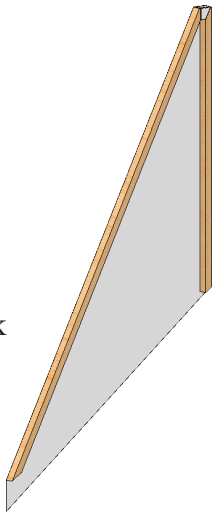
Chapter 4

Delta Dart
V Stab



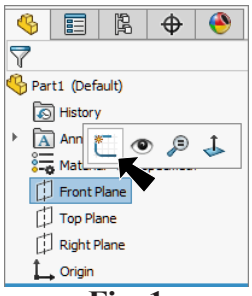


Fig. 1

A. Sheet Metal Sketch.

Step 1. Click File Menu > New, click **Part Metric** and OK.

Step 2. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 1**.

Step 3. Click **Line** **(L)** on the Sketch toolbar.

Step 4. Sketch **a vertical line down thru the Origin** to make Coincident , **Fig. 2**.

Step 5. Click **Smart Dimension** **(S)** on the Sketch toolbar.

Step 6. Add dimensions, **Fig. 3**.

Step 7. Click Zoom to Fit **(F)** on the View toolbar.

Step 8. Click **Line** **(L)** on the Sketch toolbar.

Step 9. Sketch the **4 lines** in **Fig. 4**. Keep the line from the Origin horizontal.

Step 10. **Right click sketching and click Select** from menu to unselect Line tool.

Step 11. Click **horizontal line** and click **Construction Geometry** on the context toolbar, **Fig. 5**.

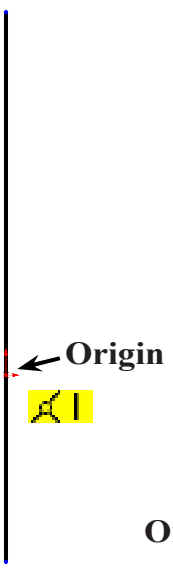


Fig. 2

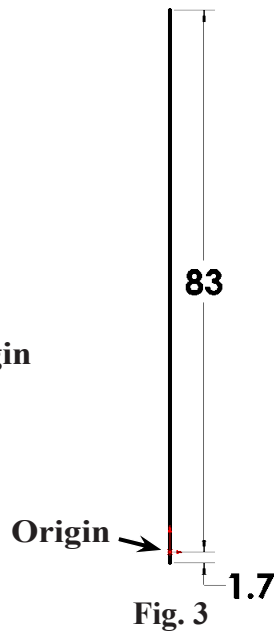


Fig. 3

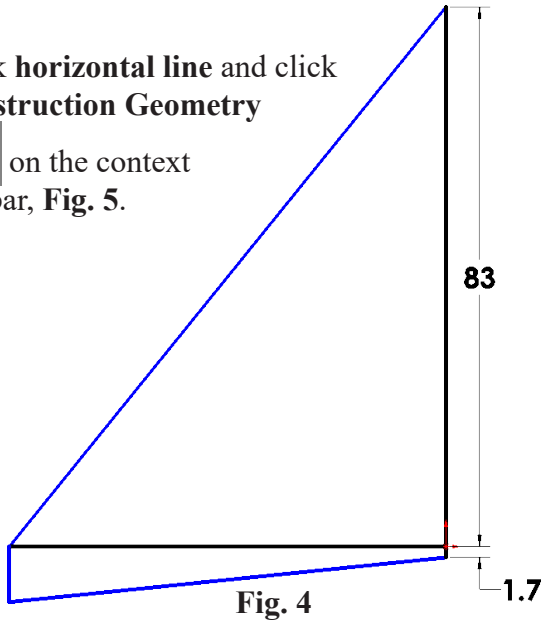


Fig. 4

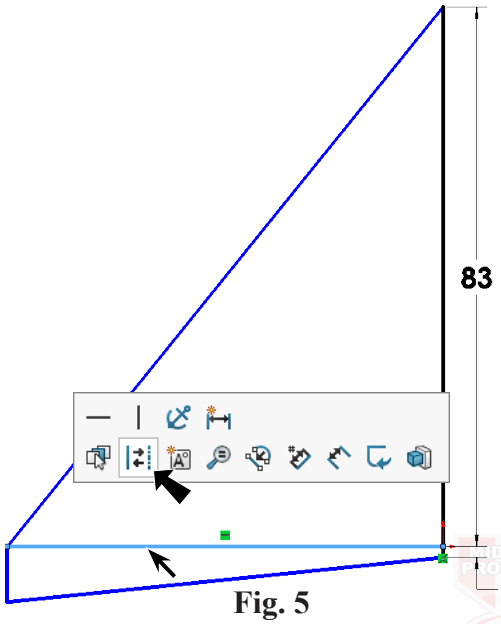


Fig. 5

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Step 12. Click **Smart Dimension**

(**S**) on the Sketch toolbar.

