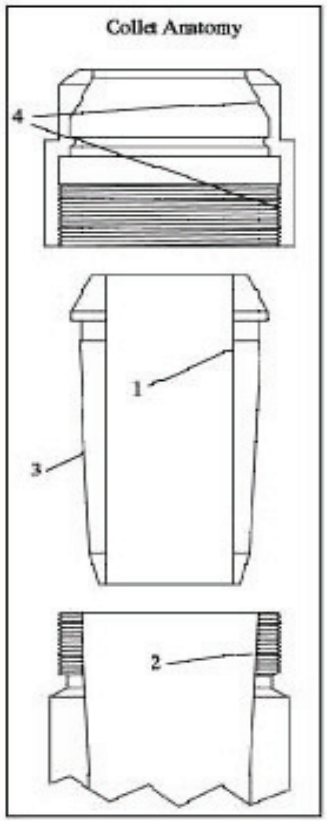
Router Collet Maintenance for Superior Router Performance and Extended Router Bit Life

Poor collet maintenance is one of the most common causes of short tool life or breakage. A router bit can only be as good as the collet that holds it. There are four links in the chain that make up the collet and the chain is only as strong as the weakest link. The small amount of time spent to regularly inspect and clean the collet system will increase productivity and reduce costs. The following are four critical components.



1. Internal Collet Surfaces (Refer to Collet Anatomy). The most important surface is the inside of the collet. A brown resin often builds up on the inside of the collet, near the end, as resin migrates through slits in the collet. This resin build up prevents the collet from applying equal pressure throughout its entire grip range. This causes pressure points at the end of the collet which allow the tool to resonate inside and to slip in the collet. Slippage then causes what is known as “collet burn”, a condition when resins are deposited on the shank of the tool in the form of brown or black markings. Resin build up can easily be removed from the collet interior with a brass tube-type brush. These brushes are nondestructive, yet adequately remove the resins that solvents or air guns cannot.

2. Internal Spindle Taper. The inside taper of the spindle is a critical surface which also accumulates resin build up and should be cleaned periodically.

3. External Collet Taper. The outside taper on the collet requires regular inspection and should be cleaned of all deposits each time the tool is changed.

4. Collet Nut. The inside taper of the nut should be clean and free from burrs on the surface, which if present, not only skew the collet but can ruin a new collet. A brand new collet can be ruined if the collet nut is in bad shape. In addition, threads should be inspected for wear and lubricated with a dry type lubricant for ease of use and longer life.

Metal Fatigue

Even if there is no damage present, the collet can be worn out through metal fatigue. Heat is directly transferred from the tool to the collet. These heating and cooling cycles remove the tempering of the spring steel, which has a certain amount of elasticity to grip the tool. As the heat cycle is repeated this elasticity diminishes. This occurs with greater frequency on small routers because of the small size of the collets and their proximity to the heat from the tool. Over time, a collet requires increased tightening to maintain the tool in proper position. As over tightening increases, the collets are distorted, creating eccentricities in the tool holder.

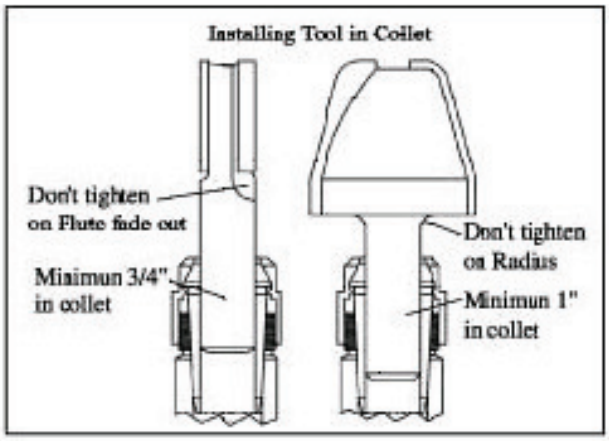
All of these components are critical and should be regularly maintained. This means inspection at each tool change to look for metallic damage such as bell-mouthing or burrs. If damage is visible, the collet and/or nut should be discarded and replaced.

Collet Replacement

Collets should be replaced every 400-600 operating hours. The old collets should be thrown away to avoid re-use. Often the cost of a new collet can be offset by the cost of needlessly broken router bits.

Installing Tool In Collet (Refer to Installing Tool in Collet)

Proper positioning of the tool in the collet is critical. The tool should only be gripped on the shank portion. At no time should any portion of the flute fade out be inside the collet. Never bottom out the tool in the spindle and never tighten the collet on any radiused portion of the shank where the shank meets the cutter body.



Tools should be inserted into the collet far enough to safely hold the tool. When installing the tool, insert it all the way until it bottoms out (this isn't always possible due to the depth of some spindles) then pull it back out approximately 1/8".

You can pull the tool out further if necessary, but always keep a minimum of 3/4" to 1" of the shank (depending on the bit size) in the collet.