CBX DRO INSTALLATION

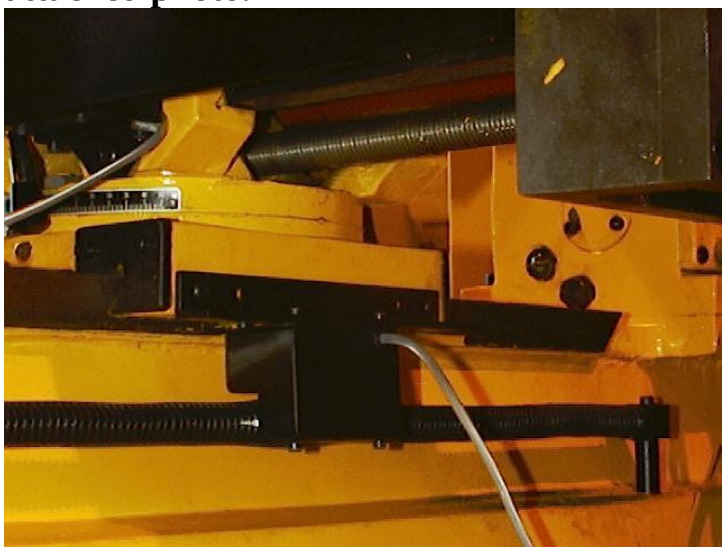
FOR 17-20 XM, XMTC, SHOPMASTER 2000 , ELDORADO and BRIDGEMILL

You will need in your CBX kit, the display, manual and hardware and the following scales

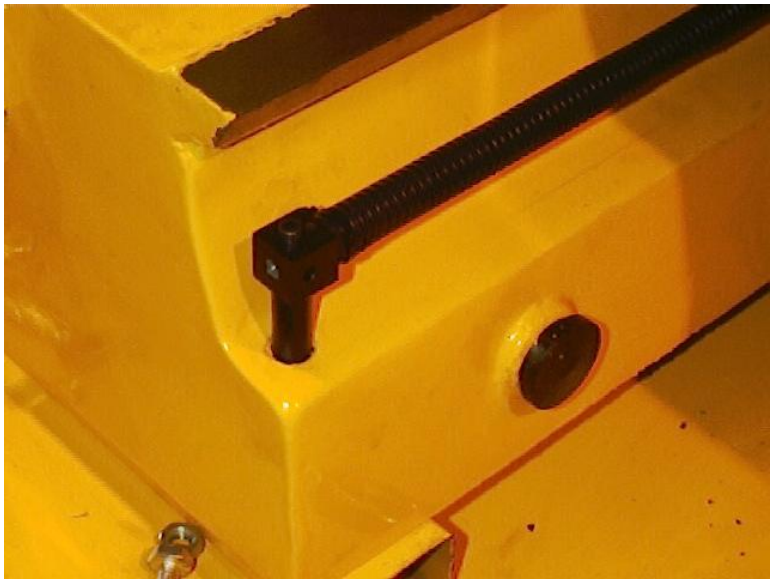
1 X axis encoder and scale 20 inches long
1 Y axis encoder and scale--18----inches long
1 Z axis encoder and scale-6-----inches long

X AXIS INSTALLTION

1. Position your machine so that you have easy access to the rear (lathe motor) side of the machine.
2. Look at the flat portion of the x axis carriage and you will see two tapped holes.
3. On the main base casting where it flares out you will also find two tapped holes and machined flat spots.
4. Use the tap provided to clean out these holes of any paint.
5. Attach one of the aluminum angle brackets to the encoder head as shown in the attached photo.



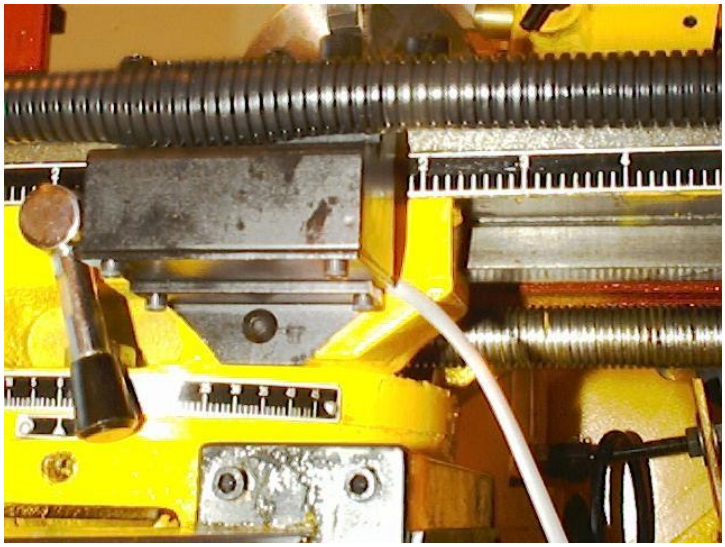
6. Bolt the encoder head and bracket to the rear of the X axis carriage as shown.
7. Run the X carriage to the tailstock end and take one of the long allen bolts from the hardware kit. Place the bolt through the end of the encoder rack bracket and thread it into the casting. DO NOT tighten it down- just thread it in enough to locate the end of the rack.
8. Take one of the long aluminum spacers from the hardware kit and place it next to the rack end and the casting. Mark it and cut it to length so it fits between the rack mount and the casting.
9. Place the spacer between the casting and rack gear mount and install the allen bolt.
See photo



10. Move the carriage to the chuck end of the machine and repeat the process with the other mount. (you may need to trim the rack to length in some cases)
11. Once both mounts are attached, stretch the rack cover over the mount on the chuck end and attach it with a plastic tie.
13. Move the carriage back and forth to test the assembly for any binding.

