



# Stud Master SME-4a

Production System

## Operating Instructions

&

## Safety Information



Manufactured by: B&G Manufacturing, Inc.  
3067 Unionville Pike  
Hatfield, Pa. 19440

# Table of Contents

Upon Receiving Your Stud Master: .....	3
Power Supply: .....	3
Pressurized Air:.....	4
Operator Controls: .....	4
Tool Speed:.....	5
Cutting Area: .....	5
Diagnostic Screen .....	6
Access to Diagnostic ScreenFront Panel: .....	6
Front Panel: .....	7
Stroke Adjustment: .....	8
Feed Adjustment: .....	8
Stamps: .....	8
Stamp Impact Force Adjustment: .....	9
Changing Collets:.....	9
Insert Tools:.....	10
Cutting Tool Adjustments: .....	11
Lubrication: .....	12
Cleaning:.....	12
Safety Tips .....	14
Recommended Maintenance schedule .....	15
Trouble Shooting Guide .....	16

## Upon Receiving Your Stud Master:

- Carefully inspect the machine to see if any components vibrated loose while the machine was in transit.
- Check pre-set machine parameters.
- Place the machine in a location that is convenient and safe for the operator. (Usually next to a saw that is cutting material that has to be chamfered and/or stamped.)
- Remove the shipping feet and install the cushioned rubber machine feet supplied with your machine.
- Level the machine to take out any rocking; keeping in mind that the foot pedal requires some floor clearance.
- Be careful not to run the leveling screws out so far that they come out of the threads.
- Lock the leveling screws in place when adjusted to the desired height.
- Allow a space on the left side of the machine for a chip container.
- Mounting the stand off electric tower: due to the size of the shipping crate, the tower is in the down position. Therefore, before wiring your machine, lift the tower straight up and turn towards the front of the machine. Attach with the two supplied 5/16 screws and secure to the table.
- **This Machine is set up for an American Standard 3-phase, 220 Volts, 50/60 Hertz system. If your shop is not set up for this system, please contact a certified electrician to hook up the machine properly. Failure to use the correct setup will result in damage to the electronics. B&G is not responsible for any improper hook-ups.**

## Power Supply:

All electrical connections come together in the front cabinet of the machine. Entrance to this panel should be limited to experienced electrical personnel only. If entrance to this panel is necessary, the main switch located on the side of the machine must be turned off and locked out.

**Caution:** When making electrical connections, make sure the chuck is running **counter clockwise** as viewed from the front of the machine. If the chuck is running clockwise, turn off the main power supply to the machine and make the necessary wiring adjustments. If the tooling chuck is running counter clockwise, the machine is ready.

## **Pressurized Air:**

Dry compressed air should be supplied by way of the quick disconnect fitting, which is located at the rear of the machine. Two bowls are located at the rear of the machine. One of the bowls collects excess moisture from the pressurized air and should be drained periodically. The other bowl is filled with a light lubricating oil, (**Preferably pneumatic air tool lubricant or similar lightweight HD 32 Non Synthetic oil**), which is delivered to the machine at a rate of approximately one drop for every 25 – 30 strokes. This bowl should never be allowed to become empty.

The knob on top of the Oil bowl regulates how much oil is released through the system. When the stud-master is sent out, the knob is set back about a ¼ of a turn back from the fully closed position. This knob should not be played with due to the fact that if too much oil is allowed through the system, the impact unit can be clogged. To allow more oil to flow, turn the knob counter-clockwise and do the opposite to decrease the amount of oil.

Air pressure may be adjusted using the regulator located at the rear of the machine. The proper pressure setting is that which prevents the stud from moving when struck by the impact unit, yet results in no thread damage. The following chart should be used as a guideline when setting air pressure.

### **STUD NOMINAL DIAMETER – AIR PRESSURE (PSI)**

3/8" - 4"

85 – 100

## **Operator Controls:**

Located on the stand off tower from left to right is the spindle speed and RPM indicator, touch the arrows to adjust your speed. Next is the parts counter that may be cleared at the start of each new job by touching the clear button. To the far right is the option to have stamping mode on auto or foot pedal, and next to that is the option to stamp both cycles, alternate cycles or have it completely turned off.

