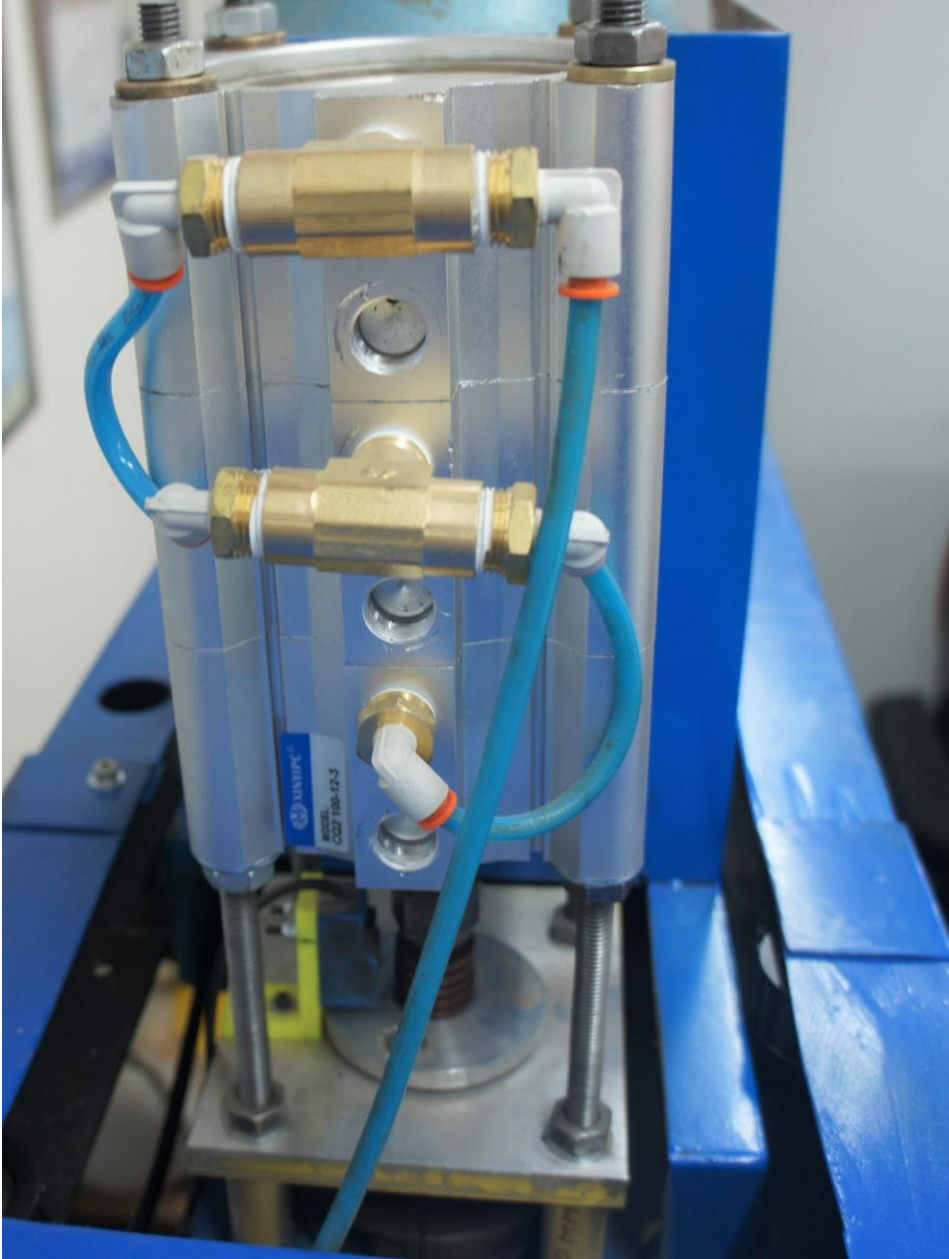


# **POWER DRAWBAR INSTRUCTIONS FOR AMERICAN BRIDGEMILL AND SHOPMASTER MILL TURN**



**Following are the instructions for installing the power drawbar  
on the Chicago Lathe BRIDGEMILL or Shopmaster MILL TURN.**

