

G-03: Troubleshoot AC Servo Motor

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- A man lift may be required to troubleshoot the motor. Wear a safety harness.
- Be careful around operating machinery, which can injure personnel.
- Lockout/tagout may be required when testing the motor.

EQUIPMENT

- DVM
- megger
- basic Electrician hand tools
- flashlight

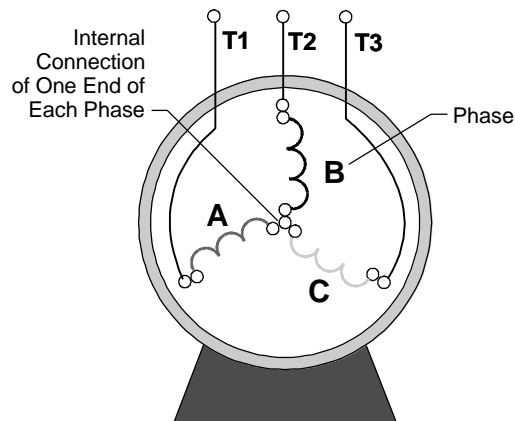
RESOURCES

- motor manufacturer's maintenance manual

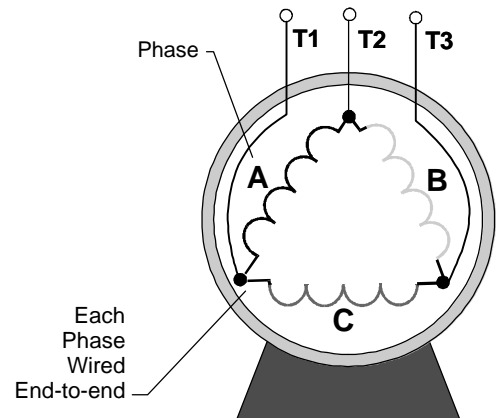
Troubleshoot an AC Servo Motor

1. Shut off the machine power.
 - Turn off the machine control power first.
 - De-energize three-phase power (main machine power).
 - Lock out and tag out the motor.
2. Measure the winding resistance.
 - Isolate the motor leads from the servo control by disconnecting all three leads from the servo control, as shown in the machine print.
 - Note the position of the wires.

- Take resistance readings of the motor leads with DVM as follows:
(Phases in USA = A, B, or C; Foreign= U, V, W)
- A to B or U to V
- B to C V to W
- A to C U to W



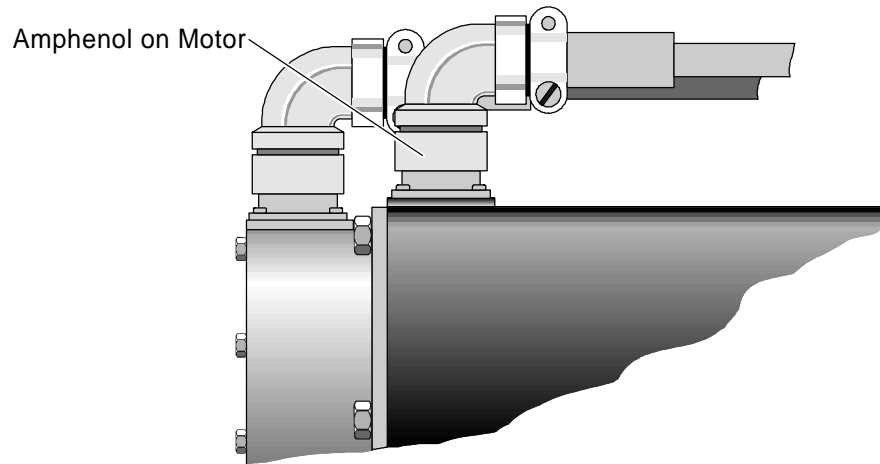
3-phase Motor
Wye-connected



3-phase Motor
Delta-connected

- All resistance readings should be the same when checked at the lowest setting (RX1) and less than 10 ohms (depending upon the size of the motor).
3. Check the windings to ground.
 - Each lead should be open when checked with a megger.
 4. Verify that the fault is in the motor and not in the wiring.
 - Locate the axis motor on the machine. Ask for assistance, as necessary.

- Disconnect the amphenol connector (or motor junction box) from the motor.



Amphenol Connectors

Note: Verify that you disconnected the motor lead plug and not the encoder plug. Disconnecting the encoder plug could cause you extra, unneeded problems.

- Check the motor leads isolated from the machine wiring.
 - Go to step 5 if resistance and megger readings are within tolerance.
 - Turn in a work order to have a maintenance mechanic replace the motor if winding resistance readings or megger readings are not correct.
5. Check the cable or amphenol connectors if the motor winding ohmmeter readings are within specification.
- Ring out the cable.
 - Attempt to repair the connector, and inspect the cable for damage.
 - Replace the cable, if damaged, then restore power and test the motor again.
 - Reconnect the terminals to the drive in the cabinet.
6. Ask the Operator to cycle the machine.
7. Document the work history.