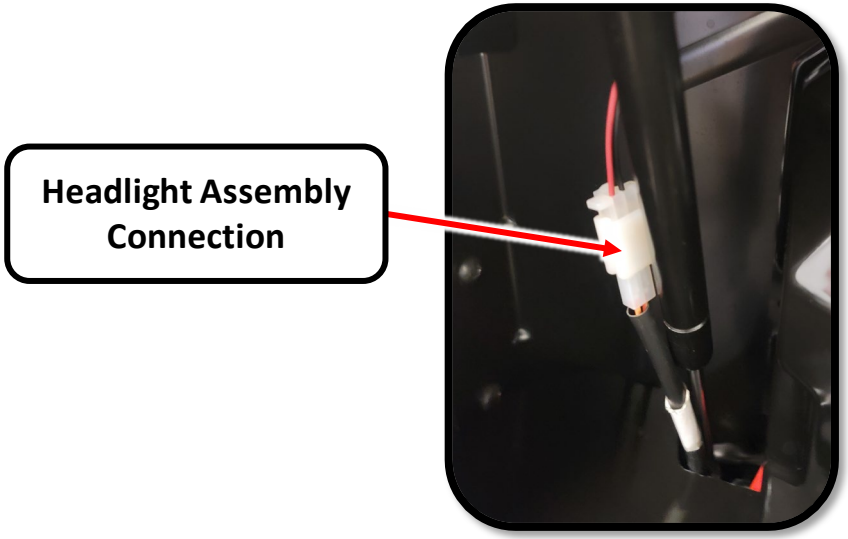
If fuse is blown, replace **ONLY** with a 2A-4A Automotive-type fuse.

DC-DC Convertor / Headlights

- **Testing DC-DC Convertor**
- Testing Steps:
  1. Power mower on
  2. Set **DMM** to **DC Volts**
  3. Check for **~80v** between the **RED** and **BLACK** wires
  4. Check for **~12v** between the **BLUE** and **YELLOW** wires



- **Testing Headlight Assembly**
- Testing Steps:
  1. Power mower on
  2. Turn on **Headlights**
  3. Set **DMM** to **DC Volts**
  4. Check for **~12v** at the harness

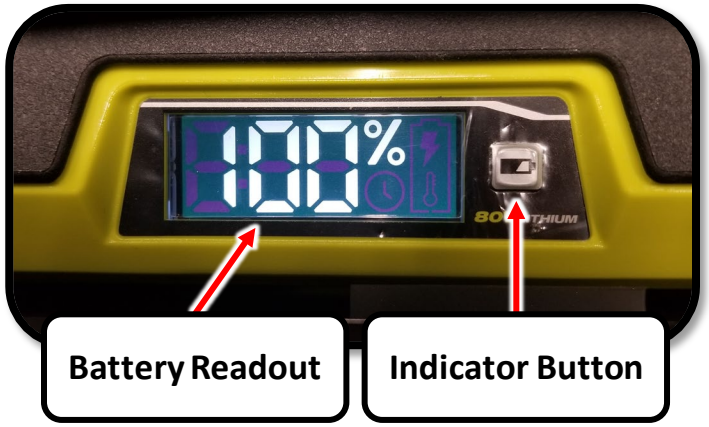


- **Testing Charging Port**
- Testing Steps:
  1. Plug **Charger** into the mower while 80v batteries are installed
  2. Check the **LCD Display** for charging status
     a. If **LCD Display** doesn't power on, check connections to **LCD Display**
        1. If connections are secure, but **LCD Display** doesn't power on, replace **LCD Display**
     b. If **LCD Display** powers on, but doesn't show charging status, replace **Charging Port**
  3. Check **Batteries** to ensure charging while in mower
     a. If the **Batteries** don't appear to charge in mower, attempt to charge **Batteries** outside of mower
        1. If **Batteries** charge outside of mower, replace **Charging Port**
        2. If any customer **Batteries** don't charge outside of mower, attempt to charge known good **Batteries** on customer **Charger**
           a. If known good **Batteries** charge properly, replace any customer **Batteries** found bad
           b. If known good **Batteries** don't charge, replace customer **Charger**

