Centroid Lathe Part Zero and Tool Setting Cheat Sheet

Introduction

The purpose of this video is to demonstrate how to use the Centroid Lathe Operators Manual as a reference during the setup of the Part Zero Position and the Tool Geometry Offset Library. We are going to use the "Master Tool" technique described in the manual. This method works on machines with or without homing/limit switches. Any reference to the manual will be based on the T-Series Operators Manual CNC11 Version 3.16 Rev. 160914 published by Centroid Corporation.

Getting Started

- It is advisable to print a hard copy of the manual for use during this procedure. Be sure to read all the safety information at the beginning of the manual, paying attention to the section "CNC Machine Tool Safety".
- Review Chapter 1 Introduction and make sure you understand what the DRO Display is and experiment with the Alt-d hot key to change the display between the machine position and the current WCS position as described on page 1-1. Make sure you are displaying the WCS position.
- Familiarize yourself with the axis orientation conventions discussed on page 1-3. Depending on your machine configuration, you may have a front or rear mounted turret. It's very important to understand which way your Positive X-axis (+X) is oriented.
- Home your machine using the procedure described on page 1-4. Use the appropriate method depending on whether your machine has limit/homing switches.
- Review Chapter 4 Tool Setup and pay attention to the section Procedures for Setting up Tools: Introduction found on page 4-5.
- Review Chapter 5 Part Zero and WCS.
- Identify a Master Tool. Although not required, it may be desirable to dedicate a Master Tool that will only be used for the purposes of setting Part Zero. Tool number one will be used as the Master Tool in this example, but any tool can be the Master Tool.

Set Part Z Zero

1. Zero out the Z Offset for the Master Tool on the **Tool Offset** screen.
    a. F1-Setup ► F2-Tool Offset
2. Zero out the Z value for the Master Tool on the **Tool Wear** screen.
    a. F9-Tool Wear
3. Take a skim cut.
    a. Keep the tool at this Z position – use X axis to clear the part but do not move Z axis.
    b. Stop the spindle.
4. Enter the resulting **Part Position**.
    a. F1 – Setup ► F1 – Part.
    b. Enter 0.000 (or the know part position) in the **Part Position** field and press Enter.
5. Enter the number of the Master Tool in the **Tool Number** field and press Enter.
6. Press **F10 – Set**.
    a. Part Zero is now set for the Z-axis.
    b. The Z axis DRO will now display the Part Position of the skim cut.
7. Carefully jog the tool to a safe position away from the part.

Set Part X Zero

1. Zero out the X Offset for the Master Tool on the **Tool Offset** screen.
    a. F1-Setup ► F2-Tool Offset
2. Zero out the X value for the Master Tool on the **Tool Wear** screen.
    a. F9-Tool Wear
3. Take a skim cut.
    a. Keep the tool at this X position – use Z axis to clear the part but do not move X axis.
    b. Stop the spindle.
    c. Using a micrometer, physically measure the skim cut and write down that value.
4. Enter the resulting diameter.
    a. F1 – Setup ► F1 – Part ► F8 - Set.
    b. Enter the skim cut diameter in the **Part Position** field and press Enter.
5. Enter the number of the Master Tool in the **Tool Number** field.
6. Toggle the **Set all WCS** field to **Yes**.
    a. This will set all of the Work Coordinate systems to the same X axis Part Zero value.
7. Press **F10 – Set**.
    a. Part Zero is now set for the X-axis.
    b. The X axis DRO will now display the measured value of the skim cut.
8. Carefully jog the tool to a safe position away from the part.

Set Tool Z Offset(s)

1. Zero out the Z Offset for the tool to be measured on the **Tool Offset** screen.
    a. F1-Setup ► F2-Tool Offset
2. Zero out the Z value for the tool to be measured on the **Tool Wear** screen.
    a. F9-Tool Wear
3. Touch off the tool on the Part Z Zero.
    a. Refer to Figure 13 on page 4-13.
    b. It may be desirable to use shim stock between the tool and the Part Z Zero face.
4. Open the Tool Geometry Offset Library.
    a. F1 – Setup ► F2 – Tool Offset.
5. Set the Reference.
    a. Make sure the Z column is highlighted
    b. Press **F1 – Z Ref**
    c. Enter 0.000 if you are touching the tool directly off the Part Z Zero face
    d. Enter the shim thickness if you are using a piece of shim stock as a feeler between the tool tip and the Part Z Zero face
6. Measure the Tool Offset.
    a. Highlight the Z Offset register of the tool to be measured
    b. F2 – Measure Tool ► F6-Measure Offset Z ► F10-Measure Here
    c. Be sure to press F10-Save before exiting screen
7. Carefully jog the tool to a safe position away from the part.

Set Tool X Offset(s)

1. Zero out the X Offset for the tool to be measured on the **Tool Offset** screen.
    a. F1-Setup ► F2-Tool Offset
2. Zero out the X value for the tool to be measured on the **Tool Wear** screen.
    a. F9-Tool Wear
3. Take a skim cut.
    a. Keep the tool at this X position – use Z axis to clear the part but do not move X axis.
    b. Stop the spindle.
4. Using a micrometer, physically measure the skim cut and write down that value.
5. Open the Tool Geometry Offset Library.
    a. F1 – Setup ► F2 – Tool Offset.
6. Set the X Measurement Diameter.
    a. Make sure the X Offset column is highlighted
    b. Press **F1 – X Diam**
    c. Enter the measured diameter into the “Establish the X Diameter field”
    d. Press **F10-Save**
7. Measure the X Offset.
    a. Highlight the X Offset register of the tool to be measured
    b. F2 – Measure Tool ► F5-Measure Offset X ► F10-Measure Here
    c. Be sure to press F10-Save before exiting screen
8. Carefully jog the tool to a safe position away from the part.

Set Reference Return Point

1. Refer to page **5-6.**
2. Physically jog the machine to a safe tool change position.
3. Enter the Reference Return screen.
    a. F1-Setup ► F1-Part ► F9-WCS Table ► F1-Return
4. Look at the Machine Position DRO display.
5. Enter the X and Z values displayed on the DRO into the #1 (G28) registers.
6. Be sure to press F10-Save before exiting screen