Located on the front of the machine is the red stop button. (When this button is pushed inward, electricity and air pressure is turned off except for the PLC in the front cabinet.) To the right of the stop button is a green start button.

**Note: When the red button is depressed, the wires in the front panel are still “HOT”. Power can be restored to operate the machine by pulling the red button to the outward position.**



**Stand Off Tower**



**Front of Machine**

## **Tool Speed:**

To adjust tool speed, use the up & down arrows on the operator interface touch screen. The indicator reads from 53 to 1300 RPM. (Refer to speeds and feeds chart for proper applications.)

## **Cutting Area:**

The cutting area has a hinged hood guard installed to protect the operator from the rotating chuck area. The hood has a safety switch that will shutdown the air supply and disconnect the drive when it is lifted. It will restore the drive and air when the hood is closed.

**Note:** Your display will remain on the screen while the hood is open.

### **Warning:**

**No attempt should be made to defeat this safety device. If the switch or any safety device is not working properly, the machine should be taken out of operations until it is repaired.**

### **Caution:**

**If the hood is lifted after the machine has started the air cycle, immediately upon closing the hood; the air cycle will continue until it has completed a full cycle.**

Located within the cutting area is a chip chute that will direct chips into a container. This is for ease of collection and separation of different materials. Light cleaning of this area may be desired prior to running a job of a different type material.

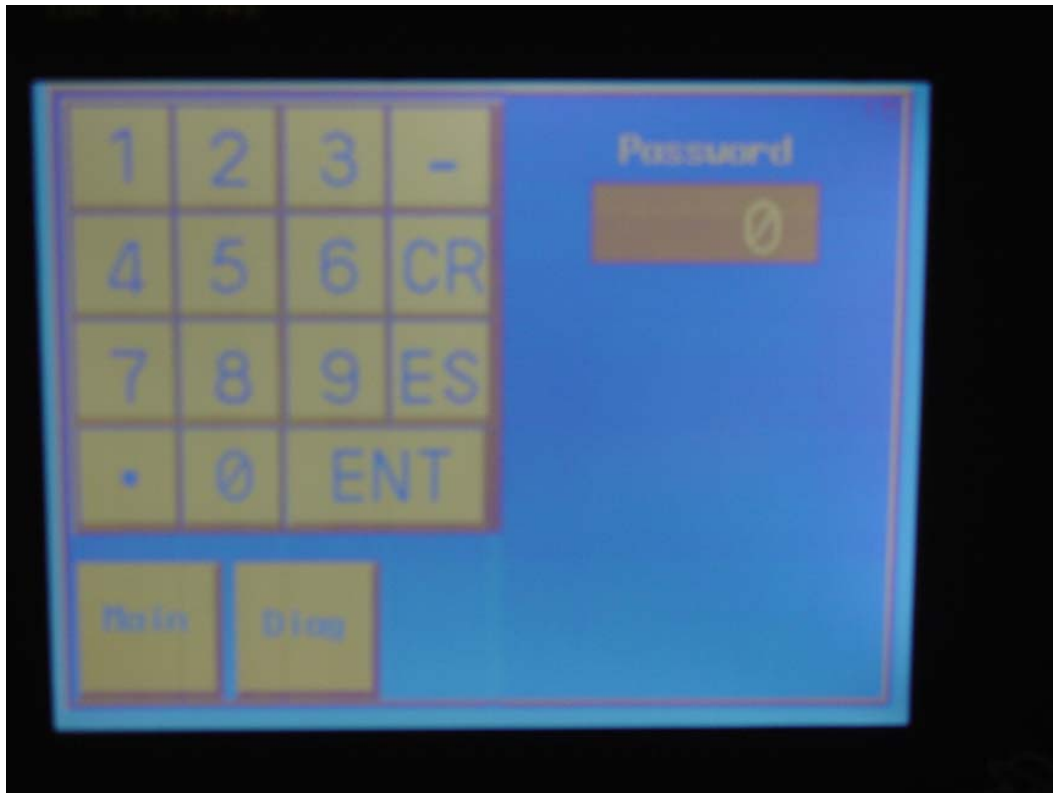
## Diagnostic Screen:

Your Stud-Master is equipped with a special feature to help aid in troubleshooting. This feature is located on the display screen.

