

INSTRUCTION MANUAL for MSI's

# Model C3A

## ChamferMate®



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## **SAFETY AND INSTALLATION INSTRUCTIONS**

IT IS VERY IMPORTANT TO READ AND UNDERSTAND THIS ENTIRE MANUAL BEFORE INSTALLING, STARTING OR OPERATING YOUR CHAMFERING MACHINE!!!

CAUTION – IT IS THE EMPLOYER’S RESPONSIBILITY TO ENSURE THAT ALL POTENTIAL OPERATORS AND MAINTENANCE PERSONNEL READ AND UNDERSTAND THIS MANUAL AND ARE ADEQUATELY TRAINED TO ENSURE SAFE INTERACTION WITH THIS EQUIPMENT.

WARNING – IT IS THE EMPLOYER’S RESPONSIBILITY TO PROVIDE ENERGY ISOLATION DEVICES FOR HIS EQUIPMENT AND INSURE THAT ALL POTENTIAL SERVICE AND MAINTENANCE PERSONNEL FOLLOW LOCKOUT/TAGOUT PROCEDURES DEVELOPED BY THE EMPLOYER IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION’S CONTROL OF HAZARDOUS ENERGY STANDARD 29 CFR 1910.147.

RESIDUAL ENERGIES – WHEN DISCONNECTED FROM THE SOURCE OF AIR PRESSURE THERE IS THE POSSIBILITY OF RESIDUAL PRESSURE IN THE SYSTEM. BE SURE ALL PRESSURE IS RELIEVED BEFORE SERVICING MACHINE. THERE IS NO RESIDUAL ELECTRICAL ENERGY WHEN DISCONNECTED FROM THE MAIN ELECTRICAL SOURCE.

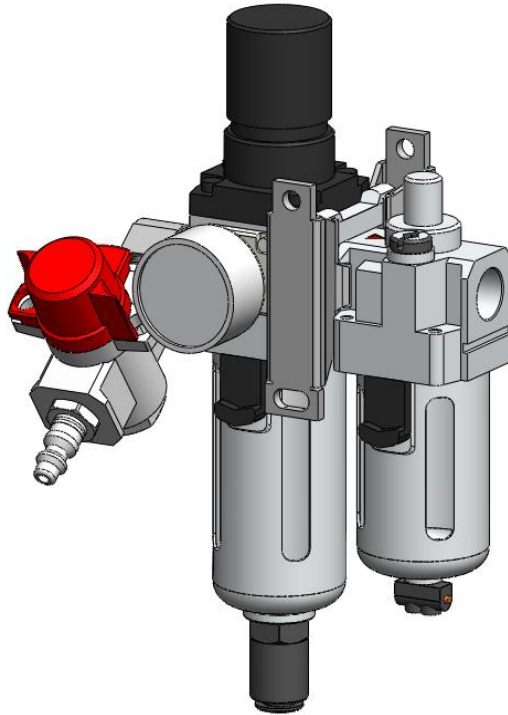
IT IS THE RESPONSIBILITY OF THE OWNER OF THE MACHINE TO ENSURE THE MACHINE IS CONNECTED TO THE ELECTRICAL AND PNEUMATIC SERVICES BY A QUALIFIED ELECTRICIAN AND PLUMBER TO MEET ALL REQUIRED CODES.

**WHEN CONTACTING THE FACTORY FOR ASSISTANCE, MAKE SURE YOU HAVE A COPY OF THIS INSTRUCTION MANUAL AS WELL AS THE SERIAL NUMBER OF THE MACHINE.**

**INSTALLATION** – Install the Vibration Dampening Mounts in the holes provided on the base. Place the machine on a level surface. Forklift slots are provided at the base for easy movement of the machine.

**ELECTRICAL** – For electrical requirements refer to the wiring diagram in this manual. Incoming power is to be connected to the top of the rotary disconnect switch (M11125). Be sure installation meets all applicable codes. Electrical connections and adjustments should be made by a qualified electrician only! The circuit is protected by fuses located inside the electrical panel. For fuse sizes, types, and designations, consult your wiring diagram included in this instruction manual. Spindle rotation is counterclockwise when viewed from vise end. Consult the factory if electrical service is to change. The frequency drive is voltage specific.

**COMPRESSED AIR** – Connect a compressed air line (minimum of ½” pipe) capable of delivering 3 CFM of air at 80 PSI to the incoming Filter/Regulator/Lubricator Unit (M10571). Set the pressure regulator to 80 PSI. The pressure switch (M10055) is set at 45 psi from the factory. The machine will not start without the pneumatics connected and turned on via the red dump valve knob located on the incoming side of the FRL.