LCD Display during charging

Charging Port

- **Testing 80v Batteries (in mower)**
- Testing Steps:
  1. Press the indicator button on each **battery** and check its readout
     a. If you receive **E:01**, allow battery to cool to room temperature naturally
     b. If you receive **E:02** or **E:03**, remove and reinstall batteries, then attempt to power mower on
        1. If mower doesn't power on, test batteries individually outside of the mower
     c. If you receive **E:04** or **E:05**, replace battery
     d. If you receive a percentage charge, place the single battery in the mower and attempt to power on
        1. If mower doesn't power on, replace battery
     e. If you receive no readout, replace the battery



BATTERY ERROR CODES	
CODE	MEANING
E:01	Electronics Over-Temperature
E:02	System Discharge Overload
E:03	System Charge Overload
E:04	Electronics Failure
E:05	Permanent Failure

- **Testing 80v Batteries (outside mower)**

- Testing Steps:
  1. Press the indicator button on each **battery** and check its readout
     a. If you receive **E:01**, allow battery to cool to room temperature naturally
     b. If you receive any other **Error Code** or no readout, replace the battery
  2. Plug in the **charger** without a **battery** (unplugging and plugging back if already plugged in) and check the **charger** indicator light
     a. If **SOLID RED**, the **charger** is working normally
     b. If any other result, the **charger** is not working normally and should be replaced
  3. Connect the **charger** to the **battery** and check the charger indicator light
     a. If **SOLID RED**, connect a different battery to the same charger
        1. If **SOLID RED**, the **charger** doesn't recognize batteries; replace **charger**
        2. If any other result, the previous **battery** doesn't provide accurate readings and should be replaced
     b. If **SOLID ORANGE**, allow battery to cool to room temperature naturally
     c. If **FLASHING RED** and **GREEN**, replace battery
     d. If **FLASHING** or **SOLID GREEN**, the battery appears to be charging or charged
        1. Place the battery in the mower by itself and attempt to power on
           a. If no power, replace **battery**

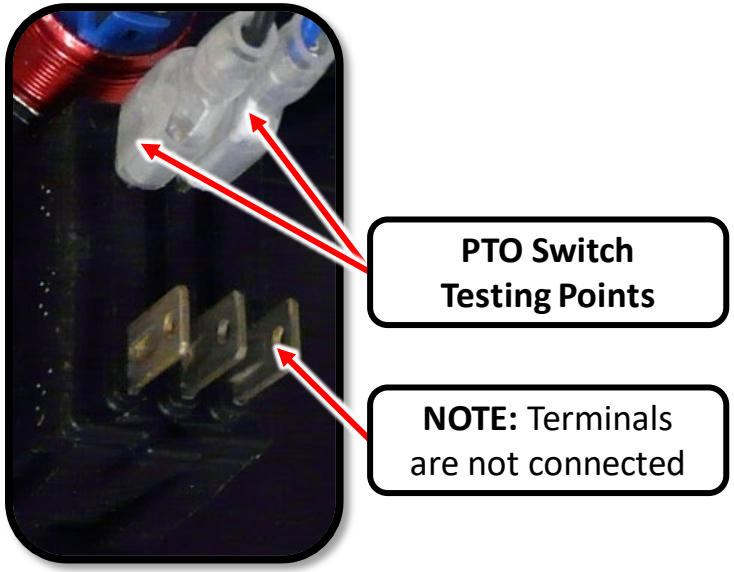
- **Testing 80v Charger**
- Testing Steps:

1. Plug in the **charger** without a **battery** (unplugging and plugging back if already plugged in) and check the **charger** indicator light
    a. If **SOLID RED**, the **charger** is working normally
    b. If any other result, the **charger** is not working normally and should be replaced
2. Check if the **charger** appears to charge a **battery**
    a. If battery appears to charge, put battery on charger by itself and try to power mower on
        1. If no power, try a different battery on the same charger
            1. If the different battery powers the mower, test the previous battery
            2. If the different battery doesn't power the mower, replace charger