To Enter the Diagnostic Screen:

- Touch the Diagnostic button on your display screen.
- Touch the box were the code should be entered into.
- Enter the default code (100) and then hit the Enter button.
- Next touch the Diagnose button.
- This will bring you into the Diagnostic screens.

In these screens, you can see which sensors are on/off and you can manually force and feed sensors to see if they are working properly.



Access to Diagnostic Screen

**Front Panel:**

The B & G Logo plate located on the front of the machine serves as an access panel for working on the clamping cylinder, regulator and air hoses.



## **Right side of machine**

### **Hydro check cylinder**

#### **Stroke Adjustment:**

Operations of the Stud Master combines a rapid stroke cycle (which advances the cutting tool to a position near the stud to be chamfered) and a feed stroke cycle (which advances the cutting tool into the stud). All stroke adjustments are set at the factory and should never require resetting. However, if for any reason the rapid or feed stroke should require readjustments, the following information should be referenced.

**STROKE LENGTH ADJUSTMENT** – Controls the length of the combined stroke cycles.

**FEED TRIP ADJUSTMENT** – Sets the position at which the rapid stroke cycle ends and the feed stroke cycle begins. This should occur when the cutting tool is approximately one-eighth inch (1/8") from the stud.

**FORWARD FEED SAFETY STOP** – Controls the maximum forward advancement of the cutting tool.

**Caution: Tampering with the forward feed stop could cause the tooling to collide with the collet assembly and result in machine damage and/or personal injury.**

#### **Feed Adjustment:**

The feed rate is adjusted using the feed adjustment control valve. Opening the valve increases the feed rate. With each full rotation of the valve handle, a new color band is exposed. At the maximum feed rate, five (5) colors will be exposed; however, most operations will be conducted within the first two color bands.

#### **Stamps:**

Stamps are made of a heat-treated material that will withstand impact forces, but in time will require replacement. Each stamp is machined to a precision diameter and length for proper fit and stop repeatability. Blank stamp rods are used when a stud requires no identification. Stamps are held in place by three rubber O-rings that create friction on the stamp.

To remove a stamp, first turn off power and air supply. Next, reach through the collet area with a tool suitable for gripping the stamp body, (such as a small vise grip or pliers). Twist slightly to the left and right while pulling. When inserting the new stamp; press firmly on the stamp end with a stud until it is seated fully in the stamp holder. Blank stamps and stamps for your particular requirements can be supplied by B&G Manufacturing.

## **Stamp Impact Force Adjustment:**

The impact force for stamping is adjusted by the regulator on the front of the machine. The impact force should always be adjusted to the minimum force necessary to produce a legible stamp.

The PSI range should be between 40-60psi, anything more may result in damage to the part.

## **Changing Collets:**

The proper collets must be installed for each nominal diameter stud. The collets are machined to a precise die of  $+0.002/-0.000$  of the nominal diameter in order to provide maximum gripping ability. Each collet half is marked with the decimal diameter. For instance, the  $\frac{3}{4}$ " collets are marked .750. Collets for diameters other than those supplied may be obtained from B&G Manufacturing Company.

