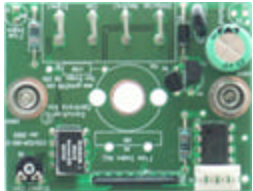


**Warning:** These tests are to be performed by qualified personnel who are familiar with the machinery where the EVO/ECM series control and connected motor is installed. All mechanical, electrical and other applicable safety practices must be observed when performing these tests. While the EVO/ECM series controls are low voltage devices, they are often installed in or near high voltage cabinets and wiring. And they are connected to electrically isolated connections on the ECM motor. Wiring and device faults can occur. Always test for high voltage before starting these tests!

**High Voltage Fault Test** *Perform this test in addition to all tests and practices prescribed by the equipment manufacturer and your professional training.*

1. Remove the machine's control cabinet cover or otherwise obtain access to the component side of the EVO/ECM series control. Leave everything connected. **Typical Component Side** → 
2. If you removed power to gain access, re-power the equipment as necessary to troubleshoot the equipment.
3. Set the multimeter to measure AC Volts.
4. Connect the BLACK lead to electrical earth.
5. Touch the RED lead to the EVO/ECM series connection marked 24Vac. The meter should read about 30 Volts AC. If the meter reads a voltage above 48 Volts AC, immediately disconnect the machine. There is a high voltage fault somewhere in the system.
6. Touch the RED lead to the other connectors to the board. If the meter reads a voltage above 48 Volts AC, immediately disconnect the machine. There is a high voltage fault somewhere in the system.
7. Touch the RED lead to the metal wire grippers (top of connector) for each of the 4 motor wires. If the meter reads a voltage above 48 Volts AC, immediately disconnect the machine. There is a high voltage fault somewhere in the system.





**Motor Control Connection** → 

You are ready to test the EVO/ECM series control.

This procedure allows you to test an EVO/ECM series GE ECM Motor control while it is powered and connected to the motor. The series includes many types of controls, all having the same interface to the ECM motor.

### Motor Interface

The EVO/ECM series uses a 4 wire interface to the motor. Most equipment uses our standard color coding for these wires:

Pin 1.	White 	Motor On/Off	0 = Off, ~22Vdc = On
Pin 2.	Black 	Tachometer	
Pin 3.	Green 	Common	
Pin 4.	Red 	Speed	0 = Min. Speed, ~22Vdc = Max. Speed

### Problem Solver:

#### ECM motor will not run.

Perform the Motor On test.

#### Motor Runs but the speed does not change.

Perform the Variable Speed Test.

#### Motor does not turn off.

Perform the Motor Off Test

#### Motor does not run unless power is removed and restored.

Perform Motor Off Test

#### Intermittent operation when connected to an automation system

Perform Motor Off Test

#### Motor Runs, but there is no RPM indication.

Perform the Tachometer Test

### A Fast Test.....

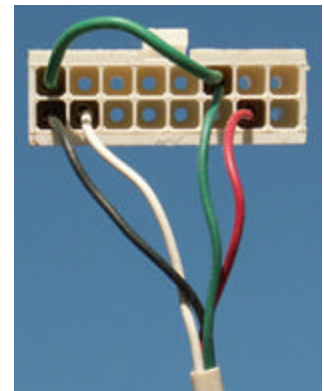
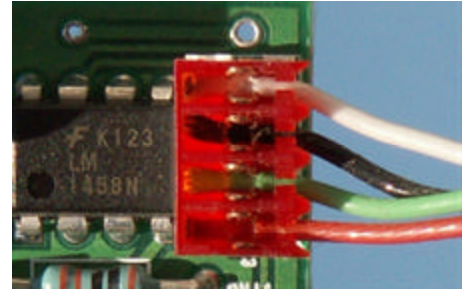
If the motor is not running and you want to determine if the EVO/ECM series control is calling for the motor to run, just measure the DC voltage between the Green and White wires on the motor control cable. If this voltage is greater than 10VDC, the motor should be running.

