Curtis 1510(A)



This sheet is provided to aid in the installation of your remanufactured CURTIS controller. Upon installation, you may encounter problems that may, or may not, be due to a faulty controller. The following steps must be taken to help diagnose a possible cart fault or faulty controller. An analog or digital volt ohm meter (VOM) will be needed to perform these checks.

WARRANTY WILL BE VOID

If These Steps are Not Performed Before Installing The Control

STEPS TO PERFORM ***BEFORE*** CONTROL INSTALLATION

CHECK MOTOR WINDINGS:

☐ Set your VOM to RESISTANCE (Ω).
☐ With your motor disconnected, measure A1 to A2. This must measure BETWEEN .3Ω and 1Ω.
☐ With your motor disconnected, measure F1 to F2. This must measure BETWEEN 1Ω and 2Ω.
☐ With your motor disconnected, measure A1 to F1. This must measure OPEN.
☐ With your motor disconnected, measure F1 to motor case. This must measure greater than 5MΩ.

CHECK MAIN SOLENOID:

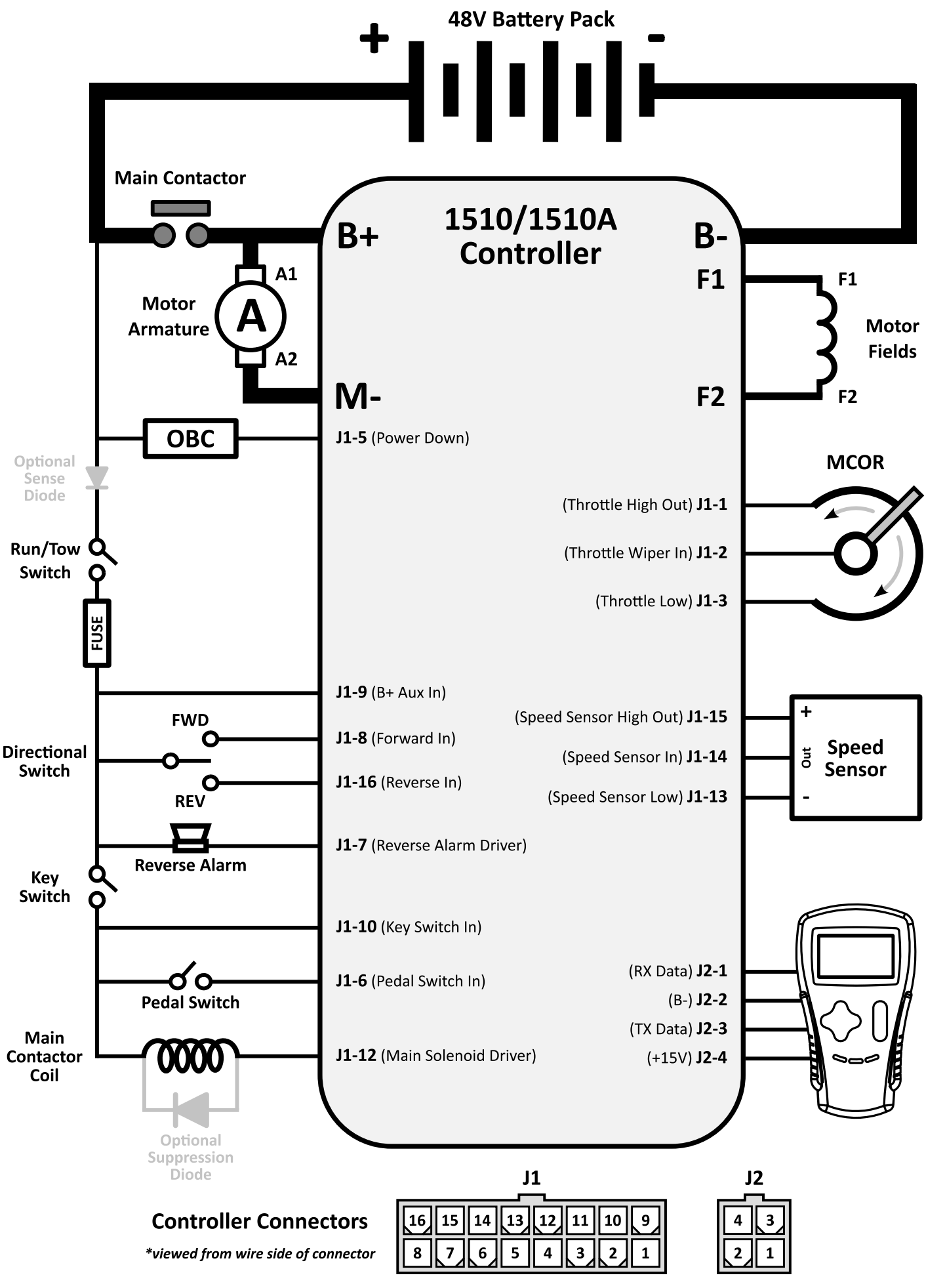
☐ Disconnect all wires from the main solenoid.
☐ Set your VOM to RESISTANCE (Ω).
☐ Measure the solenoid coil. This must measure NO LESS than 100Ω.
☐ Connect VOM leads to the main solenoid lugs.
☐ Attach jumpers from main battery positive and negative to the coil (small terminals).
☐ Meter must jump from infinity to LESS THAN .3Ω.
☐ Remove jumpers and reconnect solenoid wiring from the harness. (If suppression diode is present, The non-banded side must go to the blue/white wire – pin 12 from controller.)

