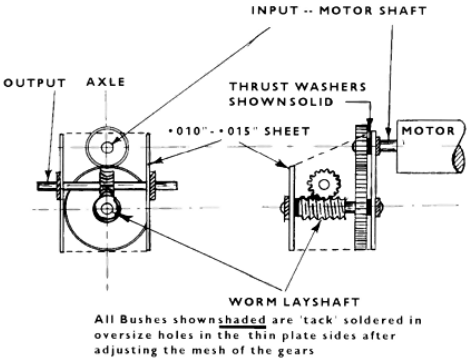
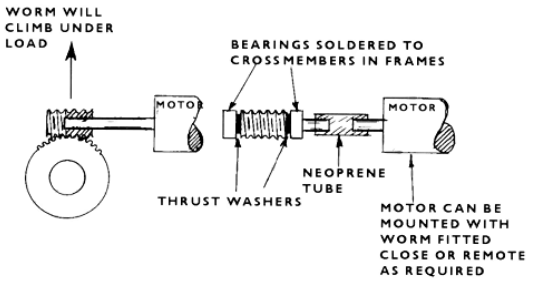
Sundry Snippets 02 - MOTOR MATTERS **By Mike Sharman (1965)**

Many of the problems presented at the clinics revolve (sorry!) round the motors, their preparation, location and mounting. No motor is at its best when new, which means it is at its greatest risk of 'burn out' while you try to run in your new 'tight' chassis.

Many modellers run their new motors slowly on the bench with just a lick of oil on each end bearing for 30 mins or so. I have had both modern Japanese - and a K's Mk II - shaft bearings start to seize through running too fast initially.

One big advantage of motors with a shaft at each end is that when you have built/fitted the gear drive system of your choice, you can fit a pin vice to the unused shaft and rotate it by finger power to check for, and eliminate tight spots. When you are happy with the concentricity and mesh of the gears, a final running-in can take place by using a heavy duty 'slave' motor driving your 'new' motor via a neoprene coupling without risk of overloading it.



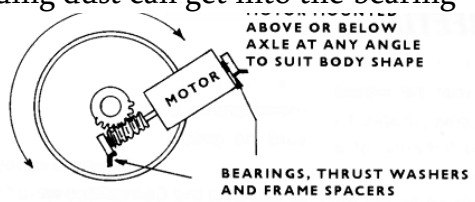


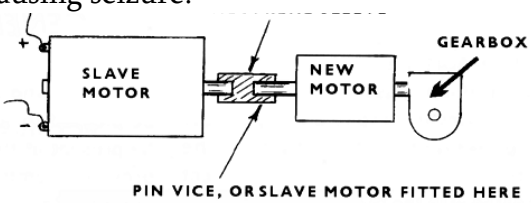
Further diagrams on opposite page

The next step is to either remove the surplus shaft or fit a flywheel. Now by far the best way to fit a flywheel - worm -wormwheel or gear is by Loctite - providing you keep it out of the bearings!!! This can be quite difficult in some installations, so a couple of safeguards are offered. First put a protective ring of grease round the bearing, it can be wiped out later. Then place a drop of Loctite on to a spare piece of card, and with a cocktail stick transfer a tiny amount to the inside of the part you are fitting and position it on the shaft, this will push any surplus adhesive away from the bearing. If you put it on the shaft the result will be to push the surplus into the bearing! The reason for transferring from tube to card and wood stick to component is that there should be no direct contact between nozzle and metal. The chemical action starts on contact and can be sucked back into the tube sending it 'off quite quickly.

Cutting the surplus shaft is not *as* simple as it sounds. Support the shaft with your pin vice and using a thin grinder/cutter, attack the shaft in short bursts to keep the heat down about 2-3mm from the bearing, the pin vice will act as a heat sink.

Do not cut it right up close to the bearing, the heat can distort the shaft and the grinding dust can get into the bearing -both causing seizure!





The enclosed sketches show several points about location and mounting in a more understandable form than a lot of my waffle, so after a few more 'general' points I will leave you to study them.

1 Try not to 'end load' a motor, take out the thrust generated by the worm trying to climb out of the worm wheel by fitting thrust washers either side.

2 Never use surplus 'cooker' wire to join the motor to the pick ups. I unsoldered one motor that actually jumped as the stress was removed. Float the motor where you can, and use the lightest types of flexible wire bent in 'S' bends to provide enough restraint to stop the motor rotating.

3 Think 360° when mounting your motor, with the gear systems available today the old Triang Jinty' need not be the 'norm'.

4 Think, "Do I need an expensive gearbox?" The main engineering case for a gearbox is that you need a two-stage reduction, and/or it is to be mounted on a floating axle. Using the vast range of gears and bushes available today, anyone can fabricate a unit to suit their needs by soldering bushes into oversize holes in light 0.010" - 0.015" material without needing the engineering skill to measure, mark out, and drill accurately!

5 Gears fitted with 'grub screws' are often at the root of your 'tight spot' problems. An oversize hole or an undersize shaft will mean that tightening the screw will produce an 'oval' path for the gear. Using solder or Loctite will often provide the cure as it will centralise the 'slop', but this can make any later modifications difficult. An lain Rice remedy is to file a flat on the axle and only tighten the screw enough to engage the shaft. Get your side play right and this works well.

6 The larger the worm wheel, the greater the friction under load. A 2:1 spur-gear step on to a 20:1 worm and wheel produces a much more powerful 40:1 drive than the 40:1 worm and wheel alone, and you can use a smaller motor!! The combination of well-matched, well-cut gears allied with the wheel diameter are far more important to good performance than the quality/power of the motor. Any smooth running average motor can produce more torque than you can possibly use in the model. I have an old K's Mk II on a 40:1 two-step gearbox that cannot be stopped by gripping with maximum finger pressure.

7 Avoid fitting a worm at the extreme end of the motor shaft. If you cannot relocate the motor, fit a bearing outboard of the worm, or even mount the worm as an independent unit and drive by neoprene tube.

INPUT - MOTOR SHAFT