Especially if you measure this voltage at the connection to the motor. If you have an instance where the motor stops intermittently, and it restarts when power is removed then restored, perform this test before removing power. It will tell you if the intermittent part is the EVO/ECM series control!

**Motor On Test**      The EVO/ECM series control must be set to ON to perform this test.

Set the multimeter to read 24Vdc.

1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Motor On/Off (White) wire on the 4 pin motor connector.
3. If the Dc voltage is ~22Vdc, the motor should run.
4. If the motor does not run, the cable may be defective.
5. Go to the control connector on the motor.
6. Insert the black meter lead into the connector shell hole containing the single green wire.
7. Insert the red meter lead into the connector shell hole containing the White wire. The DC voltage should be ~22Vdc. If it is not, the control cable is defective. If the voltage is greater than 10Vdc and the motor does not run, contact the equipment manufacturer for further instructions.
8. If the EVO/ECM series control includes an off feature, turn the control to off. The motor should stop and the voltage between the green and black wires should fall to less than 0.2Vdc.



### Automation Off Test

*If an automation system turns the ECM motor on/Off by directly feeding 24Vac to the EVO/ECM series controller, perform the Off Test.*

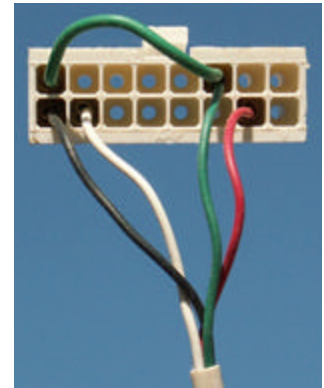
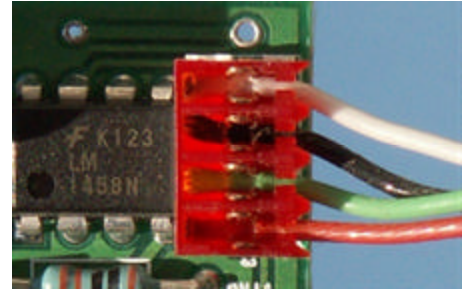
Turn the ECM motor off using the Automation System.

1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Tachometer (Black) wire on the 4 pin motor connector.
3. The Dc voltage should be less than 3Vdc
4. If the voltage is too high, the Automation Control is leaking current through its On/Off switching device.

**Variable Speed Test**    *The motor should be running to perform this test.*

Set the multimeter to read 24Vdc.

1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Speed (Red) wire on the 4 pin motor connector.
3. Set the EVO/ECM series controller to full speed.
4. The Dc voltage should be equal to the voltage on the white wire (~22Vdc). The motor should run at full speed.
5. If the motor does not run at full speed, the cable may be defective.
6. Go to the control connector on the motor.
7. Insert the black meter lead into the connector shell hole containing the single green wire.
8. Insert the red meter lead into the connector shell hole containing the Red wire. The DC voltage should equal to the voltage on the white wire (~22Vdc). If it is not, the control cable is defective. If the voltage is ~22Vdc and the motor does not run at full speed, contact the equipment manufacturer for further instructions.



**Tachometer Test** *This test only applies to EVO/ECM series controls that display or transmit RPM information. The motor should be connected but turned off or running at minimum speed for this test.*

Set the multimeter to read 5Vdc.

1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Tachometer (Black) wire on the 4 pin motor connector.
3. You should read about 5Vdc.
4. Go to the control connector on the motor.
5. Insert the black meter lead into the connector shell hole containing the single green wire.
6. Insert the red meter lead into the connector shell hole containing the Black wire. The DC voltage should about 5Vdc. If it is not, the control cable is defective. Swap the EVO/ECM series control with a known good control to determine if the problem is with the EVO/ECM series control. If the problem persists, contact the equipment manufacturer for further instructions.