Blade Power (PTO) Switch

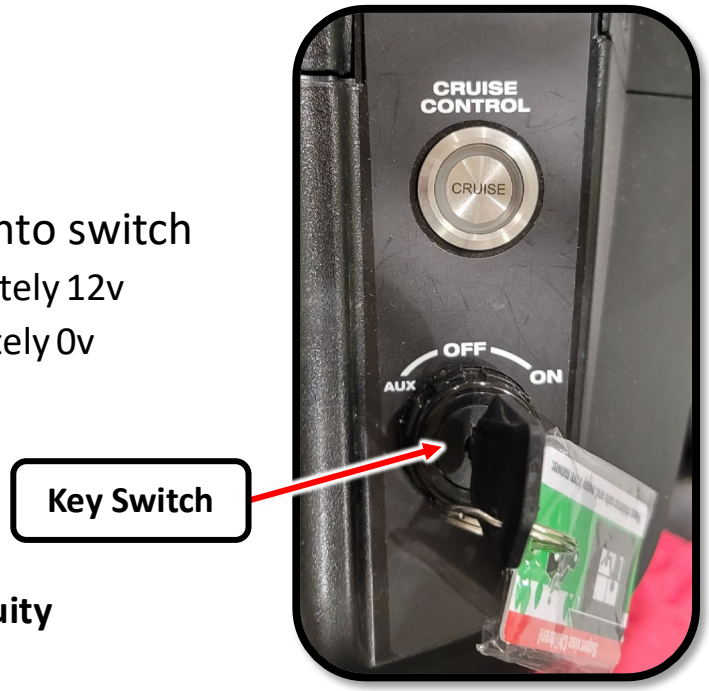
- **Testing Blade Power (PTO) Switch**
- Testing Steps:
  1. Disconnect main power from mower
  2. Set **DMM** to **Resistance**
  3. Test for **continuity** at the points indicated
     a. With the switch pulled out (closed), you should get very low resistance or **Continuity**
     b. With the switch pushed down (open), you should get very high resistance or no **Continuity**

NOTE: Make sure spade lugs are secure. They should be locked in place and should not come loose if when pulling on the wires.

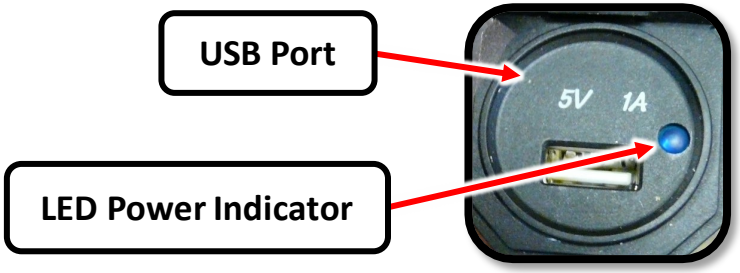


Key Switch / USB Port

- **Testing Key Switch (operates at 12v)**
- Testing Steps: (Wires Connected)
  1. Set **DMM** to **DC Voltage**
  2. Measure **Voltage** between the two wires going into switch
     a. With the switch set to **OFF**, you should get approximately 12v
     b. With the switch set to **ON**, you should get approximately 0v
- Testing Steps: (Wires Disconnected)
  1. Set **DMM** to **Resistance**
  2. Test between the two wires going into switch
     a. With the switch set to **OFF**, you should get no **Continuity**
     b. With the switch set to **ON**, you should get **Continuity**

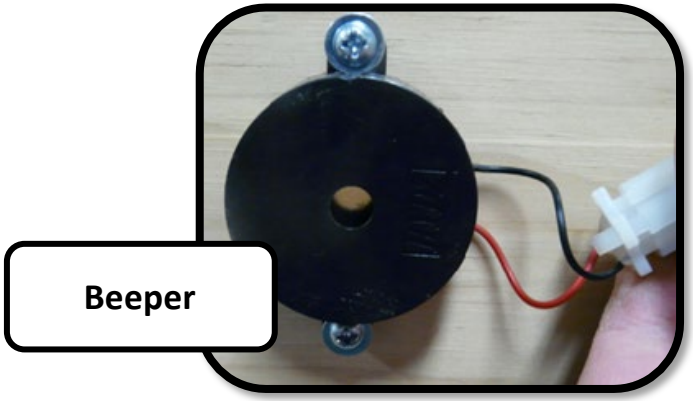


- **Testing USB Port**
- Testing Steps:
  1. Power mower on
  2. Check **USB Port** LED power indicator light
     a. If light does not come on, replace **USB Port**



- **Testing Seat Switch**
- Testing Steps:
  1. Power mower off
  2. Set **DMM** to **Resistance**
  3. Disconnect **Seat Switch** connectors
  4. Test for **continuity** across input terminals
     a. With the switch pushed down, you should get very low resistance or **Continuity**
     b. With the switch released, you should get very high resistance or no **Continuity**

