Hydraulic Tailstock - Troubleshooting Guide

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Introduction

The Hydraulic Tail Stock uses Hydraulic pressure to move forwards and backwards. A bi-directional solenoid supplies fluid for forwards and backwards movements. Normal movement of the tail stock uses metered pressure set with the adjustment knob on the side of the HPU block. A gauge is supplied to accurately adjust tail stock pressure.

When a rapid motion is desired, a Rapid motion soleniod supplies full HPU pressure to the directional solenoid.

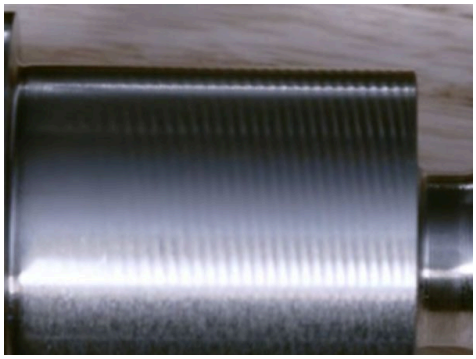
The Tail Stock uses a string encoder for positioning purposes. To establish home position, the tailstock retracts until it bottoms out the hydraulic actuator. When the rearward motion is stopped, the machine control assigns this the home position. Reference this video HOW THE TAIL STOCK FINDS HOME for more information

Symptom Table

SYMPTOM		CORRECTIVE ACTION
Part chatter.	Tailstock Advance button or handle jog, used to put pressure on the part.	Use M21 or the foot pedal to maintain pressure on the part.
	Spindle Speed Variation not in use.	Use SSV to control part chatter.
	Tailstock is out of alignment.	Align the tailstock
Taper on the part.	Tailstock pressure is incorrect.	Set pressure correctly for part material, diameter, and length.
	Tailstock is out of alignment.	Align the tailstock.
The tailstock does not move, moves slowly, or the movement is not smooth	The encoder string is pinched by the way cover	Remove way cover to inspect travel of encoder string
	The HPU solenoid or rapid valve has no voltage, or is contaminated.	Check the operation of the HPU and Solenoids

Tailstock does not Home in the correct position.	The encoder comb strip is faulty (SL Series)	Inspect the comb strip for chips or damage.
	Encoder is faulty	Check for damage, read head alignment.
	The encoder string is pinched by the way cover	Remove way cover to inspect travel of encoder string
	The Hydraulic pressure is set too low	Adjust Hydraulic pressure
	Chip Build up or obstruction of linear guides	Inspect the linear guides and waycovers for chip build up or obstruction
Alarm 439 TAILSTOCK FOUND NO PART	The settings are not set correctly for the material length.	Set **Setting 107** per the operators manual.
Alarm 9117 CHECK TAILSTOCK PRESSURE	The hydraulick tailstock pressure is low.	If this alarm happen during the zero return process, raise the tailstock pressure and zero return the tailstock.

M21

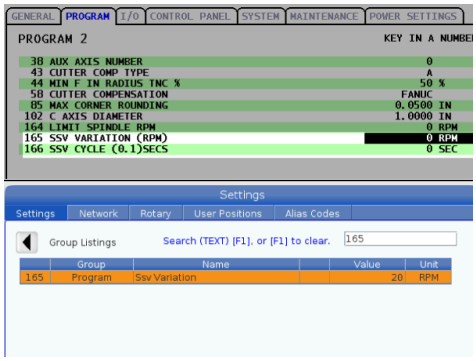


Corrective Action:

Do not use the TS hand jog keys to enage the tailstock when you cut the part. Pressure applied by the TS hand jog keys is not always consistent, and can result in chatter marks on the part.

Always use M21 or the foot pedal to maintain pressure on the part.

SSV



Corrective Action:

Spindle Speed Variation (SSV) allows you to specify a range within which the spindle speed will continuously change.

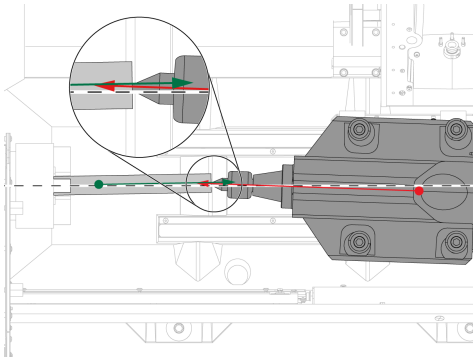
This changes the frequency of the machining process, which helps to suppress chatter.

M38 turns SSV mode ON and M39 turns it OFF.

Setting 165 specifies the amount that the spindle speed changes above and below the programmed speed.