**Note: Never attempt to operate the machine without the proper collets installed. Machine damage may occur.**

To remove collets use the following procedure:

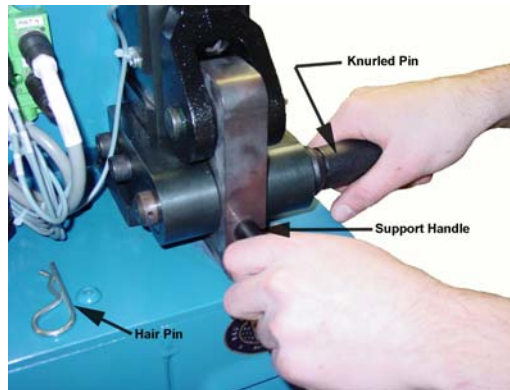
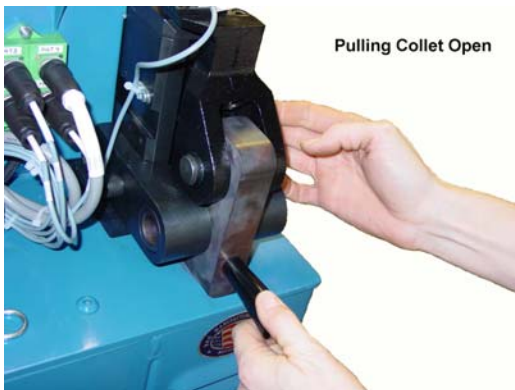
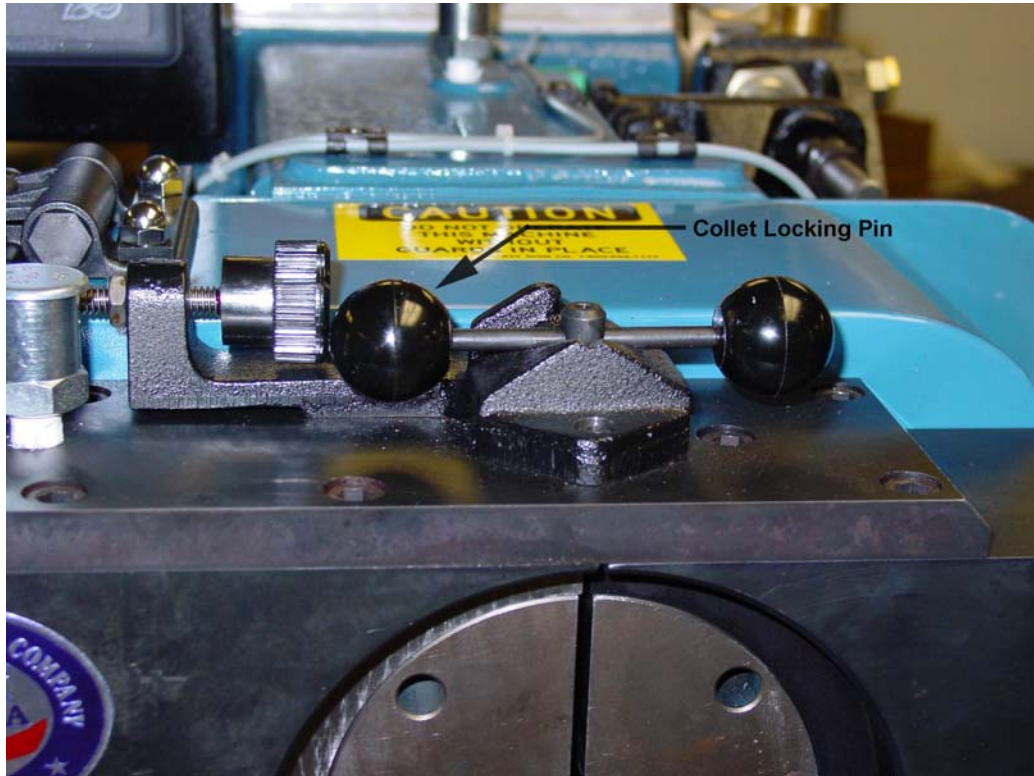
- Turn off the electric and air supply by pressing the red stop button inward.
- Remove hitch pin from the pivot pin.
- Remove the pivot pin using the support handle to gently lower the clamping linkage.
- Pull the collets open until the slide retainer makes contact with the slide stop.
- Open the chuck cover completely.
- Disengage the collet-locking pin by lifting and rotating the knob 90° to the set destination.
- Rotate each half of the collet within the housing to clear the lower key and remove it.

