



## HAAS SERVICE AND OPERATOR MANUAL ARCHIVE

### Tailstock Operators Manual 96-5000 RevC English June 2001

- This content is for illustrative purposes.
- Historic machine Service Manuals are posted here to provide information for Haas machine owners.
- Publications are intended for use only with machines built at the time of original publication.
- As machine designs change the content of these publications can become obsolete.
- You should not do mechanical or electrical machine repairs or service procedures unless you are qualified and knowledgeable about the processes.
- Only authorized personnel with the proper training and certification should do many repair procedures.

**WARNING: Some mechanical and electrical service procedures can be extremely dangerous or life-threatening. Know your skill level and abilities.**

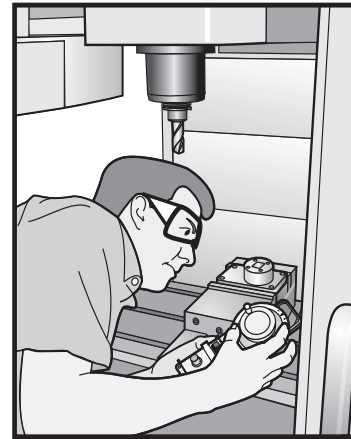
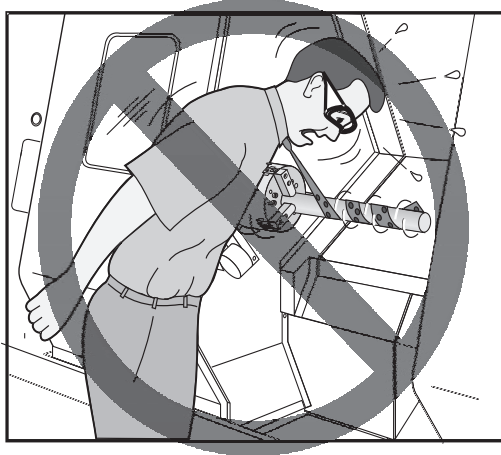
**All information herein is provided as a courtesy for Haas machine owners for reference and illustrative purposes only. Haas Automation cannot be held responsible for repairs you perform. Only those services and repairs that are provided by authorized Haas Factory Outlet distributors are guaranteed.**

**Only an authorized Haas Factory Outlet distributor should service or repair a Haas machine that is protected by the original factory warranty. Servicing by any other party automatically voids the factory warranty.**



# HAAS SAFETY PROCEDURES

# THINK SAFETY!



## DON'T GET CAUGHT UP IN YOUR WORK

All milling and turning machines contain hazards from rotating parts, belts and pulleys, high voltage electricity, noise, and compressed air. When using CNC machines and their components, basic safety precautions must always be followed to reduce the risk of personal injury and mechanical damage.

**Important – This machine is to be operated only by trained personnel in accordance with the Operator's Manual, safety decals, safety procedures and instructions for safe machine operation.**



## READ BEFORE OPERATING THIS MACHINE:

- ◆ Only authorized personnel should work on this machine. Untrained personnel present a hazard to themselves and the machine, and improper operation will void the warranty.
- ◆ Use appropriate eye and ear protection while operating the machine. ANSI approved impact safety goggles and OSHA approved ear protection are recommended to reduce the risks of sight damage and hearing loss.
- ◆ Do not operate the machine unless the doors are closed and the door interlocks are functioning properly. Rotating cutting tools can cause severe injury. When a program is running, the mill table and spindle head can move rapidly at any time in any direction.
- ◆ The Emergency Stop button is the large, circular red switch located on the Control Panel. Pressing the Emergency Stop button will instantly stop all motion of the machine, the servo motors, the tool changer, and the coolant pump. Use the Emergency Stop button only in emergencies to avoid crashing the machine.
- ◆ The electrical panel should be closed and the key and latches on the control cabinet should be secured at all times except during installation and service. At those times, only qualified electricians should have access to the panel. When the main circuit breaker is on, there is high voltage throughout the electrical panel (including the circuit boards and logic circuits) and some components operate at high temperatures. Therefore, extreme caution is required. Once the machine is installed, the control cabinet must be locked and the key available only to qualified service personnel.
- ◆ Consult your local safety codes and regulations before operating the machine. Contact your dealer anytime safety issues need to be addressed.
- ◆ DO NOT modify or alter this equipment in any way. If modifications are necessary, all such requests must be handled by Haas Automation, Inc. Any modification or alteration of any Haas Milling or Turning Center could lead to personal injury and/or mechanical damage and will void your warranty.
- ◆ It is the shop owner's responsibility to make sure that everyone who is involved in installing and operating the machine is thoroughly acquainted with the installation, operation, and safety instructions provided with the machine BEFORE they perform any actual work. The ultimate responsibility for safety rests with the shop owner and the individuals who work with the machine.
- ◆ **This machine can cause bodily injury.**
- ◆ **Do not operate with the door open.**
- ◆ **Do not operate without proper training.**
- ◆ **Always wear safety goggles.**
- ◆ **The machine is automatically controlled and may start at any time.**
- ◆ **The electrical power must meet the specifications in this manual. Attempting to run the machine from any other source can cause severe damage and will void the warranty.**
- ◆ **Do not press POWER UP/RESTART on the control panel until after the installation is complete.**
- ◆ **Do not attempt to operate the machine before all of the installation instructions have been completed.**
- ◆ **Never service the machine with the power connected.**
- ◆ **Improperly clamped parts machine at high feeds/feed may be ejected and puncture the safety door. Machining oversized or marginally clamped parts is not safe.**
- ◆ **Windows must be replaced if damaged or severely scratched - Replace damaged windows immediately.**
- ◆ **The spindle head can drop without notice. Personnel must avoid the area directly under the spindle head.**
- ◆ **Do not reset a circuit breaker until the reason for the fault is investigated. Only Haas-trained service personnel should troubleshoot and repair the equipment.**



