



# DRIVING METHODS FOR INSERTING MINIATURE SCREWS

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Several means are used for driving screws including straight slots, cross and recessed slots (also other configurations) and socket drives as well as an externally shaped head (primarily hex and square). The first and last are the most practical for miniatures. Cross recessed will tend to "cam out" unless positively seated by an inserting/driving machine and do not usually have sufficient "bite" except in larger sizes. Socket drives are not practical as the small difference between flat and corner dimensions and wrench allowance leaves insufficient engagement to overcome assembly pressures.

Normal slot type screw drivers have a tapered blade which will also tend to "cam out" in smaller slots widths and depths. The best method for slotted screws is to grind the screwdriver blade to a profile with straight sides and a width slightly smaller and length wider than that of the screw slot. This will fill the slot area and keep the blade positively seated in the screw slot while providing maximum turning torque. If used properly, it will not damage the screw head even though the screw is inserted and removed many times. In most cases this blade will stay secured in the slot when moving it to the assembly point, but a little light oil, grease, wax or adhesive will help keep it from falling out.

External shapes (usually hex) can be made in a dimension across the flats compatible with the thread body diameter and provide a sufficient corner to flat differential. The major problem with this drive is the clearance needed for the socket wrench (about .150"/000 & 00, .175"/0, .195"/1 and .215"/2).

Automatic screw feeding and assembly devices usually require screws made to a better quality level than actually needed by the product. Uniform dimensions and burr free slots prevent the feeders and tracks from jamming as well as keeping the transfer and driving mechanisms functioning smoothly.

Lower cost hand assembly units are available with vacuum pick up and approximate torque adjustment for limited production runs. Hand drivers with adjustable torque settings are available for applications where a specific clamping force or tightening setting is required. Small jewelers screw drivers can be obtained for hand use. Some hand screwdrivers have a device to hold the bit in the slot with the screw body aligned for easier insertion.

Chamfering the tapped hole as deep as possible will help guide the screw to properly mate with the tapped screw thread. It also has the advantage of clearing the part threads under the screw head to allow a flush assembly with the bearing surface as well as reducing the depth to be tapped in tough materials. It should not be so wide at the surface as to reduce the bearing area of the head beyond practical limits. Using a wider (binding) head will allow more latitude in the tougher materials.

On very small sizes hand assembly should be done under magnification.

Readers are encouraged to submit their solutions for problem situations by email: [mail@jimorrisco.com](mailto:mail@jimorrisco.com). A free slide chart (\$14.99 value) with a wealth of dimensional information on miniature screw threads and heads will be sent to those who respond.

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