

T-01a: Troubleshoot Drive (ACVS)

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Electrical hazard exists when working inside electrical cabinets. A rotating machine hazard may exist if measuring RPM on the motor.

EQUIPMENT

- DVM (capable of reading the variable frequency drive output signal)
- basic Electrician hand tools

RESOURCES

- Toshiba G3 Inverter Training Guide
- Toshiba G3 Inverter (TOS VERT 130) Operators Manual

Troubleshoot Drive (ACVS)

Note: This procedure is documented for a Toshiba AC Variable Speed Drive (TOS VERT 130).



TOS Vert 130

1. **Communicate with the Operator to determine the symptoms of the problem.**
 - Eliminate other possible causes for the problem (like a bound shaft or bearing) before troubleshooting the drive.

2. Check the drive display for error messages.

Drive Display



- Follow the manufacturer's suggested solution for the specific error message as shown in the Training Guide (if available) or the Operator's manual.
- Proceed to step 6 if there are no lights illuminated or messages displayed on the drive.

Note: Three things are required to make the drive run: 1) a start signal, 2) a direction signal, and 3) a frequency command.

3. **Verify the start contacts are closed between CC (common) and ST (start) on the terminal strip.**
4. **Verify the direction contacts are closed between CC and F (forward) or R (if set for reverse) on the terminal strip.**
5. **Verify that the correct preset speed selection is made for S1, S2, and/or S3.**

6. Check the Frequency Setting Parameter values for operating (Preset Speed #1) and maximum frequency (Preset Speed #2).

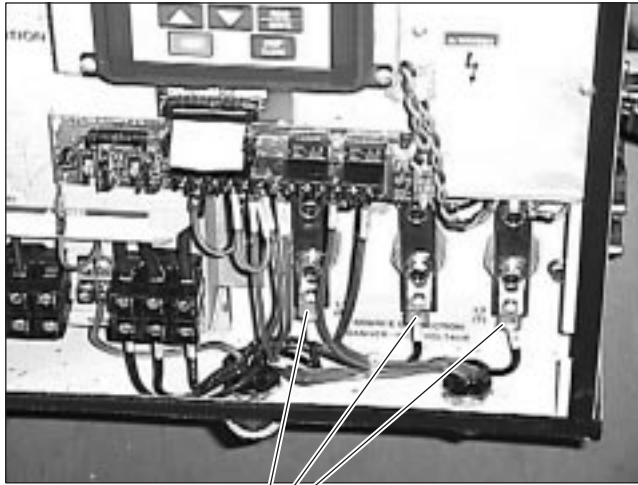


Drive Interaction Keys



- Press the PRG key.
- Scroll to the Freq Setting Param using the up and down arrow keys.
- Press the Read/Write key.
- Scroll to the Preset Speed #1 group, to view the value for desired frequency, using the up and down arrow keys.
- Press the up and down keys to adjust the value to match the documented value for the Preset Speed #1 parameter, if necessary.
- Press the Read/Write key to write any changes to memory.
- Scroll to the Preset Speed #2 group to view the maximum frequency value.
- Press the up and down keys to adjust the value to match the documented value for the Preset Speed #2 parameter, if necessary.
- Press the Read/Write key to write any changes to memory.
- Press the PRG key to exit the program mode and go back to monitor mode.

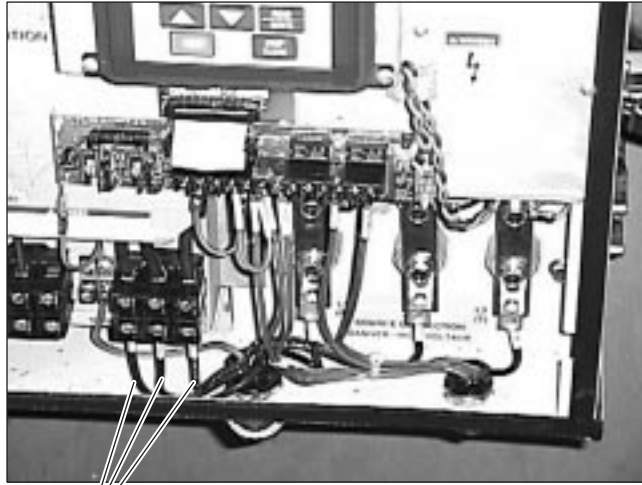
7. Check incoming power.



Incoming Power

- Check all three AC phases, expecting to read the specified incoming power.
- Check the fuse or circuit breaker if no voltage is read.
- If incoming voltage is present, check the control voltage fuses.
- Expect to read 120 VAC on the control fuses.
- Replace the control fuses, as needed.
- Replace the drive, if the expected voltage is present, if there is no indicator light on, and if there is no message displayed at the drive display window.

Note: Be aware that incorrect voltage readings may be caused due to the high pulse with modulation (PWM) frequency.

8. Check for balanced output motor voltage.

Output Motor Leads

- Verify that voltage readings match the expected value based on speed settings and nameplate data.

9. Perform the task Troubleshoot AC Motor if balanced required voltage is present between T1, T2, and T3.

- Voltage readings vary according to the motor operating speed.