



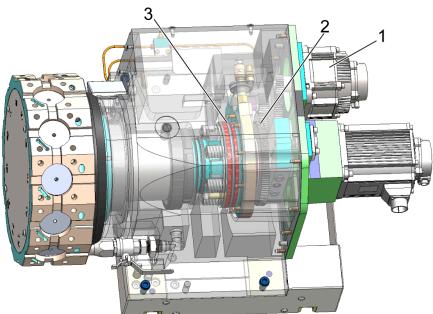
## BMT65/75 - Turret Indexer Assembly - Troubleshooting Guide

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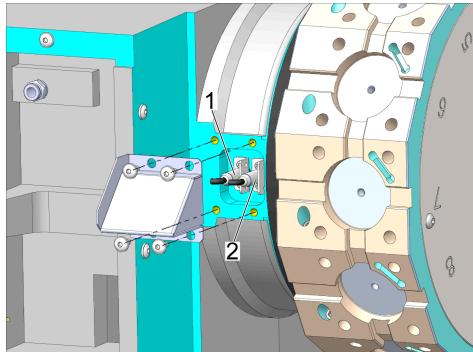
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### Introduction

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1. Servo Motor
2. Internal Gears
3. Quad-Ring



1. Turret Home Switch
2. Turret Clamp/Unclamp Switch

### Symptom Table

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SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
<b>Alarm 114</b> TURRET FAILURE TO REACH CLAMP SWITCH	The incoming air flow is incorrect.	Check the incoming air supply.
	There is a problem with the voltage to the turret clamp/unclamp solenoid.	Check the voltage to the turret clamp or unclamp solenoid.
	The turret clamp/unclamp proximity sensor is faulty.	Check the turret clamp/unclamp proximity sensor.
	The turret did not pop out far enough.	Check the piston, internal gears and spring assembly for damage.
<b>Alarm 103</b> Axis Servo Error Too Large	The internal gears are damaged. This can also cause unusual noise when the turret rotates.	Check the internal gears for damage.
<b>Alarm 8125</b> Tool Turret Not Seated	Obstruction between tool turret and housing.	Clear obstruction such as chips.

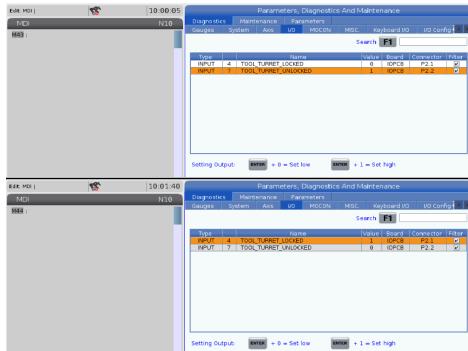
<b>Alarm 2022 TURRET FAILED TO LEAVE CLAMP SWITCH</b>	Tool turret attempted to unclamp but failed to leave the clamp switch because air is bypassing the turret piston quad-ring.	Remove the non-pressurized air line, if the air is exhausting from the hose, the quad-ring has blowby. If the air is leaking from the solenoid then it has an internal leak.
	The turret clamp/unclamp proximity sensor is faulty.	See the Clamp/Unclamp Proximity Sensor section below.
	The turret did not unclamp enough.	See Turret Pop Out section below.
Air leaking from solenoid muffler.	Air is bypassing the turret piston Quad-Ring.	Remove the non-pressurized air line, if the air is exhausting from the hose, the quad-ring has blowby. If the air is leaking from the solenoid then it has an internal leak.
Low turret clamp force	Broken or damaged springs.	Check the spring force.
	Incorrect air flow coming in.	Check the incoming air supply.

## Incoming Air Supply

Make sure that the air compressor supplies the correct air pressure and air flow. For Haas machine air pressure specifications, go to New Machine Pre-Installation for your machine model. Select your machine and scroll to the the section labeled "Air/Coolant Requirements."

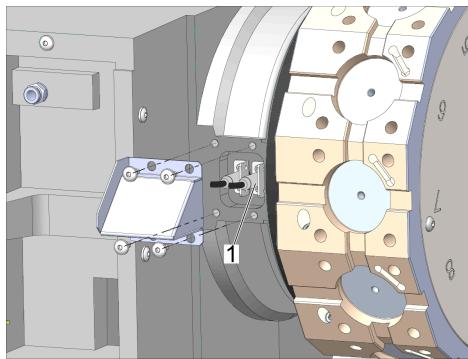
Attempt a tool change on the machine. When the machine has the correct air pressure and flow, the needle on the air pressure gauge should not drop more than 10 PSI (0.70 bar) during a tool change. This test confirms that the air pressure and air flow into the machine are correct.

## Clamp/Unclamp Proximity Sensor



Navigate to the Diagnostic screen on the pendant. Go to the I/O tab. Use an **M43** (Unclamp) **M44** (Clamp) code in MDI mode to troubleshoot the clamp/unclamp switch.

Check that **Input 4** Tool Turret Locked and **Input 7** Tool Turret Unlocked change states when the turret is commanded to unclamp/clamp.



Test the sensor by placing a screwdriver in front of the sensor. Make sure the inputs change states.

If the input does not change, jump the cable connector on the turret connector bracket. If the input changes, replace the sensor.

