

How to Mount a 3 Jaw Chuck

There are two ways a lathe chuck can be attached to a lathe. One is by direct mount and the other is via a back plate called back plate mounted chuck. This tip deals with the second method.

Most 3 Jaw self centring back plate mounted chucks are secured by bolts in the back of the chuck but there are a few that have bolt holes that go through the chuck and allow for socket head cap screws to attach the chuck from the front.

In the back of the chuck a recess is used to locate the chuck for accuracy. A spigot has to be machined on the back plate to locate the chuck and make it run true

Step 1. Select the correct back plate

Firstly you must know the spindle mount of the lathe that the chuck is to be fitted to. The back plate will be finished machined on the spindle taper ready to be mounted. but the chuck mounting side will be rough machined and requires finishing. The back plate required for the 3 jaw S.C. chuck to be mounted will need to be the same diameter as the chuck size.

Step 2. Machine the back plate

Although the spindle taper of the back plate is finished machined the side that the chuck is to be mounted on will need to be machined.

Note! It is important that the back plate is machined on the lathe that the chuck is to be used on, to achieve the best accuracy. Measure the recess in the back of the chuck as accurately as you can (some manufactures provide a sheet that lists the size of the recess.) Machine the spigot (Fig.1) using a tool with a small radius to insure that the chuck sits on the spigot and not on the radius. The spigot depth should be shorter than the depth of the recess in the back of the chuck

NOTE! The fit should be a tight fit. The tighter the fit the more accurate the chuck will run. Make sure there are no sharp edges or burrs. If the backing plate is larger than the diameter of the chuck, the outside of the backing plate should be reduced to the size of the chuck.

In the case of a 160mm chuck the smallest D1-4 camlock mount back plate may be 200mm. In this case the back plate diameter should be reduced to 160mm.

Step 3. Markout the back plate bolt holes

After the spigot has been machined measure the pitch diameter of the mounting bolts and with a pointed tool, score a circle on the back plate the same size as the pitch circle of the mounting bolts. Remove the back plate from the lathe and put a centre punch mark on the scored line. Using a divider mark out equally the hole positions. Drill a clearance hole for the size of the bolts

Check there are no burrs and that the surfaces are clean and attach the chuck. The chuck should sit flat on the back plate. After the chuck has been mounted on the back plate check with a feeler gauge that there is no gap between the back plate and the chuck. If there is a gap remove the chuck and measure the height of the spigot and the depth of the recess to insure that the spigot is not too high

Mount the chuck on the lathe.

Fig.1

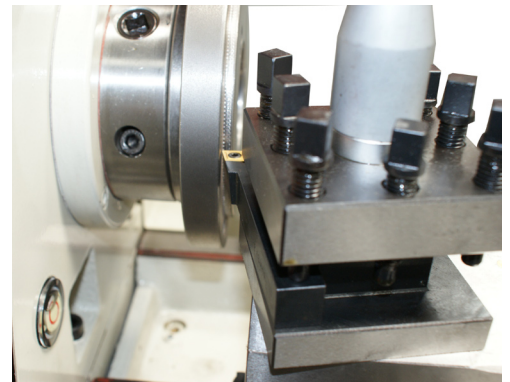
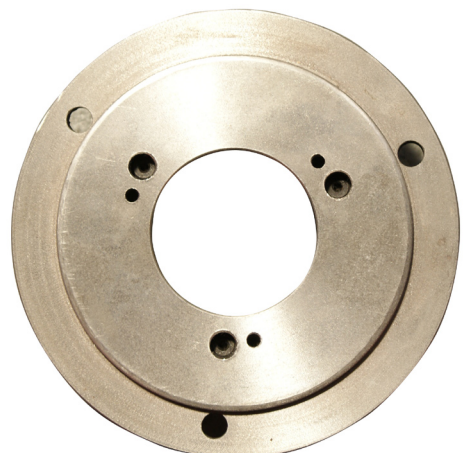


Fig.2



Step 4. Adjusting the chuck for accuracy

This is the most important part of the set up. There are many tolerances in a chuck., For every moving part there has to be a tolerance. Also between the back plate and the chuck there will be a tolerance. In some cases all these tolerance may be pointing in the same direction and cause the chuck jaws to run out. This next step is designed to get the tolerances working against each other for a more accurate result.

Hold a ground shaft in the chuck and set a dial indicator directly above the top of the shaft. (Fig.3)

Rotate the chuck by hand until you find the highest point on the shaft. Mark this point with a pencil

Undo the bolts holding the chuck to the backplate half a turn and with a soft face hammer tap the top of the chuck and then re-tighten the bolts. This will adjust the tolerance between the back plate and the chuck

Rotate the chuck again and find the highest point. If the the mark is directly opposite the first mark the loosen the bolts and split the difference by tapping the chuck with a soft face hammer.

If the high point is still in the same place then remove the bolts and rotate the chuck one bolt hole and repeat the process again until the satisfactory result is achieved.(Fig.4)

Note! How the outside diameter of the chuck runs is no indication of the accuracy of the chuck.