**DO NOT PLACE HANDS OR ANY BODY PARTS INTO THE PIPE OR VISE AT ANY TIME WHILE LOADING / UNLOADING OR RUNNING THE MACHINE. WEAR APPROPRIATE PPE WHILE OPERATING AND SETTING UP THE MACHINE. OBSERVE ALL LOCKOUT / TAG OUT PROCEDURES.**

## STANDARD SINGLE TOOL CHAMFER HEAD SETUP

WARNING! – PINCH POINTS EXIST BEHIND MACHINE COVERS! REMOVE ALL ELECTRICAL AND AIR POWER SOURCES PER YOUR EMPLOYER'S O.S.H.A. LOCKOUT/TAGOUT PROCEDURES BEFORE MAKING ADJUSTMENTS.

SETUP of the HEAD is accomplished in the following order.

1. Remove any collets from the vise by removing the two screws securing them. This will provide access to the head through the vise opening.
2. Loosen wedge lock screw (M10602) so that the wedge (11400) releases the tool holder (12244) so it can be moved. Appx 1 to 2 turns.
3. You may need to loosen size adjusting screw (11399) so that the setting gauge for the part you wish to run will fit into head as shown in the picture below.
4. Insert the setting gauge thru the collet opening of the vise and into the head between the tool holder and the head (see picture below).
5. Tighten size adjusting screw so that setting gauge is a snug fit between tool holder and the side of the head pocket it contacts and remove the gauge.
6. Tighten wedge lock screw.

This will adjust the tool holder to the proper setting for the diameter marked on the gauge. Normally one gauge is supplied for each collet purchased. Fine adjustment of the chamfer can be made by using fine adjustment knob (12106) during setup. In some cases you may need to move the tool holder in or out to produce the desired chamfer. You may also make your own gauges for special parts as needed.



NOTE: when using the center stop rod, the same gauge is used for parts  $\frac{1}{2}$ " to  $\frac{3}{4}$ ". This is because the edge of the cutting insert is set as close to the stop rod as possible using the  $\frac{1}{2}$  -  $\frac{3}{4}$ " gauge. Adjust chamfer as required by using the fine adjusting knob. Always check to see that the insert or tool holder are not rubbing the stop rod on smaller diameter settings. If required the diameter of the stop rod can be reduced on the end.

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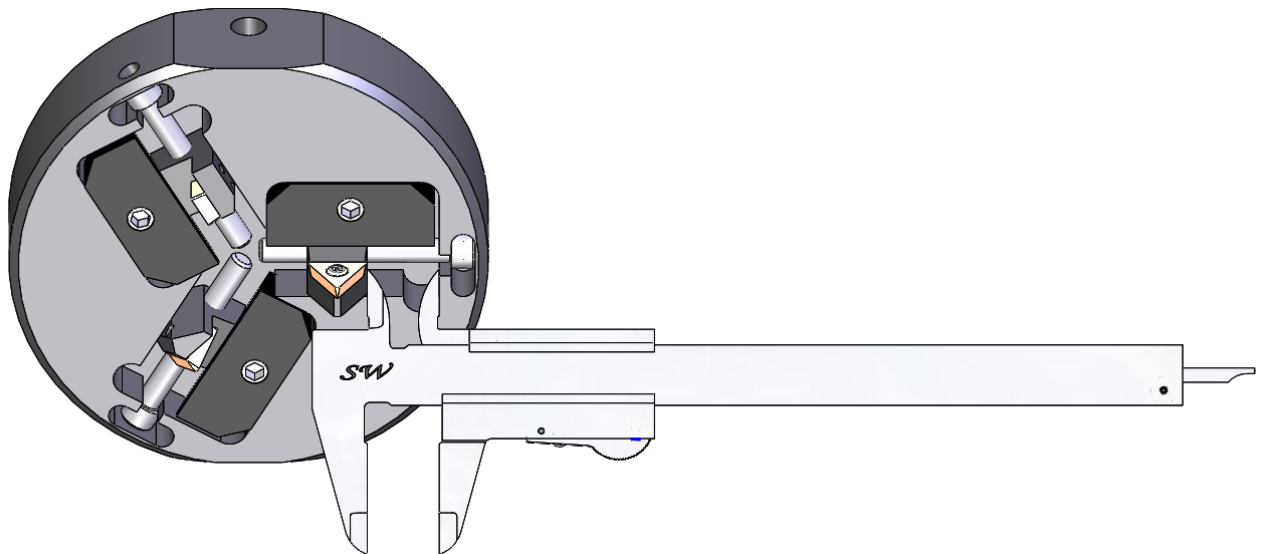
### **OPTIONAL THREE TOOL PIPE HEAD SETUP**

**WARNING! – PINCH POINTS EXIST BEHIND MACHINE COVERS! REMOVE ALL ELECTRICAL AND AIR POWER SOURCES PER YOUR EMPLOYER’S O.S.H.A. LOCKOUT/TAGOUT PROCEDURES BEFORE MAKING ADJUSTMENTS.**

SETUP of the HEAD is accomplished in the following order.

