

# Poorly machined parts and how to fix them

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By Frank Bourlon

Occasionally I receive parts that were not machined properly.

This usually occurs with the inside dimensional hole of an eccentric used on a micrometric roller shaft. Perhaps the machinist or parts manufacturer that fabricated the part believed that if you are going to engineer a problem, it's better that the hole be too small rather than too large.

The usual solution is to send the part back and wait for a replacement, which means that the assembly would have to be put back together then reinstalled in the press until another eccentric is shipped to you.

But sometimes sending the part back is impractical. A good alternative is to sand the inside of the eccentric to enlarge the hole. I've also used flapper wheels when I can find one small enough.

## Expandable option

The best solution I've found, however, is the expandable reamer. The reamer can be placed in a hand drill to speed up the process of enlarging the hole. If you take the part to a machine shop, workers there will often install the reamer in a machine lath, which works well but can be very dangerous.

A standard straight reamer will open the hole up to the exact size for which it was intended. The size of the hole that you may need for your part might be a size that is non-standard, however, and that is where an expandable reamer comes in handy. The reamer can also be used to repair a damaged hole, such as scoring caused by burr on the end of a shaft or a bolt that was removed too hastily, in the process roughing up the hole.

A set of expandable reamers can be purchased for approximately \$80 from a discount tool store, which is all you need if the tool is occasionally used. If you intend to use them often, though, you would want to consider a better set of expandable reamers, which can be purchased for approximately \$1,800.

When assembling parts or equipment, it is sometimes necessary to taper a hole to ensure that the parts can be perfectly realigned if they are ever disassembled for repair.

## Perfect alignment

If you drill holes next to the bolts holding assemblies together and then use a taper reamer to install a taper pin, you can be assured you will be able to perfectly align your equipment and parts.

The taper reamers and taper pins can be purchased from a tool supplier. Make sure that you purchase the right taper reamer for the taper pin you want to install. The angle of the taper is .25-inch per foot.

Remember: Whenever you drill a hole, the drill bit will tend to wander. To avoid that, first center punch the hole. If you don't have one, you can also use a taper tap. I normally use an 8-32 tap, but most any size will do.

Please be careful and by all means use safety glasses if you intend to try this. Taps are very brittle and will break easily if not struck properly.

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