Trouble Shooting Electrical Problems on the Economy SCV

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1. **Trouble Shooting Electrical Problems on the Economy SCV**
2. **The Minuteman Economy SCV Rider Scrubbers uses a state of the art electronic circuitry with several diagnostic features. The battery indicator serves two purposes. They are:**
3. **To display the charge status of the batteries on the LED display. This uses 10 LED bars, for example: 10-lighted LED bars indicates a fully charged battery, 5-lighted LED bars, indicates batteries are discharged 50%, 1-lighted LED indicates the batteries are discharged and so on.**
4. **To display error codes for easier diagnosis of electrical problems. These are displayed by flashing a quantity of LED bars in different sequences. The deferent flash sequences are as follows:**

Rippling: One LED bar lighted, then two LEDS, then three LEDS and so on until all ten LEDS are lighted. Then it starts over.

Flashing Steadily: Flashing a set amount of LEDS for each error code on and off steadily. The number of LEDS lighted indicates the type of error detected.

Flashing in Sequence: Flashing a set amount of LEDS for each error Code in a pulse sequence. Example: The four LEDS flashes two times then pauses, then it repeats itself.

Trouble Shooting the Code 8 Error

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(on the ES2832, CP2832 and SC2832E Models Only)

1. Check for loose or burnt connections on the controller, batteries, cables and the circuit breaker. Make the sure the circuit breaker is not damaged.
2. Measure the total battery voltage at the batteries and at the battery connections on the controller. They should be exactly the same. A 1/10 of a volt or more difference would indicate a problem in the connections.
3. Check to see, if the operator has recently washed the machine down and got water inside of the brush motor or in the controller area.
4. On the ES2832 and CP2832 only disconnect the plug on the Service Mode Switch. This is accessible by tilting the solution tank forward. Power the machine up with it disconnected. If error code is cleared replace the switch.
5. Check for a disconnected or an open circuit or faulty potentiometer on the throttle or speed circuit. Controller may not be detecting it in the circuit. Do a continuity test. See “Testing the potentiometer” section.
6. Disconnect one motor connector from the Trio controller at a time and disconnect the batteries for 1 minute and restart the machine. If the code 8 disappears and is replaced by a different code, the circuit disconnected should be considered suspect. For example the brush was disconnected. The code 8 is replaced by code 3. Code 3 indicates the brush motor is disconnected. Check for a loose or broken connection at the brush deck. Check to see if water has gotten inside the brush motor. Check for a shorted motor.
7. Static electricity. Check both the ground chains; there is one on the brush deck and one on the rear of the machine. They should be contacting the floor. The one on the deck should touch the floor when the deck is down. They also should have continuity between the end of the chain and the frame of the machine. Repair or clean if needed if needed.
8. If everything checks OK, replace the Trio Controller.

Note controllers can be damaged by loose connections on inputs and outputs, static electricity and water on electrical components such as on or in the controller and motors.

Testing the Throttle Potentiometer

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1. The throttle potentiometer resistance can be measured with an ohmmeter.
2. Unplug the throttle potentiometer at the connector next to it.
3. Analog type meters are recommended for this test.
4. Measuring across the black and white wires on the potentiometer, the resistance should be zero ohms with pedal on the riders in the neutral position or speed knob on the ES2832 and CP2832 in the full counterclockwise position. When the pedal or knob is moved to the full throttle position, in should be a smooth resistance change without dropping out. It should measure 5K (5 thousand ohms) in the full position.
5. Measuring across the black and the red wire the resistance should be 5K (5 thousand), when in the neutral position.
6. When the pedal is at full throttle or the knob is full speed position, the resistance should drop to zero.
7. Loosen the nut and screw on the throttle arm and adjust if needed (on the riders only).

- Note: when moving the throttle to the full position, the resistance should be smooth, without dropping out for both tests. If the resistance does not go to 5K during the test, the arm and the potentiometer may need to be adjusted to achieve it.

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8. If they do not find a problem here, have them retest at the connector at the Trio controller. Reconnect the plug at the throttle potentiometer.
9. Unplug the P3 connector (The large white connector) on the controller under the seat on the riders and behind the two rear panels on the ES2832s and CP2832s.
10. Locate the black/orange and the black/pink wire.
11. Measuring across the black/orange and black/pink wires the resistance should be zero ohms in the neutral position. It should 5k in the full throttle position. When the pedal is at full throttle the resistance should drop to zero.
12. Measure across the black/pink and the black/white wires. The resistance should be 5K (5 thousand) in the neutral position.
13. It should drop to zero ohms with the throttle in the full position.
14. If your reading is different with this test check all the connections between the controller and the throttle control, including the seat switch.