1. Remove any collets from the vise by removing the two screws securing them. This will provide access to the head through the vise opening.
2. Loosen wedge lock screw (M10602) on the OD chamfer tool.
3. Refer to the Tool Holder Setting Dimensions Charts in this manual. There is a different chart for each tool holder. A set of calipers are also included if your machine is equipped with a three tool pipe head.
4. See the figure below for measuring the location of the tool holders. Turn the Adjusting Screw to move the OD Chamfer tool holder to the dimension given for the pipe size to be machined.
5. Tighten wedge lock screw.
6. Repeat this procedure for the ID Chamfer tool holder and the Facing tool holder.

Fine adjustment of the chamfer can be made by using fine adjustment knob (12106). The dimensions given on these charts are intended as a starting point and can be adjusted as needed. Additional room is left on the chart for you to note your settings so that they can be easily duplicated.

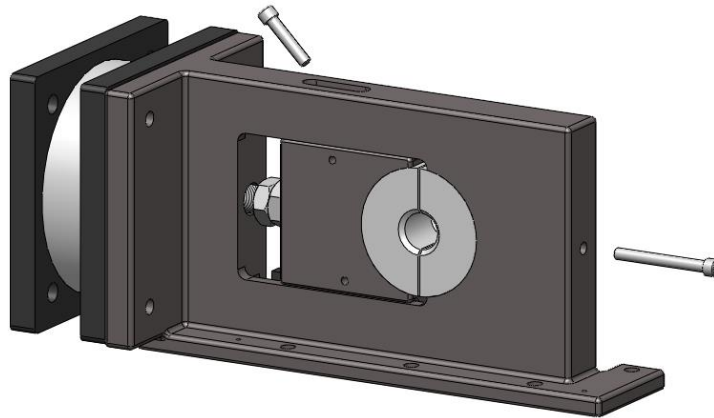


## MACHINE SETUP

# *IMPORTANT:*

*BEFORE MAKING ANY ADJUSTMENTS TO MACHINE, BE SURE ELECTRICAL POWER AND PNEUMATIC SYSTEM ARE DISCONNECTED FROM MACHINE, AND PROPER LOCKOUT TAGOUT PROCEDURES ARE STRICTLY FOLLOWED.*

1. After the cutting head has been set up per above, select the proper size set of Collets (12144) for the size of part for which the head was set up. The collets are held in place by two screws as shown in the drawing below.



2. The adjustment nuts on the hydra-brake (13201, see below) should be adjusted toward the spindle bracket for initial setup of the machine. This reduces the amount of forward rapid traverse of the head. After the machine is setup to properly machine the part, the nuts can be backed off until the cutting insert almost contacts the part before going into regulated feed for the cut. This will optimize the cycle time. The nuts need not be adjusted with each changeover unless there is significant wasted cycle time or the insert contacts the part before going into slow feed. **ALWAYS ALLOW SOME SLACK BETWEEN THE ADJUSTING NUTS AND THE BRACKET ON THE SPINDLE HOUSING. NOT DOING SO WILL DAMAGE THE HYDRACHECK UNIT.**

3. Screw the Fine Adjustment Knob (12106, see below) in a number of turns. This restricts the forward movement of the spindle/head assembly for setup.

