Create a Tool File Workbook

WORKBOOK

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CONTENTS

INTRODUCTION

HOW TO USE THIS WORKBOOK: This workbook is designed as an aid for you to use after you've participated in the 3D AccuForm Synchro Training Course. After partaking in the training course, this workbook will guide you through the steps you need to take to set up your own 3D AccuForm Synchro machine for use.

Goals

Upon completion of this course, you will be able to:

- Set up your own 3D AccuForm Machine and have it ready for use to bend wire to your specifications.

Tip

This icon will be used throughout the workbook to give additional information.

Caution

This icon will be used throughout the workbook as a symbol to use caution when performing an action.

Note

This icon will be used throughout the workbook as a section for you to jot down notes to assist you with setting up your 3D AccuForm Machine.

CREATE A TOOL FILE

Workbook Snapshot

In the past few modules, we covered how to create a tool file. An overview of how to read a tool print along with step-by-step instruction on how to enter the tool's geometric parameters into SmartEditor® was also covered. The process steps covered in these modules were:

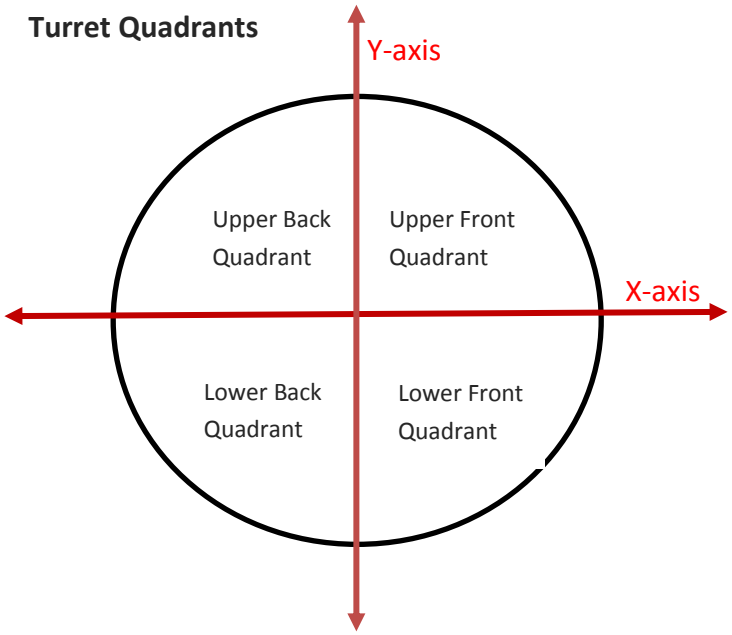
1. Define a Turret Cluster
2. Define the Mandrel and Pins
3. Define the Material
4. Define the Tool w/Pins

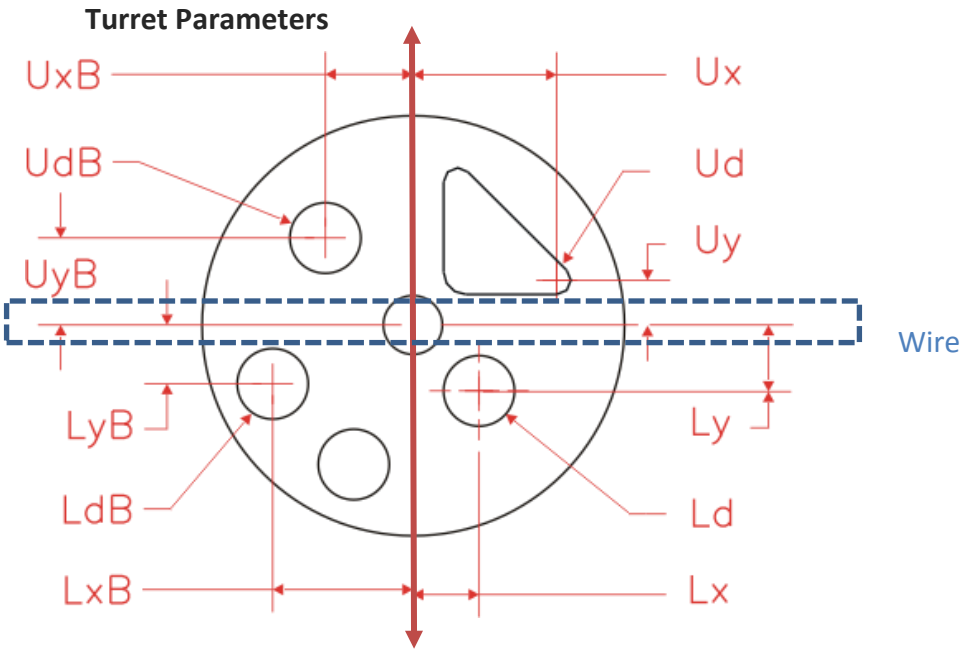
It's now time to practice these steps using the SmartEditor® application on your own machine.

