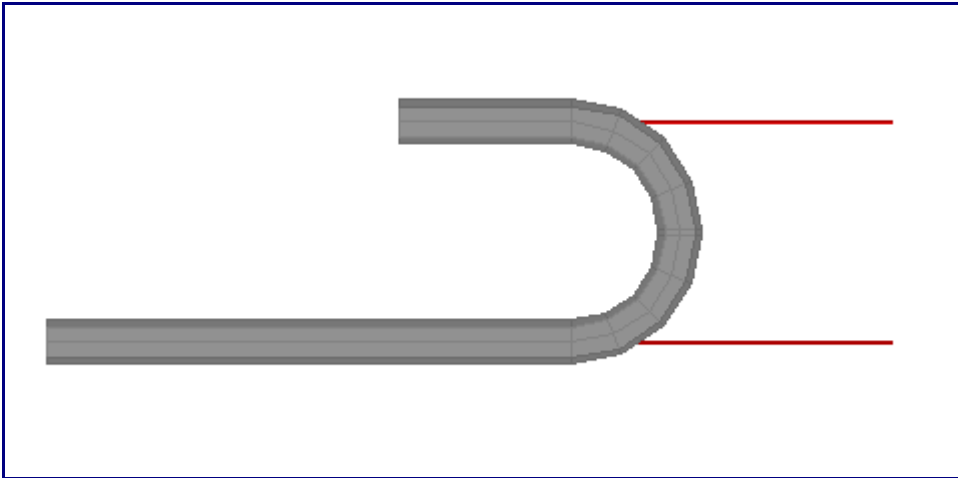


Making a 180 Degree Bend in Custom 3D

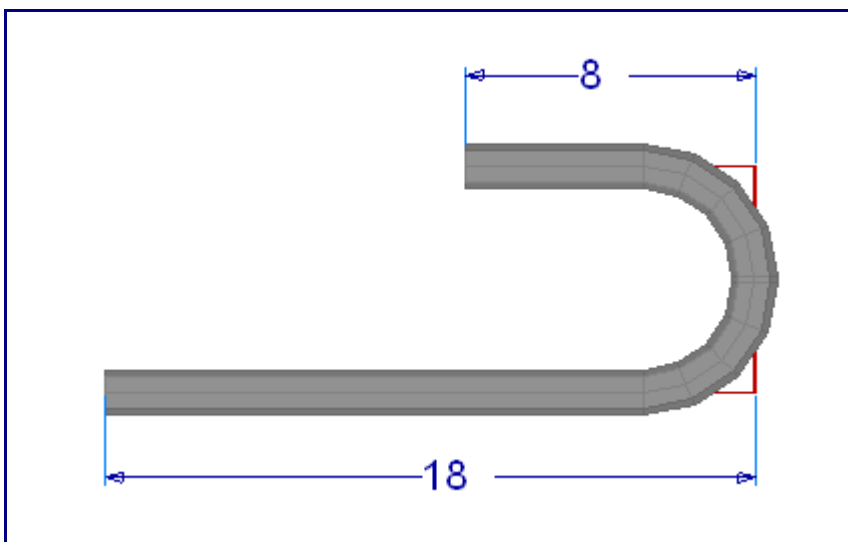
The Custom 3D part interface uses "Apex" as the primary way to enter in locations for bends. What do we do in the case of a 180 degree bend which doesn't have an apex **because the 2 edges are parallel?**



There are 2 ways to resolve this problem, use 2 90 degree bends or use the "tangent" bend location type. For many the first way (using 2 90 degree bends) will be the simplest.

Using Two 90 Degree Bends:

The following will be the part we will make.



- 1) Select **2** bends for this part.
- 2) Select "**1**" from the bend list.

3) Enter **18** to the **front**.

The screenshot shows a software window titled "Custom 3D Part - 1". It features several panels and a 3D model.

