

Curtis 1242/1243

DOES NOT APPLY TO 1243C UNITS

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 $.3\Omega$.

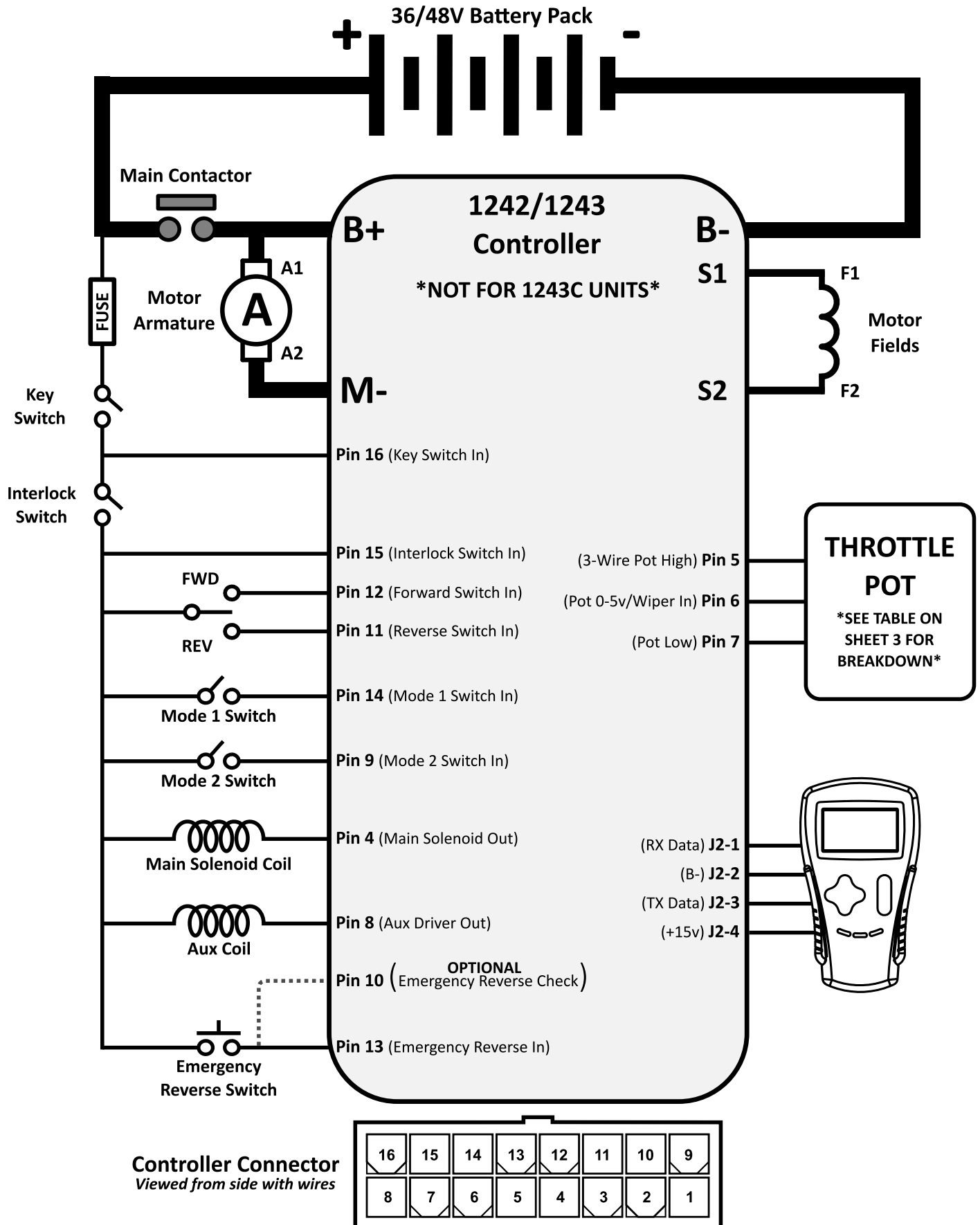
CHECK THE CART WIRE HARNESS:

- ☐ 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.