Turret Cluster Parameter Review Activity

Before moving on to defining the turret cluster, do a quick review of the turret quadrants, parameters and parameter descriptions.

The geometric values of a turret are broken into four (4) quadrants based on its x and y-axis and include: upper front quadrant, lower front quadrant, upper back quadrant and lower back quadrant. Parameters are assigned to each quadrant in SmartEditor®, as shown, to create the tool file.





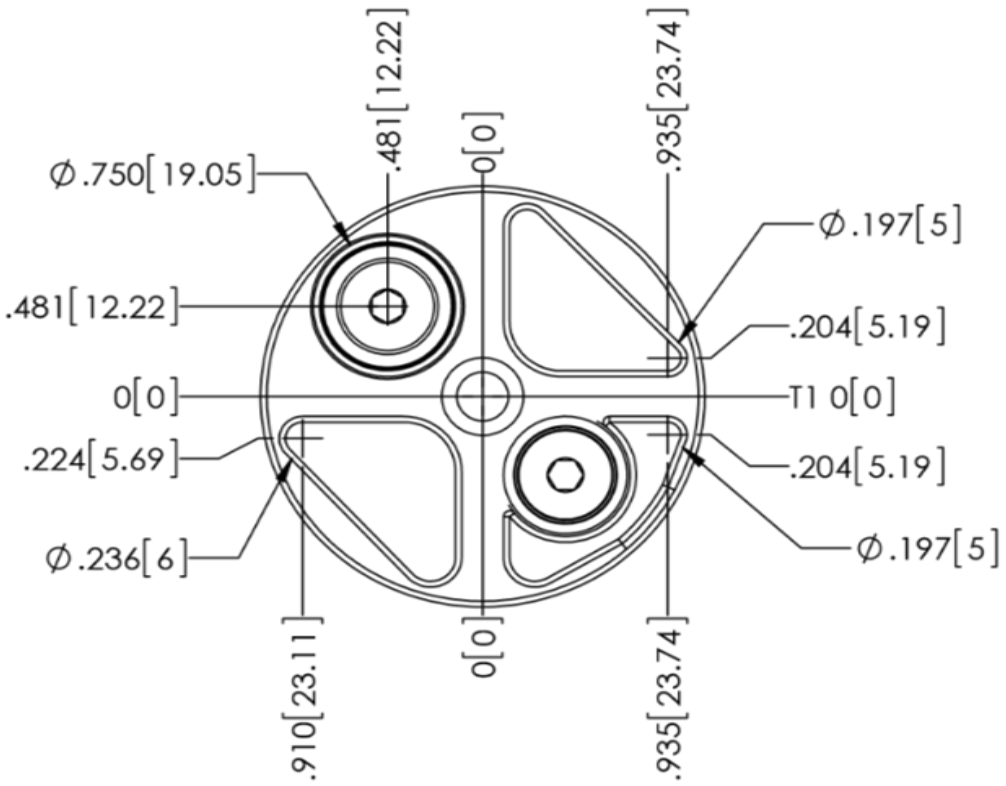
Front Turret Parameter			
Line	Value	Name	Description
0	Ud	Upper Bender Roller Diameter	The diameter dimension of the bending roller that is in the front, upper position.
1	Ld	Lower Bender Roller Diameter	The diameter dimension of the bending roller that is in the front, lower position.
2	Ux	Upper Roller Center to Y	The distance from the center of the upper roller to the Y-axis centerline of the tool.
3	Uy	Upper Roller Center to X	The distance from the center of the upper roller to the X-axis centerline of the tool.
4	Lx	Lower Roller Center to Y	The distance from the center of the lower roller to the Y-axis centerline of the tool.
5	Ly	Lower Roller Center to X	The distance from the center of the lower roller to the X-axis centerline of the tool.
6		Upper Front Roller Style	Defines what type of die style is being used on the tool cluster for the upper roller. (0 is most commonly used for hard pin and 1 for roller)
7		Lower Front Roller Style	Defines what type of die style is being used on the tool cluster for the lower roller. (0 is most commonly used for hard pin and 1 for roller)
Back Turret Parameter Definitions			
Line	Value	Name	Description
13	UdB	Back Upper Bender Roller Diameter	The diameter dimension of the bending roller that is in the back, upper position.
14	LdB	Back Lower Bender Roller Diameter	The diameter dimension of the bending roller that is in the back, lower position.
15	UxB	Back Upper Roller Center to Y	The distance from the center of the upper roller to the Y-axis centerline of the tool.

