Curtis 1204, 1205, 1209, 1221

(2-Wire Resistive Throttles 0-5k & 5k-0)

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 vehicle 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: *NOTE: The Curtis controller does not energize the solenoid. Voltage thru the Key and Accelerator Start Switches supply voltage to solenoid coil and other side of coil is connected to B-.*

☐ 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.

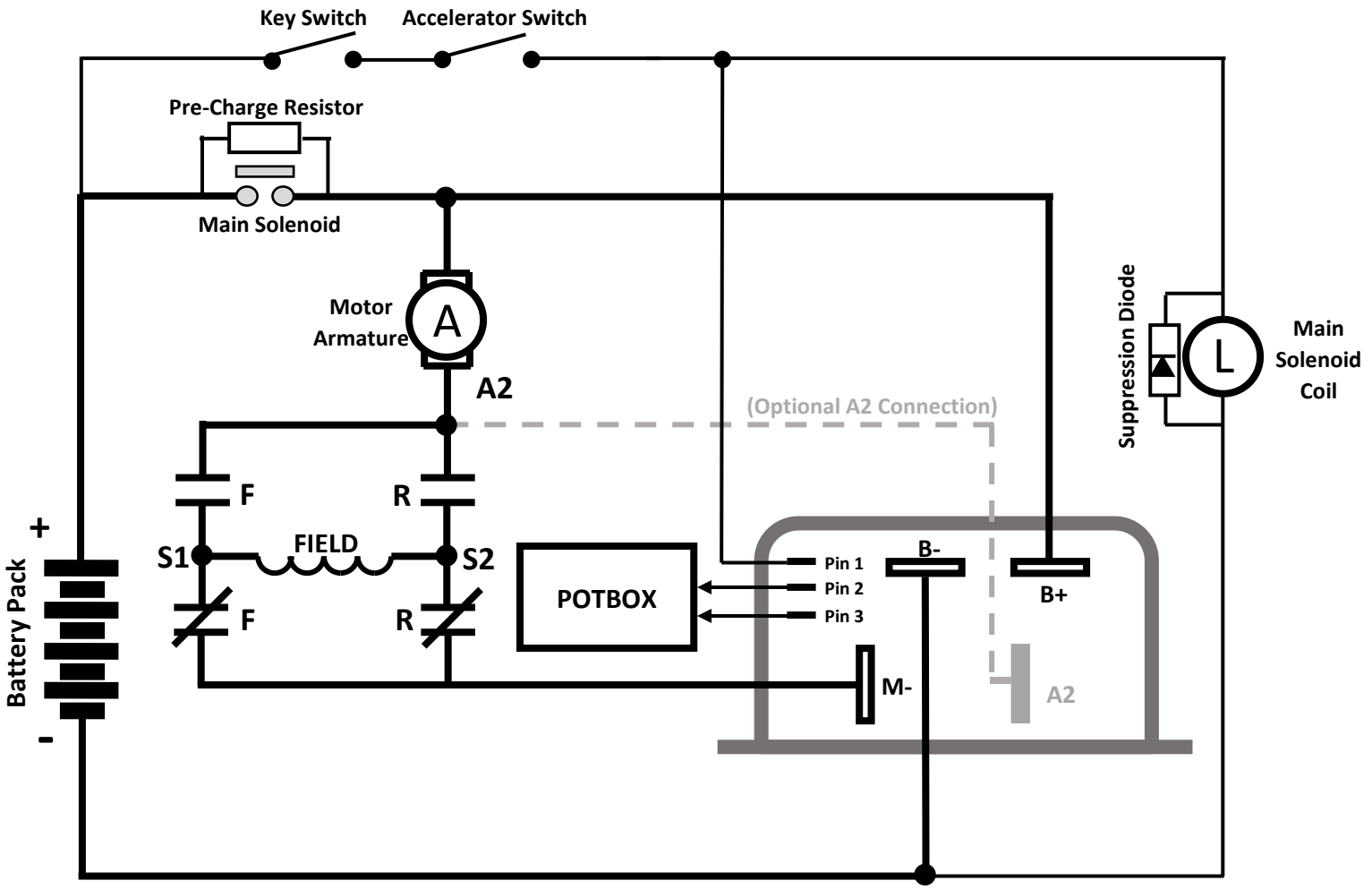
CHECK THE VEHICLE WIRE HARNESS:

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

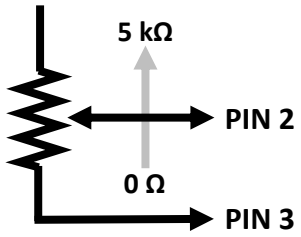
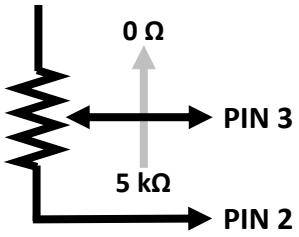
☐ Repair or replace pins as necessary.

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.



BASIC CONTROLLER WIRING

0-5k Throttle Wiring	5k-0 Throttle Wiring
	

TESTING POTBOX RESISTANCE	
With the <u>keyswitch off</u>, pull off the connectors going to the throttle input of the controller. Connect a multimeter to the two wires going to the potbox, and measure the resistance as you move the pedal up and down. The resistance values should be within these ranges:	
Pedal <u>*UP:*</u> 0-50 Ω **Pedal <u>*DOWN:*</u> 4500-5500 Ω**	**Pedal <u>*UP:*</u> 4500-5500 Ω** **Pedal <u>*DOWN:*</u> 0-50 Ω**

Troubleshooting Sequence

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

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.*

NOTE: The Curtis controller does not energize the solenoid, this is a function of the Key and Accelerator Start Switches supplying voltage to solenoid coil.

TESTING THROTTLE INPUT VOLTAGES	
0-5k Throttle ***Pin 2***	**5k-0 Throttle** ***Pin 3***
Pedal *UP:* 3.8v *± 0.2v* **Pedal *DOWN:* 9.5v *± 0.2v***	**Pedal *UP:* 4.3v *± 0.2v*** **Pedal *DOWN:* 10.2v *± 0.2v***

NOTE: If above voltage checks are outside the specified ranges, check Potbox, and wiring for an open condition.

☐ **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.**

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.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