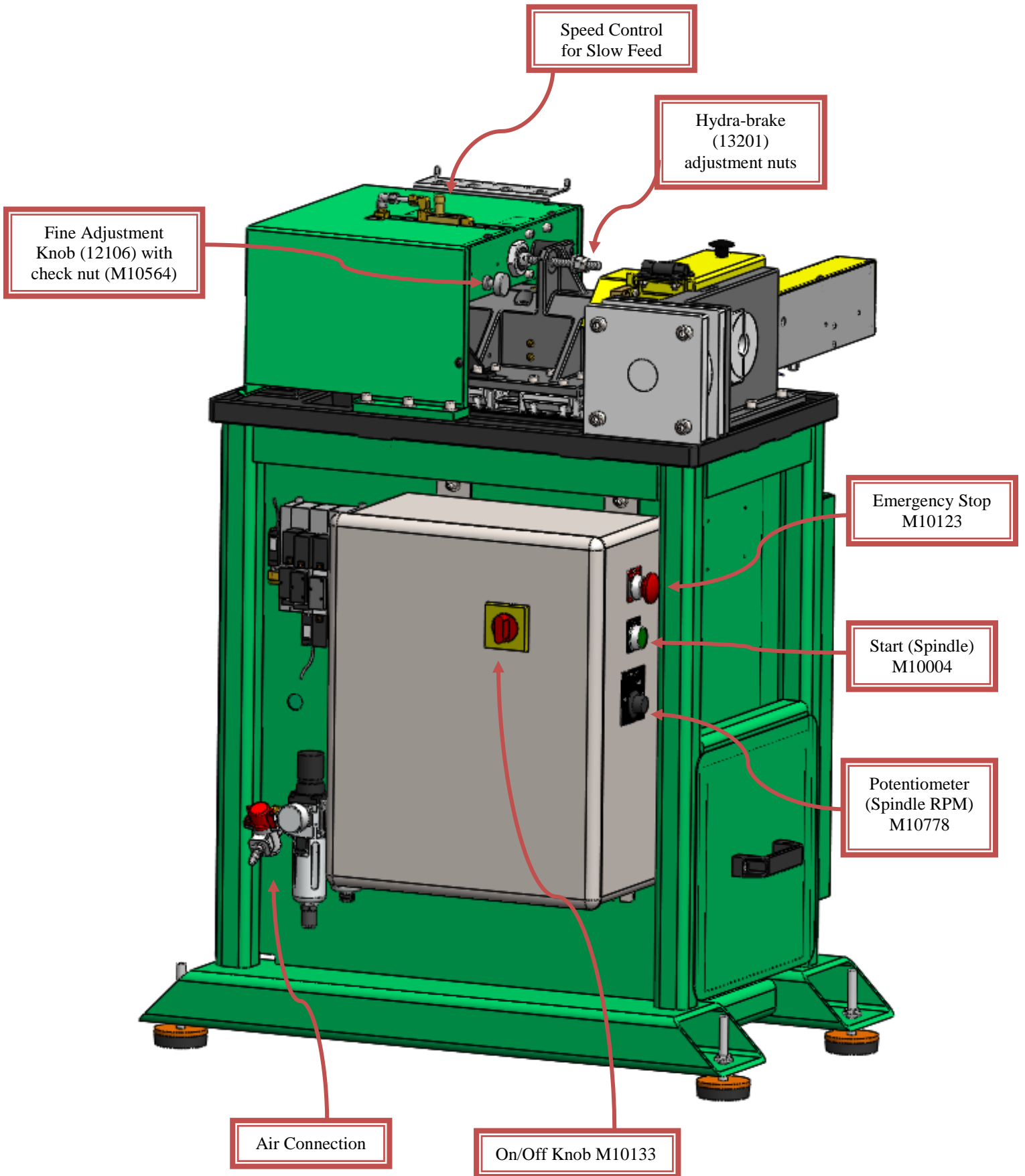
4. Cycle machine first without the spindle running to check basic machine operation. To cycle the machine:
  - a) Connect an airline to the machine at the Filter/Regulator/Lubricator (FRL). The FRL includes a lockable valve and a quick disconnect fitting. The Chamfermate also has an incoming air pressure switch. The machine will not function without air pressure.
  - b) Turn on the power.
  - c) Pull the “**EMERGENCY STOP**” button out.
  - d) Do Not push the “**START**” button (the “start” button begins the spindle rotation).
  - e) Depress and hold the foot switch.
    - The vise will close.
    - If the machine has the optional slide stop it will retract.
    - The spindle will move forward in rapid mode until the spindle housing contacts the adjustment nuts on the hydra-brake (reference step 2) and then continue moving forward in slow feed mode.
    - When the spindle reaches the end of travel it will rapidly retract to the rear position. The end of travel is adjustable via the Fine Adjustment Knob (reference step 3).
  
5. Start the spindle and adjust the potentiometer to set the spindle at the desired RPM.
  
6. Insert the part to be chamfered into the collet, against the stop rod, or slide stop if equipped, and cycle machine. Since the fine adjustment knob was screwed in at step 3, the cutter will most likely not contact the part at full forward travel of the spindle/head assembly. At this point, turn the fine adjustment knob counter clockwise about one turn and cycle machine again. Continue this procedure until the cutting head contacts the part and the desired amount of chamfer is produced. In some cases the cutting tool in the head may have to be adjusted toward or away from the center to achieve the desired chamfer. Once the machine setup is complete, use the check nut (M10564, see below) to lock the fine adjustment knob (12106).
  
7. The slow feed rate of the spindle/head assembly is controlled by the adjustment of the needle valve on top of the hydra-brake (13201, see below). It is set from the factory but can be changed to optimize both tool life and cycle times.

With experience, cycle times and tool life can be optimized by adjusting RPM's, fine feed rate and rapid traverse distance.

The stop rod is set from the factory with the end ½” from the rear of the vise.