**Your kit will come with the following items:**

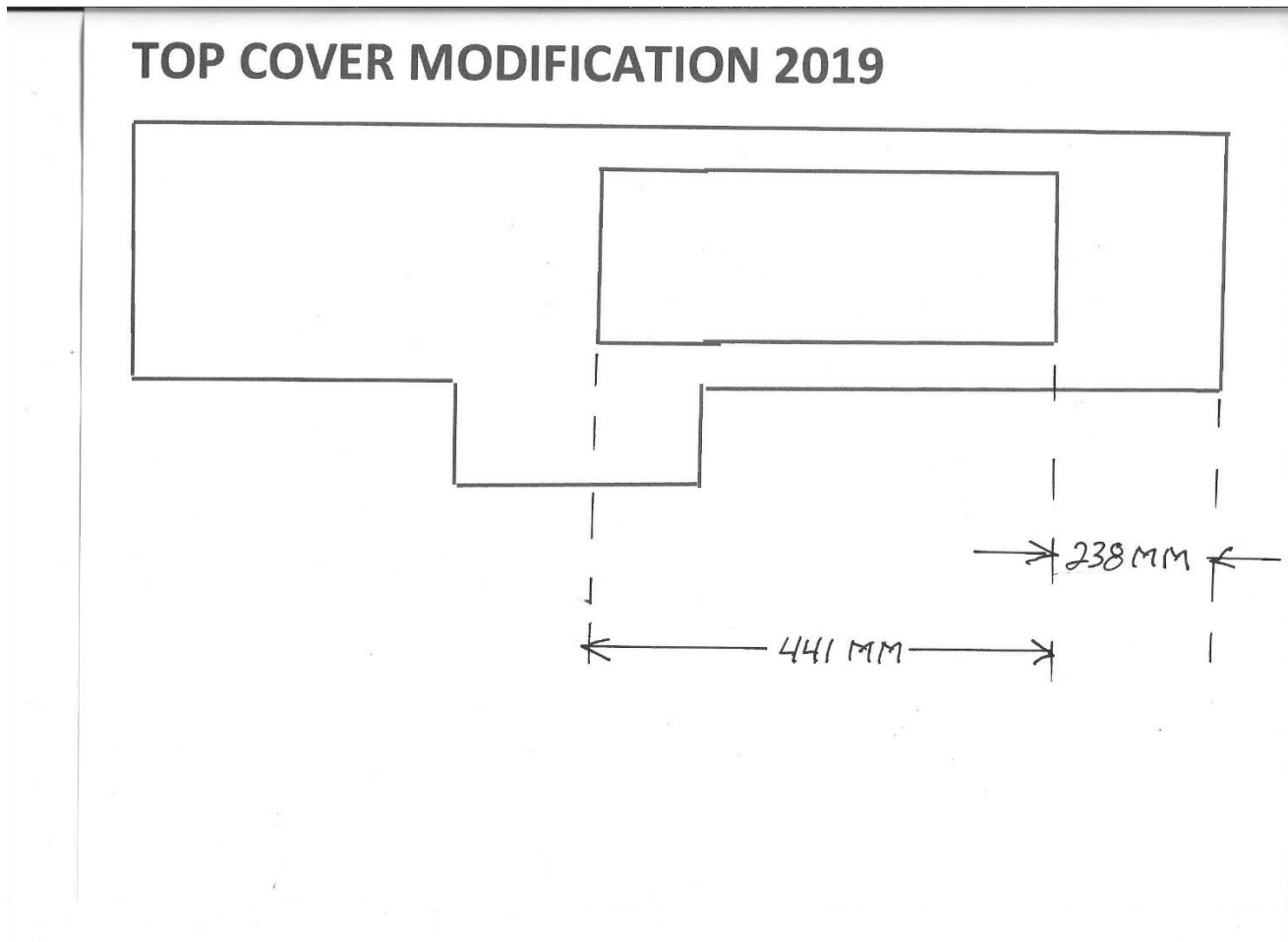
- 1 3 stack air cylinder with fittings**
- 1 air control valve with fittings**
- 1 air line T fitting**
- 10' of air line**
- 2 12.25" 10 MM X 1.5 threaded rods**
- 2 15" 10 MM X 1.5 threaded rods**
- 12 10 mm nuts**
- 12 flat washers**
- 8 nylon flange bushings**
- 10 BELLEVILLE washers**
- 1 Metal mounting plate**
- 3 10 MM X 1.5 X 75 MM socket head cap screws**
- 3 60 MM hollow spacers**
- 1 Machined disc for magnet**
- 1 Sensor pickup bracket**