♦ **Follow these guidelines while performing jobs on the machine:**

Normal operation - Keep the door closed and guards in place, while machine is operating.

Part loading and unloading – An operator opens the door or guard, completes task, closes door or guard before pressing cycle start (starting automatic motion).

Tool loading or unloading – A machinist enters the machining area to load or unload tools. Exit the area completely before automatic movement is commanded (for example, next tool, ATC/Turret FWD/REV).

Machining job set-up – Press emergency stop before adding or removing machine fixtures.

Maintenance / Machine Cleaner– Press emergency stop or power off the machine before entering enclosure.

**Do not enter the machining area anytime the machine is in motion; severe injury or death may result.**

**Unattended Operation**

Fully enclosed Haas CNC machines are designed to operate unattended; however, your machining process may not be safe to operate unmonitored.

As it is the shop owner's responsibility to set up the machines safely and use best practice machining techniques, it is also their responsibility to manage the progress of these methods. The machining process must be monitored to prevent damage if a hazardous condition occurs.

For example, if there is the risk of fire due to the material machined, then an appropriate fire suppression system must be installed to reduce the risk of harm to personnel, equipment and the building. A suitable specialist must be contacted to install monitoring tools before machines are allowed to run unattended.

It is especially important to select monitoring equipment that can immediately perform an appropriate action without human intervention to prevent an accident, should a problem be detected.

## MODIFICATIONS TO THE MACHINE

**DO NOT** modify or alter this equipment in any way. If modifications are necessary, all such requests must be handled by Haas Automation, Inc. Any modification or alteration of any Haas machining center could lead to personal injury and/or mechanical damage and will void your warranty.



## SAFETY DECALS

To help ensure that CNC tool dangers are quickly communicated and understood, hazard symbol decals are placed on Haas Machines in locations where hazards exist. If decals become damaged or worn, or if additional decals are needed to emphasize a particular safety point, contact your dealer or the Haas factory.

**Never alter or remove any safety decal or symbol.**

Each hazard is defined and explained on the general safety decal, located at the front of the machine. Particular locations of hazards are marked with warning symbols. Review and understand the four parts of each safety warning, explained below, and familiarize yourself with the symbols on the following pages.

### NEVER OPERATE THIS MACHINE WITH THE DOORS OPEN

Warning Symbol	Hazard Severity Level / Word Message	Action Symbol
	 <b>A</b> Risk of serious physical injury. Machine cannot protect from toxins. <b>B</b> Coolant mist, fine particles, chips, and fumes can be dangerous. <b>C</b> Follow specific material manufacturer's material safety data and warnings.	
<b>Warning Symbol</b> - Identifies the potential hazard and reinforces the word message. <b>Word Message</b> - Clarifies or reinforces the intent of the warning symbol. <b>A:</b> Hazard. <b>B:</b> Consequence if warning is ignored. <b>C:</b> Action to prevent injury. Also refer to Action Symbol.	<b>Hazard Severity Level</b> - Color-coded to indicate risk in ignoring a hazard. Red + "DANGER" = Hazard WILL cause death or serious injury if ignored. Orange + "WARNING" = Hazard COULD cause death or serious injury if ignored. Yellow + "CAUTION" = Hazard MAY cause minor to moderate injury if ignored. Blue + "NOTICE" = Indicates an action to prevent damage to the machine. Green + "INFORMATION" = Details about machine components.	<b>Action Symbol:</b> Indicates actions to prevent injury. Blue circles indicate mandatory actions to avoid harm, red circles with diagonal slashes indicate prohibited actions to avoid harm.