Step 13. Add dimensions, **Fig. 6**. To dimension angle, click vertical line and angled line, then move the cursor between lines and click. Key-in **86** for the dimension and press ENTER.

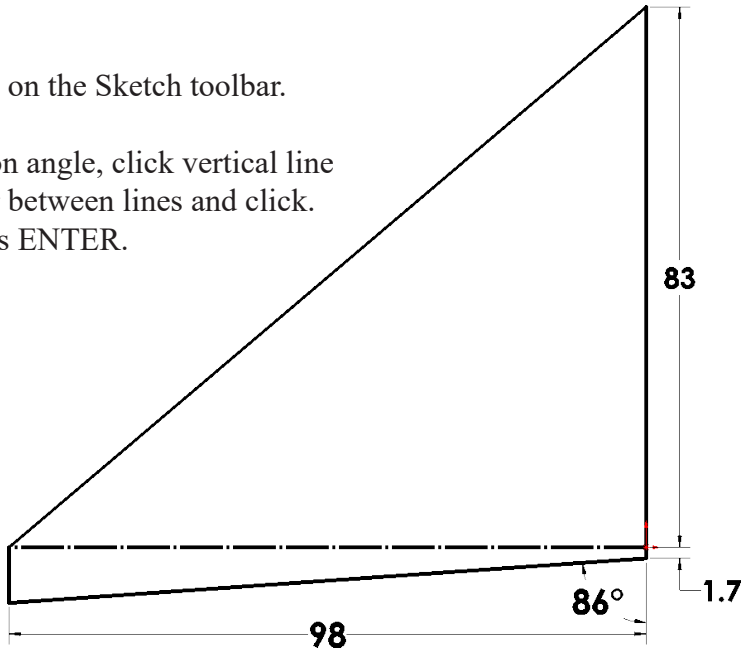


Fig. 6

B. Save as "V STAB".

Step 1. Click File Menu > Save As.

Step 2. Key-in **V STAB** for the filename and press ENTER.

C. Base Flange.

Step 1. Click **Sheet Metal**

on the Command Manager toolbar.

Step 2. Click **Base Flange/Tab**

on the Sheet Metal toolbar.

Step 3. In the Property Manager set:
under Sheet Metal Parameters, **Fig. 7**

Thickness

.05

click OK .

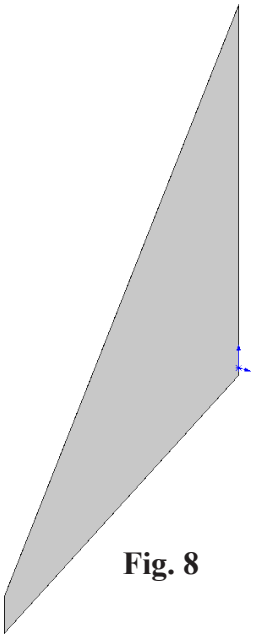


Fig. 8

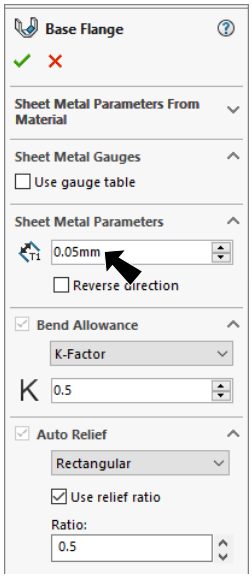


Fig. 7

D. Set Bend Radius.

Step 1. Click **Sheet-Metal** in the Feature Manager and click **Edit Feature** on the context toolbar, **Fig. 8**.

Step 2. In the Property Manager set:
under Bend Parameters, **Fig. 9**

Bend Radius (Default) **.01**

click OK .