Die & Material Panel:

- Select Material: 1.75 DOM
- Select Die: 3.0
- Buttons: Custom CLR, Detailed List
- Checkboxes: Display Spring Angle
- Parameters: Diameter: 1.75, Wall Thickness: 0.13, Weight: 0.00, CLR: 3.00, Calibrated CLR: 3.90, Bend Location Offset: 0.00

Number of Bends Panel:

- Number of Bends: 2
- Buttons: Refresh Part, Add Custom CLR, Detailed Die List
- Checkboxes: Refresh on Keystroke, Verification Points, Display Dimensions, Use 3D Angle Interface
- Parameters: Die: 3.0, Dim Type: Apex

Bend List Table:

Order	Bend	Location	Rotation	Angle	Spring Angle	CLR	Bend Length	Orientation
1	1	15	0	90	90	3	4	From Start
2	2	19	0	90	90	3	4	From Start

3D Model: A 3D rendering of a metal part with two bends. A coordinate system is shown with labels: "to ceiling", "to floor", "to left", "to back", "to right", and "to front". The "to front" label is circled in red, and the value "18" is entered in the corresponding input field.

4) Select "2" from the bend list.

5) Enter **2 times your CLR** (in our case that value becomes 6.0) to the **ceiling**.

Custom 3D Part - 1

Die & Material | Part Details | Settings | Tools | Manuf. Warning | Display

Select Material:
 1.75 DOM Diameter: 1.75
 Wall Thickness: 0.13
 Weight: 0.00

Select Die:
 3.0 CLR: 3.00
 Calibrated CLR: 3.90
 Bend Location Offset: 0.00

Display Spring Angle

Die: 3.0 Cut Length: 29
Material: 1.75 DOM Part Weight: 0

Order	Bend	Location	Rotation	Angle	Spring Angle	CLR	Bend Length	Orientation
1	1	15	0	90	90	3	4	From Start
2	2	19	0	90	90	3	4	From Start