**NOTE: items in red are for MILL TURN machines only, they are already installed on the BRIDGEMILL.**

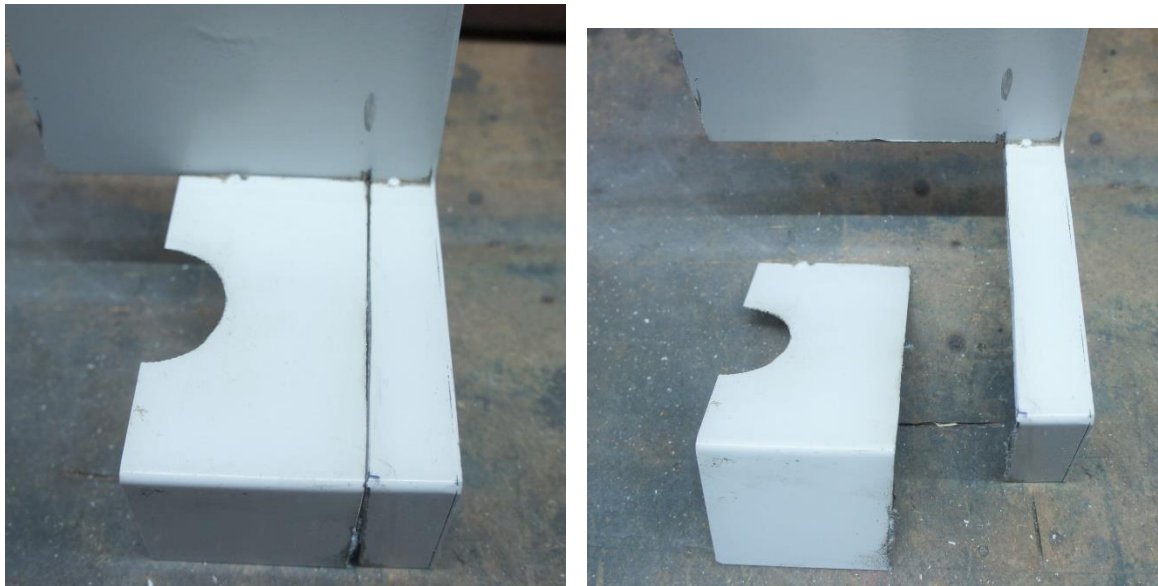
# INSTALLATION

**NOTE: STEPS 1-5 ARE ONLY FOR MILL TURN MACHINES. BRIDGEMILL OWNERS GO TO STEP 6 AND BEGIN**

1. Remove the top cover of the machine and enlarge the opening for The air cylinder clearance according to the drawing.



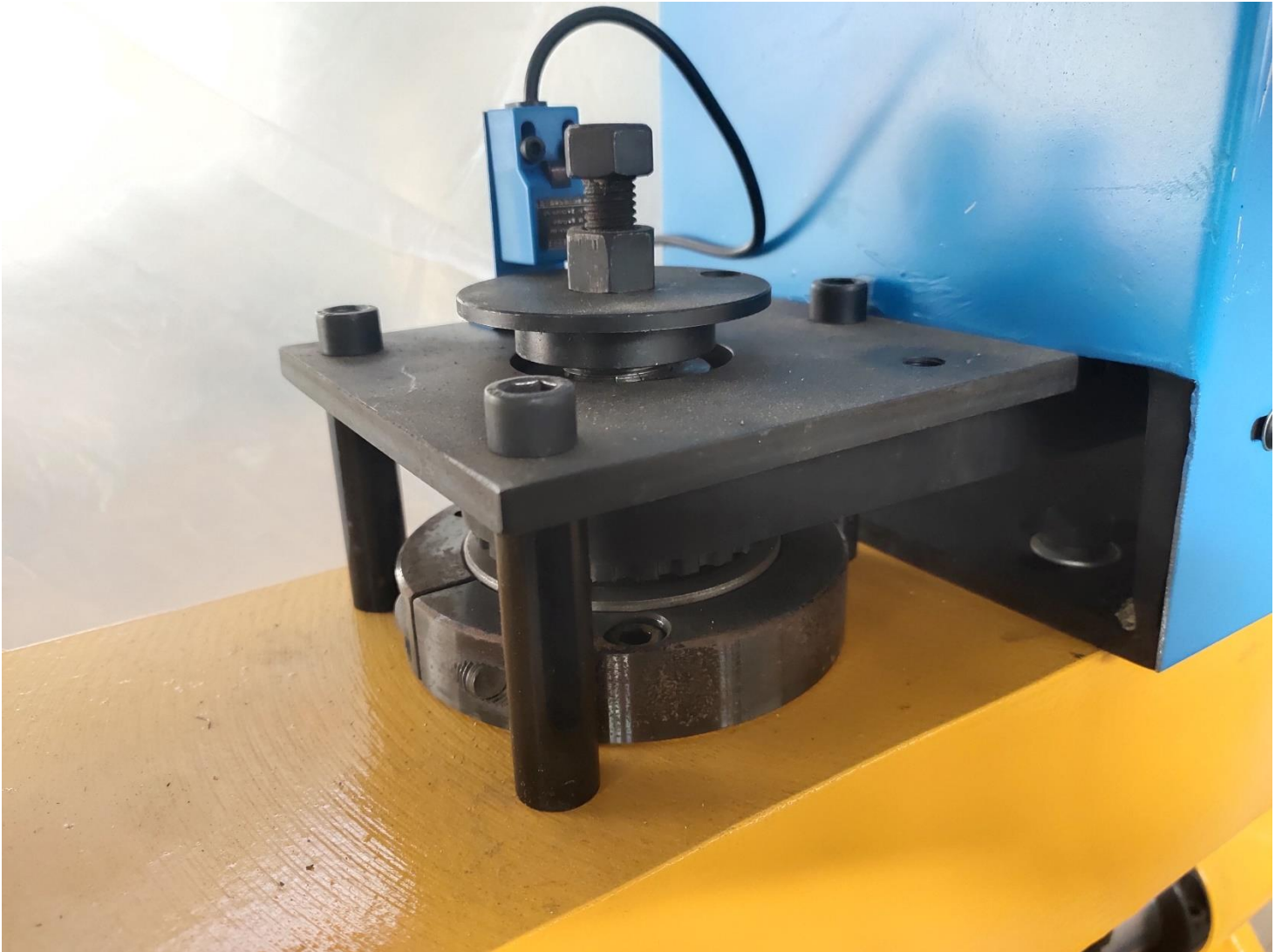
## 2. Remove the motor shield and modify as in the pictures



3. Place the mounting bracket on the 3 spacers with the single hole facing the motor. Center the hole in the bracket over the spindle and square the bracket to the mill head casting. Clamp it in place with a “C” clamp and using a transfer punch mark the 3 holes through the spacers. Drill and tap the 3 places to 10 MM X 1.5 threads.