**MILL WARNING DECALS**

<b>⚠ DANGER</b>				
	<p><b>Electrocution hazard.</b> Death by electric shock can occur. Turn off and lock out system power before servicing.</p>		<p><b>Automatic Machine may start at any time.</b> Injury or death could be caused by untrained operator. Read and understand operator's manual and safety signs before using this machine.</p>	
	<p><b>Risk of serious physical injury.</b> Machine cannot protect from toxins. Coolant mist, fine particles, chips, and fumes can be dangerous. Follow specific material manufacturer's material safety data and warnings.</p>		<p><b>Risk of serious bodily injury.</b> The enclosure may not stop every type of projectile. Double-check job set up before beginning any machining operations. Always follow safe machining practices. Do not operate with doors or windows open or guards removed.</p>	
	<p><b>Risk of fire and explosion.</b> Machine is not designed to resist or contain blasts or fire. Do not machine explosive or flammable materials or coolants. Refer to specific material manufacturer's material safety data and warnings.</p>		<p><b>Risk of bodily injury.</b> Serious cuts, abrasions, and physical injury may result from slips and falls. Avoid using the machine in wet, damp, or poorly lit areas.</p>	
	<p><b>Severe injury can occur.</b> Moving parts can entangle, trap, and cut. Sharp tools or chips can cut skin easily. Ensure the machine is not in automatic operation before reaching inside.</p>		<p><b>Risk of eye and ear injury.</b> Flying debris into unprotected eyes can cause loss of sight. Noise levels can exceed 70 dBA. Must wear safety glasses and hearing protection when operating or in the area of machine.</p>	
<p>Safety windows may become brittle and lose effectiveness when exposed to machine coolants and oils over time. If signs of discoloration, crazing, or cracking are found, replace immediately. Safety windows should be replaced every two years.</p>				
<b>⚠ WARNING</b>				
	<p><b>Severe injury can occur.</b> Moving parts can entangle and trap. Always secure loose clothing and long hair.</p>		<p><b>Risk of serious bodily injury.</b> Follow safe clamping practices. Inadequately clamped parts can be thrown with deadly force. Securely clamp workpieces and fixtures.</p>	
	<p><b>Impact hazard.</b> Machine components can crush and cut. Do not handle any part of the machine during automatic operation. Always keep clear of moving parts.</p>		<p><b>Moving parts can crush.</b> The tool changer will move in and crush your hand. Never place your hand on the spindle and press ATC FWD, ATC REV, NEXT TOOL, or cause a tool change cycle.</p>	
<p>           • Do not allow untrained personnel to operate this machine.            • Do not alter or modify machine in any way.            • Do not operate this machine with worn or damaged components.            • No user serviceable parts inside. Machine must be repaired or serviced by authorized service technicians only.         </p>				
<b>NOTICE</b>				
<p><b>Coolant Tank Maintenance</b></p>		<p>Clean the filter screen weekly. Remove the coolant tank cover and clean out any sediment inside the tank weekly. Do not use plain water, permanent corrosion damage will result. Rust inhibiting coolant is required. Do not use toxic or flammable liquids as a coolant.</p>		



## LATHE WARNING DECALS

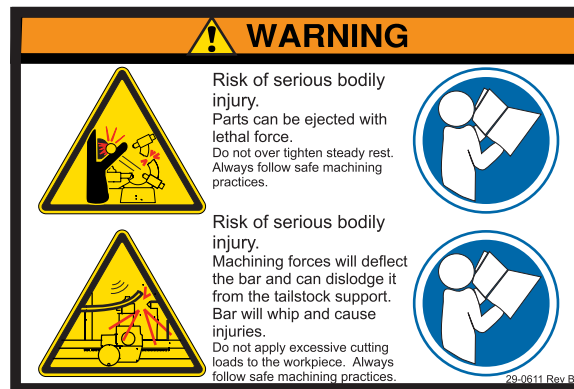
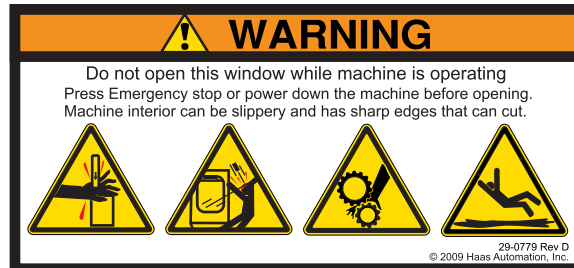
 <b>DANGER</b>			
 <p>Electrocution hazard. Death by electric shock can occur. Turn off and lock out system power before servicing.</p>		 <p>Automatic Machine may start at any time. Injury or death could be caused by untrained operator. Read and understand operator's manual and safety signs before using this machine.</p>	
 <p>Risk of serious physical injury. Machine cannot protect from toxins. Coolant mist, fine particles, chips, and fumes can be dangerous. Follow specific material manufacturer's material safety data and warnings.</p>		 <p>Risk of serious bodily injury. The enclosure may not stop every type of projectile. Double-check job set up before beginning any machining operations. Always follow safe machining practices. Do not operate with doors or windows open or guards removed.</p>	
 <p>Risk of fire and explosion. Machine is not designed to resist or contain blasts or fire. Do not machine explosive or flammable materials or coolants. Refer to specific material manufacturer's material safety data and warnings.</p>		 <p>Risk of bodily injury. Serious cuts, abrasions, and physical injury may result from slips and falls. Avoid using the machine in wet, damp, or poorly lit areas.</p>	
 <p>Severe injury can occur. Moving parts can entangle, trap, and cut. Sharp tools or chips can cut skin easily. Ensure the machine is not in automatic operation before reaching inside.</p>		 <p>Risk of eye and ear injury. Flying debris into unprotected eyes can cause loss of sight. Noise levels can exceed 70 dBA. Must wear safety glasses and hearing protection when operating or in the area of machine.</p>	
<p>Safety windows may become brittle and lose effectiveness when exposed to machine coolants and oils over time. If signs of discoloration, crazing, or cracking are found, replace immediately. Safety windows should be replaced every two years.</p>			
 <b>WARNING</b>			
 <p>Severe injury can occur. Moving parts can entangle and trap. Always secure loose clothing and long hair.</p>		 <p>Risk of serious bodily injury and impact hazard. Unsupported bar can whip with deadly results. Do not extend barstock past end of drawtube without adequate support. Do not apply excessive machining forces, doing so can dislodge the bar from support. Do not allow the carriage or tool to strike the steady rest or tailstock; the part may come loose. Do not over tighten steady rest.</p>	
 <p>Risk of serious bodily injury. Inadequately clamped parts can be thrown with deadly force. High RPM reduces chuck clamping force. Do not machine using an unsafe setup or exceed rated chuck RPM.</p>			
 <p>Moving parts can cut. Sharp tools can cut skin easily. Do not handle any part of the machine during automatic operation. Do not touch rotating work pieces.</p>		<ul style="list-style-type: none"> <li>Do not allow untrained personnel to operate this machine.</li> <li>Restrict access to open frame lathes.</li> <li>Use steady rest or tailstock to support long bars and always follow safe machining practices.</li> <li>Do not alter or modify machine in any way.</li> <li>Do not operate this machine with worn or damaged components.</li> <li>Machine must be repaired or serviced by authorized technicians only.</li> </ul>	
<b>NOTICE</b>			
	<p>Clean the filter screen weekly. Remove the coolant tank cover and clean out any sediment inside the tank weekly. Do not use plain water, permanent corrosion damage will result. Rust inhibiting coolant is required. Do not use toxic or flammable liquids as a coolant.</p>		





