

Curtis 1206AC E-Z-GO RXV

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 PHASES: Set your VOM to RESISTANCE (Ω). (NOTE: Motor Resistance between U, V, and W is 6.8 – 8.36 milliohms. Most DVM meters will not read this. Test below for open windings)

- With your motor disconnected, measure U to V. This should measure BETWEEN .5 Ω and 1 Ω .
- With your motor disconnected, measure V to W. This should measure BETWEEN .5 Ω and 1 Ω .
- With your motor disconnected, measure W to U. This should measure BETWEEN .5 Ω and 1 Ω .
- Motor disconnected, measure U, V, & W to Motor Frame. This must measure greater than 5M Ω .

CHECK MAIN SOLENOID:

- Disconnect all wires from the main solenoid. Set your VOM to RESISTANCE (Ω).
- Measure the solenoid coil. This should measure between 95 and 115 ohms.
- 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 Ω .
- Remove jumpers and reconnect solenoid wiring from the harness. (If suppression diode is present, The non-banded side must go to the Red/Black wire – from pin 6 of controller.)

CHECK BRAKE COIL

- Set your VOM to RESISTANCE (Ω). Measure the brake coil. This should measure approx. 25 Ω at room temp.

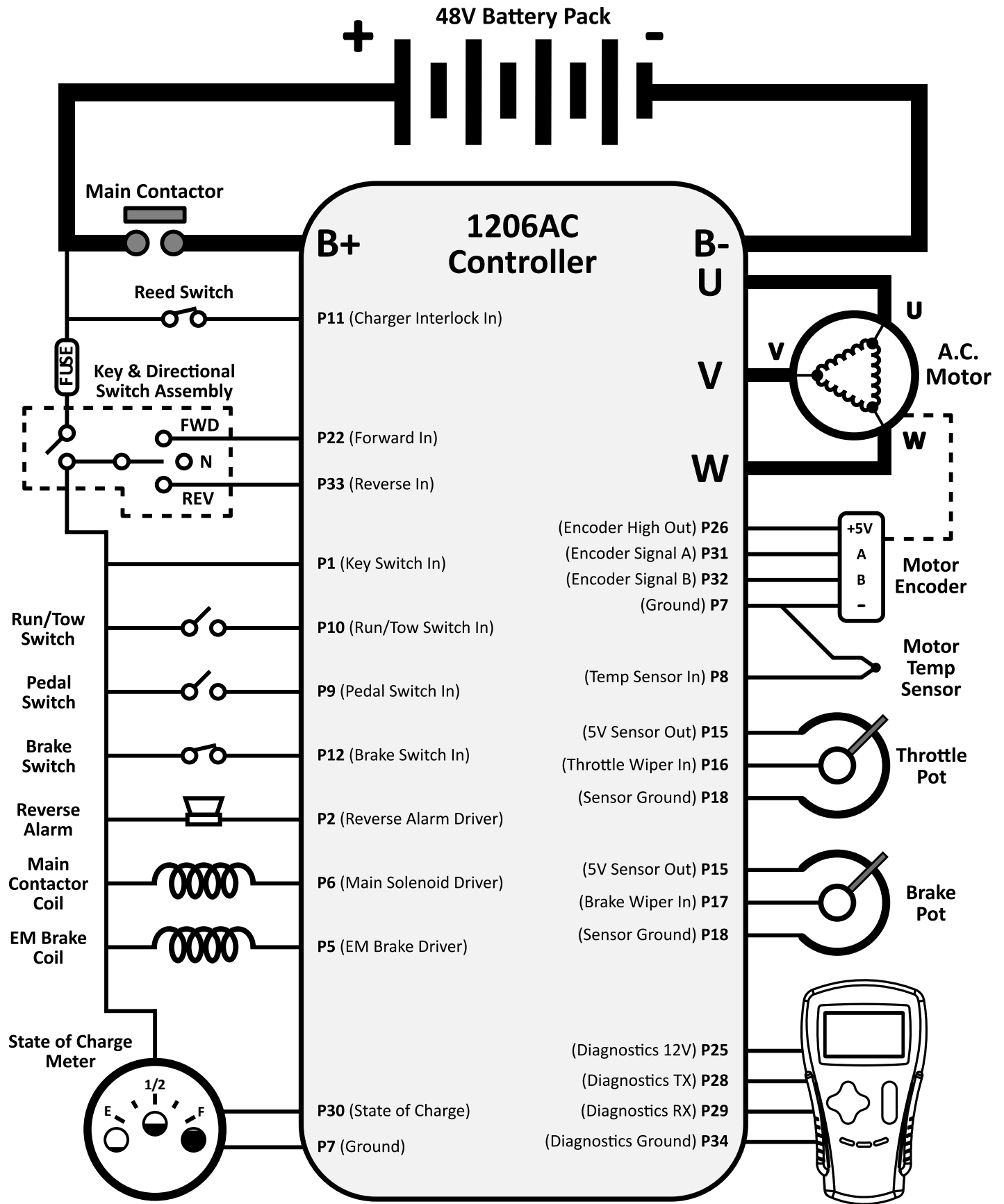
CHECK THE CART WIRE HARNESS:

- 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.

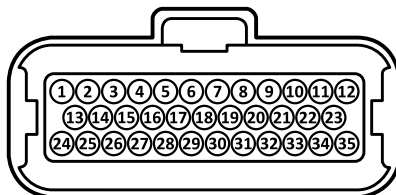
It is recommended to replace your solenoid at the time of controller replacement. FSIP now stocks popular replacement White Rodgers solenoids for your convenience.

48V Battery Pack



Controller Connectors

*viewed from wire side of connector



RXV POWER-UP SEQUENCE

During the first second after turning the key on, the vehicle performs several system checks:

- **Electric Brake Test:** The controller attempts to rotate the motor a quarter-turn in each direction.
- **Reverse Alarm Test:** The reverse alarm is activated briefly for 100 milliseconds.
- **Charger Connection Test:** The controller verifies whether the charging port is connected to a charger.
- **Throttle Switch Verification:** The throttle switch must be in the "open" position to pass the startup procedure.
- **Throttle Position Check:** The controller ensures the throttle position sensor (TPS) indicates 0% throttle.
- **Throttle Range Test:** The controller confirms the TPS operates within the expected open and closed range.

If any issues are detected in these systems, the vehicle will not operate.

The Curtis Handheld Diagnostic unit is used for programming, testing, troubleshooting, tuning, diagnosing and parameter adjustments for speed controller and auxiliary devices.

Note: Many fault codes will disable the EM Brake and/or Main Solenoid until the fault condition is cleared.



Plug the Curtis handheld programmer into the Curtis programmer port only. If plugged into the wrong port, voltage from other interface circuits may result in permanent damage to the programmer.

Note: Do not use the CAN plug located under the 4 cup console.



Curtis 1206AC RXV Troubleshooting Sequence

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

ALL TESTS ARE CONDUCTED 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 11 With Charger NOT plugged in**, must be > 16V
 - *If not >16V, check Charger Interlock input and wiring for an open/shorted condition.*
- Pin 10 With Tow/Run in Run**, must be approximately 0V (Pin 10 will read Pack voltage in TOW Position)
 - *If not approximately 0V, check Tow/Run input and wiring for an open/shorted condition.*
- Pin 1 With Key Switch set to Forward or Reverse**, must be approximately Pack Voltage
 - *If not approximately Pack Voltage, check Key Switch input, Main Input Fuse, and wiring for an open/shorted condition.*
- Pin 22 With Key Switch set to Forward**, must be approximately Pack Voltage
 - *If not approximately Pack Voltage, check Key Switch input, Main Input Fuse, and wiring for an open/shorted condition.*
- Pin 33 With Key Switch set to Reverse**, must be approximately Pack Voltage
 - *If not approximately Pack Voltage, check Key Switch input, Main Input Fuse, and wiring for an open/shorted condition.*
- Pin 2 With Key Switch set to Reverse**, must be approximately 0V and reverse buzzer should sound
 - *If not approximately 0V, Reverse Buzzer and wiring for an open/shorted condition. If this tests good, controller may be faulty.*
- Pin 9 With Pedal Switch NOT engaged**, must be approximately 0V
 - *If not approximately 0V, check Pedal Switch input and wiring for a shorted condition.*
- Pin 9 With Pedal Switch engaged**, must be approximately Pack Voltage
 - *If not approximately Pack Voltage, check Pedal Switch input and wiring for an open/shorted condition.*
- Pin 12 With Brake Switch NOT engaged**, must be approximately Pack Voltage
 - *If not approximately Pack Voltage, check Brake Switch input and wiring for an open/shorted condition.*
- Pin 12 With Brake Switch engaged**, must be approximately 0V
 - *If not approximately 0V, check Brake Switch input and wiring for a shorted condition.*
- Pin 6 With Key Switch engaged**, must be approximately 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.*
- Pin 15** Must be approximately 5V
 - *If not approximately 5V, check wiring for an open/shorted condition. If this tests good, controller may be faulty. A faulty Throttle or Brake sensor could affect 5V output.*
- Pin 18** Must be approximately 0V
 - *If not approximately 0V, check wiring for an open/shorted condition. If this tests good, controller may be faulty.*