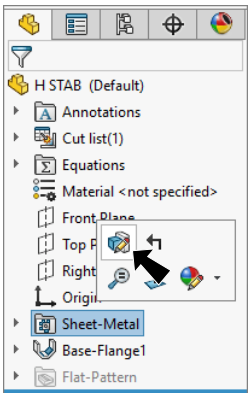


Fig. 9

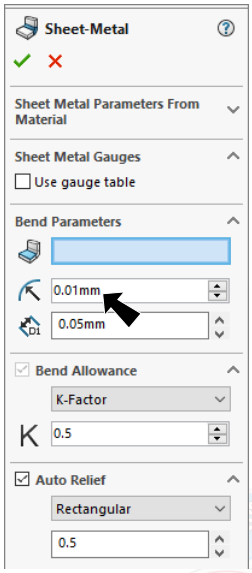


Fig. 10

E. Material Paper -Sheet Metal.

Step 1. Expand **Cut List(1)** in the Feature Manager. Expand **Sheet 1**, **right click Base-Flange1** body and click **Material > White Paper** from Favorites list, **Fig. 11**.

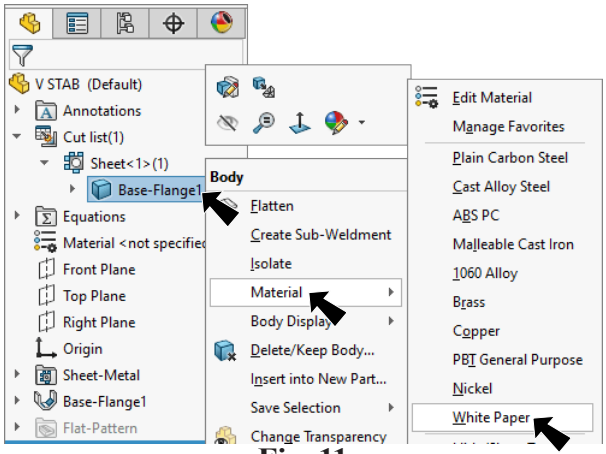


Fig. 11

Step 2. Save. Use **Ctrl-S**.

F. Sketch for Weldments.

Step 1. Click the **side face of sheet metal** and click **Sketch** on the context toolbar, **Fig. 12**.

Step 2. Click **Normal To** on the Standard Views toolbar. **(Ctrl-8)**

Step 3. Click **Line** **(L)** on the Sketch toolbar.

Step 4. Sketch Line from top corner 1 to top left corner 2, along leading edge. Then, second line from top corner 1 to Origin 3 trailing edge, **Fig. 13**.
To terminate chain, double click back on the line you have just sketched.

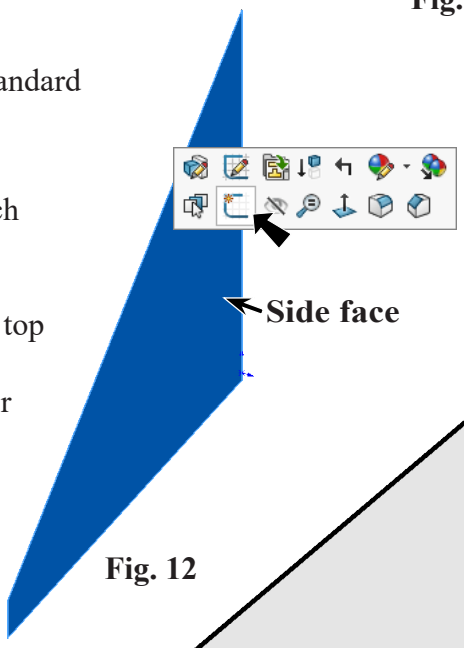


Fig. 12

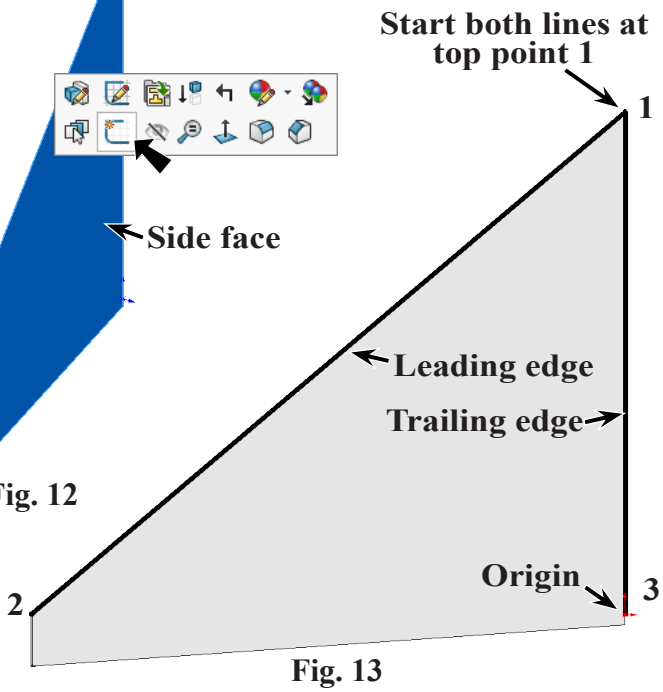


Fig. 13

Step 5. Click **Exit Sketch** on the Sketch toolbar.

