



Spindle Drive - How it Works and Troubleshooting Guide

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Translation Available



How it Works



Prior to the implementation of the Haas Vector Drive, Haas Automation used variable frequency drive from a number of drive manufacturers such as Fuji, Mitsubishi, Magnatek and Yaskawa. Spindle Drives used in Haas machinery are variable frequency motor controllers. They vary the frequency and voltage to operate the electric motors.

The MOTIF PCB sends spindle speed commands to the spindle drive. The I/O PCB sends directional commands to the spindle drive. The spindle drive sends (3) signals to the I/O PCB. It will send a Spindle Stop, Spindle at Speed, or a Fault Signal command.

Symptom	Possible Cause	Corrective Action	Section
Alarm 123 SPINDLE DRIVE FAULT	There are multiple possibilities.	Check the error code on the drive for the cause and the corrective action.	1
Alarm 149 SPINDLE TURNING	The spindle speed is not at zero during a tool change.	Use the diagnostic data to identify and address the fault.	2
Alarm 186 SPINDLE NOT TURNING	The spindle does not turn when commanded to.		
Alarm 116 SPINDLE ORIENTATION FAULT	The spindle did not orientate correctly.	Inspect the orientation ring/shot pin assembly.	3
The spindle speed is incorrect.	The signal from the control is incorrect or bad.	Check the command voltage.	4
The spindle load is too high.	There is a mechanical problem with the spindle or the motor.	Check that the spindle turns freely.	5
	The tools are dull.	Replace the dull tools.	6

Section 1

Symptom: Alarm 123 SPINDLE DRIVE FAULT

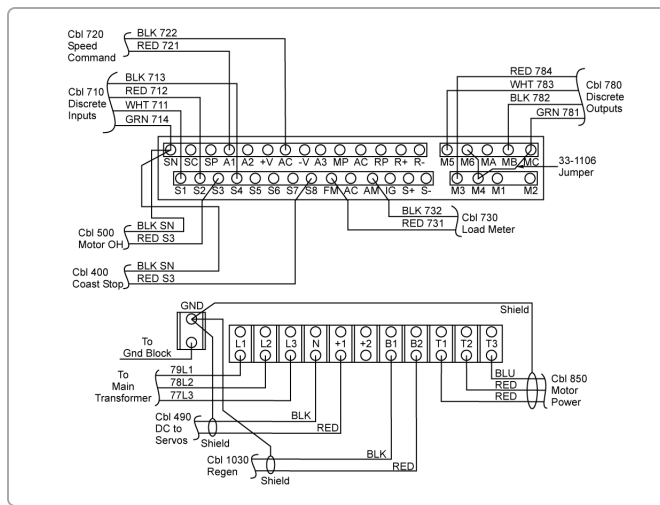
Possible Cause: There are multiple possibilities.

Corrective Action:

Check the spindle drive display for an error code. Refer to (1) of these manuals for the cause and the corrective action.

- [Mitsubishi A200](#)
- [Yaskawa GPD 503 Technical Manual](#)
- [Yaskawa GPD 515 Manual](#)

Section 2

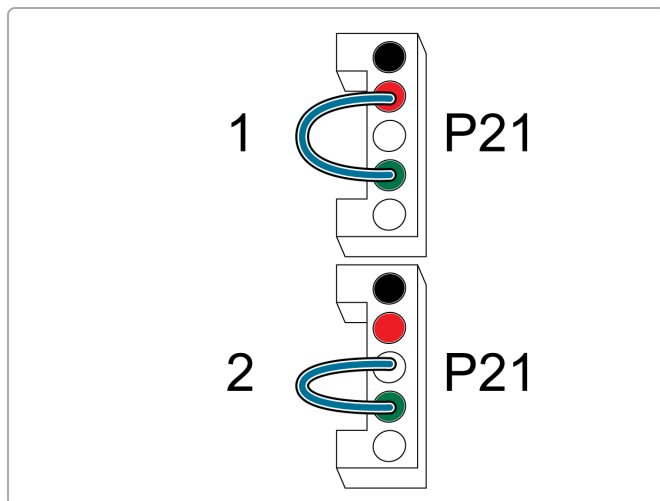


Symptom: Alarm 149 SPINDLE TURNING. Alarm 186 SPINDLE NOT TURNING.

Possible Cause: The spindle speed is not at zero during a tool change. The spindle does not turn when commanded to.

Corrective Action:

Check the following inputs on the diagnostic page of the Haas control.