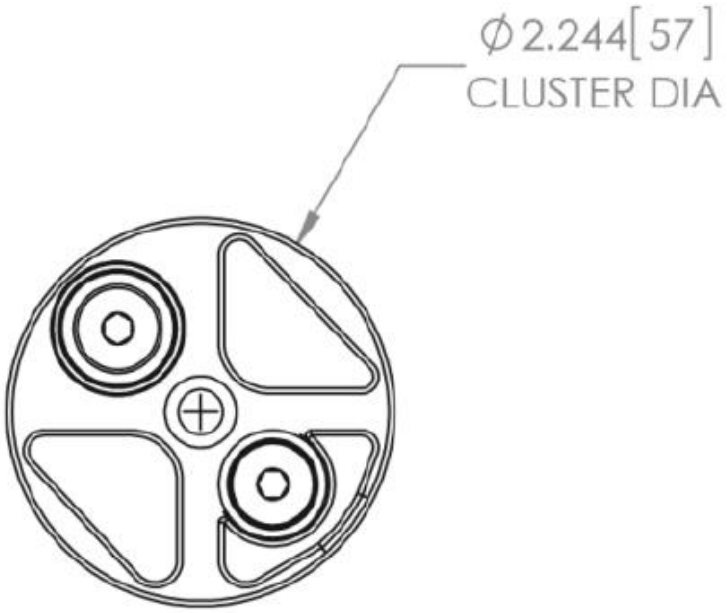
Front Turret Parameter			
Line	Value	Name	Description
16	UyB	Back Upper Roller Center to X	The distance from the center of the upper roller to the X-axis centerline of the tool.
17	LxB	Back Lower Roller Center to Y	The distance from the center of the lower roller to the Y-axis centerline of the tool.
18	LyB	Back Lower Roller Center to X	The distance from the center of the lower roller to the X-axis centerline of the tool.
19		Upper Front Roller Style	Defines what type of die style is being used on the tool cluster for the upper roller. (0 is most commonly used for hard pin and 1 for roller)
20		Lower Front Roller Style	Defines what type of die style is being used on the tool cluster for the lower roller. (0 is most commonly used for hard pin and 1 for roller)

Define a Turret Cluster, Part 1 Activity

Use your own 3D AccuForm Machine and the sample tool print below and on the next page to define the turret cluster for **Tool #1**. Follow the steps below. Remember, you can quickly access the Tool Definitions window in SmartEditor® by pressing F5 on your keyboard. For more detailed instructions see Module 18: Read and Define a Tool Cluster.