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## **MACHINE OPERATION**

### **BASIC OPERATION OF MACHINE**

The Model C3A ChamferMate® machine is designed to chamfer the ends of threaded bars, studs, or bar stock. With the optional slide stop and tooling, parts can be pointed, or pipe/tubing can be chamfered (ID, OD, and Faced). The part to be machined is inserted into the collets (12144) until it rests against the stop rod (11795), or slide stop if so equipped. The operator then depresses the foot switch, which begins the machine's cycle. The collets clamp the part and the revolving cutter head advances rapidly until the spindle/head assembly contacts the stop nuts. The stop nuts pull the rod on the hydra-brake (13201), which regulates the feed of the advancing spindle/cutter head assembly while it is machining the part. This is referred to as the slow feed. Upon reaching the full depth of cut, which is adjustable by the fine adjustment knob (12106), the cutter rapidly retracts and the vise opens to release the part. The cycle can then be repeated. Cycle times of 1 to 2 seconds are normal for chamfering.

### **OPERATION OF SLIDE STOP (IF YOUR MACHINE IS EQUIPPED WITH THIS OPTION)**

The slide stop option allows small diameter parts and hollow parts (i.e. tube or pipe) to be chamfered on the machine. The slide stop replaces the stop rod. The stop rod cannot be used in conjunction with a machine that has the slide stop option. The operator will insert a part to be chamfered into the collet gently up against the slide stop and step on the foot pedal. This will close the vise and when the vise is closed the slide stop will retract to allow the spindle housing to come forward, thus chamfering the part. After the part is chamfered and the slide stop extends back toward the spindle, the vise will open and the part can be removed. The slide stop cylinder has (2) reed switches that signal the machine which position the slide stop is in. If the reed switch farthest from the machine does not light up when the slide stop retracts then the head will not come forward. If the slide stop does not extend fully and the reed switch closest to the machine is not lit, then the vise will not open.

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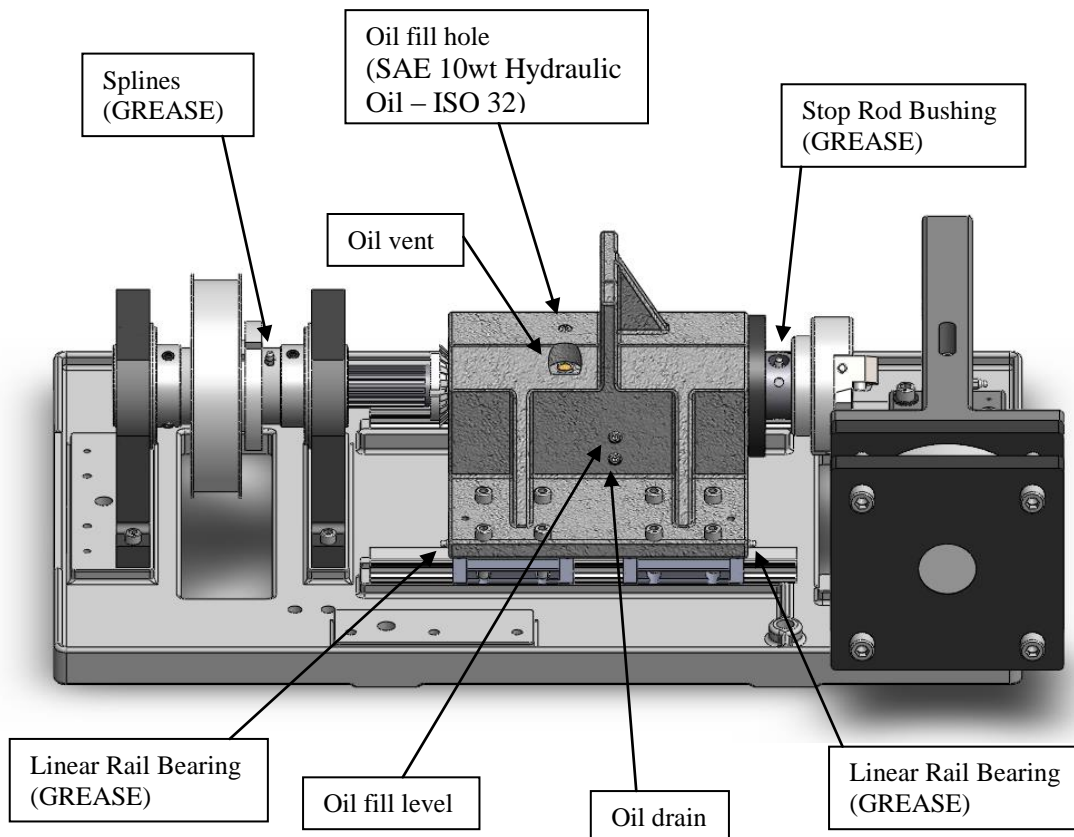
## MAINTENANCE

**MAIN SPINDLE BEARINGS** – The main spindle bearings are lubricated via the oil in the spindle housing. The oil level in the spindle housing needs to be checked on a monthly basis. This is done by removing the pipe plug that is installed at an angle in the left hand side of the spindle housing when standing in front of the machine. The oil level should be up to the bottom of the “oil fitting level” hole (see below). SAE 10wt hydraulic oil (ISO32) is installed in the spindle housing from the factory. The oil should be completely drained and refilled on a yearly basis. There is a drain hole provided on the left hand side of the spindle housing.