## OTHER SAFETY DECALS

Other decals may be found on your machine, depending on the model and options installed:





**TAILSTOCK SETUP**

**IMPORTANT!** Warranty card should be filled out prior to operation.

**When using Servo 5c Indexers, Haas Automation recommends using LIVE CENTERS ONLY!**

**PREPARATION**

Clean bottom surface of tailstock casting before mounting to mill table. If there are any noticeable burrs or nicks on the mounting surface, clean them with a deburring stone.

**TAILSTOCK ALIGNMENT**

1. Mount the supplied 0.625 dia. locating pins to bottom of tailstock using **1/4-20 x 1/2" socket head cap screw (SHCS)**.
2. Mount tailstock to clean mill table.
3. Fasten lightly to mill table using **1/2-13 hex head bolt (HHB), hardened tooling washers** and **1/2-13 T-Nuts**.
4. Extend the tailstock spindle from the body. Use the spindle surface to sweep the spindle center line to rotary product center line, align to within 0.003 TIR. Once the unit is properly aligned, torque the 1/2-13 nuts to 50 ft./lbs.

**INSTALLATION/REMOVAL OF MORSE TAPER ACCESSORIES**

1. Inspect and clean tailstock taper and tapered surface of live center.
2. Apply a light coat of oil on the center, before inserting into the spindle. This aids in removing the center and also prevents corrosion buildup.

**MANUAL TAILSTOCK**

Live or dead centers: Retract the spindle into the body and the leadscrew will force the center out.

**PNEUMATIC TAILSTOCK**

Live centers: Wedge an aluminum bar between the face of the spindle and the rear surface of the live centers' flange.

Dead centers: Thread dead centers are recommended (Often called N/C Dead Centers). Use a wrench to hold the center in place and turn the nut until it backs the center out from the spindle.

**TAILSTOCK OPERATION****MANUAL TAILSTOCK OPERATION**

1. The tailstock should be positioned so that after approximately 1" of spindle travel, the center comes into contact with the work piece/fixture. If the tailstock needs to be repositioned, repeat Step 4 of Tailstock Alignment.
2. Once in contact, apply only enough force on the handwheel to hold the workpiece / fixture securely.