Action 1: Select the Tools Tab
Action 2: Select the Tool Position
Action 3: Select the Tool Type
Action 4: Enter the Front Parameters
Action 5: Select the Front Roller Style
Action 6: Enter the Back Parameters
Action 7: Select the Back Roller Style
Action 8: Enter the Turret Diameter



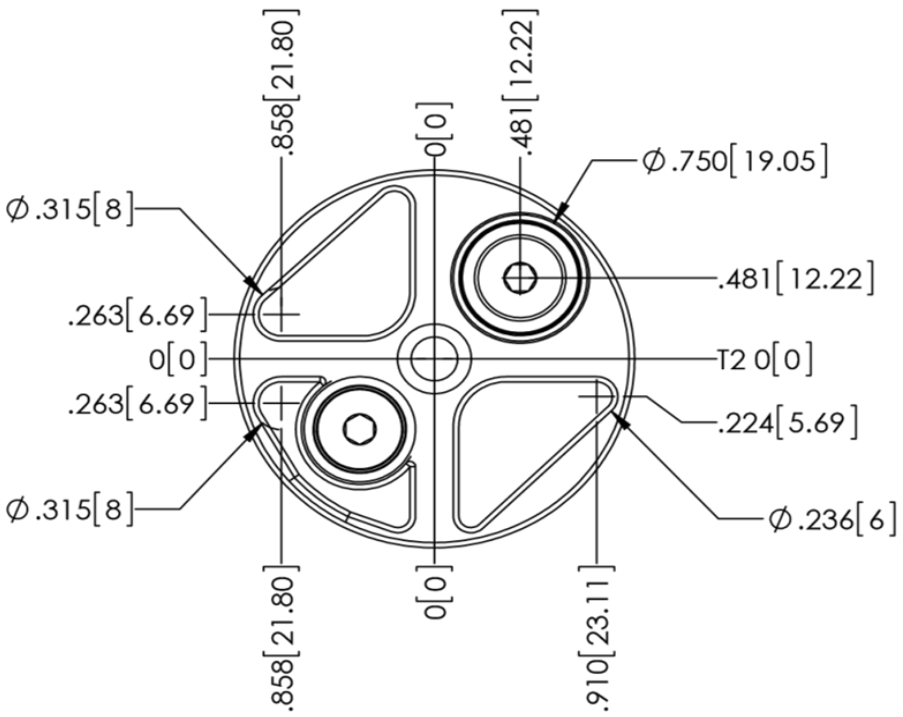


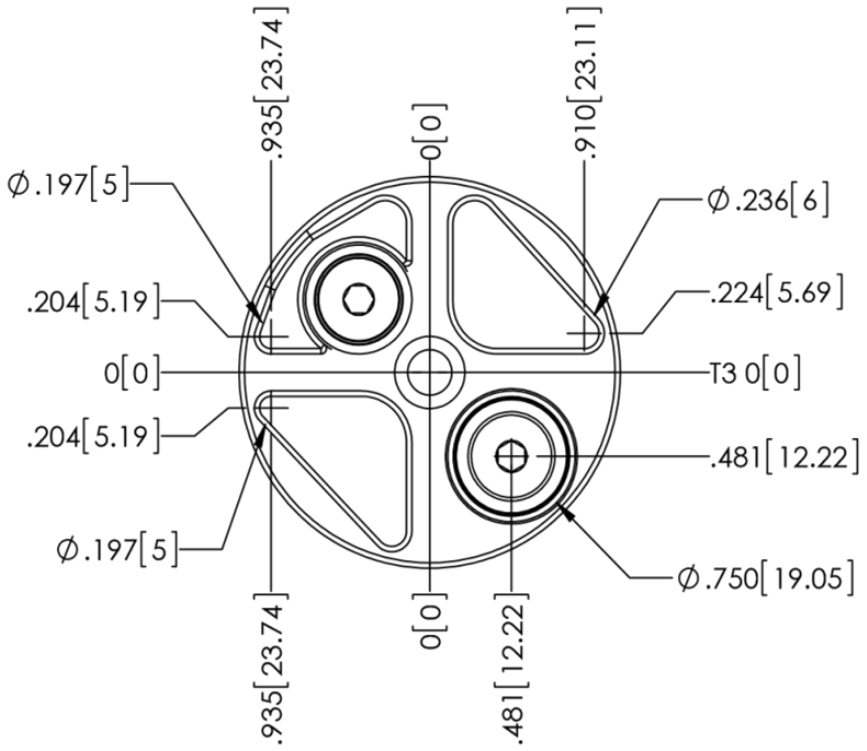
Note any questions you have as you create the tool file, then review the online modules to address your questions.