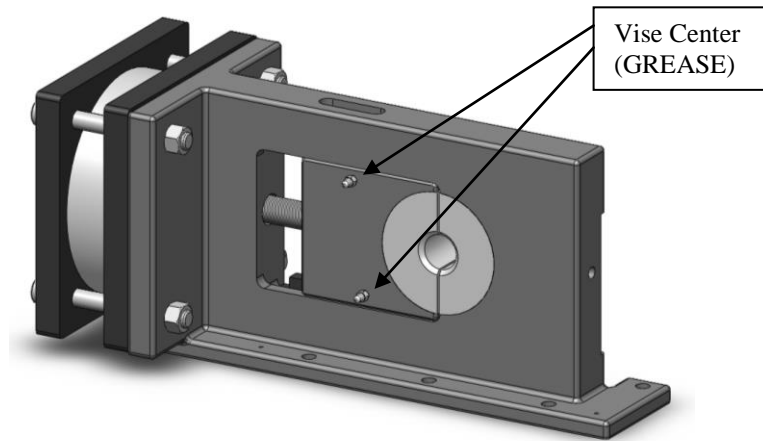
**SPLINES** – Grease monthly through zerk on rear drive hub. Supply one full pump from standard grease gun. It is recommended to use the same grease as is used on the linear bearings.

**LINEAR RAILS AND BEARINGS** – The linear rails and bearings require monthly lubrication. This is done by SLOWLY supplying grease from a standard grease gun to each of the four zerks located on the linear rail bearings. The linear bearing manufacturer suggests using grease that complies with DIN 51825 consistency class 2. It is imperative that greases with solid lubricant content (such as graphite or MoS2) **NOT** be used!!!

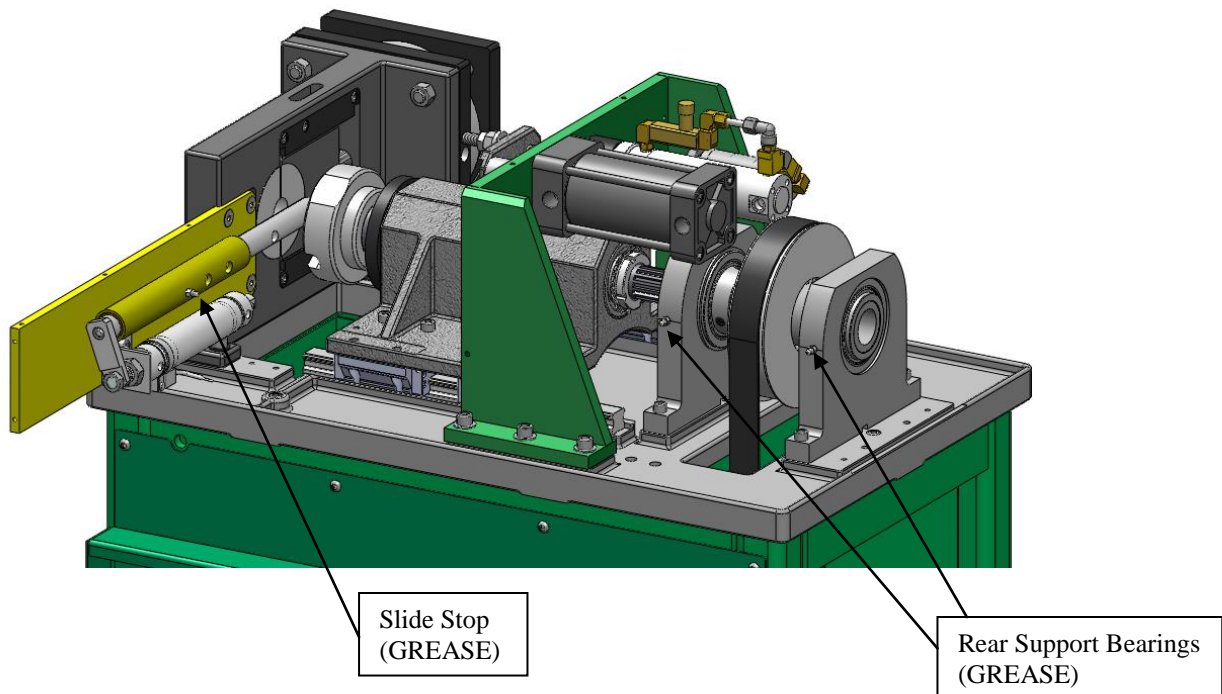
**STOP ROD BUSHING** – Grease monthly through zerk on spindle near chamfer head. It is recommended to use the same grease as is used on the linear bearings.



