Spindle Motor - Troubleshooting Guide

Introduction

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2. Power leads
3. Over-temp sensor connector

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<td>The input cable for the spindle head does not have a ferrite filter (NGC Only).</td>
<td>Make sure the 33-9090 cable has a ferrite filter installed at connection P39 on the I/O PCB. If the cable does not have a ferrite filter installed, install one. (P/N: 64-1252).</td>
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<td>There is a problem with the temperature sensor on the spindle motor.</td>
<td>Remove the spindle head cover. Examine the temperature sensor on the spindle motor. Make sure that the cable is not damaged and that it is firmly connected.</td>
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<td>Determining if the problem is mechanical or electrical.</td>
<td>1. Run the spindle to where the noise is heard. 2. Turn off the machine. 3. If the noise is still heard then the problem is mechanical. 4. If the noise goes away then test all the electrical components in the spindle drive system.</td>
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Spindle Motor Test

Corrective Action:

Use a multimeter to check these terminals on the motor:

- Measure between motor leads or terminals (1-4) (2-5) (3-6). If the difference between each pair is more than 0.1 Ohms, replace the spindle motor.
- Measure between motor leads or terminals (2-4 and 3-4) (1-5 and 3-5) (1-6 and 2-6). If the multimeter reading is not open (O.L.), replace the spindle motor.
- Measure between each individual motor lead or terminal and the motors armature. If the multimeter reading is not open (O.L.), replace the spindle motor.

If the motor is cool but alarm persists, check Parameter 278:14.

If the parameter is correct, replace the motor sensor with P/N 33-7500A.
Corrective Action:

Press [POWER OFF].

If the vector drive voltage indicator light is on, do not touch the electrical components. The high voltage in the control cabinet can kill you. Wait for the voltage indicator LED on the vector drive to go off completely.

Inspect the vector drive.

Disconnect terminals 2 and 3 and check for a short to the spindle motor circuit by measuring the resistance of terminal 2 to 9, 10, and 11. Measure terminal 3 to 9, 10, and 11.

Go to VECTOR DRIVE - TROUBLESHOOTING GUIDE to troubleshoot the vector drive.

Wye/Delta Inspection

Corrective Action:

Check for loose connections or burn marks.

Go to WYE-DELTA CONTACTOR - TROUBLESHOOTING GUIDE to troubleshoot the Wye/Delta contactors.
Spindle Motor Cables Test

Corrective Action:

1. Disconnect all the spindle motor cables from the amp/vector drive (terminals A, B, C. + GND).
2. If machine is equipped with a Wye-Delta contactor, disconnect the cable going to the motor. (L1,L2,L3 + GND).
3. Disconnect the spindle motor cables from the motor, including the ground cable.
   - **Important:** At the motor end put electrical tape to each lead to make sure the leads do not touch each other.
4. At the electrical cabinet end, using a meter test for resistance across each lead. Take the same readings from the cable that goes to the motor from the Wye-Delta contactor.
   - If the meter reads O.L. then the cable is good.
   - If the meter reads a short circuit or low resistance the cable needs to be replaced.

Make sure all cable connections are not damaged. Use a multimeter to test each cable connection.

Regen

Corrective Action:

Disconnect the REGEN load leads from the vector drive at terminals 1 and 2. Measure the resistance across the leads. The reading must be as follows:

- 2-resistor box: between 9.5 and 12.5 ohms.
- 3-resistor box: between 6.3 and 8.3 ohms. (As shown in the illustration.)
- 4-resistor box: between 4.6 and 6.6 ohms.

Go to [VECTOR DRIVE - TROUBLESHOOTING GUIDE](#) to troubleshoot the vector drive.

Go to [REGEN - TROUBLESHOOTING GUIDE](#) to troubleshoot the REGEN resistors.
Spindle Fan

Corrective Action:

Check for airflow on top of the spindle enclosure. Make sure there is air flow out of the spindle enclosure when the spindle is commanded to run. DT/DM were setup to blow air down onto the motor but it should now be blowing out the top. Change the fan direction to blow out the top.

Run this command in MDI: S50 M03;

Check the voltage across the black and red wires on the I/O PCB at this location:

- P41 if the machine has a Classic Haas Control
- P32 if the machine has a Next Generation Control

The voltage should be 120 VAC. If no voltage is present, the I/O PCB is bad.

Encoder Belt

Corrective Action:

Make sure the encoder belt is adjusted correctly and is not damaged. Replace a damaged or worn belt.

Make sure the encoder pulley is not damaged. Make sure the set screw is tight.

Program/Application

Corrective Action:

Reduce the axis feed rate, or adjust the spindle rpm in the program.

Check for dull or damaged tooling.

Coolant (TSC Only)

Corrective Action:

Remove the head cover and inspect the TSC union for leaks. A leaking coolant union may cause coolant to get into the motor and wash the grease out of the bearings.
Bearings

Corrective Action:

Damaged bearings in the spindle motor can cause finish issues on the part. Contact your local HFO for a vibration analysis to see if the bearings are damaged.