- **Testing Beeper**
- Testing Steps: (on mower)
  1. Power mower on
  2. Remove yourself from the seat
  3. Beeper should activate within 1 minute
- Testing Steps: (at harness)
  1. Set **DMM** to **DC Volts**
  2. Remove yourself from the seat
  3. Place probes in harness socket
  4. Measurement should alternate between 0 and 5v-12v



Beep Codes

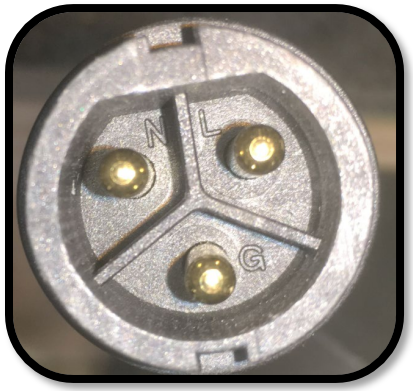
BEEP #	DESCRIPTION	CHECK	IF NOT SOLVED…		
1 Short beep	Reverse	Wiring and connections; ensure solid connection and no loose wires	Replace angular transducer	Replace Drive Motor Controller	
2	Pedal out of Center	Check angular transducer	Check pedal assembly		
3	Seat Switch	Use hand to push down center of seat and repeat	Check Seat Switch connection and wiring	Disconnect Seat Switch and short circuit the male terminal; if resolved, replace Seat Switch	
4	Overtemp Drive Controller	Disconnect Seat Switch and short circuit the male terminal; if resolved, replace Seat Switch	Wait 30 minutes and repeat	Replace Drive Motor Controller	
5	Pedal assembly not responding	Wiring and connections; ensure solid connection and no loose wires	Replace angular transducer		
1 long beep Followed by 2 short beeps	Hall sensor	Wiring and connections; ensure solid connection and no loose wires	Replace Drive Motor Controller		

- **Testing Deck Motor Controller**
- Testing Steps: (resistance of output)
  1. Set **DMM** to **Resistance**
  2. Test for **continuity** between any two terminals
     a. Typical resistance should be roughly 142K Ohms
  3. Test for **continuity** between other terminals
     a. Typical resistance should be roughly 142K Ohms
  4. Measurements should be nearly identical
     a. Typical resistance should be between 10K-70K Ohms

NOTE: Color of controller housing/casing may vary; typically, between black, gray, and white.

- Testing Steps: (power and ground to output)
  1. Set **DMM** to **Diode**
  2. Connect black lead of **DMM** to heavy **RED** wire (ground)
  3. Sequentially connect the red probe to each pin
     a. Measurement should be ~0.48v for each pin

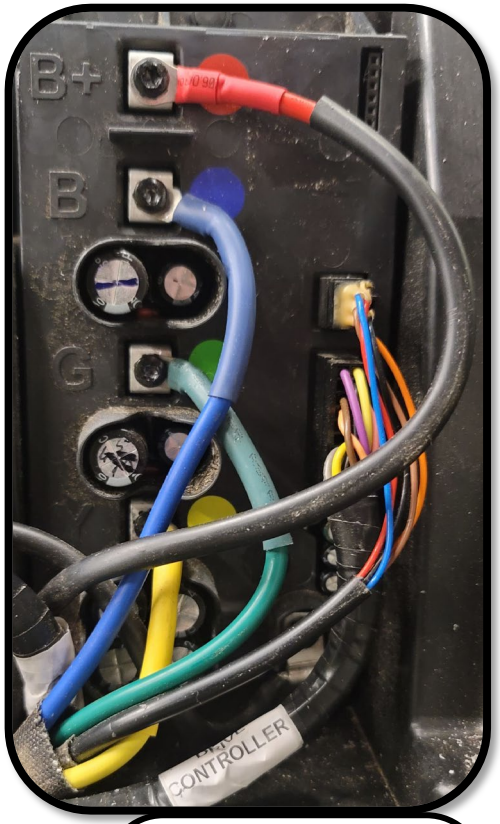
- **Testing Deck Motors**
- Testing Steps:



1. Set **DMM** to **Resistance**
2. Test for **continuity** between any two pins
3. Test for **continuity** between other pins
4. Measurements should be nearly identical
    a. Typical resistance should be ~0.1 Ohm

NOTE: Ignore the **N**, **L**, and **G** labels on the connector. These are NOT for neutral, line, and ground. **Never connect to AC Power!**