Define a Turret Cluster, Part 2 Activity

Next use the steps and tool prints below to define **Tool # 2**, **Tool #3** and **Tool #4**. For more detail, see Module 18: Read and Define a Tool Cluster.

Action 1: Select the Tool Position
Action 2: Enter the Front Parameters
Action 3: Select the Front Roller Style
Action 4: Enter the Back Parameters
Action 5: Select the Back Roller Style
Action 6: Repeat actions 1-5 until all Tools are Defined

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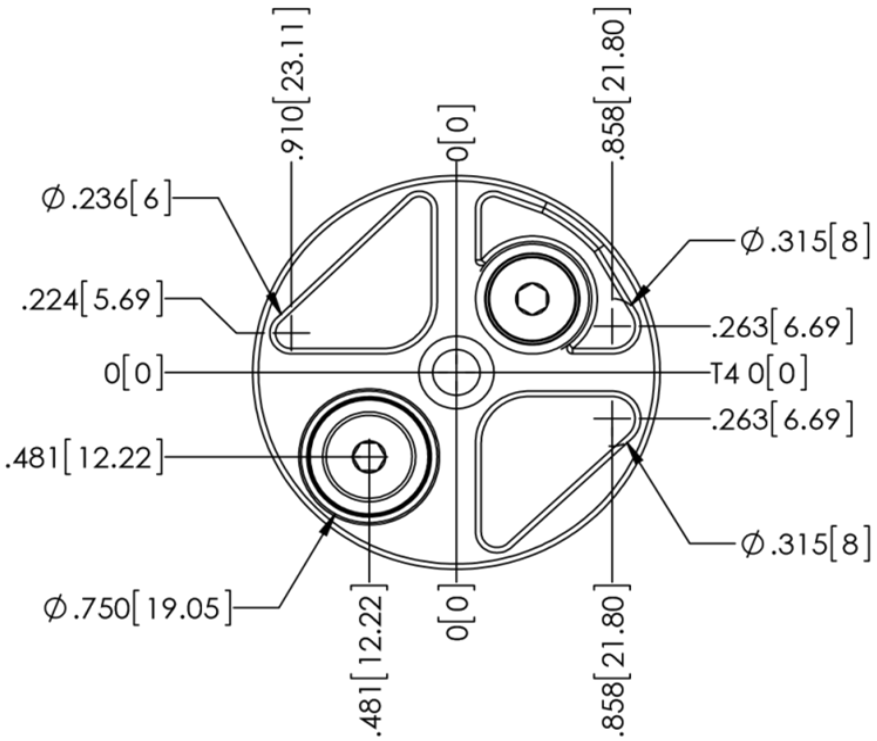
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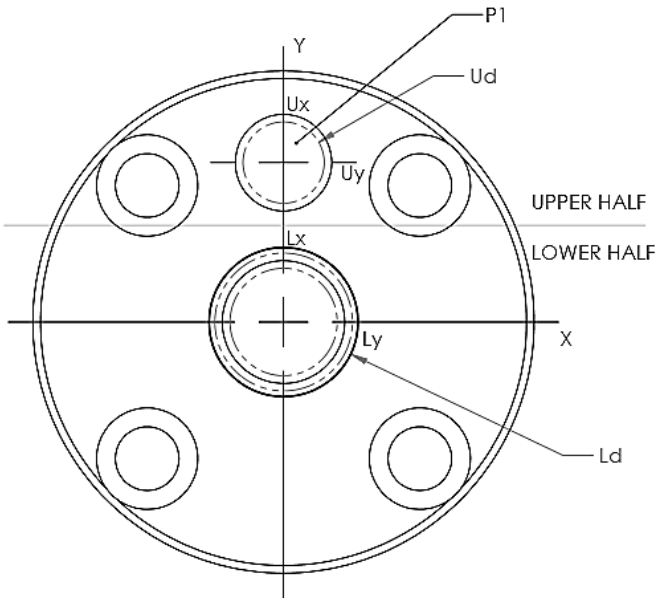
Note any questions you have as you create the tool file, then review the online modules to address your questions.

