Curtis 1264-ITS

Part Numbers: 1264-5404, 5405, 5407

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

CHECK MOTOR WINDINGS:

☐ Set your VOM to RESISTANCE (Ω).

☐ To test the resistance of VOM leads, please touch the meter leads together. Subtract this measurement from each test below to get your true measurement.

☐ With motor disconnected, measure **A1** to **A2**. This **should** measure approximately BETWEEN **.2Ω** and **2Ω**.

☐ With motor disconnected, measure **F1** to **F2**. This **should** measure approximately BETWEEN **.8Ω** and **3Ω**.

☐ With motor disconnected, measure **A1** to **F1**. This **should** measure **OPEN**.

☐ With motor disconnected, measure **F1** to motor case. This **should** 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 **should** measure **100Ω - 250Ω** (depending on solenoid type).

☐ Connect VOM leads to the main solenoid lugs.

☐ Attach jumpers from main battery positive and negative to the coil (small terminals).

☐ Meter **should** 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 wire from J1 pin 17 from the controller. Be sure to check diode functionality with VOM prior to install. If pre-charge resister is installed, please remove. This control is equipped with an internal resistor, and installing one on the solenoid could cause damage to the control.)**

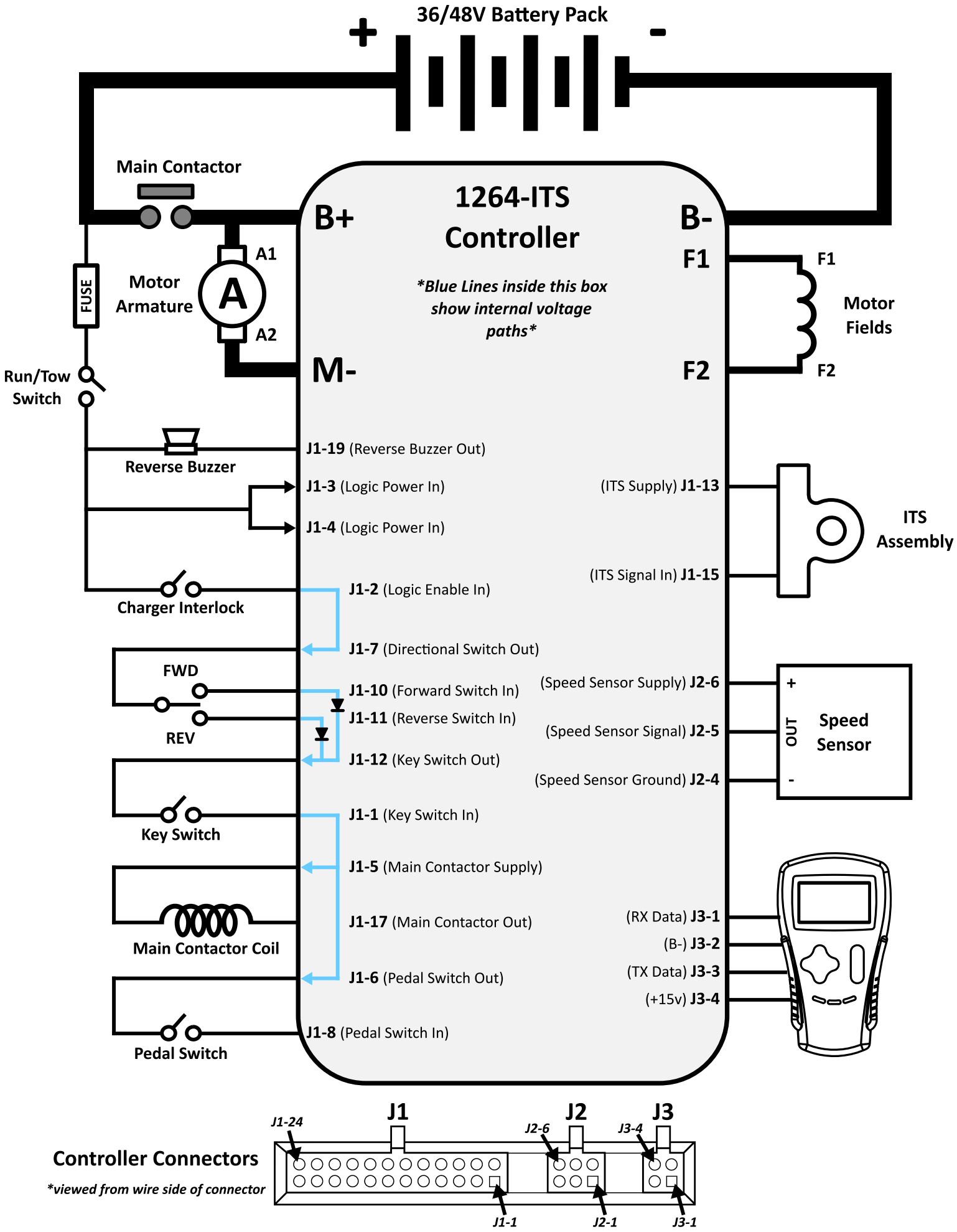
CHECK THE CART WIRE HARNESS:

☐ 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.