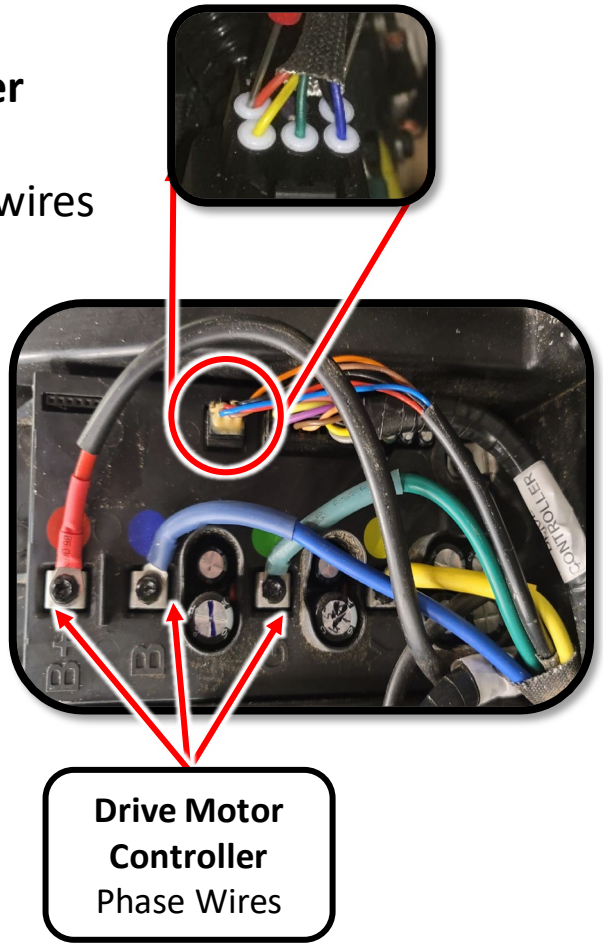
- **Testing Drive Motor Controller**
- Testing Steps: (resistance of output)
  1. Set **DMM** to **Resistance**
  2. Test for **continuity** between any two terminals
  3. Test for **continuity** between other terminals
  4. Measurements should be nearly identical
     a. Typical resistance should be ~18.5K



- Testing Steps: (power and ground to output)
  1. Set **DMM** to **Diode**
  2. Connect black lead of **DMM** to heavy **BLACK** wire
  3. Sequentially connect the red probe to each heavy phase wire
     a. Measurement should be OL or OPEN for each heavy phase wire
  4. Connect black lead of **DMM** to heavy **RED** wire
  5. Sequentially connect the red probe to each heavy phase wire
     a. Measurement should be ~0.45v for each heavy phase wire

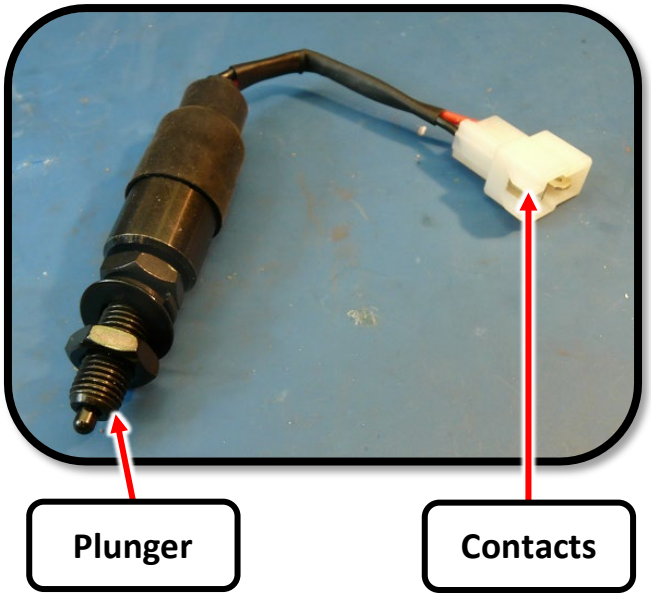
NOTE: Color of controller housing/casing may vary; typically, between black, gray, and white.

