

How to not break a tap.

Threading deep holes for small screws can too easily result in broken taps, as more than one FBV builder can attest. Getting a broken tap out of the hole can be extremely difficult, though there are special tools made for the purpose.

When tapping small, deep holes, there are several things you can do to help avoid breakage.

1. Drill the right size hole for your tap size.

For relatively deep holes (>3x screw dia) or for any holes in steel, 60% threads are more than adequate and much less likely to break taps than higher thread percentages.

6-32 #33 drill

8-32 #28 drill

10-32 #19 drill

For short thread lengths in brass or aluminum, 75% threads might be better.

6-32 #36 drill

8-32 #29 drill

10-32 #21 drill

2. Use threading lubricant.

You can use light oil, WD-40, or even better, a special tapping lubricant such as 'Tap Magic'. Put some on the tap when you start and add more as needed.

3. Start the tap straight.

I use a tap wrench having a centering rod opposite the tap, which can be loosely held in a drill press chuck to keep it perfectly vertical when starting to tap.

4. Be patient and go slow.

Don't put excessive force on the tap, either by twisting too hard or bending it to the side. Feed about half a turn, then turn backwards a bit until you can feel the chip break free, then feed another half turn, etc. Every few turns, back the tap all the way out and clean off any chips that have collected on it.

5. Know when to stop.

For blind holes, be aware of when the tap has hit bottom. Also, to make good threads almost to the bottom of the hole, you can finish tapping blind holes with a special bottoming tap.