

Curtis 1204-410, 411 & 412

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 $.3\Omega$ 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 $5M\Omega$.

CHECK MAIN SOLENOID:

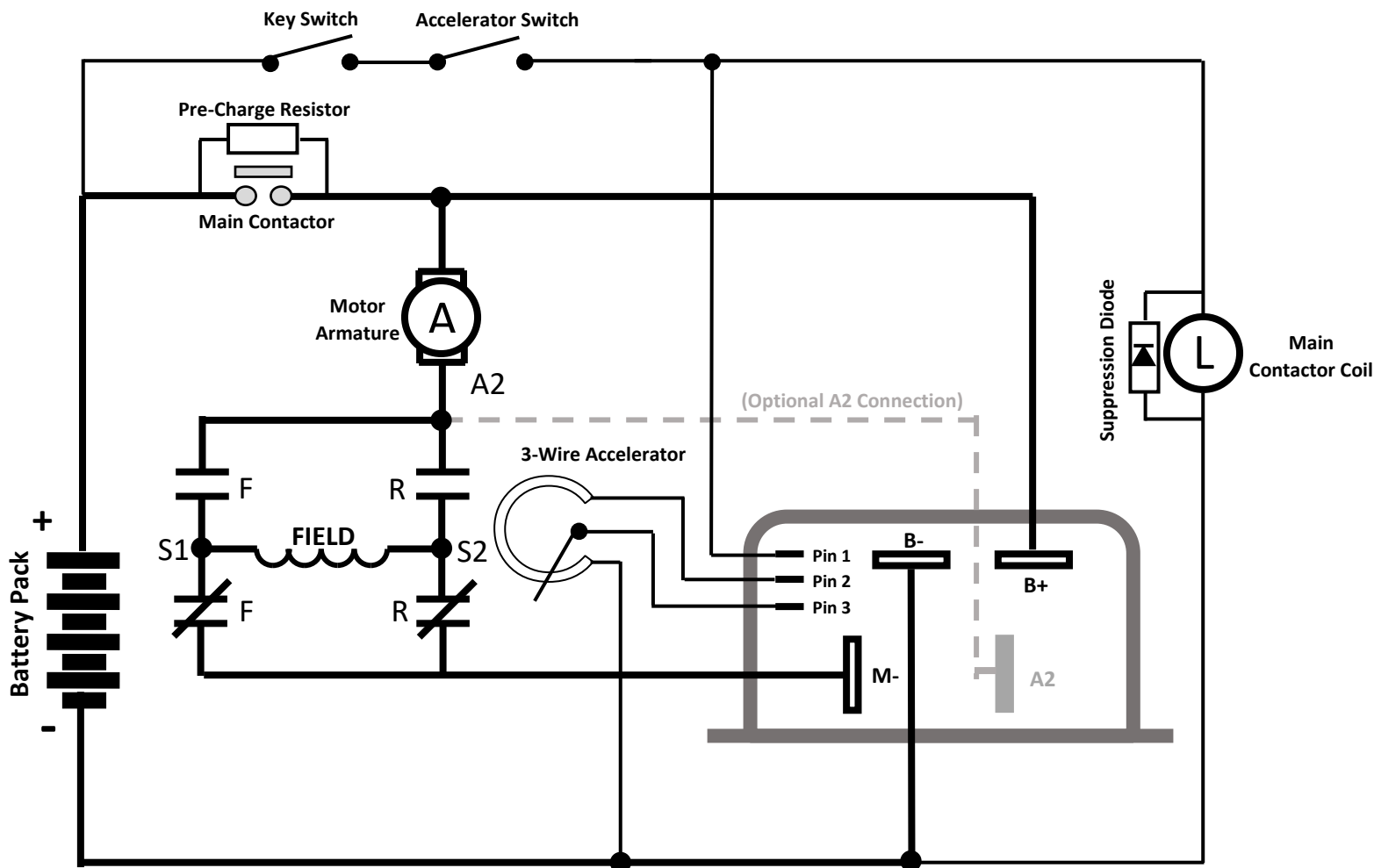
- Disconnect all wires from the main solenoid.
- Set your VOM to RESISTANCE (Ω).
- Measure the solenoid coil. This must measure NO LESS than 100Ω .
- Connect VOM leads to the main solenoid lugs.
- Attach jumpers from main battery positive and negative to the coil (small terminals).
- Meter must jump from infinity to LESS THAN $.3\Omega$.
- Remove jumpers and reconnect solenoid wiring from the harness.

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 SPECIFIED 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.



1204-410, 411, 412 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 POSITION AND WITH A GOOD BATTERY PACK VOLTAGE MEASUREMENT.

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 1 – With Key Switch On, Pedal Depressed, must be pack voltage (and solenoid must click)**
 - If not pack voltage, check Key Switch, Accelerator Switch, and wiring for an open condition.
 - If pack voltage at pin 1, but solenoid does not click, verify pack voltage across the solenoid's small terminals. Repair open wire, or replace solenoid if necessary.
- Pin 2 – With Pedal Depressed, and Solenoid engaged, must be approximately 8-9v.**
 - If not ~8-9v, remove Pin 2 wire from controller and measure voltage, should return back to ~8-9v.
 - If voltage still is not ~8-9v, then replace controller.
- Pin 3 – With Pedal Depressed enough to make Solenoid Engage, must be ~0v.**
 - If not ~0v, check wiring and throttle for an open condition.

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- **Pin 3 – With Pedal Fully Depressed, must be ~8-9v.**
 - If not ~8-9v, check wiring and throttle for an open/short condition.
 - Verify Accelerator POT assembly has 3rd wire of the potentiometer going to Battery Negative.
- **M- Post – With Accelerator slightly depressed, just where the solenoid first clicks, verify M- post reads battery voltage. Then, as the accelerator continues to be depressed to full throttle, M- voltage reading should drop towards 0v, with the motor running at full speed.**
 - If M- post does not show B+ voltage when solenoid first energizes, check the wiring to/from the Main Contactor, thru the Motor Armature winding, thru the F&R switch and the motor field winding as shown on the wiring diagram.

Helpful Hints

- **DO NOT UNDER ESTIMATE THE IMPORTANCE OF MOTOR RESISTANCE CHECKS AND MAIN SOLENOID CHECKS. MANY CART ISSUES ARE CAUSED BY BURNT/DAMAGED BRUSHES THAT WILL BE FOUND AS PART OF THE ARMATURE RESISTANCE CHECK. ALSO A SHORTED ARMATURE AND FIELD WITHIN THE MOTOR WILL DAMAGE THIS CONTROLLER.**

Flight Systems Industrial Products also offers the following Technical Support options ...



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

Live Tech Support Chat
www.fsip.biz



Technical Support Forum
fsip.websitetoolbox.com

Phone Support
 1-800-333-1194 (Option 4)

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

IMPORTANT!
TROUBLESHOOTING INFORMATION
INCLUDED IN THIS PACKET