36/48V Battery Pack
+
-
Main Contactor
1264-ITS
Controller
B+
B-
F1
F2
M-
Blue Lines inside this box show internal voltage paths
FUSE
Motor Armature
A1
A2
A
Motor Fields
Run/Tow Switch
Reverse Buzzer
J1-19 (Reverse Buzzer Out)
J1-3 (Logic Power In)
J1-4 (Logic Power In)
(ITS Supply) J1-13
(ITS Signal In) J1-15
ITS Assembly
Charger Interlock
J1-2 (Logic Enable In)
J1-7 (Directional Switch Out)
FWD
REV
J1-10 (Forward Switch In)
J1-11 (Reverse Switch In)
J1-12 (Key Switch Out)
(Speed Sensor Supply) J2-6
(Speed Sensor Signal) J2-5
(Speed Sensor Ground) J2-4
OUT
Speed Sensor
Key Switch
J1-1 (Key Switch In)
J1-5 (Main Contactor Supply)
Main Contactor Coil
J1-17 (Main Contactor Out)
J1-6 (Pedal Switch Out)
(RX Data) J3-1
(B-) J3-2
(TX Data) J3-3
(+15v) J3-4
Pedal Switch
J1-8 (Pedal Switch In)
Controller Connectors
*viewed from wire side of connector
J1
J2
J3
J1-24
J2-6
J3-4
J1-1
J2-1
J3-1

Generic 1264-ITS Troubleshooting Sequence

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

THE FOLLOWING 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 Negative (-) 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 J1-3** ***Must be Pack Voltage*** with cart in Run
- *If not Pack Voltage, check wiring, Run/Tow switch and fuse for an open condition.*

☐ **Pin J1-4** ***Must be Pack Voltage*** with cart in Run
- *If not Pack Voltage, check wiring, Run/Tow switch and fuse for an open condition.*

☐ **Pin J1-2** ***With charger disconnected***, must be Pack Voltage
- *If not Pack Voltage, check wiring and charger interlock switch for an open condition.*

☐ **Pin J1-7** ***With charger disconnected***, must be Pack Voltage
- *If not Pack Voltage, check continuity between J1-2 and J1-7. If open, internal trace in controller has been damaged.*

☐ **Pin J1-10** ***With F/R Switch in Reverse***, must equal 0 volts
- *If not 0 volts, check wiring and F/R Switch for a shorted condition. If wiring tests good, check continuity between J1-10 to J1-11, if shorted, internal controller damage.*

☐ **Pin J1-10** ***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 J1-11** ***With F/R Switch in Forward***, must equal 0 volts
- *If not 0 volts, check wiring and F/R Switch for a shorted condition. If wiring tests good, check continuity between J1-10 to J1-11, if shorted, internal controller damage.*

☐ **Pin J1-11** ***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 J1-12** ***With F/R Switch in Forward or Reverse*** must equal Pack Voltage
- *If not Pack Voltage, and previous directional switch tests are good, then internal trace in controller has been damaged.*

☐ **Pin J1-1** ***With Key Switch On*** must equal Pack Voltage
- *If not Pack Voltage, check wiring and Key Switch for an open condition.*

☐ **Pin J1-5** ***With Key Switch On*** must equal Pack Voltage
- *If not Pack Voltage, check continuity between J1-1 and J1-5. If open, internal trace in controller has been damaged.*

☐ **Pin J1-17** ***With Key Switch On*** must equal Pack Voltage (Solenoid should NOT be engaged at this time)
- *If not Pack Voltage, check wiring and Key Switch for an open condition. Also check main contactor coil and wiring for an open condition.*

☐ **Pin J1-6** ***With Key Switch On*** must equal Pack Voltage
- *If not Pack Voltage, check continuity between J1-6 and J1-1. If open, internal trace in controller has been damaged.*

Continued on next page …

☐ **Pin J1-8** ***With Pedal Up***, must equal 0 volts
- *If not 0 volts, check wiring and Pedal Switch for a shorted condition.*

☐ **Pin J1-8** ***With Pedal Down***, must equal Pack Voltage
- *If not Pack Voltage, check wiring and Pedal Switch for an open condition.*

☐ **Pin J1-17** ***With Key Switch On*, and Pedal Down**, must equal less than 1v (Solenoid should be engaged)
- *If not less than 1v, and solenoid does not engage, check solenoid coil/wiring for faulty condition. Ensure no active fault occurring.*

☐ **Pin J1-19** ***With F/R Switch in Neutral**, m*ust equal approximately Pack Voltage
- *If not approximately Pack Voltage, check wiring and Reverse Alarm for an open condition.*

☐ **Pin J1-19** ***With F/R Switch in Reverse**, m*ust equal less than approximately 1 volt (and Reverse Alarm beeps)
- *If correct voltage, but no sound from Reverse Alarm, replace beeper.*