**NOTE: You may need to loosen the motor, remove the belt and slide the motor back to do the single hole. Some machines have a very close clearance between the motor mount and the 3<sup>rd</sup> bolt and spacer. In this case, you may need to eliminate the spacer and use a jam nut up under the plate as shown in the diagram at the end of this instruction.**

**4. Bolt the plate in place as in the picture**



**5. Remove the magnet from your old pulley, marking the up side, as the magnets only work one way, and install it into the recess in the new**

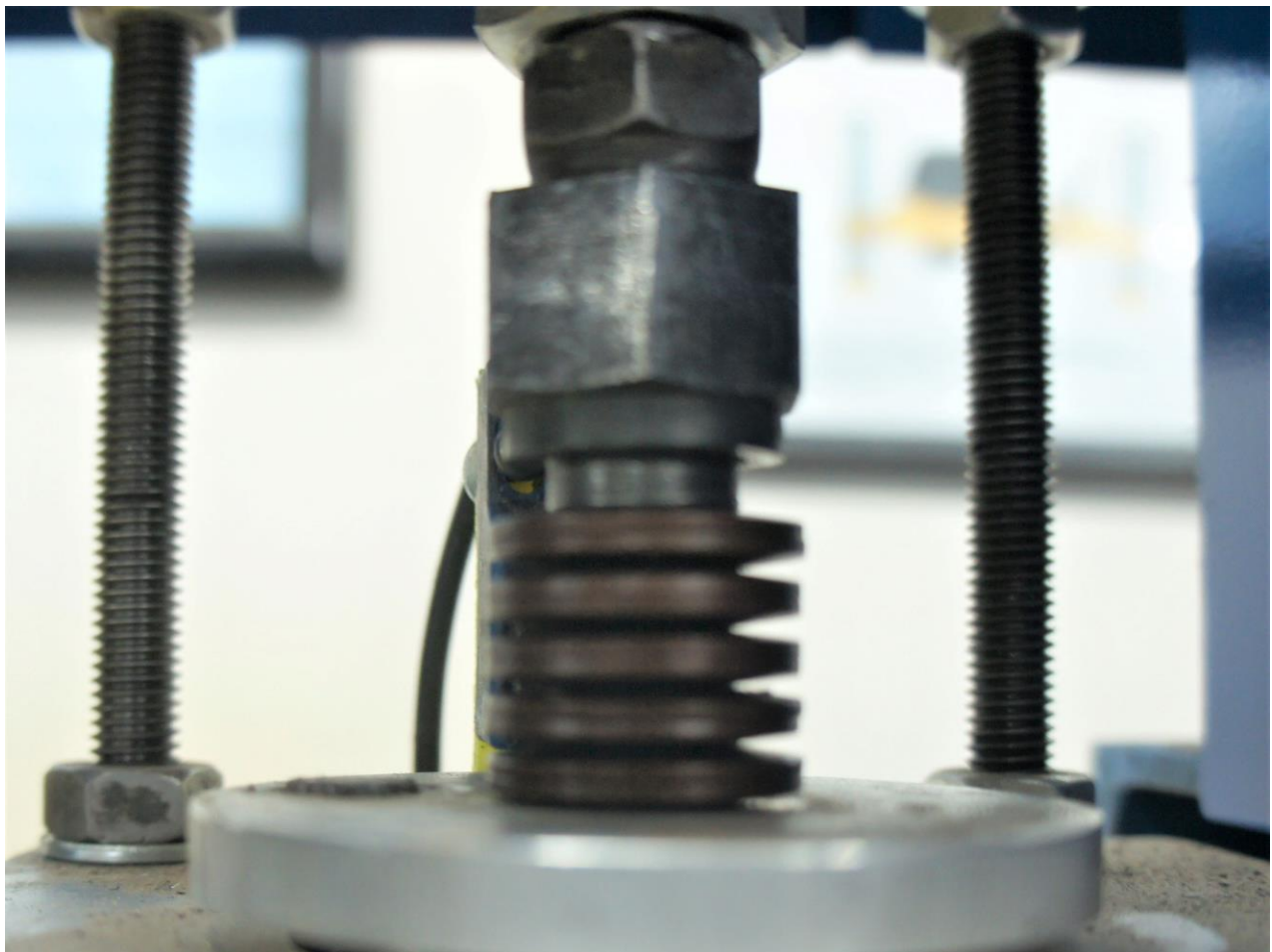


disc using epoxy or super glue.