- **Testing Drive Motors**
- Testing Steps:
  1. Unbolt heavy phase wires from **Drive Motor Controller**
  2. Set **DMM** to **Resistance**
  3. Test for **resistance** between heavy **GREEN** & **YELLOW** wires
  4. Test for **resistance** between heavy **GREEN** & **BLUE** wires
  5. Measurements should be nearly identical
     a. Typical resistance should be ~0.1 Ohms



- **Testing Drive Motor Hall Sensor**
- Testing Steps:
  1. Power mower on and raise rear-end so wheels don't move mower
  2. Set **DMM** to **DC Volts**
  3. Measure with red probe to **RED** wire and black probe to **BLACK** wire
     a. Measurement should be 4v-5v
  4. Move red probe to **YELLOW** wire and slowly rotate motor
     a. Voltage should jump between 0v and 4v-5v
  5. Repeat with **GREEN** and **BLUE** wires

- **Testing Brake Switch**
- Testing Steps:
  1. Set **DMM** to **DC Volts**
  2. Disconnect **Brake Switch** connector
  3. Measure between **RED** & **BLACK** terminals on mating connector of the harness
     a. Nominal voltage should be 3.2v when plunger depressed and 0v when plunger released



- Testing Steps: (testing independently)
  1. Power mower off
  2. Set **DMM** to **Resistance**
  3. Disconnect **Brake Switch** connector
  4. Test for **continuity** across **RED** & **BLACK** contacts
     a. With the plunger released, you should get very low resistance or **Continuity**
     b. With the plunger depressed, you should get very high resistance or no **Continuity**

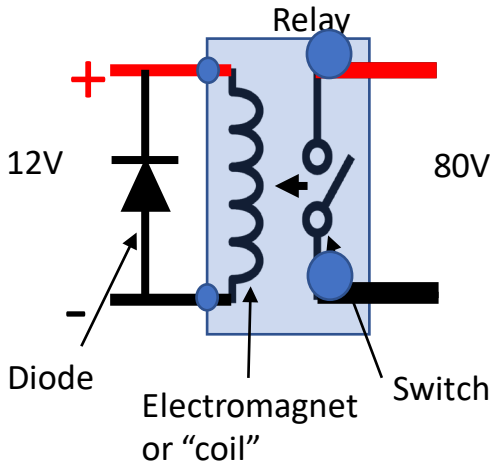
Relay Overview

A **Relay** consists of an electromagnet and a switch operated by the electromagnet within a single package.

When 12v is supplied to the two small terminals on the left of the relay, it causes the switch to close and supply 80v to the mower.

When 12v is absent, the switch will automatically open. This causes the mower to shut off.

While it is standard practice to add a diode across the electromagnet to suppress spikes, the diode is internal to the relay on these models and should require no maintenance.

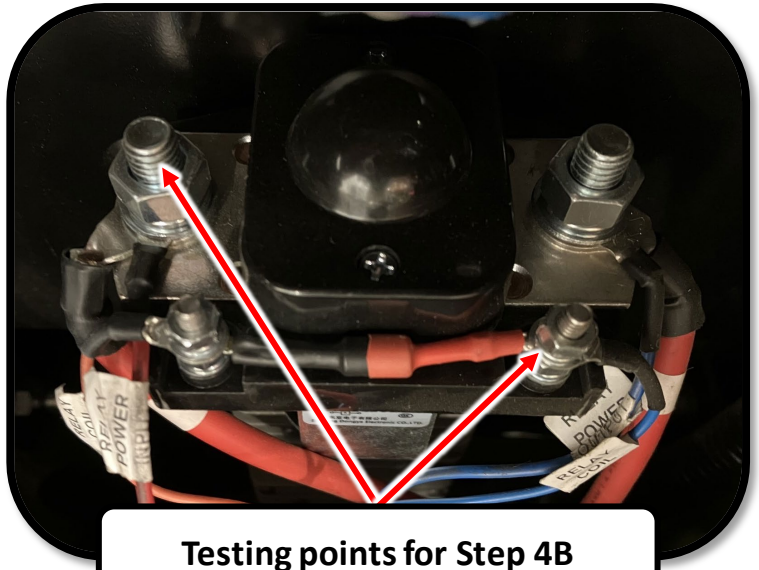


When you turn the mower on/off, you should hear an audible "click" when the relay engages/disengages.

If USB and headlights work, the relay is good

If the relay "chatters", check all connections and bolts are tight.

- **Testing Main Relay**
- Testing Steps:
  1. Power the mower on.
  2. You should hear an audible “click” as the Main Relay activates
  3. Set **DMM** to **DC Volts**
  4. Measure between terminals
     a. Nominal voltage between small terminals (under black caps) should be ~12v
     b. Nominal voltage between the rear left large terminal and front right small terminal (as pictured right) should be ~80v (+/- 5)



Testing points for Step 4B

IMPORTANT NOTE
Never connect terminals on the same side of the Main Relay. This **WILL** damage the unit.