WIRING DIAGRAM FOR REFERENCE



Some inputs/outputs may not be used on your application. Always refer to the vehicle wiring diagram for specifics

THROTTLE TYPES AND TESTS

Basic Diagram	Type Setting	Resistance Tests	Voltage Tests @ Pin 6
5k-0Ω	1	Pedal <u>Up</u>: 4500-5500Ω Pedal <u>Down</u>: 0-50Ω	Pedal <u>Up</u>: 3.8v ±0.2v Pedal <u>Down</u>: 0.2v ±0.2v
0-5v	2	N/A	Pedal <u>Up</u>: 0.2v ±0.2v Pedal <u>Down</u>: 5v ±0.2v
0-5kΩ 3-Wire	2	Pedal <u>Up</u>: 0-50Ω Pedal <u>Down</u>: 4500-5500Ω	Pedal <u>Up</u>: 0.2v ±0.2v Pedal <u>Down</u>: 5v ±0.2v
0-5kΩ	3	Pedal <u>Up</u>: 0-50Ω Pedal <u>Down</u>: 4500-5500Ω	Pedal <u>Up</u>: 0.2v ±0.2v Pedal <u>Down</u>: 3.8v ±0.2v
Wig-Wag ★ = Neutral Position	4 *1243 only*	N/A	<u>Forward</u> Throttle: 4.4v ±0.2v <u>Neutral</u>: 2.5v ±0.2v <u>Reverse</u> Throttle: 0.6v ±0.2v

Curtis 1243/1243 Troubleshooting Sequence

THESE UNITS ARE PROGRAMMABLE. A MIS-PROGRAMMED CONTROLLER MAY NOT FUNCTION CORRECTLY OR COULD SHOW FALSE FAULT CODES. ALWAYS ENSURE YOUR CONTROL IS PROGRAMMED FOR THE SPECIFIC VEHICLE IT IS BEING INSTALLED INTO.

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. 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 16 With Key Switch On**, must be Pack Voltage
 - If not pack voltage, check wiring and Key Switch for a shorted/open condition
- ☐ **Pin 15 With Interlock Switch On**, must be Pack Voltage
 - If not Pack Voltage, check wiring and Interlock Switch for a shorted/open condition.
- ☐ **Pin 12 With F/R Switch in Reverse**, must equal 0 volts
 - If not 0 volts, check wiring and F/R Switch for a shorted condition
- ☐ **Pin 12 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 11 With F/R Switch in Forward**, must equal 0 volts
 - If not 0 volts, check wiring and F/R Switch for a shorted condition
- ☐ **Pin 11 With F/R Switch in Reverse** must equal Pack Voltage
 - If not Pack Voltage, check wiring and F/R Switch for an open condition
- ☐ **Pin 4 With Key Switch and Interlock Switch On**, must equal 0v and solenoid should engage
 - If not approximately 0v, check Solenoid Coil and wiring for an open/shorted condition. If this tests good, controller may be faulty

FOR TESTING THE THROTTLE, PLEASE SEE SHEET 3

OPTIONAL

- ☐ **Pin 14 With Mode 1 Switch On**, must be Pack Voltage
 - If not Pack Voltage, check wiring and Mode 1 Switch for a shorted/open condition.
- ☐ **Pin 9 With Mode 2 Switch On**, must be Pack Voltage
 - If not Pack Voltage, check wiring and Mode 2 Switch for a shorted/open condition.
- ☐ **Pin 8 With Key Switch and Interlock Switch On**, must equal 0v and Aux Relay should engage
 - If not approximately 0v, check Aux Relay Coil and wiring for an open/shorted condition. If this tests good, controller may be faulty
- ☐ **Pin 13 With Emergency Switch On**, must be Pack Voltage
 - If not Pack Voltage, check wiring and Emergency Reverse Switch for a shorted/open condition.