Step 6. Save. Use **Ctrl-S**.

G. Structural Members.

Step 1. Click **Weldments** Weldments on the Command Manager toolbar.

Step 2. Click **Structural Member** Structural Member on the Weldments toolbar.

Step 3. In the Structural Member Property Manager set:
under Standard:
My Profiles, **Fig. 14**
under Type:
Balsa
under Size:
1.5 x 3
click **line at trailing edge first, then line at leading edge**, **Fig. 15**
click **End Miter**
confirm all members on **inside of sketch**
click OK ✔.

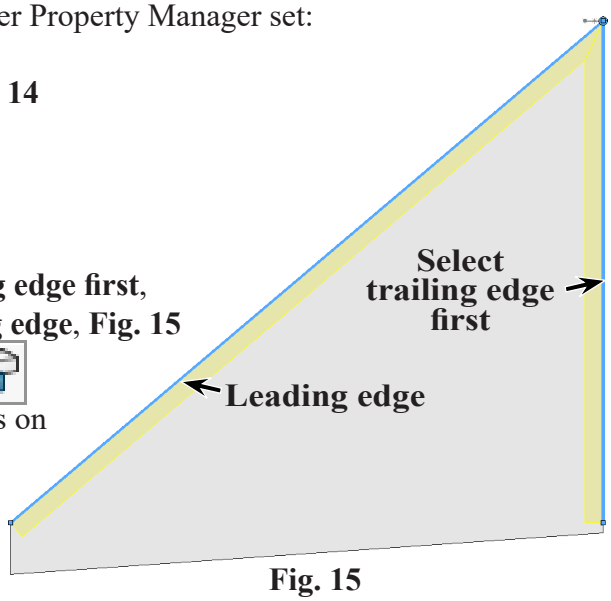


Fig. 15

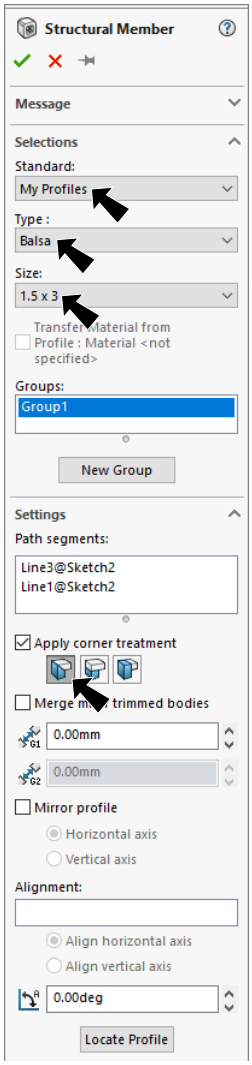


Fig. 14

Step 4. Save. Use **Ctrl-S**.

H. Extruded Cut.

Step 1. Click **face** of sheet metal and click **Sketch** on the context toolbar, **Fig. 16**.

Step 2. Click **Line** **(L)** on the Sketch toolbar.

Step 3. Sketch the **3 lines**, **Fig. 17**. To sketch line, start at leading edge corner and sketch line to Origin, then up trailing edge stopping before tip. Then, sketch line at angle across tip.

