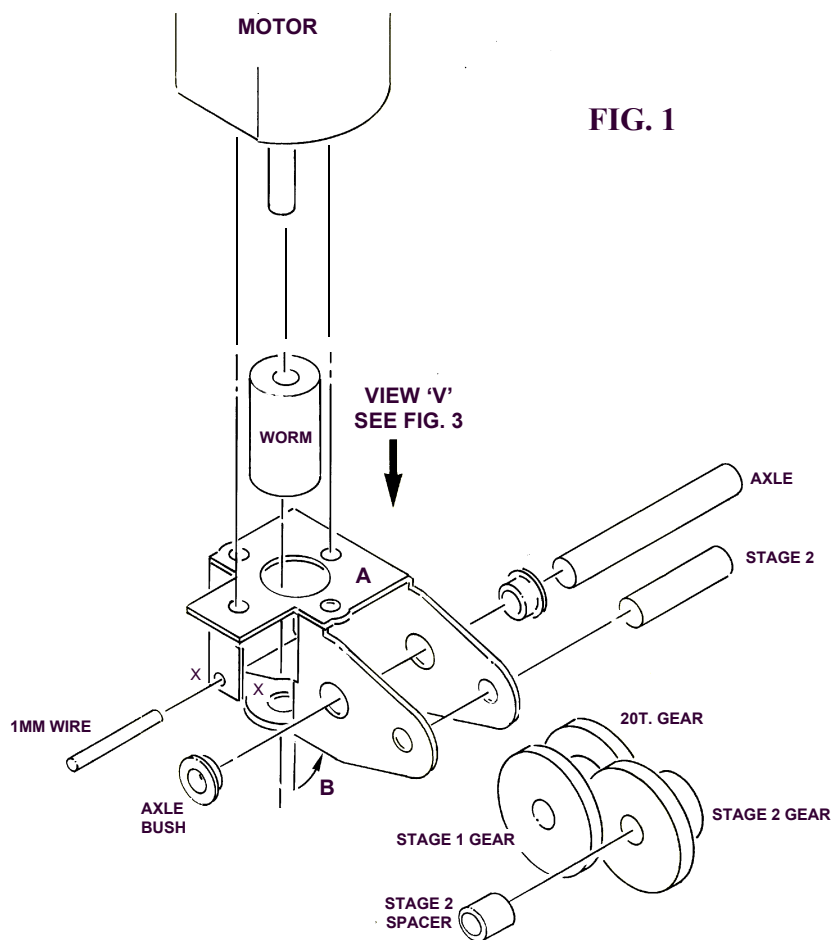


MicroMiser Vertical 60/80/108:1



The MicroMiser gearbox has been designed for use with the tiny Mashima 10 series motors, which have their mounting screws at 8.5mm centres. The MiniMiser gearbox is almost identical, but is suitable for motors with 8mm mounting hole centres.

Study Figs 1 and 2. Before cutting the gearbox etch from the fret, progressively ream out each of the **holes** to the sizes shown in Fig 2. Components should be offered up until they a tight push-fit in their holes. Remove burrs by inserting the tip of a drill bit (of much larger diameter than the hole) and gently rotating it between your fingers.

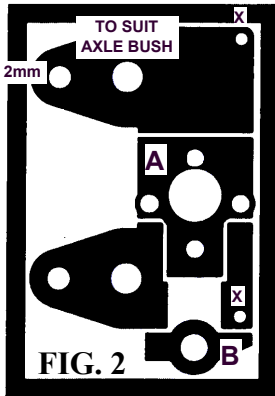
Solder the **2mm axle bushes** in place on the gearbox (A) with the larger-diameter shoulders on the opposite side of the etch to the bend lines. File the inside (non-shouldered) face of the bush flush. Remove burrs as above. Check that the threaded part of the motor mounting screws are able to pass through their locations, and that the boss on the front of the Mashima 10 series motor will sit in the hole in the etch. Carefully open out the holes in the etch with a reamer if necessary.

The driven axle in the **MicroMisers** is 2mm diameter. Sharman, Gibson etc. supply components to enable the axle to be stepped up to accept 1/8th bore wheels and to rebush the loco frames to suit the smaller axle.