**Note: The ideal time to change stamps is when the collets are removed. This is because clearance access is available through the collet housing.**

To install collets use the following procedure:

- Place the collet halves into the collet housing, rotating them to engage the lower key.
- Engage the collet locking pin by rotating it 90°.

- Push the collets closed.
- Lift the clamping linkage slightly by using the support handle to align the hole and install the knurled pin.
- Install the hitch pin.



## **Insert Tools:**

Carbide nitride coated insert tools are used to cut chamfers. B&G has extensive experience working with nitride coated carbide inserts and we have found that coated inserts can be expected to last 2 – 3 times longer than non-coated inserts.

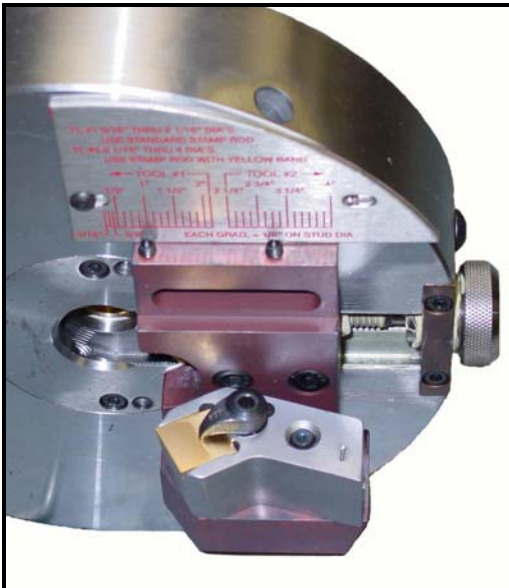
Each positive rake insert has four cutting edges and can be ground on a diamond wheel for additional use, provided the insert is not chipped. When replacing or indexing inserts, be sure to clean the area where the insert rests to assure proper seating.

## Cutting Tool Adjustments:

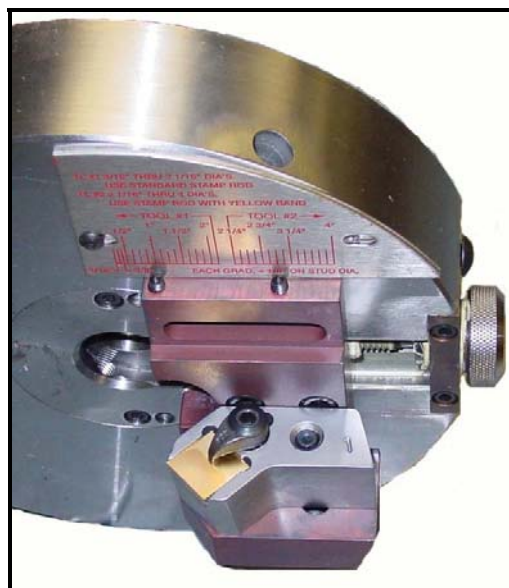
The Stud Master tooling must be adjusted to the proper diameter of the stud that is being chamfered and to the proper angle of the chamfer (30° or 45°).

To adjust the chamfer angle to 30° - 45°, use the following procedure:

- Loosen the tool pivot locking screw.
- To achieve a 45° chamfer, pivot the cutting tool towards the chuck until it contacts the vertical surface of the tool slide.
- To achieve a 30° chamfer, pivot the tool holder away from the chuck until it contacts the stop.
- Tighten the tool pivot locking screw.



**30° Position**



**45° Position**

To adjust the cutting tool for different diameter studs, use the following procedure:

- Loosen the diameter adjustment locking screw.
- Turn the diameter adjustment knob until the pointer indicates the proper nominal size of the stud to be chamfered. **Note: Be sure to read from the proper pointer. The pointer on the left is used when the machine is set for**

**chamfering studs up to 2 in. in diameter and the pointer on the right is used when the machine is set for studs bigger than 2 in. in diameter.**

- Tighten the diameter adjustment locking screw.