- Pin 16 With Throttle Pedal Up**, must be approximately 0.5V, but no less than 0.35V
 - If not approximately 0.5V, check Throttle assembly and wiring for an open/shorted condition.
- Pin 16 With Throttle Pedal Fully Depressed**, must be < approximately 4.8V
 - If not approximately 4.8V, check Throttle assembly and wiring for an open/shorted condition.
- Pin 17 With Brake Pedal Up**, must be approximately 0.5V, but no less than 0.35V
 - If not approximately 0.5V, check Brake assembly and wiring for an open/shorted condition.
- Pin 17 With Brake Pedal Fully Depressed**, must be approximately 4.8V
 - If not approximately 4.8V, check Brake assembly and wiring for an open/shorted condition.
- Pin 26** Must be approximately 5V
 - If not approximately 5V, check wiring for an open/shorted condition. If this tests good, controller may be faulty.
- Pin 7** Must be approximately 0V
 - If not approximately 0V, check Motor Encoder, Temperature Sensor, and wiring for an open/shorted condition. If this tests good, controller may be faulty.
- Pin 31 & Pin 32** With the Tow Switch Engaged, and the Key Switch set to Neutral, measure across the two pins. Rotating the drive wheel should show 0-5V
 - If not approximately 0-5V, check Encoder, Motor, and wiring for an open/shorted condition.

Fault Codes and Troubleshooting

FAULT	POTENTIAL CAUSES	FAULT	POTENTIAL CAUSES	FAULT	POTENTIAL CAUSES
Brake Input Supervision	1. Mismatch in Analog/Digital Value. 2. Check Wiring and Brake Sensor.	Controller Overtemp Cutback	1. Controller Temp >85C. 2. Check Heat Sink Temp. 3. Possible Resistor fault.	EM Brake Driver OFF	1. Driver current <320mA when driver set ON. 2. Open Brake Circuit. 3. Check Park Brake.
Brake Light Coil Missing	1. Voltage at pin 4 too low when driver is OFF.	Controller Severe Overtemp	1. Controller Temp >95C. 2. Check Heat Sink Temp. 3. Possible Resistor fault.	EM Brake Driver ON	1. Driver current >320mA when driver set OFF. 2. Verify Driver Voltage.
Brake Light Driver OC	1. Brake Light Relay > 1A. 2. Check Relay. 3. Shorted wiring or a faulty Brake Sensor.	Controller Severe Undertemp	1. Controller Temp <-40C. 2. Check Heat Sink Temp.	EM Brake Failed to Set	1. Wheel Rotation exceeds 1/4 revolutions. 2. Check for Park Brake slip.
Brake Wiper	1. Brake pot wiper <0.35V. 2. Brake pot wiper >4.8V. 3. Check Brake Pedal.	Current Sensor Fault	1. Check Motor connection. 2. Open/Shorted Motor.	EM Brake Test Failed	1. Motor Rotation exceeds 2 revolutions. 2. Check for Park Brake slip during start-up test.
Buzzer Driver OC	1. Buzzer current >200mA. 2. Check wiring and buzzer.	Direction Error	1. Fwd/Rev both high for >1 second. 2. Check wiring and Fwd/Rev switch.	Encoder Fault	1. Motor pulses missing while driving. 2. Encoder supply <22mA. 3. Check encoder/wiring.
Buzzer Driver OFF	1. Buzzer current <3mA when driver set ON. 2. Open/Short buzzer.	EEPROM Failure	1. EEPROM or check sum corrupt. 2. Cycle Key Switch. 3. Controller micro failure.	Encoder Supervision	1. Motor RPM between Supervision and Micro ≠. 2. Check encoder/wiring.
Buzzer Driver ON	1. Buzzer current >3mA when driver set OFF. 2. Buzzer short to ground. 3. Controller driver short.	EM Brake Coil Missing	1. Pin 5 Voltage low when EM Brake Driver is OFF. 2. Open Brake Circuit. 3. Put cart in TOW; cart should freely roll. 4. Inspect Park Brake.	Full Brake Check	1. EM Brake Switch Hi & Brake Input = 100%. 2. EM Brake Switch Low & Brake input < 90%. 3. Check Brake Switch. 4. Check Brake Pedal.
Charger Input Supervision	1. Faulty Charger interlock. 2. Check interlock wiring.	EM Brake Driver OC	1. Brake driver > 3A. 2. Dead short in Park Brake circuit. 3. Check wiring and EM Brake coil.	FWD Switch Supervision	1. Switch status faulty. 2. Check F/R Switch and wiring.
Controller Overcurrent	1. Current >315A on controller U, V, or W. 2. Check for bad wiring or faulty motor. 3. External short.				

