The spindle in a Haas machine consists of a single shaft, supported by bearings, into which a spring-loaded drawbar is installed. The drawbar uses spring tension to lock the toolholder into the spindle, and a tool release piston makes tool changes possible. The spindle is turned by a powerful motor, either inline with the spindle or belt-driven.

While most mill spindles are lubricated with air/oil mist supplied from the lube panel, a grease-packed spindle is used on these machines: TM, MM, MM2, and GR (depending on the machine RPM).

Spindle speed functions are controlled by the S address code, which specifies RPM from 1 to the maximum spindle speed. The codes M3 (clockwise) and M4 (counterclockwise) specify the direction of the spindle rotation. For example, M3 S1000; turns the spindle at 1000 RPM in the clockwise direction.

When you troubleshoot a spindle, be aware that the problem may be the result of another issue. You must investigate further to determine the root cause of the spindle problem. Perform a spindle system vibration analysis as part of the troubleshooting process. Contact your local dealer for this service.

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**Mill 40-Taper Belt-driven Spindle with TRP**

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<td>The spindle is hot.</td>
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<td>The surface finish shows chatter, or the spindle vibrates.</td>
<td>The spindle drive belt is worn or damaged.</td>
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<td>Tools stick or do not come out of the spindle easily.</td>
<td>The drawbar force is incorrect.</td>
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<td></td>
<td><em>(Through-spindle coolant only)</em> Some coolants cause tools to stick.</td>
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<td>The volume of air supplied to the machine is not sufficient.</td>
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<td>The toolholder is fretting.</td>
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Section 1

**Symptom:** The spindle is hot. The spindle makes an unusual noise.

**Note:** Make sure the spindle temperature is not more than 140°F (60°C). Refer to [Mill - Spindle - External Temperature - Measurement](#) to measure the temperature of the spindle.

**Possible Causes:** The spindle lubrication system does not function correctly.

**Corrective Action:**

Insufficient or excessive oil supply to the spindle bearings can cause the spindle to overheat. Using the incorrect spindle lubrication oil on the spindle bearings can cause the spindle to overheat. Make sure you use the correct spindle lubrication (SHC 625) and the air pressure to the spindle is correct.

Inspect all tubing, hoses and fittings in the lubrication system for leaks. Check for puddles of oil to help locate leaks.

Go to [Mechanical Bijur Lube Pump - How it Works and Troubleshooting Guide](#) for additional troubleshooting information.

Section 2

**Symptom:** The spindle makes an unusual noise. The surface finish shows chatter, or the spindle vibrates.

**Possible Cause:** The spindle drive belt is worn or damaged.

**Corrective Action:**

Power off, lock and tag out machine. Remove the spindle head covers. Disconnect the air supply to the machine. Remove the four 3/8-16 SHCS on the TRP. Remove the TRP and set it aside.

**Inspect the spindle drive belts and pulleys for damage:** Look for frayed, stretched or broken belts, and damaged or stripped cogs on the inside surface of the belt. Go to [diy.haascnc.com](http://diy.haascnc.com) to further troubleshoot the spindle drive belts.
Section 3

**Symptom:** The spindle makes an unusual noise. The surface finish shows chatter, or the spindle vibrates.

**Possible Causes:** The encoder pulleys or drive belt are 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 worn. Make sure the set screw is tight.

Section 4

**Symptom:** The surface finish shows chatter or the spindle vibrates. Tools stick or do not come out of the spindle easily.

**Possible Causes:** The drawbar force is incorrect.

**Corrective Action:**

Use a drawbar force gauge in the spindle to measure the clamp force. Refer to Spindle - Drawbar Force Reference Table, or search for the document by keywords on diy.haascnc.com.

If the drawbar force is incorrect, go to Spindle - Drawbar - How it Works and Troubleshooting Guide.

Section 5

**Symptom:** The fixture does not support the part.

**Possible Cause:** Adjust the cutting load or program.

If the workholding does not adequately support the part, it can cause chatter.

**Corrective Action:**

Stiffen the workholding if possible.

Lower the cutting load with adjustments to the tool selection, or the program.
Section 6

Symptom: Tools stick or do not come out of the spindle easily.

Possible Causes: (Through-spindle coolant only) Some coolants cause tools to stick.

Corrective Action:

If the machine has through-spindle coolant (TSC), different types of coolant can cause the toolholder to stick in the spindle. Consider a different type of coolant if the symptom persists.

Section 7

Symptom: The surface finish shows chatter, or the spindle vibrates.

Possible Cause: The spindle is not balanced.

Corrective Action:

Make sure the spindle is balanced. Your local HFO can balance these spindles:

- All belt-driven spindles
- Inline spindles made after August, 2016

All tooling that runs over 10K RPM must be balanced. Do not exceed the recommendations for special tooling from the manufacturer.

Section 8

Symptom: Tools stick or do not come out of the spindle easily.

Possible Cause: The tool stayed in the spindle for hours while the machine was not in operation.

This effect can occur while the machine is in operation if a cold toolholder is placed into a warm spindle taper. This creates thermal expansion [1] on the sides of the toolholder and makes it stick in the spindle taper before it is released.

A common example is if you change from a hot cutter to the cool spindle probe to check your part at the end of a cycle. If the cool probe is left in the hot spindle overnight, it will make a "popping" noise when it is released.

Corrective Action:

Clean the toolholders and spindle taper. Check for damaged toolholders before you put them back in the machine. A damaged toolholder can cause damage to the spindle taper and create tool runout or problems with finish.

Make sure the pull stud is lubricated. Refer to Mill - Tooling - Maintenance on diy.haascnc.com.
**Section 9**

**Symptom:** Tools stick or do not come out of the spindle easily.

**Possible Cause:** The toolholder is fretting.

**Corrective Action:**
Look for fretting on the toolholders. Long tools can cause fretting on toolholders if you use them aggressively. If there is fretting on the toolholder, or if the symptom persists, go to [Spindle - Drawbar - How it Works and Troubleshooting Guide](#).

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**Section 10**

**Symptom:** The surface finish shows chatter, or the spindle vibrates.

**Possible Cause:** The spindle bearings are damaged.

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