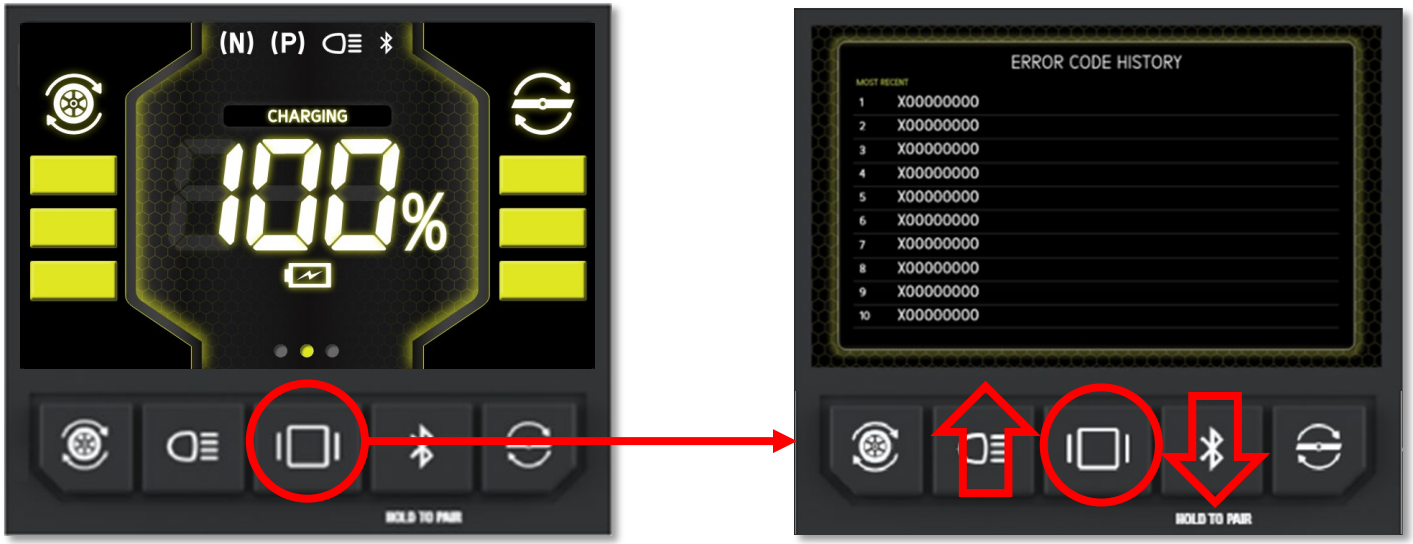
- Testing Steps: (independent of mower)
  1. Set **DMM** to **Resistance**
  2. Connect **DMM** to the large terminals
  3. Apply 12v to the small terminals
  4. You should hear an audible “click” as the Main Relay activates
  5. Measure **Resistance** at the large terminals
     a. Nominal resistance should be ~1.5 Ohms

LCD DISPLAY

Main Dashboard

After booting up/powering on, defaults to Main Dashboard.
After 20s of no inputs, GUI will default to Main Dashboard.

Error Code Interface



Main Dashboard

If you press and hold the **Mode Button** for **10s**, the **Error Code History** is accessed.

Error Code History

To return to the **Main Dashboard**, press and hold the **Mode Button** for **10s**. The **Lights Button** cycles up through the menu and the **Bluetooth Button** cycles down through the menu.

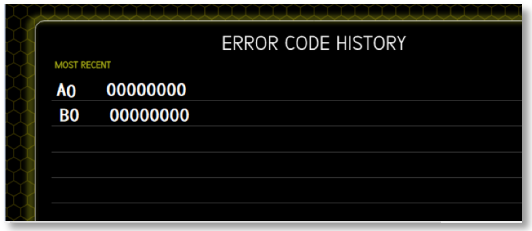
EXAMPLE ERROR CODE: A0 0000000

A0

This **INDICATOR CODE** shows the area where the error is present.

0	0	0	0	0	0	0	0
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

The **BIT CODE** indicates the error(s). A **0** in the space indicates **No Error**. A **1** in the space indicates an **Error.**



To clear **Error Codes**, press and hold the **Headlight** button until "Clear" appears in the lower left corner of the **Error Code** screen. Press the **Drive Speed** button to then clear the codes. This must be done per page, then power cycled.