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FAULT	POTENTIAL CAUSES	FAULT	POTENTIAL CAUSES	FAULT	POTENTIAL CAUSES
HPD/Sequence Fault	1. Pedal Switch ON prior to Key Switch. 2. Faulty Pedal Switch or wiring issue.	Motor Open	1. U, V, or W <20A while other phases >100A or All Phases <5A. 2. Check for open motor.	Stall Detected	1. Missing Motor pulses. 2. Check Motor Encoder and wiring.
Key Switch Supervision	1. Cycle Key Switch. 2. Check Key Switch and wiring.	Motor Temp Hot Cutback	1. Motor Temp >140C. 2. Check Sensor and Motor.	Supervisor Comms	1. Communication error. 2. Check for HPD fault.
Main Coil Missing	1. Voltage on pin 6 is low when driver is OFF. 2. Check solenoid and wiring.	Oversvoltage Cutback	1. Capacitor voltage >72V. 2. Check Resistor circuit.	Supervisor Watchdog	1. Cycle the Key Switch.
Main Contactor Did Not Close	1. Capacitor Voltage < KSI - 2V when closed. 2. Check Voltage across Main contacts.	Pedal Switch Supervision	1. Check Pedal Switch and wiring.	Throttle Supervision	1. Verify sensor voltages and % on handset. 2. Check the 5V circuit.
Main Contactor Dropped	1. Capacitor Voltage < KSI - 5V when closed. 2. Check for battery issue. 3. Faulty Contactor or external connection to Main contacts faulty.	Precharge Failed	1. Capacitor Voltage <75% of Battery Voltage. 2. Check Main Contactor and wiring. 3. External connection to controller B+/B- faulty.	Throttle Wiper	1. Throttle pot wiper voltage <0.35V. 2. Throttle pot wiper voltage >4.8V. 3. Check Throttle pot and wiring.
Main Contactor Welded	1. Capacitor Voltage within 1V of previous reading when contactor opened. 2. Contactor tips welded closed.	Resistor Driver OC	1. Check Resistor or wiring.	Throttle Zero Check	1. Pedal Switch closed and Throttle pot reads <0%. 2. Pedal Switch open and Throttle pot reads >9%. 3. Check Throttle pot and wiring.
Main Driver OC	1. Main Coil current >2A. 2. Shorted Main Coil or wiring issue.	Resistor Driver OFF	1. Resistor Driver < current limit when set ON. 2. Check Resistor or wiring.	Tow Switch Supervision	1. Check switch operation on handset. 2. Check for Brake unlock when set to Tow. 3. Check Tow Switch and wiring.
Main Driver OFF	1. Current <65mA when driver set ON. 2. Check contactor and wiring.	Resistor Driver ON	1. Resistor Driver > current limit when set OFF. 2. Check Resistor or wiring.	Undervoltage Cutback	1. Voltage below set point (38V). 2. Check batter condition. 3. Possible wiring or contactor issue.
Main Driver ON	1. Current >65mA when driver set OFF. 2. Check contactor and wiring.	Resistor Missing	1. Check wiring and ensure resistor for .86ohms.		
		REV Switch Supervision	1. Check F/R Switch and wiring.		
		Severe Oversvoltage	1. Capacitor Voltage > set Battery Volts + 10V. 2. Bad Battery or resistor.		
		Severe Undervoltage	1. Voltage below 20V. 2. Bad Battery or resistor. 3. Check Main Contactor.		

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!
EZGO RXV CURTIS 1206AC
TROUBLESHOOTING INFORMATION
INCLUDED IN THIS PACKET