**NOTE:**

**Tool #1 is used for studs smaller than 2 inches in diameter and tool # 2 is used for chamfering studs over 2 inches in diameter. When chamfering studs bigger than 2 inches you must also change out the stamp rod with the yellow banded stamp rod.**

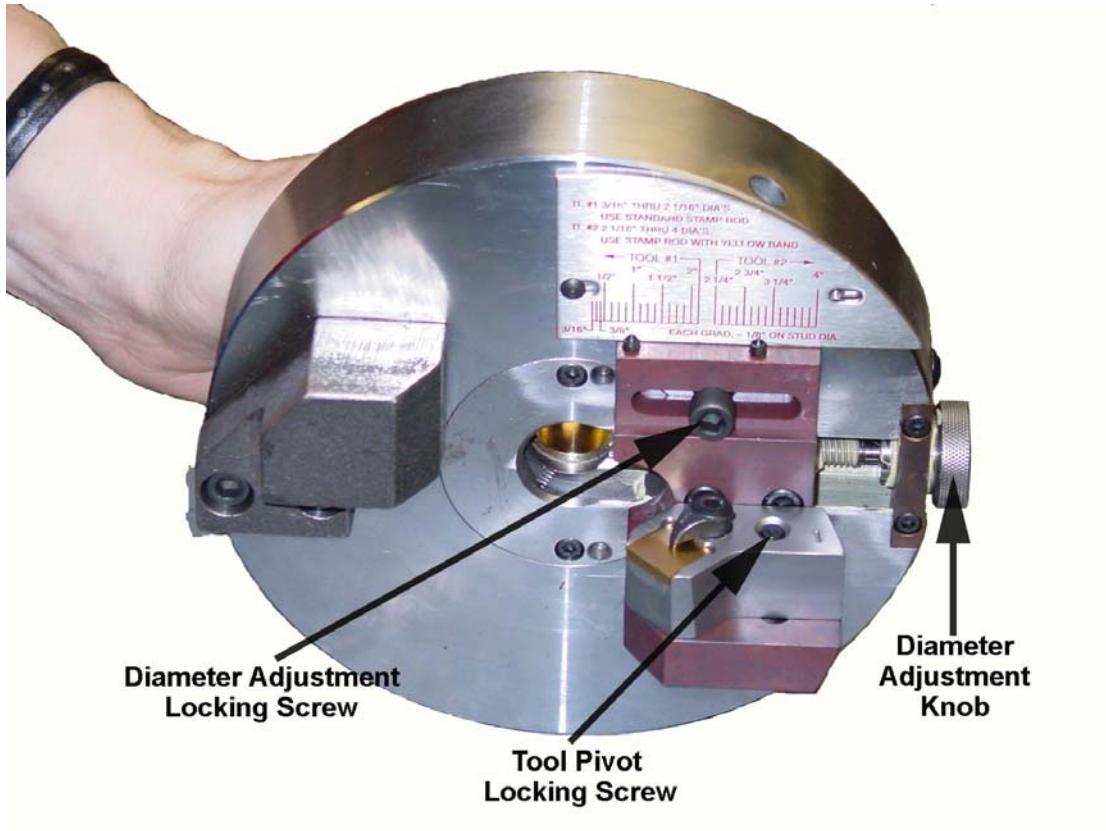
### **Lubrication:**

Located on top of the machine are 2 oil cup reservoirs. Each oil cup should be filled daily with a 30 wt. lubricating oil to insure proper machine operation. Once a week use a drop of oil on exposed moving parts.

The spline shaft located at the rear of the drive housing should be greased once a week with a white lithium type grease. This can be done with an aerosol can. For better access inside the protective sheet metal cover use an aerosol extension; a light coating around the shaft diameter at the point of entrance into the female spline is sufficient. Use light lubricating oil on all pivot points.

### **Cleaning:**

At the end of each shift wipe the machine down with a clean dry cloth. Do not allow any accumulation of liquids to collect on machine surfaces.