INDICATOR CODE KEY	
CODE	**MEANING**
A0	Drive Controller data0
A1	Drive Controller data1
A2	Drive Comm Timeout (11111111)
B0	Deck Controller data0
B1	Deck Controller data1
B2	Deck Controller data2
B3	Deck Controller data3
B4	Deck Controller data4
B5	Deck Controller data5
B6	Deck Controller data6
B7	Deck Comm Timeout (11111111)
C0	Permanent Battery Failure
C3	TIC Comm Timeout (11111111)

INDICATOR CODE	MEANING	BIT	MEANING
A0	Drive Controller data0	7	Motor Hall Sensor fault
		6	Over-temperature
		5	Communication failure
		4	Under voltage
		3	Seat Switch failure
		2	Motor stall
		1	Overcurrent
		0	Unit operating; key on, accelerator not in "zero" location – NOT AN ERROR

Error Codes

INDICATOR CODE	MEANING	BIT	MEANING
A1	Drive Controller data1	7	NOT USED
		6	Over-voltage protection
		5	NOT USED
		4	NOT USED
		3	CPU self-test failure
		2	Primary & Secondary self-test fault
		1	AD acquisition failure
		0	Accelerator failure
B0	Deck Controller data0	7	Undervoltage protection (primary)
		6	Overvoltage (primary)
		5	Temperature protection (primary)
		4	Blocking protection (primary)
		3	Motor failure
		2	**Low speed protection (primary)** (Controller will be protected when speed is under 50 RPM & current over 80% of limit)
		1	MCU self-test fault (primary)
		0	NOT USED
B1	Deck Controller data1	7	Current detection circuit fault (primary)
		6	high bridge MOSFET fault (primary)
		5	low bridge MOSFET fault (primary)
		4	high & low bridge MOSFET shorted fault (primary)
		3	Communication failure 1
		2	Communication failure 2
		1	Communication failure 3
		0	Communication failure 4

Error Codes (continued)

INDICATOR CODE	MEANING	BIT	MEANING
B2	Deck Controller data2	7	Seat Switch is not closed
		6	PTO switch is not closed
		5	Error with the seat and PTO logic
		4	F gear
		3	R gear
		2	RMO enable flag
		1	NOT USED
		0	NOT USED
B3	Deck Controller data3	7	Undervoltage protection (secondary control 1)
		6	Overvoltage protection (secondary control 1)
		5	Temperature protection (secondary control 1)
		4	Stall protection (secondary control 1)
		3	Motor out of step (secondary control 1)
		2	Low speed protection (secondary control 1)
		1	MCU self-test fault (secondary control 1)
		0	NOT USED
B4	Deck Controller data4	7	Current detection circuit fault (secondary control 1)
		6	High bridge MOSFET fault (secondary control 1)
		5	Low bridge MOSFET fault (secondary control 1)
		4	High and low bridge MOSFET short circuit fault (secondary control 1)
		3	Communication failure 1
		2	Communication failure 2
		1	Communication failure 3
		0	Communication failure 4

Error Codes (continued)

INDICATOR CODE	MEANING	BIT	MEANING
B5	Deck Controller data5	7	Undervoltage protection (secondary control 2)
		6	Overvoltage protection (secondary control 2)
		5	Temperature protection (secondary control 2)
		4	Stall protection (secondary control 2)
		3	Motor out of step (secondary control 2)
		2	Low speed protection (secondary control 2)
		1	MCU self-test fault (secondary control 2)
		0	NOT USED
B6	Deck Controller data6	7	Current detection circuit fault (secondary control 2)
		6	High bridge MOSFET fault (secondary control 2)
		5	Low bridge MOSFET fault (secondary control 2)
		4	High and low bridge MOSFET short circuit fault (secondary control 2)
		3	Communication failure 1
		2	Communication failure 2
		1	Communication failure 3
		0	Communication failure 4
C0	Permanent Battery Failure	7	NOT USED
		6	NOT USED
		5	NOT USED
		4	40v Battery 4
		3	40v Battery 3
		2	40v Battery 2
		1	40v Battery 1
		0	80v Battery

Update Log

8.26.23 Created (GAW)

8.30.23 Minor visual update (MLB)

9.5.23 Beep codes updated (GAW)