Now cut the etches from the fret with a heavy blade and trim off the tabs. **Fold up the gearbox** (A) along with the fold-up stretcher (B) using flat nosed pliers to grip the motor mounting plate near the bend lines when doing so. This will prevent the plate from accidentally buckling across the hole centres. All bends are 90 degrees, with the bend lines on the inside of the gearbox. Add fillets of solder to the inside of the folds to strengthen the gearbox. For extra strength you can brace the gearbox by pushing a piece of 1mm wire through the small holes (X) and soldering it in position. De-flux the gearbox by scrubbing it with household cleaner, then rinse and allow to dry. If it is likely to be visible then **paint** it black.

Using a carborundum disc in a mini-drill, cut the **gearshaft** so its length equals the overall width of the gearbox. Wear effective eye protection – cutting discs can and do disintegrate if they snag. Remove any burrs with a fine file. If the shaft is a tight fit, you will only be able to pass it through both sides of the etch if it is truly square. If it won't go through, then the etch hasn't been folded accurately. Light finger tweaking should put things right.

Push the **worm** onto the motor shaft until its mid-point is 6mm from the front face of the motor. The worms provided may be either **brass or nylon**, according to type and gear ratio (they are not interchangeable). The nylon type worms should



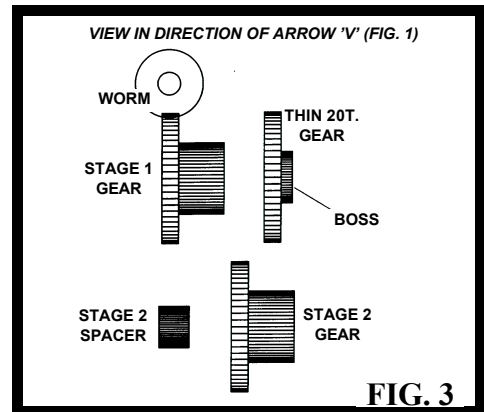
be a firm push fit on the motor shaft. Some brass worms supplied to us are fractionally tighter than others and if they aren't an easy push-fit, they can be gently forced onto the shaft in a vice. Don't use excessive force or the shaft may bend. Instead, use a broach to ease the fit of the worm and then, if necessary, secure the brass worm with a small drop of Loctite 601 at the outer end of the motor shaft. Trim off the excess motor shaft, flush with the end of the worm

Both longitudinal and lateral **motor fixing holes** are provided, giving a choice of motor positions. We suggest that, if possible, you use the outer (lateral) holes, which will allow you to fit (and remove) the motor once the power unit is assembled and installed in the chassis. This will enable you to add wheels, valve gear and other fittings to a free-rolling chassis, and makes it much easier to identify and put right any tight spots or clearance problems.

If clearance restrictions dictate that the longitudinal motor mounting holes must be used then fit **the motor** and worm assembly onto the gearbox and secure it with the fixing screws supplied with the motor.

Refer to Figs. 1 and 3. Fit the **gearshaft**, along with the Stage 2 double gear (20/10T.) and collar into the gearbox. Secure the shaft in place with a small amount of glue. The stage 1 double gear will be one of two types - 20/10T (80:1) or 27/10 (108:1) - depending on the overall reduction ratio of the gearbox. The thin 20T. gear, which sits on the same axle as the stage 2 gear, is an interference fit. It may profitably be eased slightly with a reamer before fixing, but be very careful not to ream the gear too slack. It is not possible to secure this gear with adhesive.

Place the gearbox between the locomotive frames and push the drive axle through the frames and gearbox, fitting the stage 1 double gear (a loose fit on the axle) and the 20T. gear as you go. Fit washers between the outside faces of the gearbox and the inside of the frames, to stop the gearbox sliding along the axle. Use extra washers to eliminate all sideplay on the driven axle - aim for a running clearance only. If you have not already done so, fit the motor.



The gears are effectively self-lubricating but a little plastics-compatible grease will do no harm. Do not use general-purpose modelling oil, which attracts dust and grit. Metal-on-metal contact areas (motor bearings, axle bushes) should be lubricated with a tiny amount of Zeuthen ultra-adhesive oil.