Mandrel Parameter Review Activity

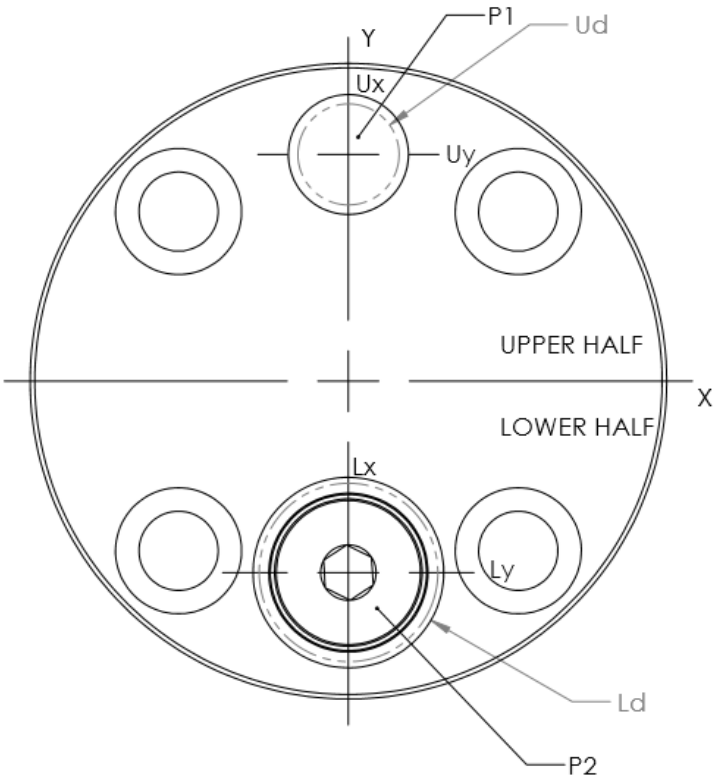
Before moving on to defining the mandrels, do a quick review of the mandrel parameters and descriptions for the standard mandrel and the mandrel used as a bending pin.

Standard Mandrel Style Parameters



Standard Mandrel Style Parameter			
Line	Value	Name	Description
0	Ud	Upper Bender Roller Diameter	Defines the bending pin diameter on mandrel. For grooved pins, this is the part that will touch the wire.
1	Ld	Lower Bender Roller Diameter	Diameter dimension for the center pin on mandrel.
2	Ux	Upper Roller Center to Y	Typically a value of zero. The distance from Y-axis centerline of the tool to the Y-axis centerline of the upper roller.
3	Uy	Upper Roller Center to X	The distance from X-axis centerline of the tool to the X-axis centerline of the upper roller.
4	LX	Lower Roller Center to Y	Typically a value of zero. The distance from Y-axis centerline of the tool to the Y-axis centerline of the lower roller.
5	LY	Lower Roller Center to X	The distance from X-axis centerline of the tool to the X-axis centerline of the lower roller.

Mandrel as a Bending Pin Parameters



Mandrel as a Bending Pin Parameter Definitions

Line	Value	Name	Description
0	Ud	Upper Bender Roller Diameter	Defines the bending pin #1 diameter on mandrel. For grooved pins, this is the part that will touch the wire.
1	Ld	Lower Bender Roller Diameter	Defines the bending pin #2 diameter on mandrel. For grooved pins, this is the part that will touch the wire.
2	Ux	Upper Roller Center to Y	Typically, a value of zero. The distance from Y-axis centerline of the tool to the Y-axis centerline of the upper roller.
3	Uy	Upper Roller Center to X	The distance from X-axis centerline of the tool to the X-axis centerline of the upper roller.
4	LX	Lower Roller Center to Y	Typically, a value of zero. The distance from Y-axis centerline of the tool to the Y-axis centerline of the lower roller.
5	LY	Lower Roller Center to X	The distance from X-axis centerline of the tool to the X-axis centerline of the lower roller.