**NOTE:** The force required on the hand wheel is similar to the force used in closing a typical garden faucet.

3. Tighten the spindle lock at this time.

**PNEUMATIC TAILSTOCK OPERATION**

1. The tailstock should be positioned so that after approximately 1" of spindle travel, the center comes into contact with the work piece / fixture. If the tailstock needs to be repositioned, repeat Step 4 of Tailstock Alignment.
2. Use of the spindle lock is optional when using pneumatic tailstock models. Use the following information to determine tailstock air pressure:

<b>•Rotary Tables: Normal operating range 10-60 psi, Max: 100 psi</b>
<b>•Servo 5c indexers*: Normal operation range 5-40 psi. Max: 60psi.</b>
<b>*LIVE CENTERS ONLY!</b>

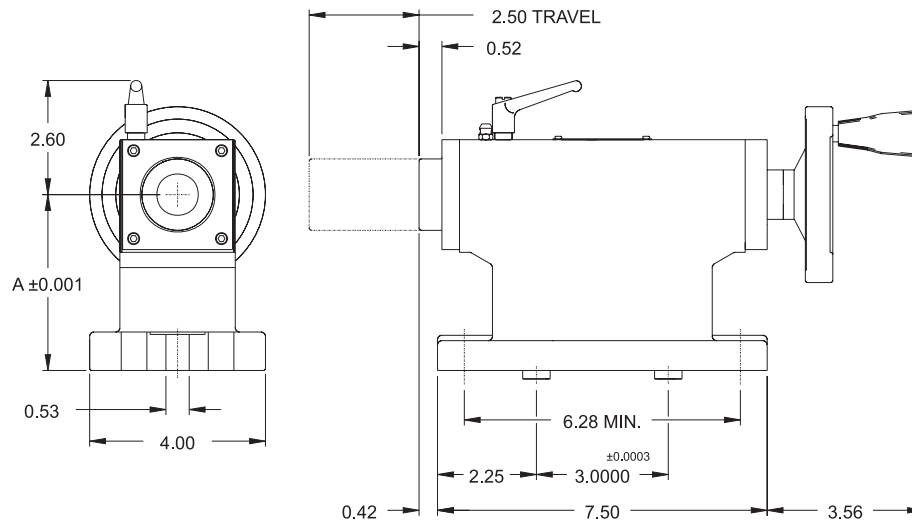
<b>•Maximum Air pressure = 150 psi (lbs/sq/in.) results in 450 lbs tailstock force.</b>
<b>•Minimum Air pressure = 5 psi (lbs/sq/in.) results in 15 lbs tailstock force.</b>

**NOTE:** Excessive tailstock force and misalignment greater than 0.003 tir will cause premature wear on the geartrain and motor.

**MAINTENANCE**

- Daily:** Use a shop rag to thoroughly clean the unit free of chips and apply a rust preventative such as WD-40.
- Weekly:** Use a standard grease gun and apply 1 full stroke to the top mount zerk fitting, for a pneumatic tailstock.
- Monthly:** Use a standard grease gun and apply 1-2 full strokes to the top mount zerk fitting, for a manual tailstock.

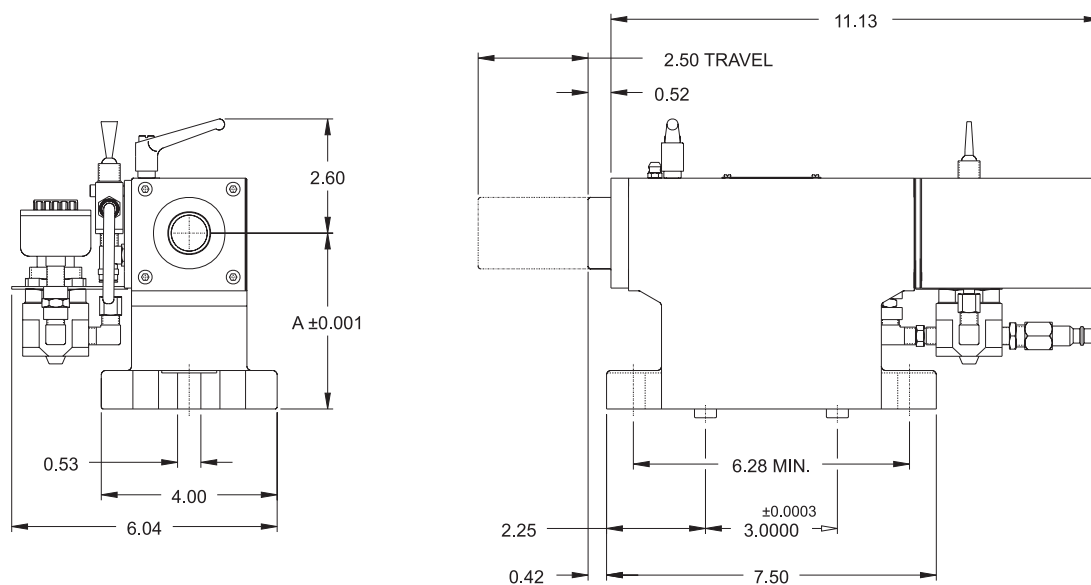
**Lubrication:** Use MOBIL multipurpose grease with MOLY (Molybdenum disulfide) or equivalent.

