

## The Art of Changing Tools

That's what I said, "ART". According to Webster, Art is 1- human creativity, 2- skill, 3- any specific skill or its application, 4 – any craft or its principles. These are just a few, but you get the idea.

Whether you believe it or not changing tools requires skill, attention to detail, and a desire to do the job right the first time. Now, I'm not going to give you a complete procedure here. If you want that, you should refer to the Operator's Manual that was provided with the machine. If you can't find it, I suggest you contact our Parts Department.



Motorum 2548 turret

In order to start, the operator should be provided with a set-up sheet, and all the necessary tools. These tools are not just what will be installed for the production requirements, but the hand tools needed for the proper installation of those punches and dies. These tools include the inch and metric allen wrenches, punch holder lifter, the "tee" handle



Torque wrenches

for tightening the dies, brass bar for seating the dies, and the special torque wrench used for the "ETP" bushings.



I have been in many customer facilities, and I've witnessed numerous questionable tool change practices. One that seems to be constant from shop to shop is the operator beating the shaped dies into the die holder without lining up the orientation pin. The alignment slot in the die holder should be crisp and straight. If it appears to be egg shaped, or as they say down south, "wollered out", then that means the operator is not lining up the dies properly. They simply beat it into submission with the brass bar. If that continues, the die holder will need to be replaced because of excess tool wear. With the fixed stations, die holder replacement can be postponed because you have multiple orientation slots.



In the auto index (A/I) station however, you only have one slot for lining up your die. If that one is egg shaped, your A/I station may be giving you a saw tooth appearance in your part. Normally when that happens, you assume that your A/I station is out of alignment. If you are running with tight die clearances, you may even be knocking the corners off your punches and dies. So before you call the Service Department, and complain, remove the die, look down inside the turret bore for the station presenting the problem. If it's wollered out, you will need to change out your die cup for that station.

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Customers that have a Motorum or Vectrum series machine with the quick change die holders require the use of special torque wrenches to secure the die holders into the lower turret.

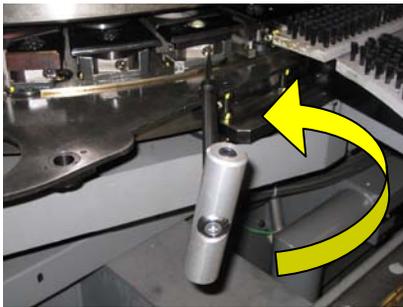


These torque wrenches are the only device that should be used for securing the die holder. **Do not use a standard allen wrench.** If you use a standard wrench, you will rupture the hydraulic cylinder contained in the ETP bushing. If that happens, there is a possibility that the cap on the ETP bushing will bounce up during the machine punching process, and you could crash a sheet. For your convenience, I have included the part numbers for the torque wrenches. For the Motorum 2033, 2034, 2044, 2048, 2048LT, and 2048LT-T as well as the Vectrum 3046, and 3056 the part # is **P37-64030-53**. If you have a Motorum 2548 or a 2558, the part # is **P68-64100-50**. Be sure to contact our parts department with the machine type, and serial number, and they'll be glad to help you out.

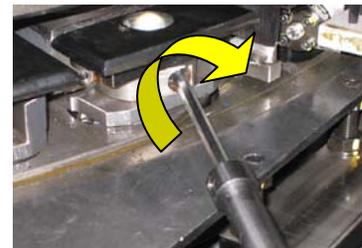
Customers with a Motorum 2044EZ do not require these torque wrenches because they have a different style die holders.

Now getting back to your tool changes... In order to increase your productivity, and minimize your tool change time, you may want to consider having multiple quick change die holders and punch holders on hand. This will enable your operator to set up for the next job, while the machine is running. When the first job is complete, he or she would simply change out the holders, download the new program, and put the machine back into production.

When you're removing the die holder with the torque wrench, simply turn the wrench counterclockwise only to break the tension on the bushing. Do not keep turning because there is a small set screw in the bushing designed to prevent you from totally removing the large screw. If you continue to turn, you will break off the small set screw, and could potentially lose the large one. Once the large set screw is loose, lift the cap high enough to slide the entire die holder out. At this point, you are able to change the dies. After the dies have been replaced, slide your die holder back into the turret after you clean out any slugs and slivers making sure that nothing drops in the bore for the ETP bushing.



Now, with the die holder in place, keep your hand on the die holder cap holding it down, and using your torque wrench, turn it clockwise one full click. This is all that is required to securely lock the die holder in place. As a reference, your wrench should be calibrated to  $90 \pm 5$  (kgf cm).



don't hesitate to contact us.

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