Y AXIS INSTALLATION

1. Move the Y axis toward the tailstock end of the machine. This will allow you to work on the side of the table from the end of the bench. (If this is not possible, loosen the rotation clamp locks and turn the table to face the front.)
2. Remove the gib adjusting screw nearest the CNC drive end of the Y carriage. You must shorten this screw so that when the gib is adjusted the end of the screw is flush with the lock nut.
3. Once this is done, adjust both gibs to the proper setting so you have no rocking of the table.
4. Test the action of the locking lever on your cross table. You must adjust it until it is free in the 6 O 'Clock position and locks in the 8 O'Clock position, this is done by simply unscrewing the lever and grinding the tip until the desired position is obtained.
5. Take one of the aluminum angle brackets from your hardware kit and cut it to the length of the encoder head. Cut each end of one side at a 45 degree angle and bolt it to the encoder head (see photo)



6. Take the threaded studs from your hardware kit and thread them into the holes on the side of your carriage. NOTE: the 2 tapped holes closest to the surface of the mill table are for the ST130 installation. Slip the 2 aluminum spacers over the studs followed by the rack gear and encoder head. Place the 2 nuts from the hardware kit on the studs and tighten them. The encoder mounting bracket should now just meet the lower carriage. If there is a space, use a washer to fill it. If the encoder head causes a bow in the rack, remove the rack and space it out with the use of washers. Remove the 2 allen bolts on the top of the encoder head so they will not rub the shield.

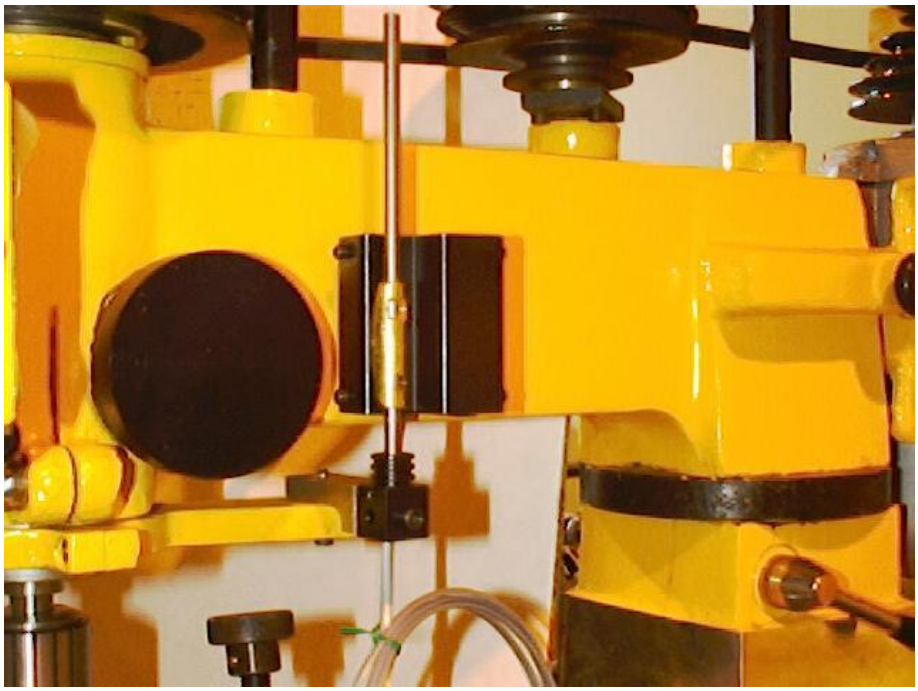
7. Transfer the location of the tapped hole in the lower carriage to the mounting bracket. Remove the bracket and drill the hole. Replace the bracket and secure the encoder head to the carriage.

8. Your powder coated shield will slip over the ends of the studs. Use washers to space the shield so it is even with the small bevel on the side of the table. Use the 2 self locking nuts to secure the shield in place. Due to variations in the final machined length of the mill table, it may be necessary to file the mounting holes a little to fit the studs.

9. For Shopmaster machines with power tailstock, you will need to install the extension for your tailstock coupling. Take the 8mm coupler nut and stud from the kit. Install the stud into the carriage and thread the coupler over it. This will allow the tailstock to attach to the carriage and not hit the shield.

Z AXIS INSTALLATION

1. Take the last aluminum bracket from your hardware kit and cut it to the length of the encoder head. Bolt it to the encoder as shown in the photo.



2. Place the encoder and rack assembly against the rear of the mill head so that it is vertical and the encoder mount is even with the depth stop bracket. (if you have an older machine without depth stop, you will need to fabricate an arm)
3. Mark through the aluminum bracket holes into the mill head and drill and tap. Attach the encoder and rack assembly to the mill head.
4. Find the aluminum bracket in your hardware kit and bolt it to the rack mount as in the photo. Mark the aluminum bracket to match the hole in the depth stop bracket.
5. Remove the aluminum bracket and drill the hole. Replace the bracket onto the rack mount and then bolt it to the depth stop.
6. Clip off the plastic tie and remove the plastic shield material, as it will not be used here.
7. With the mill quill fully up, mark the end of the rack so that it is just below the lowest pulley groove on you mill head. Cut the rack with a hack saw. This insures that your mill belts will not bend the rack.
8. Test the motion of the mill quill up and down.

DISPLAY INSTALLATION

Your DRO display can be mounted in a number of ways, normally it is mounted directly to the mill head just to the left of the drill press handle assembly. To mount the unit here, place it against the mill head and trace around it with a pencil. Then remove the electronic display assembly by removing the 4 allen screws on the front. Place the aluminum housing against the mill head where you traced your lines. Mark through the 2 holes and drill and tap the mill head. Bolt the housing to the head and replace the electronic display. Some customers prefer a moveable mounting system and fabricate a swing arm assembly to attach to the machine and the display.