Define the Mandrel and Pins Activity

Use your own 3D AccuForm Machine and the sample mandrel tool prints below to define the mandrels for Mandrels #1, Mandrel #2 and Mandrel #3; then define the mandrel and pin(s). Follow the steps below. For more detailed instructions see Module 19: Read and Define Mandrel Clusters.

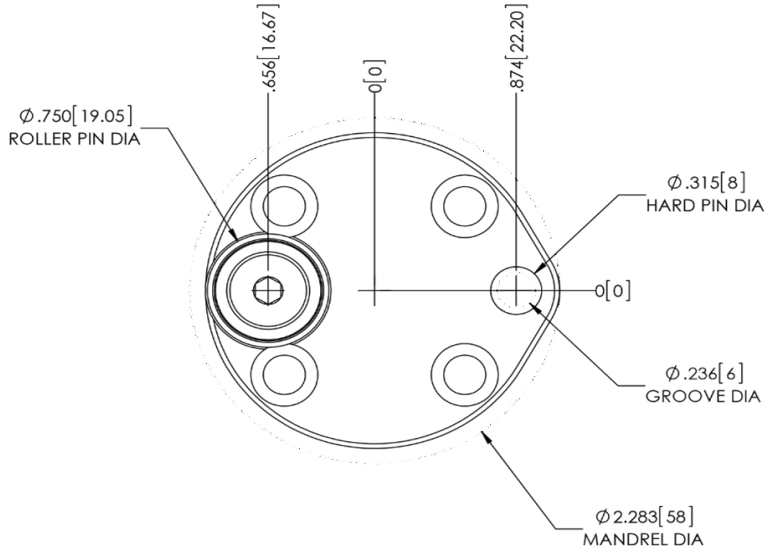
Action 1: Select the Tools Tab
Action 2: Select the Mandrel Position
Action 3: Select the Tool Type
Action 4: Enter the Parameters
Action 5: Select the Pins Tab
Action 6: Select the Mandrel and Pin(s)
Action 7: Enter the Bending Pin Outer Diameter
Action 8: Repeat actions 1-7 for each Mandrel

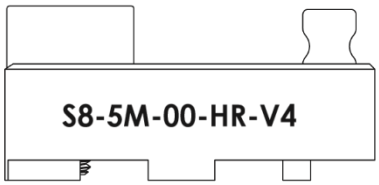
Note

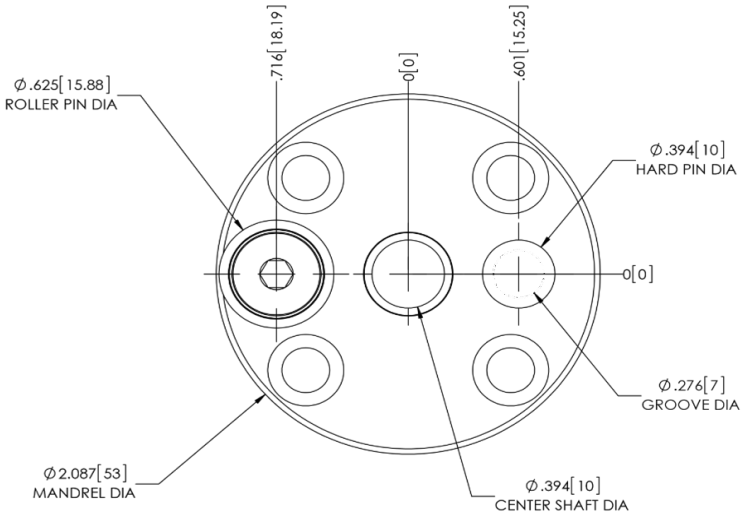
Remember, if the mandrel has two pins, you will need to select two pins for the mandrel in the Pins tab.

