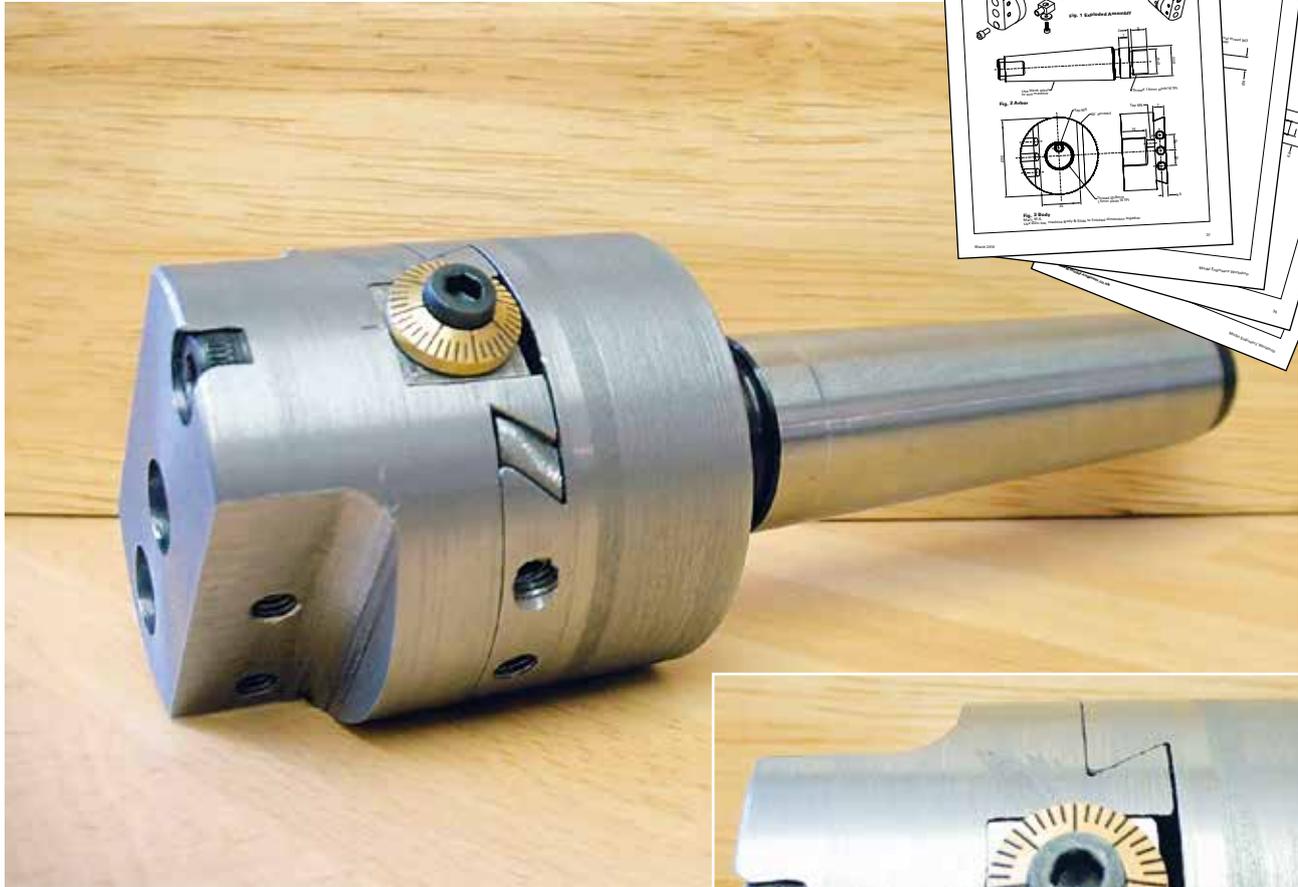


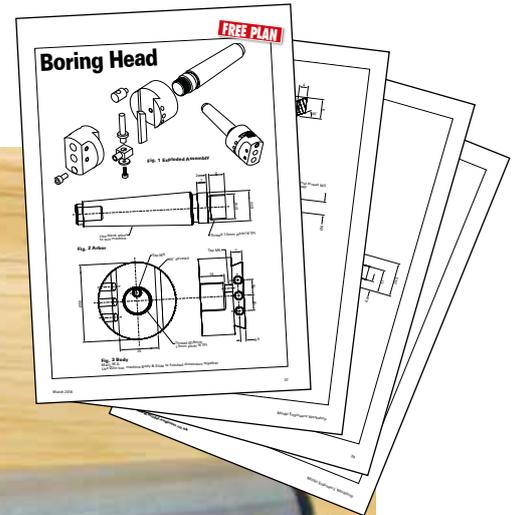
A Micrometer Boring Head

Build this useful accessory from our **FREE PLAN**.



The completed boring head.

A close up showing the graduated dial.



Our boring head demands a certain amount of care in construction, but will reward you with a handy tool that should last a lifetime.

Exploded Assembly Figure 1

This assembly diagram will help you understand how the whole boring head goes together. The sliding head fits in a dovetail on the body, and is moved, over a fairly short range, using the leadscrew.

Arbor Figure 2

This shows the arbor on which the head is mounted. This can be any commercial blank-end arbor, with a suitable thread and register cut on the end.

Body Figure 3

The body of the unit can be made from 2 inch diameter EN1A, which leaves a small allowance for final machining. It should be threaded to be a close fit on the arbor. Take care to get the dovetail central and observe the depth and width of the dovetails as closely as possible.

Gib Figure 4

The gib strip should be left unfinished until the body and slide are completed,

but make the 'embryo' strip now as it can be used as a gauge when fitting the two dovetails – the gib should slide freely into the gap between the two parts, without any binding.