## Safety Tips

- Safety is of utmost importance whenever operating machinery.
- Never wash the machine down with water or any liquid due to the presence of high voltage electricity.
- Do not perform any type of maintenance before turning off the electricity (lock out) and disconnecting the air supply.
- Never attempt to defeat (by pass) safety devices. They are installed for your protection.
- Keep hands and fingers away from collet area, air cylinder feed mechanism, and impact drive system.
- Never attempt to place objects other than studs into the collets; and always use the correct collet with the size stud that is going to be chamfered. Each collet has the size stamped on the front.
- Always wear safety glasses when operating machinery.
- Never remove or paint over safety labels. These labels are placed on the machine to remind you of danger areas.
- Never operate a machine if you suspect an unsafe condition exists. Have it checked and corrected.
- Surfaces painted yellow indicate a caution area.
- Do not lean or allow others to lean against machine surfaces as this could result in fingers being caught in moving parts.
- Total awareness of how equipment works is your best insurance against operator injury. Have each operator read operating instructions and keep a set at the machine site.

## **Recommended Maintenance schedule**

Check FRL and drain if necessary.	Daily
Wipe down all machine surfaces with a clean, dry cloth.	Daily
Check and fill oil cup reservoir on top of machine.	Daily
Check lubrication reservoir for the air supply system add oil if necessary.	Weekly and
Lubricate exposed moving parts with light oil.	Weekly
Grease spline shaft.	Weekly
Grease slide area of motor adjustment.	Monthly

# Trouble Shooting Guide

## Caution

**Only Authorized electrical personnel should service electrical problems. Plant power supplying machine power should be locked-out when servicing; the switch box power should also be turned off.**

### **Power is turned on at the switch box, but machine has no power?**

- 1) Make sure chip hood is in the down position and making contact with the switch.
- 2) Make sure the side mounted switch box is in the on position.
- 3) Check the three fuses inside the mounted switch box. (turn off plant power supplying power to machine)
- 4) Check for loose wiring.
- 5) Make sure the red all stop button is pulled to its outward position.

### **Spindle does not stop turning when chip hood is opened?**

- 1) Make sure spring loaded switch button is not stuck in the down position. (check spring in switch)
- 2) Check for faulty switch. Replace if necessary.

### **Spindle rapids forward, but does not go into slow feed mode?**

- 1) Check setting of "Feed Adjustment". (If fully closed machine will not feed forward)
- 2) Check Position of "Feed Trip Adjustment". (Double lock-nuts may be set to far away from castings)
- 3) Check and see if cylinder check is leaking oil, if it is determine reason, repair and refill.
- 4) Cylinder check is damaged beyond repair. Replace cylinder check.

### **Collets will not release stud?**

- 1) Check to see if sensor #3 is making contact with screw adjustment. (this sensor opens collets)
- 2) Reset screw adjustment against sensor #1. (Make sure sensor is not being contacted when sensor #3 is contacted).

### **Collets will not clamp stud?**

- 1) If collets close and open immediately, follow step above, **“Collets release stud prematurely”**. If collets close and stay closed through a complete machine cycle, but never actually clamp on the stud. First check and make sure the stud diameter is not under size.
- 2) Make sure chips have not accumulated between the two slide areas preventing it from closing.
- 3) Check the clevis on the rod of the clamping cylinder, (located behind the black plastic logo cover), mounted on the upper front of the machine. If the clevis lock nut is not tight against the bottom of the clevis; the rod may have rotated within the air cylinder causing the original collet opening to change. If this is the case; the cylinder's travel is being exceeded. The collets should open 1/32” to 1/16”. To adjust: Lower the cylinder at the clevis end by removing the pin. Rotate the clevis away from the cylinder one or two full revolutions, remount the cylinder and check the collet opening. If the collet opening is correct, lock the locking nut tightly against the clevis. If the opening is not correct; readjust. Turn electric power off at the side mounted switch box before attempting any removal or adjustments.