Setting 166 specifies the SSV duty cycle in 0.1-second increments. The duty cycle affects the rate of spindle speed change.

Alignment



Corrective Action:

Make sure the tailstock is correctly aligned to the center bore of the spindle.

Hydraulic Pressure

Corrective Action:

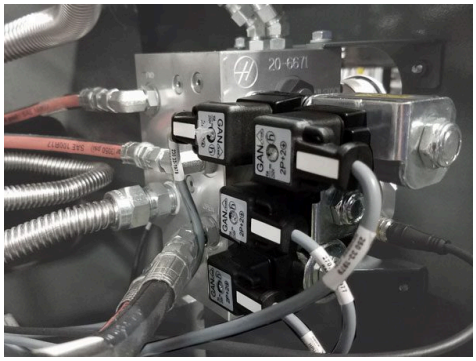
If the taper is consistent across the part, you may need to increase the tailstock pressure to hold the part more firmly.

If the taper is not consistent, the tailstock pressure may be too high. Reduce the pressure to make sure the stock does not deform.

Note: Verify that the tool Taper offset is zero.

For more information, watch this video on TAILSTOCK FUNDAMENTALS.

Solenoid



It is normal for the hydraulic pressure unit (HPU) solenoids to be hot to the touch.

Corrective Action:

Use a voltmeter to check for 120 VAC at the solenoid on the hydraulic power unit (HPU):

- Pull the solenoid connectors partially apart so you can access the leads with your needle-tip probes while the solenoid is connected.
- With the tailstock in operation, measure the voltage to the solenoid.

If there is no voltage, go to

-I/O PCB - TROUBLESHOOTING GUIDE (CLASSIC HAAS CONTROL)

-I/O PCB - TROUBLESHOOTING GUIDE (NGC)

to troubleshoot the I/O PCB.

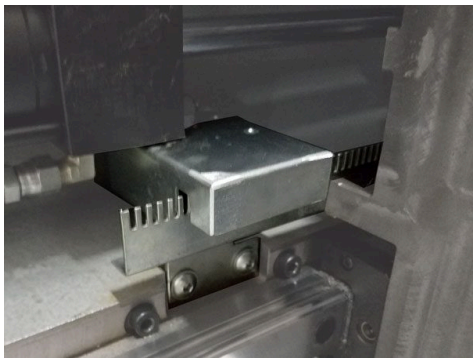
If the HPU solenoid receives voltage, but does not operate correctly, clean the solenoid or rapid valve:

- Turn off the power to the machine.

- Remove the solenoid or valve.
- Use compressed air to clean the solenoid or valve.
- Reinstall the solenoid or valve.

Reference this Video HOW TO CLEAN A HYDRAULIC SOLENOID

Encoder - SL



Corrective Action:

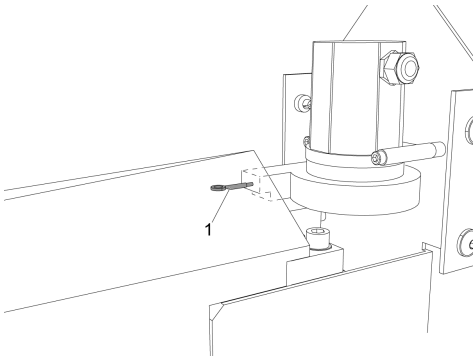
Inspect the encoder comb strip for damage, contamination or improper alignment.

Clean and align the encoder comb strip.

Make sure the encoder read head is not contaminated or damaged. Damage can occur by the comb strip rubbing on the optical sensor. If the optical sensor face is scratched or cracked the encoder will need to be replaced.

Make sure that the way covers and way cover rails are not contaminated or damaged

Encoder - ST



Corrective Action:

When handling the encoder, never let go of the string allowing it to retract under its own tension, damage may occur. Carefully pull the string out and let it retract slowly.

Make sure the string [1] can move freely in and out of the encoder housing. Make sure the encoder string is not pinched or touching the way cover at anytime during its travel. The B-Axis position on the screen should change as you pull on the encoder string. If there is no change in the position display check the encoder connection in the cable trey behind the Z-Axis.

Inspect the encoder string for contamination or damage (cuts or fraying).

Inspect the encoder housing for signs of damage or contamination.

Way Cover

Corrective Action:

Clean the lower way cover rails.

Make sure the way covers move smoothly on the rails, and do not bind on each other.

Settings

Corrective Action:

Set the tailstock hold point, **Setting 107**, to be .25" to .5" past the part. The tailstock should never reach its hold position, if so **Alarm 439** TAILSTOCK FOUND NO PART will be generated.

Ensure that all bar stock material is the same length.