**WISE CENTER** – Grease monthly thru the two zerks on the front of the vise. It is recommended to use the same grease as is used on the linear bearings.



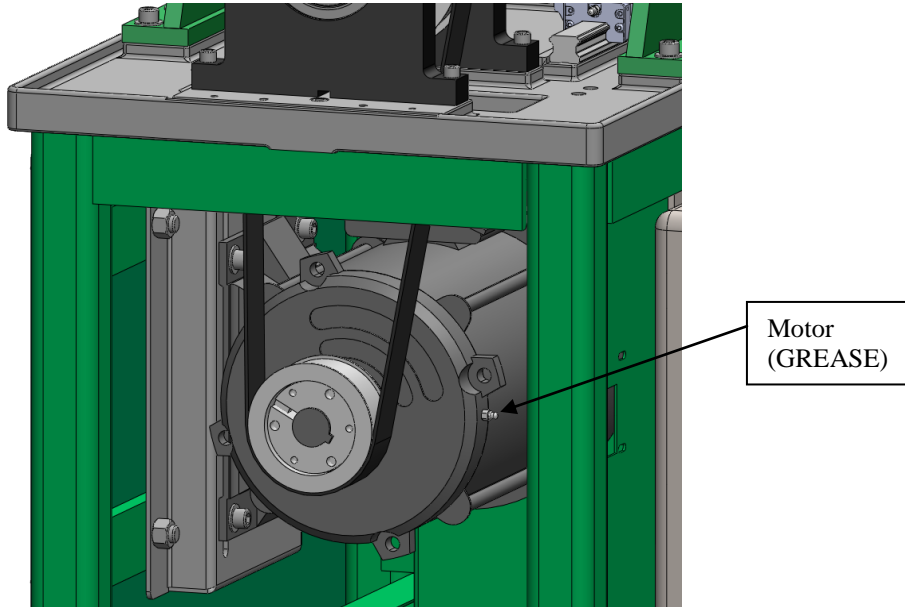
**REAR SUPPORT BEARINGS** – The rear support bearings need to be greased on a monthly basis also. This is done by SLOWLY supplying one full pump from a standard grease gun, with the machine running about 1000 RPM, to each of the two rear bearing zerks. It is recommended to use the same grease as is used on the linear bearings.



**SLIDE STOP** – If your machine is equipped with a slide stop it should be greased monthly thru the zerk on the slide stop. It is recommended to use the same grease as is used on the linear bearings.

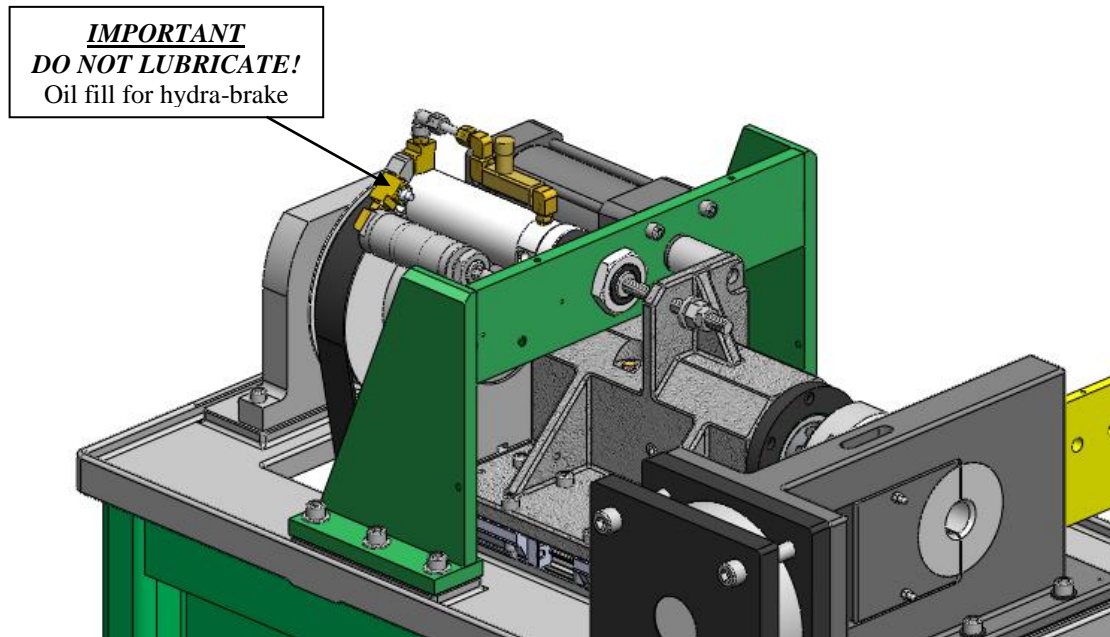
**AIR LINE LUBRICATOR** – Fill reservoir with 10 wt. hydraulic oil as needed and adjust to supply one drop of oil with each 4 to 5 cycles of machine.