Number of Bends: 2

Refresh on Keystroke

Verification Points Die: 3.0

Display Dimensions Dim Type: Apex

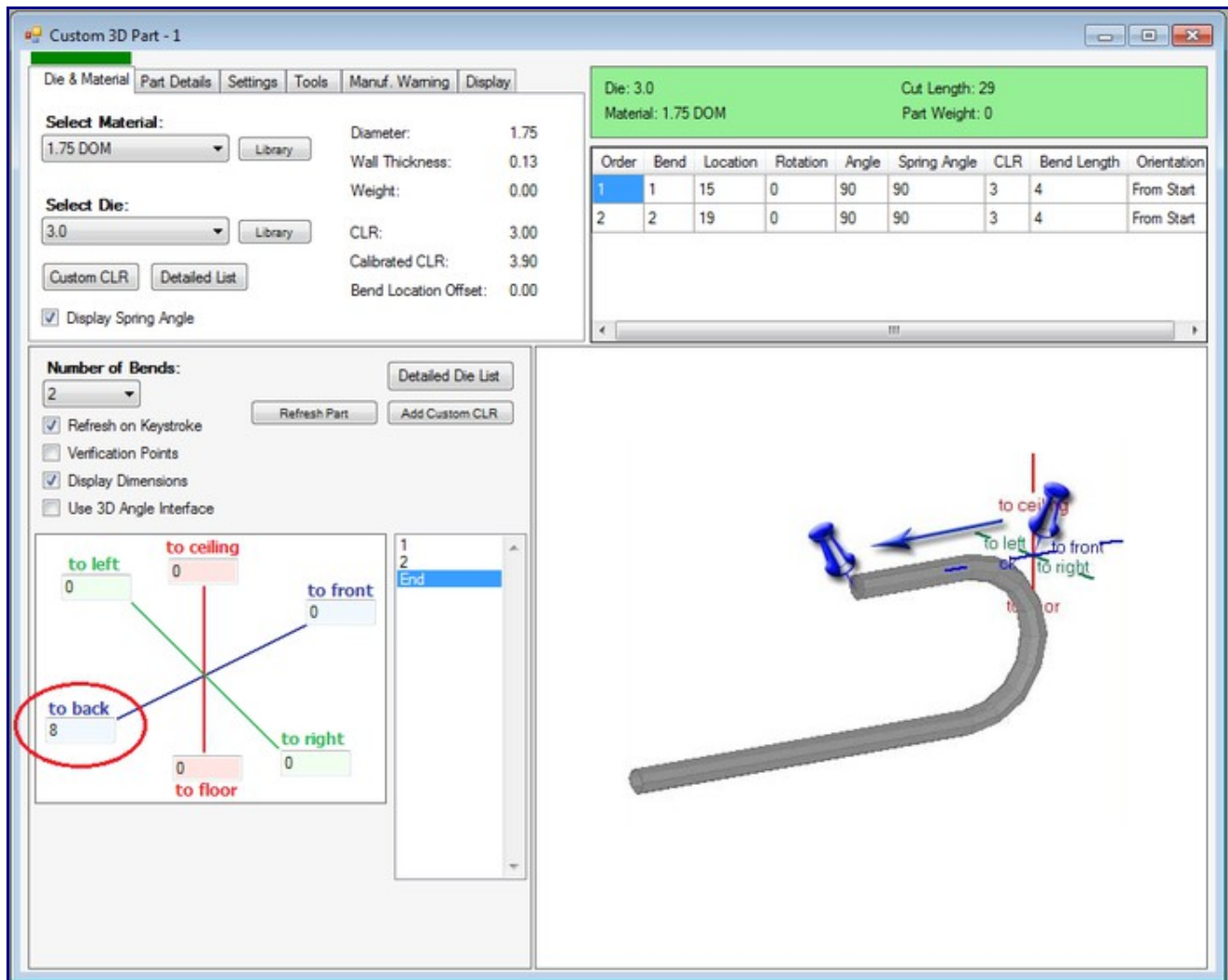
Use 3D Angle Interface

to left 0 to ceiling 6 to front 0
 to back 0 to floor 0 to right 0

1
 2
 End

6) Select "E" from the bend list.

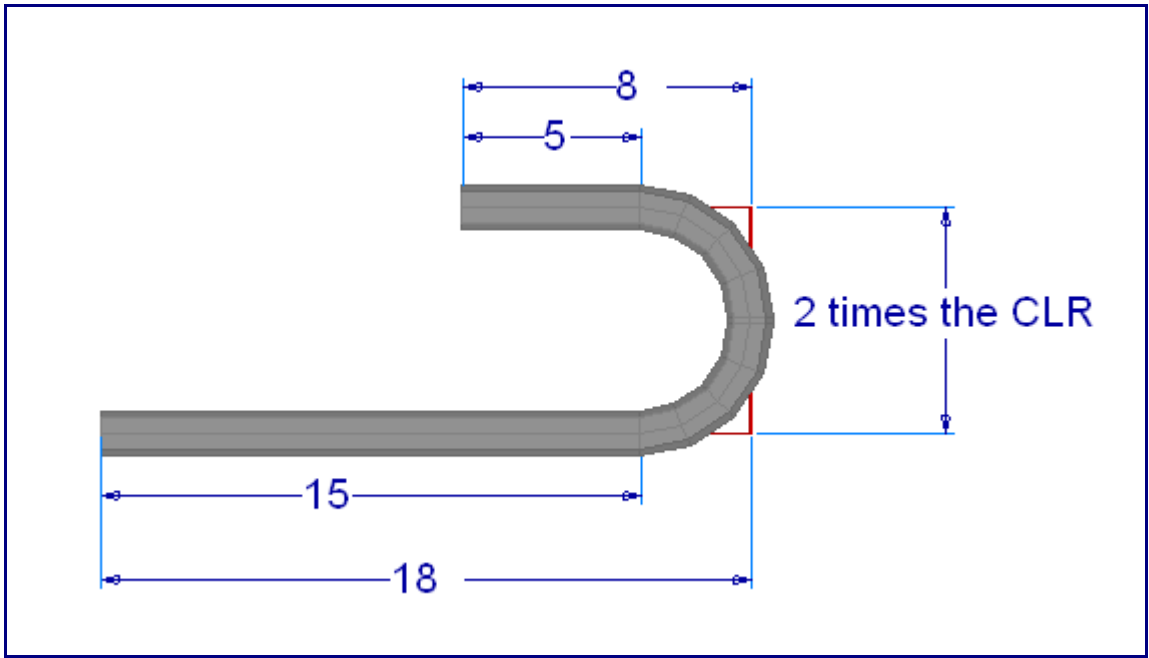
7) Enter 8 to the back.



