How it Works

AC motors pass alternating current through opposing pairs of magnets to create a rotating magnetic field, which creates a magnetic field in the motor's rotor, causing it to spin around.

Spindle motors are powered by a Vector drive. Some smaller machines use a power supply and servo amplifier to power the spindle motor. On machines built before January 1997 spindle motors were powered by a Spindle Drive. Spindle motors are used to drive various spindle configurations, which include gearbox, direct belt drive, and inline spindle assemblies.

Some machines have a Wye/Delta contactor assembly. The assembly is used to switch between motor windings to provide quick acceleration and maintain the highest possible torque throughout range of speed of the machine. An encoder relays the motor's speed and direction information to the control.

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2. Power leads
3. Over-temp sensor connector
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**Section 1**

**Symptom:** Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD.

**Possible Cause:** Internal short circuit. Failed temperature sensor.

**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 (OL), replace the spindle motor.

- Measure between each individual motor lead or terminal and the motors armature. If the multimeter reading is not open (OL), 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.
Section 2

Symptom: Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD. Alarm 254 SPINDLE MOTOR OVERHEAT.

Possible Cause: Over-aggressive application

Corrective Action:
Reduce the axis feed rate, or adjust the spindle rpm in the program.
Check for dull or damaged tooling.

Section 3

Symptom: Motor noise, or poor finish on parts

Possible Cause: Vibration due to damaged bearings or motor housing.

Corrective Action: Vibration analysis
Check motor bearings. A vibration analysis recommended.

Section 4

Symptom: Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD.

Possible Cause: Vector drive shorted. Vector drive fans failed.

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 diy.haascnc.com to troubleshoot the vector drive.
Section 5

**Symptom:** Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD.

**Possible Cause:** Cable connection incorrect or loose. Shorted cable.

**Corrective Action:**
Inspect and reseat all cable connections. Make sure all cable connections are not damaged. Use a multimeter to test each cable connection.

Section 6

**Symptom:** Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD.

**Possible Cause:** Wyde/Delta contacts burnt or shorted

**Corrective Action:**
Check for loose connections or burn marks.
Go to [diy.haascnc.com](http://diy.haascnc.com) to troubleshoot the Wye/Delta contactors.

Section 7

**Symptom:** Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD.

**Possible Cause:** Shorted regen resistors

**Corrective Action:**
Disconnected 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 [diy.haascnc.com](http://diy.haascnc.com) to troubleshoot the vector drive and the regen resistors.
Section 8

Symptom: Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD. Alarm 254 SPINDLE MOTOR OVERHEAT.

Possible Cause: Spindle fan failed.

Corrective Action:

Check for airflow on top of the spindle enclosure. Make sure there is air flow into or out of the spindle enclosure when the spindle is commanded to run.

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.

Section 9

Symptom: Alarm 123 SPINDLE DRIVE FAULT. Alarm 236 SPINDLE MOTOR OVERLOAD.

Possible Cause: Spindle encoder belt is worn or damaged.

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.

Section 10

Symptom: Motor noise, or poor finish on parts

Possible Cause: Coolant contamination.

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.