Install the special machined magnet disc, the new sensor bracket and the sensor and adjust the clearance. Test for the red light as the magnet passes the sensor.

**NOTE: Early Mill Turn machines with V belt drive may require you to Shorten the 3 support tubes to allow the special washer to engage the end of the spindle.**

6. Remove the drawbar and screw the jam nut up against the top nut .
7. Place the ten Belleville washers in a stack as in the picture and slide Them over the drawbar.



8. Place your R-8 collet in the spindle and put one of the ER 20 chucks in it. Tighten the drawbar until the collet chuck is securely held in the R-8 collet. About 50 Ft/LBS torque. You will see that the Belleville washers compress some. The spring tension of these washers is now what is holding tension on the R-8 collet.
9. Now assemble the nuts and washers on the threaded rods as in the picture.



10. Thread the 2 shorter rods into the 2 tapped holes in the mounting Plate so the rod is just flush at the bottom of the plate and secure them with the nut.
11. Remove one of the cap screws from the bracket and thread the long rod down through the spacer and into the casting and secure it with the nut. Do the same with the other cap screw.
12. Now you are ready to install the air cylinder.
13. Remove the top nut, washer and nylon bushing from each rod.

**NOTE: Some cylinders do not use the nylon bushing- just leave them**

**off.**

- 14. The air cylinder is actually 3 separate cylinders stacked together. They are held together for shipping by 2 long socket head cap screws. Remove these 2 screws. Don't worry as the 3 pieces become loose and move around- they are fully independent and there are no gaskets or seals between them.**
- 15. Hold the 3 sets in alignment by hand and slide it down over the threaded rods with the air fittings facing the left side of the machine. Be sure the nylon bushings are in the holes at the bottom. Slide the other 4 nylon bushings over the threaded rods at the top and secure them with nuts and flat washers- just finger tight for now.**
- 16. The air cylinder has a 5/8" total throw, and it only takes 1/8" Compression of the Belleville washers to release the collet, so You need to adjust the cylinder so it has 1/2" clearance from the top of the drawbar. This is done by adjusting the 4 nuts that the cylinder is resting on. Once the gap is adjusted you can tighten the 4 top nuts to secure the assembly in place.**

## **AIR FITTINGS AND LINES**

**Both the BRIDGEMILL and the MILL TURN came equipped with an air coolant system using the same size air lines. Both systems have an inlet for your air at the rear of the machine which goes to a**



pressure regulator at the front and the air exits out near the lathe motor and is connected to the air coolant nozzle and magnetic base. You can tap into the pressurized air by cutting the line inside the electrical housing that goes to the valve and installing the “T” fitting. Then run a line from the “T” fitting to your control valve port “P”. From the control valve port “A” you then run another line to the air cylinder.

These lines are the “push to connect” style- very easy to do- just push the line into the fitting and it’s done. To remove a line just depress the collar and pull it out. There is no fixed place for the control valve to mount on the machine , we leave that up to your own preference. The control valve mounts with a round nut and requires a 30 MM (1 3/16”) hole.



## **TESTING**

**Once you have everything hooked up, all you need to do is push the green button on the valve and the cylinder will activate and compress the Belleville washers and you should be able to remove the ER 20 collet from the spindle. When you release the button, the Belleville washers will push the cylinder piston back up, but not all the way- you will see the end of the cylinder is almost touching the drawbar, but has enough clearance so it is not rubbing. Begin using the machine and test that the R-8 is holding your tools tight. If you experience pullout of the ER 20 collet, you may need to tighten the drawbar a bit more. You can now begin to build a tool library with different ER 20 collets ready to change out for all your different operations.**