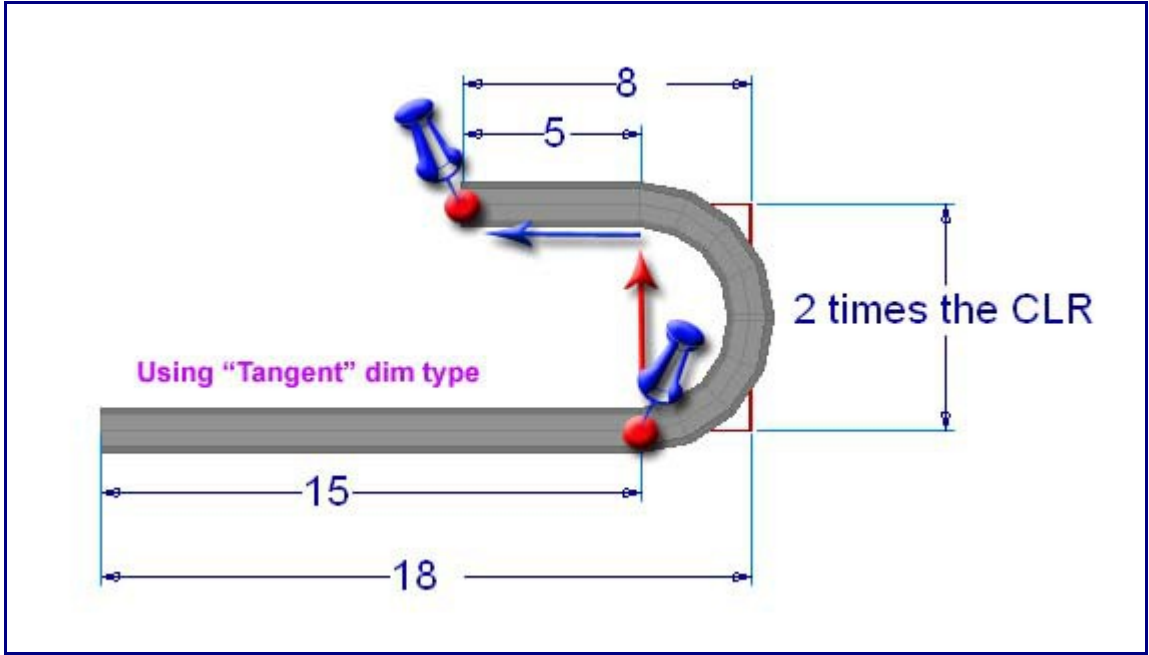
NOTE: You will need to remember to run the bend 180 degrees and ignore the 2nd bend line from the results window.

Using the Tangent Method

This method allows for one bend, as the part is. In the method you will go to the tangent or start of the bend. You will need to subtract a CLR from your values. So in our case 18 becomes 15. [please note we have rounded the actual CLR of 3.063 for customers to follow easier.]