If the bit does not change when they are supposed to, jump the connector at P21 on the I/O PCB:

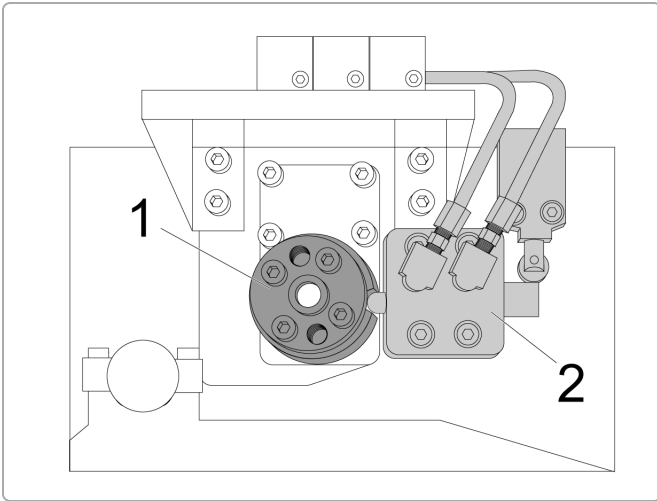
1. **Jump RED to GRN:** The input "SP ST*Spindle Not Stopped" should change.
2. **Jump WHT to GRN:** The input "SP AT* Spindle Not At Speed" should change.

Field	Spindle is Stopped	Spindle is Not Stopped
SP ST*Spindle Not Stopped	0	1
SP AT* Spindle Not At Speed	1	0

If the bit changed after you jumped the P21 connector on the I/O PCB, the cable or spindle drive is at fault.

If the bit did not change after you jumped the P21 connector, go to diy.haascnc.com to troubleshoot the I/O PCB.

Section 3



Symptom: Alarm 116

Possible Cause: The spindle did not orientate correctly.

Corrective Action:

Decrease the values of Parameter **73** SP HIGH G/MIN SPEED and Parameter **74** SP LOW G/MIN SPEED to slow the orientation speed. The spindle will orient easier in high gear than it will in low gear and the machine can be programmed for this.

Inspect the orientation ring [1] and shot pin assembly [2] for damage.

Verify the operation of the mechanical roller switch and solenoid.

Section 4

Symptom: The spindle speed is incorrect.

Possible Cause: The signal from the control is incorrect or bad.

Corrective Action:

Check the voltage of the speed command. The speed command for the spindle drive is sent by the 720 cable from P16 on the Motif or the Mocon. When the maximum rpm for the spindle is commanded you should measure 10 VDC across the 720 cable at the drive and P16 at the Motif or the Mocon.

Check 720 cable connections. Make sure they are not loose and make good contact.

If the voltage is correct, verify if the spindle drive parameters are correct. Refer to the [Magnatek & Mitsubishi SP Drive Programming Manual](#).

Section 5

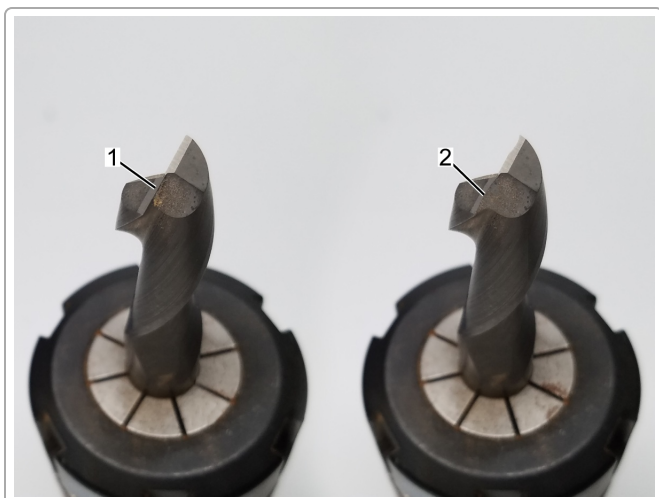
Symptom: The spindle load is too high.

Possible Cause: There is a mechanical problem with the spindle or the motor.

Corrective Action:

Check if the spindle and motor turn freely by hand. Check for a short to ground in the spindle motor. Go to diy.haascnc.com to troubleshoot the spindle motor and spindle.

Section 6



Symptom: The spindle load is too high.

Possible Cause: The speeds and feeds are incorrect. The tools are dull.

Corrective Action:

Check the program for the application and the tool path.

Check for dull or damaged tools. Replace tools as needed.