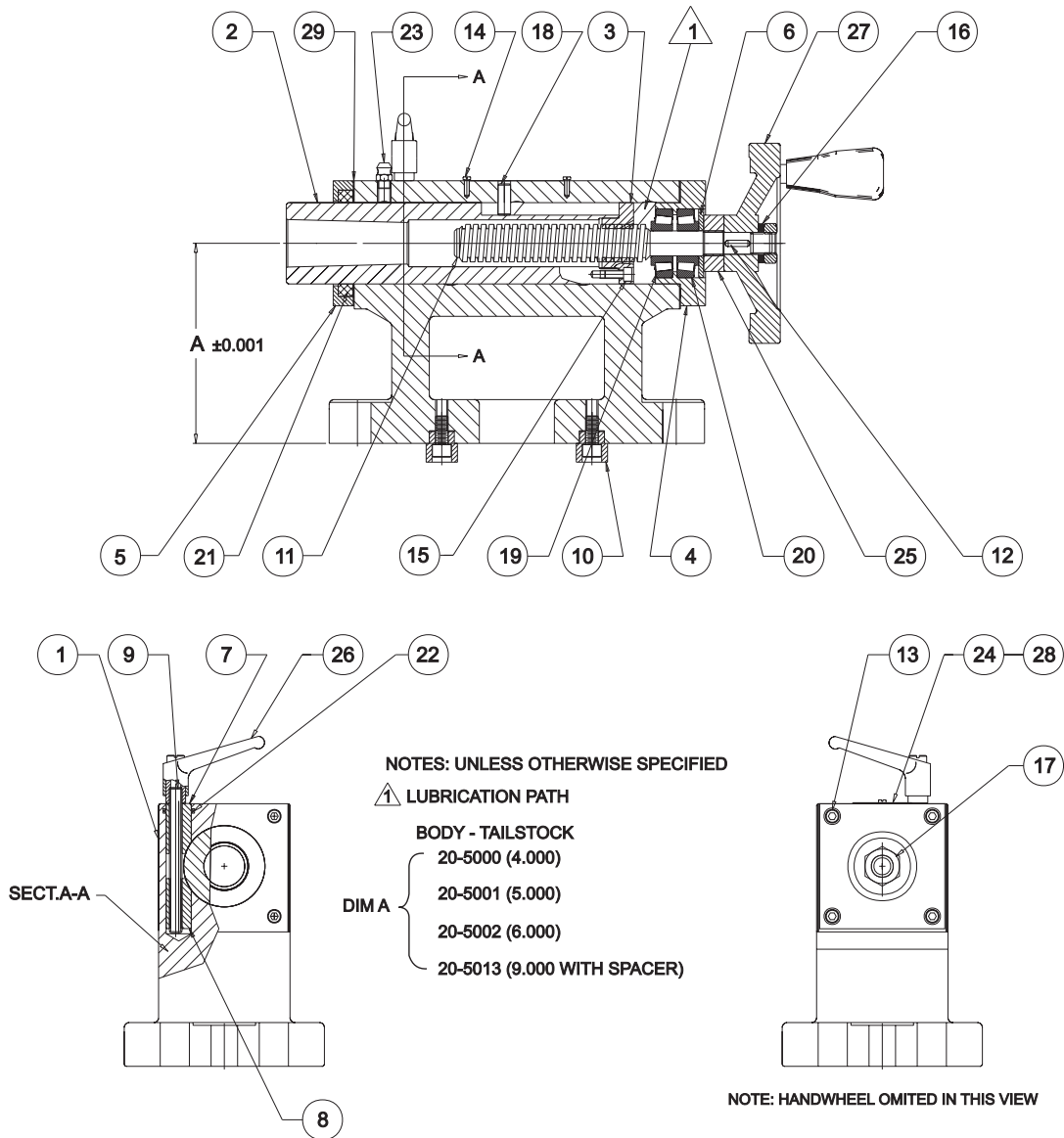
**ASSEMBLY DRAWINGS****HTS 4,5,6,9 MANUAL TAILSTOCKS**