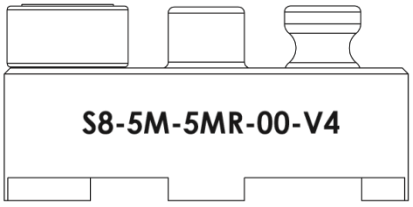
Note any questions you have as you create the tool file, then review the online modules to address your questions.

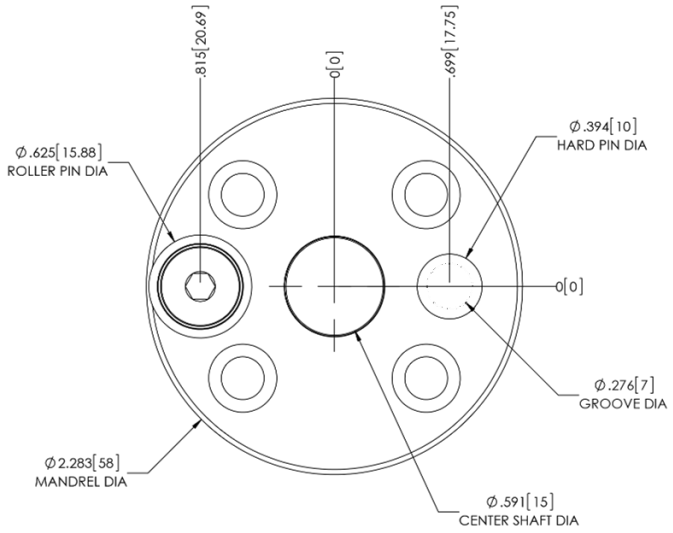
Sample Tool File

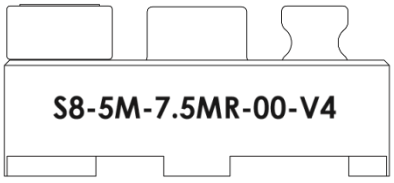












Define the Material and Tools w/Pins Activity

In this activity, you will define the material or wire and define how the tools and pins will interact. To complete this activity, you will need to locate wire you will use to form parts and identify the following:

Wire Hardness	▪ This value is provided from the wire manufacture and defines the tensile strength.
Wire Diameter	▪ Defines the size of the material or wire
Cutter to Center of Bender Distance	▪ Defines the distance between the shearing point of the cutter and the center of the tool cluster.

Next, complete the following steps to define the Material and Tool w/Pins. Review the commonly used Tool w/Pins Parameters on the next page, to assist with Action 5. For more detailed instructions see Module 20: Define Material and Tool w/Pins.

Action 1: Access the Material Tab
Action 2: Enter the Material Values
Action 3: Select the Tool w/Pins Tab
Action 4: Create Tool Combinations
Action 5: Enter Tool w/Pins Values
Action 6: Save Tool File

Tool w/Pins Parameters		
Line	Name	Description
0	Use Bender Geometry Parameters	0 = Disables bender geometry. 2 = Use bender geometry. 3 = Use bender geometry plus Bend Corrections.
2	Use Axis Interpolation	Enables the “Feed wire w/ analogy” options. 0 = Off 3 = Feed material while bending; simultaniously feed and return bender when using “RD” flag.
3	(Inch/Degree)Feed Wire w/analogy	Controls the amount of wire that feeds during the bend.
4	(Degrees) Feed wire w/analogy after starting angle	Sets the angle at which SmartEditor® will start feeding wire into the bend.
5	Feed Wire w/ Analogy Ending Angle	Sets the angle at which SmartEditor® will stop feeding wire into the bend.
7	Wire Angle at 90 degrees Programmed Bend	Controls the calibration so that the programmed 90 degree angle will match the formed 90 degree angle. Not available for Mandrel Only bends.
8	Min. Generated Radii	When using the “RD” flag, defines the point at which machine switches from generating an arc to incrementaly bending the arc.
9	MultiBend Increment	Controls the amout of material fed out between bends when incrementally bending.

Note any questions you have as you create the tool file, then review the online modules to address your questions.