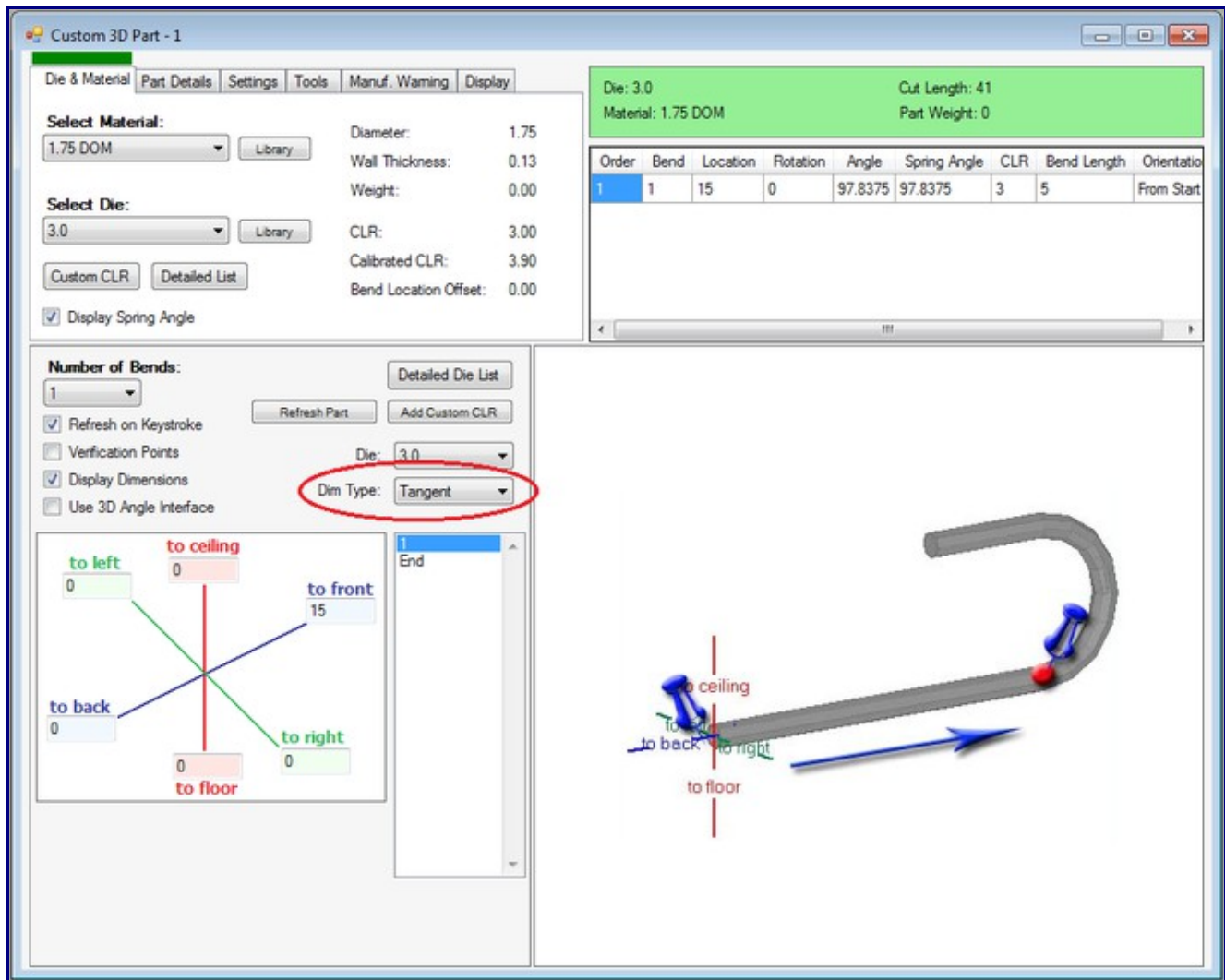


The next feature location is in reference to the start of the bend as shown in the following picture.



Lets make our part:

- 1) Select **1** bend from the "**Number of Bends**" pull-down.
- 2) Select "**1**" from the bend list.
- 3) Change your **Dimension Type** to **Tangent**.
- 4) Enter **15** to **front**.



- 5) Select "E" from the bend list.
- 6) Enter **2 times your CLR** (6.0) to the **ceiling**.
- 7) Enter **5** to the **back**.

Custom 3D Part - 1

Die & Material | Part Details | Settings | Tools | Manuf. Warning | Display

Select Material:
 1.75 DOM Library
 Diameter: 1.75
 Wall Thickness: 0.13
 Weight: 0.00

Select Die:
 3.0 Library
 CLR: 3.00
 Calibrated CLR: 3.90
 Bend Location Offset: 0.00

Custom CLR

Display Spring Angle

Number of Bends:
 1 Detailed Die List
 Refresh on Keystroke Refresh Part Add Custom CLR
 Verification Points
 Display Dimensions
 Use 3D Angle Interface

to left: 0 to ceiling: 6 to front: 0
to back: 5 to floor: 0 to right: 0

1
End

Die: 3.0 Cut Length: 29
 Material: 1.75 DOM Part Weight: 0

Order	Bend	Location	Rotation	Angle	Spring Angle	CLR	Bend Length	Orientation
1	1	15	0	180	180	3	9	From Start