Leadscrew Figure 5

The leadscrew is a nice exercise in screwcutting, but will benefit from finishing with a die. Note that M6 is 1mm pitch, but you can use other pitches if they

suit your needs. Note the small slot – this will be needed to lock the leadscrew for final assembly.

Leadscrew Nut Figure 6

The leadscrew nut threads into the body. This means you need to fit it and check its orientation before drilling and tapping it for the leadscrew.

Slide Figure 7

The slide is the most complex part of the boring head. Rough machine the dovetail, then 'tweak' it so that the embryo slide aligns well with the body and use the gib to finish the dovetail to width. Break the corners of the dovetails so they do not bind.

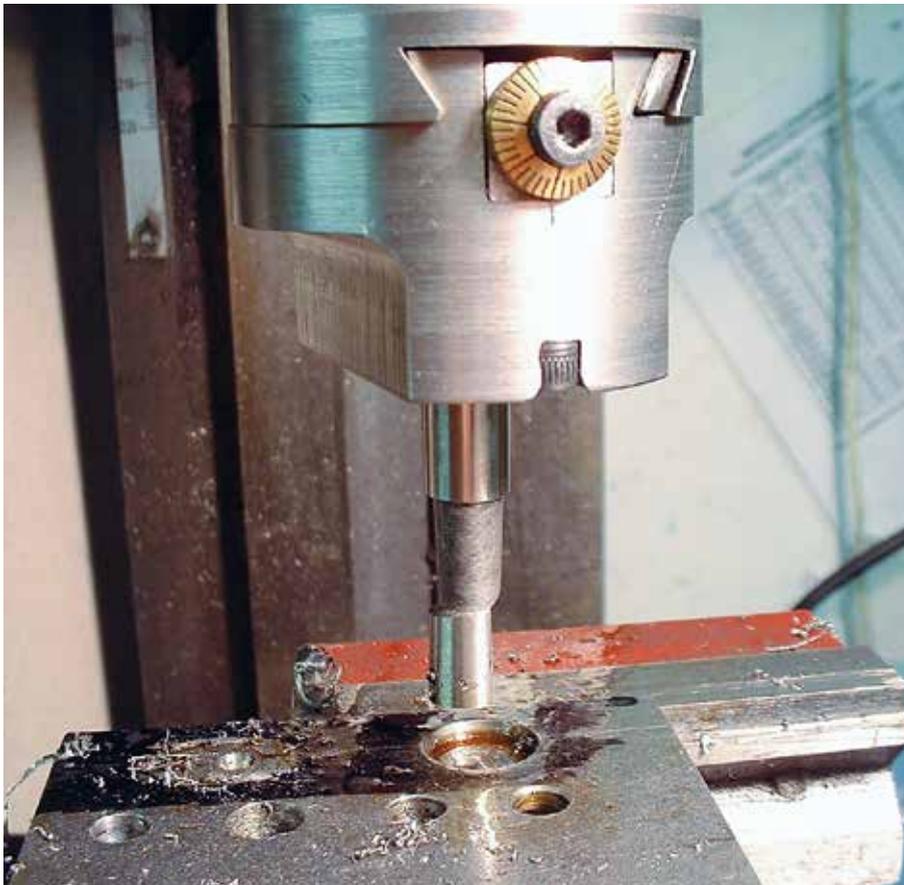
The two holes for the boring bars should be finished with flat-ended d-bits to get a close fit on your bars. Both 10mm and $\frac{3}{8}$ inch sets are available so make sure your holes match your bars!

The scallops are not just decorative, they reduce out of balance weight, but the exact radius is not important.

Index Dial Figure 8

This is a nice little job, and it isn't too hard to make the 40 division marks. First angle the top slide to turn the taper and then use it to move a sharp pointed tool across the dial to cut the grooves. Dividing the forty divisions can be done by fitting a 40-tooth change wheel to the back of the lathe spindle, and using a springy strip of brass to improvise a detent.

The boring head in use.



A set of boring tools, together with allen keys to fit the boring head.

Leadscrew Support Figure 9

This piece should be carefully made so that it fits in the end of the leadscrew groove on the underside of the slide, locating in the 7mm hole. Make some careful measurements and ensure that the 6mm hole aligns exactly with the thread in the leadscrew nut.

Assembly

To assemble the head you will need some M5 grub screws for the gib and bar clamp screws. The best type have a short, cylindrical section on the end with a flat, rather than a point.

Before fitting the leadscrew, fully tighten the gib and take a light skim over the whole body and slide to bring them to their finished 50mm dimension.

Fit the leadscrew nut and leadscrew, then over these fit the slide. With the leadscrew wound in a little you should be able to fit the leadscrew support (with an M5 cap screw) then wind the leadscrew out. You may need to make small adjustments until the dial (when fitted with a 10mm long M3 capscrew) gives a shake-free fit for the leadscrew in the support. Use a screwdriver in the notch in the leadscrew collar to stop it turning.

Check everything works, but bear in mind that you will need to use some retainer on the dial fixing screw on final assembly. A little moly grease on the leadscrew and slides is a good idea.

In Use

The boring head should be used with the gib set fairly stiff, and the rpm rather slow. The minimum hole size is about 12mm using the central hole and over 60mm using the outer hole.

The biggest challenge, as with any such head, is setting the boring bars just right, as it is very easy for them to rub. This is not an automatic head, so after each run through a hole, stop the machine and put on the cut. One division is 0.025mm or 0.001 inch on radius, or twice that on diameter. With a little practice you should have no trouble using the head to bore out holes to an accuracy of better than half that. ■