☐ **Pin J1-13** ***With Key Switch on**, m*ust equal 14 to 15 volts
- *If not 14 to 15 volts, remove ITS sensor and recheck. If voltage returns, check ITS sensor and wiring; ITS sensor or wiring may be faulty. If voltage does not return, controller may be defective.*

☐ **Pin J1-15** ***With Key Switch on, and Pedal up***, must equal approximately 1 (+/- .3) volts
- *If voltage is out of tolerance, ITS may be defective. Replace as necessary.*

☐ **Pin J1-15** ***With Key Switch on, and Pedal fully depressed***, must equal approximately 3.5 (+/- .3) volts
- *If voltage is out of tolerance, ITS may be defective. Replace as necessary.*

☐ **Pin J2-6** ***Must equal 14 to 15 volts***
- *If not 14 to 15 volts, check wiring and check with Speed Sensor removed – if voltage returns to 14 to 15 volts, Speed Sensor may be faulty.*

☐ **Pin J2-4** ***Must equal 0 volts***
- *If not 0 volts, harness and/or harness connector is defective, check wiring.*

☐ **Pin J2-5** ***While <u>slowly</u> turning the drive wheel***, must toggle between 0 volts and approximately 5 volts
- *If not toggling, check wiring and if necessary, replace Speed Sensor and/or magnet.*

<u>FAULT CODES</u>

A built-in Status LED is visible through a window in the label on top of the controller. When the controller detects a fault, the Status LED flashes the 2-digit fault code. The code is flashed continuously until the fault is corrected. For example, code “3,2” – welded main contactor – appears as:

(3, 2)

(3, 2)

(3, 2)

A Curtis Handset may also be used to determine Active and Stored faults. Using the Troubleshooting Chart shows a description and possible causes of each fault.

Continued on next page …

TROUBLESHOOTING CHART

LED CODE	PROGRAMMER LCD DISPLAY	EXPLANATION	POSSIBLE CAUSE
1,1	HW FAILSAFE	Self-test or watchdog fault	1. Controller Defective
1,2	THROTTLE FAULT 1	Wiper Signal out of range (ITS fault)	1. Throttle input wire open 2. Throttle input wire shorted to B+ or B- 3. ITS defective
1,3	SPEED SENSOR FAULT	No pulses from speed sensor	1. Speed sensor not connected 2. Speed sensor defective 3. Speed sensor magnet damaged
1,4	HPD	High Pedal Disable fault	1. Improper sequence of direction and throttle inputs
1,5	MOTOR STALL	Motor stall at current	1. Slope too steep for vehicle weight 2. Mechanically locked motor 3. EM brake wiring fault 4. Speed sensor defective
2,1	LOW BATTERY VOLTAGE	Low battery voltage	1. Battery voltage < undervoltage cutback threshold 2. Corroded battery terminal
2,2	OVERVOLTAGE	Overvoltage	1. Battery voltage > overvoltage shutdown threshold 2. Vehicle operating with charger attached 3. Battery disconnected during regen braking
2,3	THERMAL CUTBACK	Over/under temperature cutback	1. Temperature > 85 degrees C or < 25 degrees C 2. Excessive load on vehicle 3. Improper mounting of controller 4. Operation in extreme environment
2,4	MAIN DRIVER ON	Main contactor coil held low	1. Main contactor missing or wire to coil open 2. Controller defective
2,5	VOLTS DIRECT CURRENT FAULT	Vehicle will not run	1. Controller Defective
3,1	MAIN DRIVER OFF	Main contactor driver held high	1. Main contactor coil shorted 2. Controller defective
3,2	MAIN WELDED	Main contactor welded	1. Main contactor stuck closed 2. Main contactor driver shorted
3,3	PRECHARGE FAULT	Internal voltage too low at startup	1. External short or leakage path to B- on external B+ connection (lighting, DC-DC converter connected to controller B+?) 2. Controller defective
3,4	FIELD MISSING	Field winding fault	1. Motor field wiring loose 2. Motor field wiring open
3,5	FIELD OVERCURRENT	Field winding fault	1. Motor field wiring shorted 2. Motor defective
4,1	CURRENT SENSE FAULT	Armature or field current sensor fault	1. Controller defective
4,3	M- SHORTED	Internal M- short to B-	1. Verify M- and B- cables are not swapped 2. Motor armature shorted 3. Controller defective
4,4	AUX RELAY DNC	Aux relay did not close	1. Controller defective
4,5	WELDED AUX RELAY	Welded aux relay	1. Controller defective

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TROUBLESHOOTING CHART, cont'd			
5,1	EEPROM FAILSAFE	Controller memory fault	1. Controller defective
5,2	MAIN COIL OPEN	Missing main contactor	1. Main contactor coil open or not connected
5,3	MAIN CONTACTOR DNC	Main contactor did not close when commanded	1. Check all solenoid wiring; Replace solenoid if necessary
5,5	MISSING CONTACTOR	Main contactor open	1. Check all solenoid wiring; Replace solenoid if necessary

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!
1264- (ITS THROTTLE)
TROUBLESHOOTING INFORMATION
INCLUDED IN THIS PACKET

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