



MURATA MACHINERY USA, INC.

## Retractable Tooling

Most Motorum and Vectrum 3000α series machines were built with this option incorporated into their assembly. The only exceptions are the Motorum M2044EZ, Motorum 2048ST, Motorum 2048TE, and the Motorum 2044TC. Retractable tooling is not an option on those machines.

### WHAT IS RETRACTABLE TOOLING?

As you can see in Figure 3, the pin (or spud) of the up/down die sticks down through the die holder, and through the lower turret. When that tool is commanded to the punching position, the tool is raised up by way of a pneumatically operated mechanical device, and held in the up position until the punch is executed. When the hit is completed, the tool retracts to the lowered position.

On its own, this up and down motion would add cycle time to your process. In order to prevent this, an M-code keeps the tool in the up position until all hits are completed, at which time it retracts. It will also retract when another tool station is selected. However, if you are trying to push the height limits of your forms, it is advisable to have the tool drop down between each hit.



Figure 1: Retractable die (L); traditional die (R).



Figure 2: 114 style die holder (L); Retractable die holder (R).

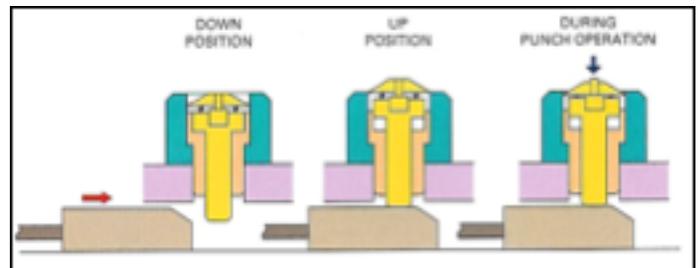


Figure 3



**Figure 4: Different heights with traditional forming tooling.**



**Figure 5: Level height with retractable forming.**

### **WHAT IS THE DIFFERENCE BETWEEN RETRACTABLE AND TRADITIONAL TOOLING?**

As you can see in Figures 4 & 5, there is a considerable height difference between the traditional forming die and the retractable dies. Machines with the traditional forming tool wouldn't be able to use the inner track station or the stations on either side with any degree of accuracy. With the retractable tool in Figure 5, all of those stations would be available because the forming die drops back into the die holder at the end of the programmed hits.

### **WHAT ARE THE BENEFITS OF RETRACTABLE TOOLING?**

Retractable tooling allows you to no longer require removing forming tools when you're done with them, or program around them to prevent damage. This flexibility saves on time otherwise taken for tool changes. Additionally, you can now program hits next to the adjacent stations without encountering possible accuracy issues.

### **HOW DO YOU SET UP RETRACTABLE TOOLING?**

First, make sure the die is secured in your die holder, then proceed to set-up your punch. Place the forming punch on a flat surface and set it beside a new piercing punch of the same station range. The example below shows a 114 style "D" station extrusion, and a 2.0" diameter punch ("D" station). In Figure 6, notice how much shorter the forming tool is. This is so you will not cause damage by bottoming out your tool. Use punch shims to raise the forming tool until it approaches the height of the piercing tool, keeping it under by about 0.050" (Figure 7). From there, finish assembling your punch holder and put it in your turret.



**Figure 6**



**Figure 7**

With applicable machines, retractable tooling is a great way to eliminate excessive tool changes and allows greater flexibility in production. And, it provides a way to maintain accuracy when hitting next to adjacent stations. Retractable tooling can be provided by both Mate and Wilson. However, retractable die holders must be purchased from the Murata Machinery USA, Inc. parts department located in Charlotte, NC.

Contact our Applications Department in Charlotte, NC, if you have questions about this procedure or retractable tooling in general. Please visit our website for more information about training opportunities or to contact our spare parts department.

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