**MOTOR** – Grease annually thru the zerk fitting located on the shaft end of the motor. It is recommended to use the same grease as is used on the linear bearings.



**CLEANING** - Empty chip pan as needed. Wipe exterior of machine clean with a towel dampened with household type spray cleaner. Do not use harsh solvents or blowgun to clean machine.

HYDRA-BRAKE –There is an oil fitting located on the hydra-brake. This ***IS NOT*** a lubrication point. The hydra-brake requires no normal maintenance. If required, consult factory for refilling.



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## **TROUBLE SHOOTING GUIDE**

### **WHEN CONTACTING THE FACTORY FOR ASSISTANCE, MAKE SURE YOU HAVE A COPY OF THIS INSTRUCTION MANUAL AS WELL AS THE SERIAL NUMBER OF THE MACHINE.**

Spindle will not start:

- A: Check disconnect switch is turned to the “ON” position (M10132).
- B: Check that the limit switch (M10255) on top cover is actuated by the hinged top cover.
- C: Check that the incoming air is turned on and the air pressure is set to at least 80psi.
- D: Check incoming power.
- E: Check fuses in control panel. For fuse sizes, types, and designations consult your wiring diagram included in this instruction manual.

Spindle will run but cycle does not actuate when foot pedal is depressed:

- A: Check air pressure is set to at least 80 PSI on regulator (M10571).
- B: Check vise clamped pressure switch (M10055) is set at 45 PSI.

Vise closes and head begins to travel forward, but then retracts before completing a cycle:

- A: Check air pressure is set to at least 80 PSI.

Inserts are breaking prematurely:

- A: Check insert (M10600) is not contacting part in rapid traverse.
- B: Check condition of seat (M10361) and ensure seat screw (M10362) is tight.
- C: Check hydra-brake (13201) for excessive feed rate.
- D: Change to a carbide insert that is suited for the particular material being processed.

Excessive chatter:

- A: Check condition of insert (M10600), seat (M10361) and seat screw (M10362).
- B: Check that the wedge (11400) is tight.
- C: Adjust RPM and feed rate.
- D: Check condition of spindle bearings (M10317 and 12552).
- E: Check condition of linear rails and bearings assembly (M10773).
- F: Check collets fit part properly in the vise.

Vise will not open when head is retracted:

- A: Check rear limit switch (M10167) is being activated by the screw mounted in the spindle housing.
- B: If equipped with the slide stop option. Check to be sure the slide stop reed switch closest to the spindle is lit when the machine is at rest, powered up, compressed air turned on, and slide stop extended toward spindle. Adjust if necessary.

Part is not chamfered when tool holder is set right and head travel is at maximum

- A: Check axial position of stop rod (11795). It should be set ½” from the back side of the vise.

Chamfer is off center:

- A: Check that the appropriate collets for the diameter bar (pipe/tube) are installed correctly in the machine.
- B: Check parts to ensure they are not out of round, over/under size etc.
- C: Re-center vise. Consult factory.

Fine feed rate is spongy, inconsistent, or does not respond to adjustment of the needle valve:

- A: Hydra-brake (13201) may require maintenance. Consult factory.

RPM's of machine slow down as part is being machined:

- A: Check condition of belt and sprockets
- B: Slow down feed rate (13201)
- C: Adjust RPM to better suit material and diameter

Spindle assembly slams forward or reverse:

- A: Adjust flow controls (M10686 – located stacked under the solenoid valve that controls the feed cylinder, adjust using a straight blade screwdriver as necessary).

Vise will not hold part securely:

- A: Check that the lock nuts on the vise center have not loosened and allowed the stud to screw into the vise center thus not allowing the vise center to not travel far enough to clamp the part.
- B: Check that the piston in the clamp cylinder has not broken.

SLIDE STOP OPTION (IF SO EQUIPPED)

Vise will not open:

- A: Check to be sure the slide stop reed switch closest to the spindle is lit when the machine is at rest, powered up, compressed air turned on, and slide stop extended toward spindle. Adjust if necessary.

Spindle housing will not come forward after vise clamps part:

- A: Check that the slide stop reed switch farthest away from the machine is lit when the slide stop retracts after the vise clamps the part. Adjust if necessary.

For other problems, consult factory.

**WHEN CONTACTING THE FACTORY FOR ASSISTANCE, MAKE SURE YOU HAVE A COPY OF THIS INSTRUCTION MANUAL AS WELL AS THE SERIAL NUMBER OF THE MACHINE. IN ADDITION, IF INQUIRING ABOUT PARTS MAKE SURE YOU HAVE THE ASSEMBLY DRAWING NUMBER ON WHICH THE PART IS CALLED OUT.**