CHECK THE CART WIRE HARNESS:

☐ Check the connectors on the wire harness for corrosion, loose, broken, burnt or missing pins.
☐ Repair or replace pins as necessary.

IF ANY OF THE ABOVE ITEMS ARE NOT WITHIN THE SPECIFICED RANGES THE CONTROLLER WILL FAIL. THESE ITEMS MUST BE CORRECTED BEFORE THE CONTROLLER IS INSTALLED OR WARRANTY WILL BE VOID.

It is recommended to replace your solenoid at the time of controller replacement. FSIP now stocks popular replacement White Rodgers solenoids for your convenience.



Controller Connectors

**viewed from wire side of connector*

Club Car Precedent (IQ) Troubleshooting Sequence

FOR SAFETY, ALWAYS LIFT THE DRIVE WHEELS OFF THE GROUND WHEN TROUBLESHOOTING!

ALL TESTS ARE CONDUCTED WITH RUN-TOW/MAINTENANCE SWITCH IN THE RUN. ALSO, THE CONNECTOR MUST BE ATTACHED TO THE CONTROLLER WHEN MAKING THESE CHECKS. YOU WILL NEED TO 'BACK PROBE' THE PINS FROM THE WIRE SIDE OF THE CONNECTOR. USE A PAPERCLIP IF NECESSARY.

Attach voltmeter negative (-) lead to main battery – for the following tests

Use the following sequence when checking individual pins (don't skip steps). **If you find a fault, do not move on to the next step until the fault is corrected:**

☐ Measure the voltage at the main battery positive post (let's call it Pack Voltage)

☐ **Pin 5** ***With the Charger disconnected***, must be greater than 30V **(if less than 30V this control will be dead)**
- *If not, your OBC may be in sleep mode. Put your cart on charge for 1 minute, disconnect then recheck. If you still do not have more than 30V at this pin, you may have an OBC issue.*

☐ **Pin 9** Must be equal to Pack Voltage
- *If not Pack Voltage, check wiring, Sense Diode (if present), Run-Tow/Maintenance Switch or Fuse.*

☐ **Pin 8** ***With F/R Switch in Forward***, must equal Pack Voltage
- *If not Pack Voltage, check wiring and F/R Switch for an open condition.*

☐ **Pin 16** ***With F/R Switch in Reverse,*** must equal Pack Voltage and Reverse Alarm should sound
- *If not Pack Voltage, check wiring and F/R Switch for an open condition.*

☐ **Pin 7** ***With F/R Switch in Reverse***, must equal 0V and Reverse Alarm should sound
- *If not 0V, check wiring and Reverse Alarm for an open condition.*

☐ **Pin 10** ***With Key On***, must equal Pack Voltage
- *If not Pack Voltage, check Key Switch for open condition.*

☐ **Pin 12** Must equal Pack Voltage
- *If not Pack Voltage, check wiring and Main Solenoid Coil for an open condition*

☐ **Pin 6** ***With Pedal Up***, must equal 0V
- *If not 0V, check wiring and Pedal Switch for a shorted condition.*