### **Pneumatic impact unit will not stamp?**

- 1) Check air pressure at the front of the machine.
- 2) Check to see if exhaust mufflers are clogged, four on each side of impact unit. Try running with mufflers removed; at least two from each side. If unit works, clean or replace mufflers.
- 3) Check for loose assembly pins at front area of impact unit, four places, (remove top cover box).
- 4) Check to see if the impact hammer is binding up; take an airline and force air into the back of the impact unit. If you hear the hammer moving back and forth, the hammer is not binding up. If you can not hear the hammer moving back and forth; take some electrical or carburetor cleaner and spray it into the 3/8<sup>th</sup> line going into the pneumatic unit. If this does not work, chances are the hammer is binding in the piston wall. This could be caused by a lack of lubrication, too much lubrication or possibly dirt introduced by the air supply. See instructions supplied with “Pneumatic Impact System”. Make a mental picture of how things are assembled before removing parts; if necessary make some notes as parts are removed. Remove the acoustics box. ( see supplied drawings of impact assembly) Remove the four 1/2” hex head bolts at the rear of the impact unit; collect the loose parts when removing the flow control cap. Then remove the impact hammer inside the tube. You may be able to achieve this by blowing air into one of the side 1/4” lines (being careful the hammer does not fly out at you) or

get a magnet to try and pull it out. If either of the two does not work, try to disconnect and remove the stamp rod. Remove the four 1/4" screws holding the end cap on at the front of the unit. Remove the two 1/4" set screws, lock washers and nuts at the left and right side of the front nose piece. Pull the anvil and spring out from the front of the unit. Place a rod in the front of the unit and tap on the hammer until it comes out from the back of the unit. (make sure you catch the hammer before it falls to the floor) Lightly sand the hammer down with some emery paper to make sure no raised areas are on the surface. Clean the tube with a clean cloth; push the cloth all the way through and out again, blow the tube out with compressed air. (if there was no oil present in the tube, that indicates the unit is not receiving enough oil through the lines. To adjust oil see "**Pressurized air**" on page 4) Spray WD-40 or a similar product onto the hammer and see if it slides through the tube freely. Slide it through until it makes solid contact at the front and then see if it is easily pushed back. If it does not slide freely, polish the hammer some more and if necessary it would not hurt to remove .002"/.003" of material off the front one inch of the hammer.

**Note:**

When re-assembling the unit, refer to the supplied assembly drawings. When tightening the 1/2" hex bolts, tighten just enough that the rubber washers compress about 1/32" to 1/16". Make sure the anvil slides freely when you re-install the 1/4" set screws at the sides of the nose piece. Run the set-screws all the way down and then back them off a half to one revolution, tighten lock-nut.

**Pneumatic Impact Unit will not stop stamping?**

Check and make sure that sensor # 3 is working properly and the screw is contacting the sensor in the back position.

**Stamp Rod Sticks When Pushed In-Ward & Does Not Travel A Full 1/8"**

- 1) Check the dog point-set screws at the left and right side of the nose-piece, on the impact unit. These screws prevent the anvil from rotating. If one or both of these screws break; the anvil will not slide smoothly and the unit will not function correctly. Use a 1/8" hex wrench and a 7/16" open end or box wrench to remove. If you find one or both have broken, fish out the broken end and replace with a new dog point screw.
- 2) If the dog point-set screws are fine; check and make sure that the anvil is not binding up inside the nose piece. If it is binding up; remove the end cap (four 1/4" screws), and emery smooth, clean, lube and reassemble the anvil and end cap.
- 3) If anvil is moving freely; check for broken spring behind the anvil inside the nose piece.
- 4) Check and make sure the stamp rod is not bent. If the rod is found to be bent, straighten and reinstall.

- 5) Check and see if chips have built up between the stamp rod and the chuck bearing bushing.

### **Stamp Rod Hitch-Pin Breakage?**

- 1) **Pneumatic Impact System:** Hitch pin breakage may be directly attributed to the stud moving upon impact. This can be caused by the operator not fully depressing the spring loaded stamp rod, inadequate air pressure at the lower FRL unit or too much Impact air pressure.