TROUBLESHOOTING FAULT CODES

LED CODE	Handset Display	Possible Causes	Fault Clearance
0,1	No Faults	N/A	N/A
1,1	CURRENT SHUNT FAULT	1. Abnormal vehicle operation causing high current spikes. 2. Current sensor out of range . 3. Controller failure.	Cycle KSI. If problem persists, replace controller.
1,2	HW FAILSAFE	1. Noisy environment 2. Self-test or watchdog fault. 3. Controller failure.	Cycle KSI. If problem persists, replace controller.
1,3	M - SHORTED	1. Internal or external short of M- to B-. 2. Incorrect motor wiring. 3. Controller failure.	Check High Current wiring; Cycle KSI. If problem persists, replace controller.
1,4	SRO	1. Improper sequence of KSI, interlock, and direction inputs. 2. Interlock or direction switch circuit open. 3. Sequencing delay too short 4. Wrong SRO or throttle type selected. 5. Misadjusted throttle pot.	Follow proper sequence; adjust throttle if necessary; adjust programmable parameters if necessary.
2,1	THROTTLE WIPER HI	1. Throttle input wire open or shorted to B+. 2. Defective throttle pot. 3. Wrong throttle type selected.	When Throttle Wiper High input returns to valid range.
2,2	EMR REV WIRING	1. Emergency reverse wire or check wire open.	Re-apply emergency reverse cycle interlock.
2,3	HPD	1. Improper sequence of KSI, interlock, and throttle inputs. 2. Misadjusted throttle pot. 3. Sequencing delay too short. 4. Wrong HPD or throttle type selected. 5. Misadjusted throttle pot.	Follow proper sequence; adjust throttle if necessary; adjust programmable parameters if necessary.
	SRVC TOTAL	1. Total Maintenance timer expired	Reset with programmer.
	SRVC TRAC	1. Traction Maintenance timer expired	Reset with programmer.
	TOTAL DISABLED	1. Total disable timer expired	Reset with programmer.
	TRAC DISABLED	1. Traction disable timer expired	Reset with programmer.
2,4	THROTTLE WIPER LO	1. Throttle pot wire open or shorted to B +. 2. Wrong throttle type selected. 3. Defective throttle pot.	When Throttle Wiper Low input returns to valid range.
3,1	FIELD SHORT	1. Main contactor coil shorted 2. Field winding shorted to B+ or B-. 3. Field resistance too low.	Check contactor coil and field winding; cycle KSI.
3,2	MAIN CONT WELDED	1. Main contactor stuck closed . 2. Main contactor driver shorted.	Check wiring and contactor; cycle KSI.
3,3	FIELD OPEN	1. Field winding connection open. 2. Field winding open.	Check wiring and cycle KSI.
3,4	MISSING CONTACTOR	1. Main contactor coil open. 2. Main contactor missing. 3. Wire to main contactor open.	Check wiring and cycle KSI.

TROUBLESHOOTING FAULT CODES

LED CODE	Handset Display	Possible Causes	Fault Clearance
4,1	LOW BATTERY VOLTAGE	1. Battery voltage < undervoltage cutback. 2. Corroded battery terminal. 3. Loose battery or controller terminal.	When voltage rises above undervoltage cutoff point.
4,2	OVERVOLTAGE	1. Battery voltage > overvoltage shutdown limit. 2. Vehicle operating with charger attached.	When voltage falls below overvoltage cutoff point.
4,3	THERMAL CUTBACK	1. Temperature >85°C or < -25°C. 2. Excessive load on vehicle. 3. Improper mounting of controller.	Clears when heatsink temperature returns to within acceptable range.
4,4	ANTI-TIEDOWN	1. Mode switches shorted to B+. 2. Mode Select 1 "tied down" to select Mode 2 or Mode 4 permanently.	Release Mode Switch 1.
	MOTOR HOT	1. Field resistance > motor hot setpoint	When resistance < setpoint.
	MOTOR WARM	1. Field resistance > motor hot setpoint	When resistance < setpoint.

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.shop.fsip.biz



Technical Support Forum
fsip.websitetoolbox.com

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

IMPORTANT!
1242 & 1243
TROUBLESHOOTING INFORMATION
INCLUDED IN THIS PACKET