☐ **Pin 6** ***With Pedal Down***, must equal Pack Voltage
- *If not Pack Voltage, check wiring and Pedal Switch for an open condition.*

☐ **Pin 12** ***With Pedal Down***, should equal approximately 0V
- *If not* approximately 0V*, check wiring and Main Solenoid Coil.*

☐ **Pin 1** Must equal 5V
- *If not 5V, check wiring and check with MCOR removed – if voltage goes to 5V, replace MCOR.*

☐ **Pin 3** Must equal 0V
- *If not 0V, harness and/or harness connector is defective, check wiring.*

☐ **Pin 2** ***With Pedal Up***, must equal approximately 0.5V
- *If not* approximately 0.5V*, check wiring and MCOR.*

☐ **Pin 2** ***With Pedal Down***, must equal 5V
- *If not 5V, check wiring and MCOR.*

☐ **Pin 15** Must equal 15V
- *If not 15V, check wiring and with Speed Sensor removed. If reading 15V, replace Speed Sensor.*

☐ **Pin 13** Must equal approximately 0V
- *If not approximately 0V, check wiring and check with Speed Sensor.*

☐ **Pin 14** ***While <u>slowly</u> turning the drive wheel***, must toggle between 0V and 5V
- *If not toggling, check wiring and if necessary, replace Speed Sensor.*

TROUBLESHOOTING FAULT CODES

Fault	Causes/Resolutions
HW Failsafe	Internal Failure. *Replace controller.*
Throttle Fault	Throttle Wiper < 0.2V or > 4.8V. Faulty wiring or MCOR. *Replace MCOR.*
Speed Sensor	Speed Sensor pulses not detected. *Replace Speed Sensor.*
Main Welded	Main contacts are welded closed. Possible shorted contactor or external B+ short. *Replace Main Contactor.*
Main Driver On	Main contacts detected closed when not commanded. Possible shorted contactor or external B+ short. *Replace Main Contactor/controller.*
Main Driver Off	Main contacts detected open when commanded closed. Possible faulty contactor. *Replace Main Contactor/controller.*
Main Coil Open	Main Solenoid Coil not closing. Possible wiring issue, a defective solenoid coil or faulty suppresion diode. *Replace Main Contactor or wiring.*
Field Missing	Field current detected by controller is less than expected. Possible faulty Motor or Motor wiring. *Test Motor and wiring. Replace controller.*
HPD (High Pedal Disable)	Pedal is already depressed when key is turned ON. Faulty pedal switch or wiring. *Replace pedal switch.*

Fault	Causes/Resolutions
Overvoltage	Voltage is >68.4 - 75.6V. Faulty Batteries or shorted component to frame of cart. *Check batteries and for loose connection.*
Low Battery	Voltage is <34V. Faulty Batteries or wiring. *Check batteries and for loose connection.*
Thermal Cutback	Controller Heatsink > 85C. Possible brakes dragging, car under extreme loads or tire pressure issues. *Check for non-stock modifications and mechanical issues.*
Motor Stall	Motor Current is high with no travel detected. Faulty motor or motor wiring. *Check motor, wiring and speed sensor.*
Main Dropout (1 and 2)	Main contacts opened when traveling. *Check Main Solenoid and wiring.*
Current Sense Fault	Motor Armature Current issue. *Check motor, wiring and speed sensor.*
Main Driver Overcurrent	Current at Main Coil detected high. Faulty Solenoid Coil, wiring issue or incorrect solenoid. *Replace Main Solenoid.*
M- Shorted	Voltage detected at M- Post of controller is lower than expected. Faulty motor, wiring or possible shorted controller. *Check motor Armature for open/short and motor wiring. Replace controller.*

FSIP Electronics also offers the following Technical Support options …

Troubleshooting Manuals / Codes
www.shop.fsip.biz/en/content/technical-documents

Live Tech Support Chat
www.shop.fsip.biz

Technical Support Forum
fsip.websitetoolbox.com

PRE-INSTALLATION INSTRUCTIONS MUST BE FOLLOWED OR WARRANTY WILL BE VOID

IMPORTANT!
1510(A)
TROUBLESHOOTING INFORMATION INCLUDED IN THIS PACKET

FSIP ELECTRONICS
A division of TVH