NOTES: UNLESS OTHERWISE SPECIFIED

BODY - TAILSTOCK

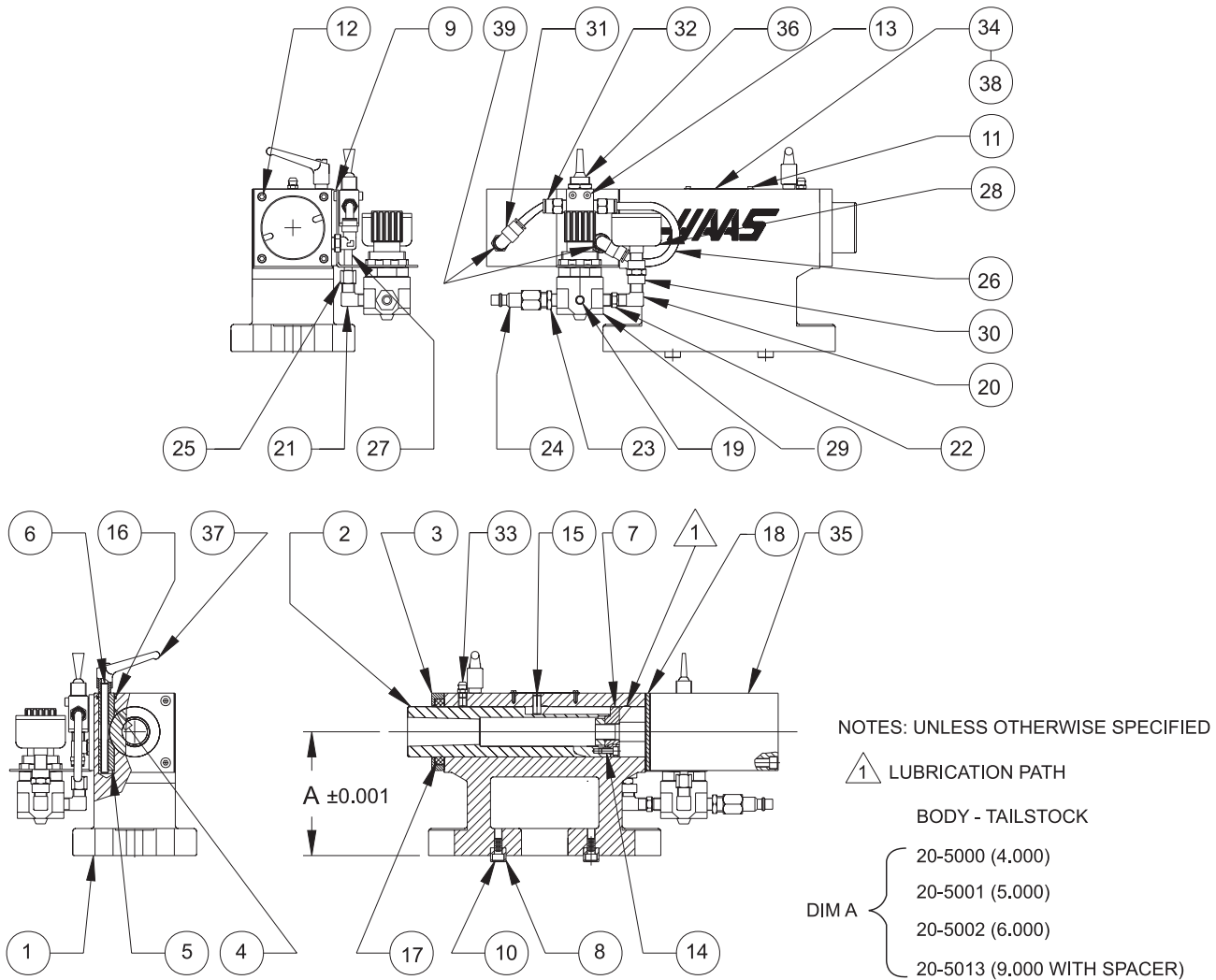
DIM A	20-5000 (4.000)
	20-5001 (5.000)
	20-5002 (6.000)
	20-5013 (9.000 WITH SPACER)

**HPTS 4,5,6,9 PNEUMATIC TAILSTOCKS**



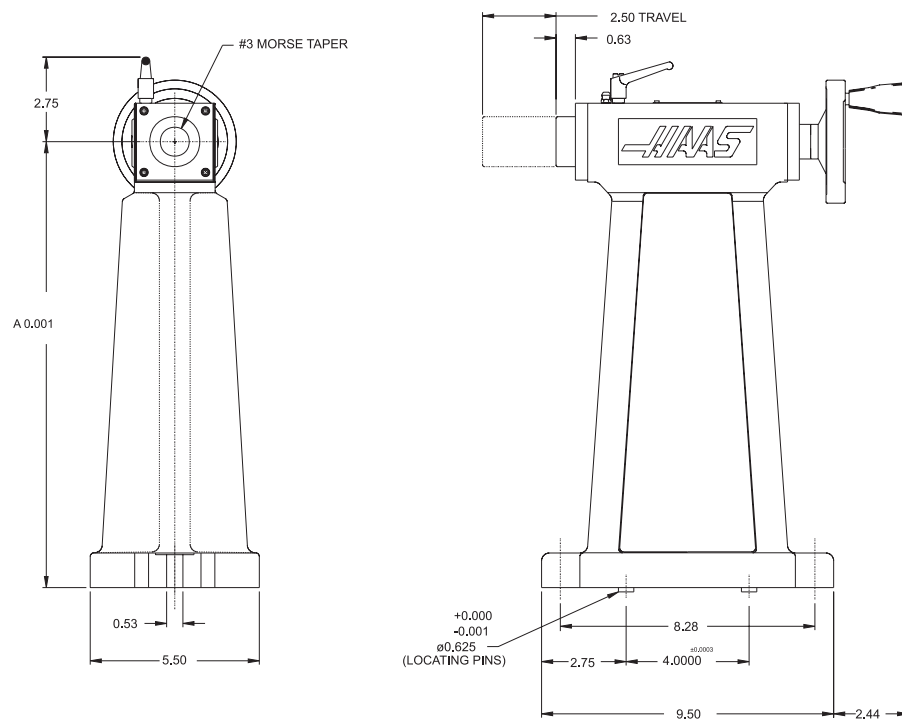
30-50000 TAILSTOCK ASSEMBLY DWG.

