



CJWINTER

A Brinkman International Group, Inc. Company

Cold Root Rolling Process on a Weiler Machine Tool





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Weiler has a long history of manufacturing high end and high powered industrial lathes. These lathes are commonly used in the oil industry to manufacture and thread rotary shoulder connections. One of the most advantageous features of the Weiler lathe is their customizable interface. To run their state-of-the-art drive technology they use a straight-forward operating and programming system. This operating system can be configured to run simple work pieces like conventional machines. However, it can also incorporate multiple canned cycles to run an extensive range of accessories. One of these accessories is the CJ Winter Cold Root Rolling (CRR) Tool. CRR Tooling can easily adapt cycles based on the Siemens control structure for power threading and precision thread re-cuts.

The CRR process is becoming a common practice in the finishing of threads. By rolling the thread's root, the manufacture can increase the fatigue life of the threads by 3 to 5 times over a similar, but untreated, connection. The CRR process burnishes the root radius by forcing a hardened wheel into the surface. This displaces material, compacting the previously cut and displaced grains, resulting in a harder surface and an improved surface finish.

The CJ Winter CRR Tool is an error proof, self-contained tooling system requiring no external power supplies, meaning no hoses to tangle or pumps to lose. The tool is equipped with an easy to read pressure gauge that can be placed in a variety (4) of locations. Its 1:1 pressure ratio removes operator error based on incorrect readings, calculations or confusing look up tables. The tooling can be ordered in a Boring Bar Style for BOX/PIN connections or as a Square Shank style for PIN connections, which has been designed for reduced clearance situations.

Although the CJ Winter CRR Tool is used with a variety of machine tools, there is a simple format for setting up and using it with a Weiler lathe. There is enough empirical data available to pre-determine the proper rolling forces on their machines; especially when using the Weiler E70 and E90 lathes. The control systems for these lathes also include a library of commands that can be altered from threading to the CRR process with minimal set-up. Once the system and tooling have been entered, the actual machining begins with a manual check of and verification that the tooling is running true to the root prior to the full automatic CRR process.

Process

Following is the basic process when using a CJ Winter CRR tool in a Weiler lathe – See the full instruction manual for further explanation:



Tooling:

1. Create your Cold Roll OD tool and add it to the Tool database
 - It is actually easier to take an existing stock threading tool and copy it
 - This is easier than creating a tool from scratch and will contain all the default info as necessary
2. Chose a Number and add a description for the new tool



Creating a Cycle:

1. Similarly, it is easier to copy an existing threading cycle than it is to create one
2. This is done at the Cycle Main and Cycle Organization pages
3. Follow the detailed instructions as to how to copy and paste a threading cycle
 - Change the name of the copied cycle to Cold Roll Cycle
 - Select the newly created Cold Roll OD tool
 - Choose 1 rough pass and 0 spring passes
4. It is critical to note that the tool will clear the shoulder at the z2 value so as to avoid collisions

Verifying the Root Position:

1. Move the tool into the root of the thread
2. TEACH the start angle as described in the manual
3. Press the Handwheel OFFSET ON softkey
4. Press the CYCLE START button
5. During the initial thread of the cycle, the tool will be moving slowly
 - Use this time to dial in the Root of the thread
 - Using the handwheel, increment the X axis until the tool is actuated within the root
6. Let the Cycle Finish

The ability for the Weiler lathes to allow the operator to actuate the tooling manually during its first cycle is a key advantage of this system. By allowing the tool to be optimally placed during the execution of the CRR process, it will operate nearly error free for the duration of the cycle. Such a system will save the damage to the CRR tool, the threaded part and the lathe itself.