If the input does not change, refer to:

- [PROXIMITY SENSOR - HOW IT WORKS AND TROUBLESHOOTING GUIDE](#)
- [NEXT GENERATION CONTROL - I/O PCB - TROUBLESHOOTING GUIDE](#)

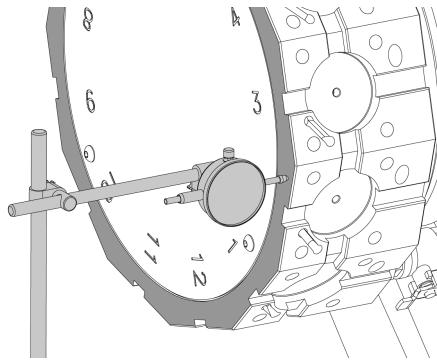
# Servo Motor

## **Corrective Action:**

Disconnect the axis servo motor cables. Make sure they are not contaminated. Measure the resistance from the pins labeled A, B, and C at the motor power cable connector to chassis ground. The reading should show an open circuit. If there is resistance to ground, the cable is at fault.

Go to: [AXIS SERVO MOTOR AND CABLES - TROUBLESHOOTING GUIDE](#) to troubleshoot the SIGMA motor and SIGMA motor cables.

## Turret Pop Out

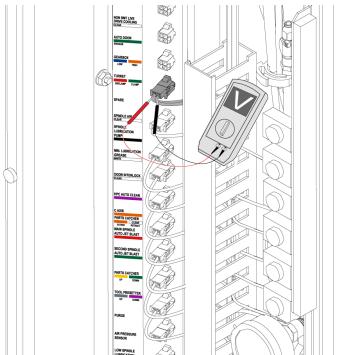


If you commanded an **M43** (Unclamp) and the turret moved, but did not move far enough to clear the coupler, measure the distance the turret traveled.

Set indicator to zero when turret unclamped  
**M43**. Command the turret to clamp **M44**. The indicator should measure 0.160" - 0.200".

If the turret does not travel far enough, the piston shaft, gears, or spring assembly could be at fault; these components must be inspected by your local HFO.

## Clamp / Unclamp Solenoid Voltage

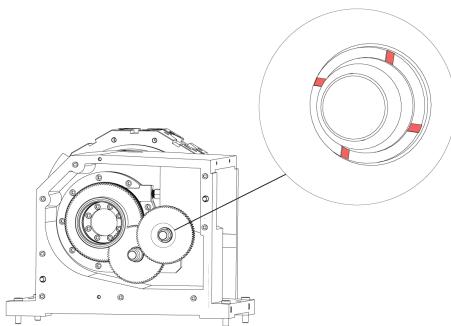


Measure the voltage of the clamp/unclamp solenoid. The solenoid is inside the Consolidated Air/Lubrication Manifold (CALM) Cabinet.

Run M43 (Unclamp) and M44 (Clamp) codes in MDI mode and measure the voltage of the solenoids. The voltage must measure 120 VAC.

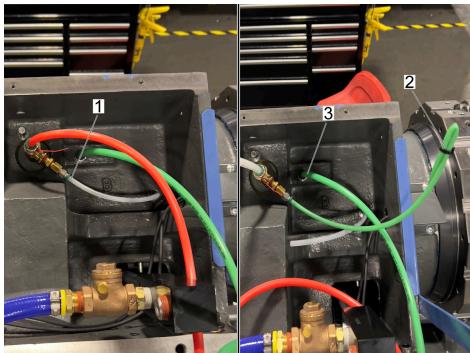
If there is no voltage, refer to the [NEXT GENERATION CONTROL - I/O PCB - TROUBLESHOOTING GUIDE.](#)

# Internal Gears



The turret's pop out and rotate function can fail because the tool changer gears are damaged. A machine crash can cause damage to the piston and gears, and must be inspected by your local HFO.

## Spring Force



1

To check the clamping force due to the internal compression springs, measure the air pressure required to overcome the springs and pop the turret out. Before supplying air to the unclamp port, remove the purge air line [1] and replace it with a piece of hose clamped closed [2] to avoid misreading the air pressure.

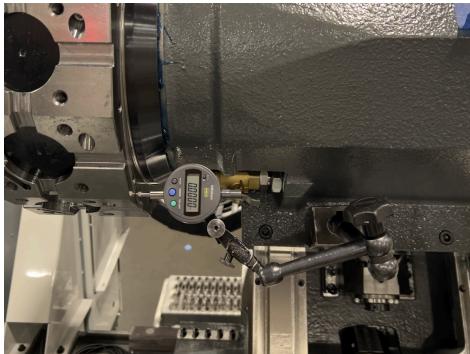
**Note:** Make sure to unplug the clamp hose [3] to remove any built up pressure in the system that would add to the clamping force.



2

Plug the airline to the incoming port [1] of the pressure regulator and the outgoing port [2]. Connect the airline from the outgoing port [2] into the unclamping port of the indexer.

**Note:** The unclamping port can be seen with the red hose attached in the image above.



3

Set up an indicator onto the turret to measure pop out. Slowly increase the air pressure on the regulator until you see a pop out of .001" from the indicator. Record this value of the air pressure (PSI) required to overcome the clamping force of the springs.

Use this value to calculate the spring clamp force by multiplying it with the surface area of the unclamping face of the piston ( $21.4\text{in}^2$ ).

- Spring Force = Applied Air (psi) \*  $21.4\text{in}^2$

The spring force should fall between 509 - 730 lbs.

If it does not, follow the [BMT65/75 - TURRET - PISTON - REPLACEMENT](#) procedure to replace any damaged springs.