1	1	20-5000	BODY - TAILSTOCK 4"
1	1	20-5001	BODY - TAILSTOCK 5"
1	1	20-5002	BODY - TAILSTOCK 6"
1	1	20-5013	BODY - TAILSTOCK 7.25"
2	1	20-5003	SPINDLE
3	1	20-5005	NUT, LEAD SCREW
4	1	20-5006	BEARING HOUSING
5	1	20-5007	SEAL CAP
6	1	20-5008	THRUST WASHER
7	1	20-5009	UPPER CLAMP
8	1	20-5010	LOWER CLAMP
9	1	20-5011	CLAMP STUD
10	2	22-5017	LOCATING PIN
11	1	22-5004	LEAD SCREW
12	1	22-5014	SQUARE KEY, 1/8
13	10	40-1632	SHCS, 1/4-20 x 1/2"
14	2	40-1666	MC.DR.SCREW #2 x 1/4"RD.HEAD
15	4	40-1801	SHCS, 8-32 x 3/8"
16	1	45-1680	FLAT WASHER, 7/16 SAE
17	1	46-1660	HEX. JAM NUT, 7/16-20
18	1	48-0060	PULL PIN 1/4 x 5/8 LG.
19	2	51-5000	BEARING CAP, TIMKEN #A 4138
20	2	51-5010	BEARING CONE, TIMKEN #A 4050
21	1	57-5012	WIPER, 1/4" THICK
22	1	57-0058	O'RING, 2-014
23	1	59-2016	GREASE FITTING
24	1	59-2091	NAME PLATE, GENERAL PURPOSE
25	1	59-6010	SHAFT COLLAR, #TCL8-20F
26	1	59-6700	CLAMPING HANDLE
27	1	59-6800	HANDWHEEL, GN 321-100-B10D
28	1	29-5022	TAILSTOCK LABEL
29	2	57-5020	GASKET, AIR CYLINDER

**HPTS PNEUMATIC TAILSTOCKS**

1	1	20 - { 5013 5002 5001 5000	{ 7.25" 6" 5" 4" }	BODY -TAILSTOCK	19	1	58 - 1627	1/8 - 27 PIPE PLUG
2	1	20 - 5003		SPINDLE	20	1	58 - 16700	STREET ELBOW 1/8"
3	1	20 - 5007		SEAL CAP	21	1	58 - 16705	MALE ELBOW 1/8 M TO 1/8 M
4	1	20 - 5009		UPPER CLAMP	22	1	58 - 16732	1/1 x 1/8 MALE HEX. JOINT
5	1	20 - 5010		LOWER CLAMP	23	1	58 - 1674	ADAPTER MALE 1/4 NPT
6	1	20 - 5011		CLAMP STUD	24	1	58 - 1675	QUIK RELEASE FITTING, FEMALE
7	1	20 - 5016		NUT, AIR CYLINDER	25	2	58 - 16755	MALE AIR FITTING
8	2	22 - 5017		LOCATING PIN	26	2 Ft.	58 - 1981	TUBING, AIR LINE, 1/4 O.D.
9	1	25 - 5021		VALVE, BRACKET	27	2"	58 - 19900	COPPER TUBING
10	6	40 - 1632		SHCS, 1/4-20 x 1/2"	28	1	58 - 27395	AIR PRESSURE GAUGE
11	2	40 - 1666		MC.DR.SCREW #2 x 1/4" RD.HEAD	29	1	58 - 2740	AIR REGULATOR
12	4	40 - 1696		SHCS, 1/4-20 x 4 1/2"	30	1	58 - 2746	1/8 TO 1/8 FEMALE COUPLER
13	2	40 - 1800		SHCS, 8 - 32 x 3/4"	31	2	58 - 3050	ELBOW 1/8 NPT - 1/4
14	4	40 - 1801		SHCS, 8 - 32 x 3/8"	32	2	58 - 3070	FITTING, 1/8 NPT - 1/4
15	1	48 - 0060		PULL PIN 1/4 x 5/8"	33	1	59 - 2016	GREASE FITTING
16	1	57 - 0058		O'RING, 2 - 014	34	1	59 - 2091	NAME PLATE, GENERAL PURPOSE
17	1	57 - 5012		WIPER, 1/4" THICK	35	1	59 - 2736	AIR CYLINDER, #QJ 92-1673
18	2	57 - 5020		GASKET, AIR CYLINDER	36	1	59 - 2746	4 WAY VALVE, CLIPPARD, #TV-4DP
19	1				37	1	59 - 6700	CLAMPING HANDLE
20	1				38	1	29 - 5022	TAILSTOCK LABEL
21	1				39	2	58-4040	AIR CHOKE DISK
IT	QTY	HAAS P/N	TITLE		IT	QTY	HAAS P/N	TITLE

### HTS 11.5 AND HTS 14.5 MANUAL TAILSTOCKS



### HPTS 11.5 AND HPTS 14.5 PNEUMATIC TAILSTOCKS