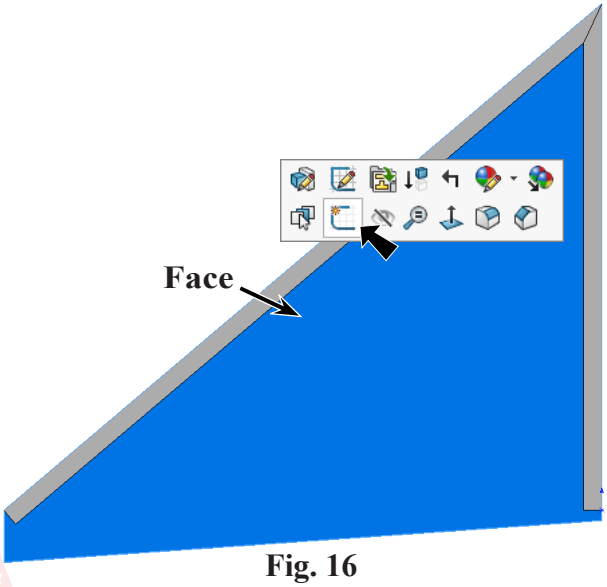


Fig. 16

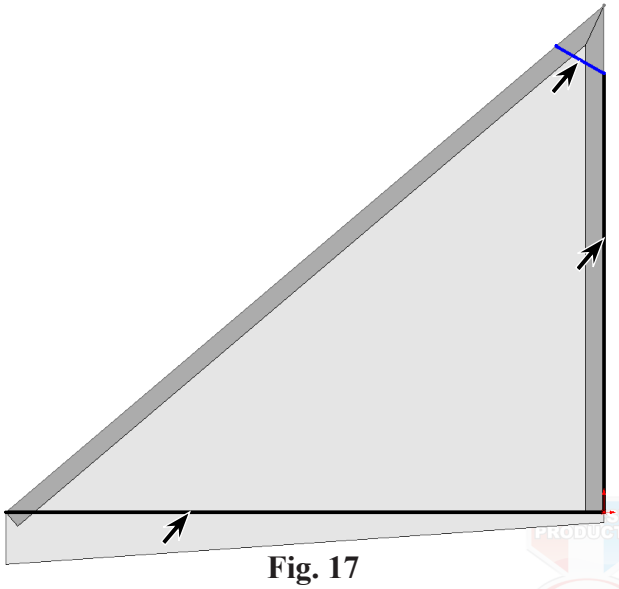


Fig. 17

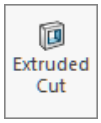
Step 4. Click **Smart Dimension**

(S) on the Sketch toolbar.

Step 5. Add the two **8** dimensions, **Fig. 18**.

Step 6. Click **Features**

on the Command Manager toolbar.

Step 7. Click **Extruded Cut** 

on the Features toolbar.

Step 8. In the Cut-Extrude Property Manager set:

under Direction 1, **Fig. 19**

End Condition **Through All**

click **Reverse Direction**

uncheck **Flip side to cut**.

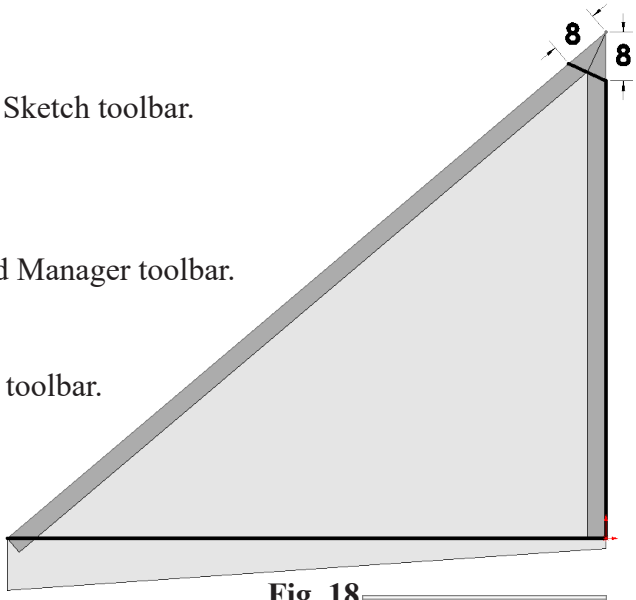


Fig. 18

The **Direction arrow should point towards area to be cut away**, **Fig. 20**. If arrow is pointing in wrong direction, check **Flip side to cut**.

uncheck **Direction 2**

under Feature Scope

uncheck **Auto-select**

select **Selected bodies**

click **both members** in graphics area, **Fig. 20**

click OK ✔ .

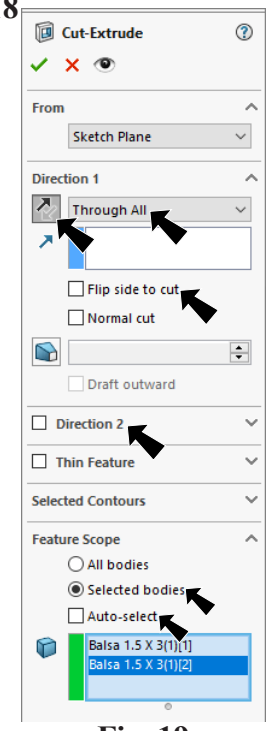


Fig. 19

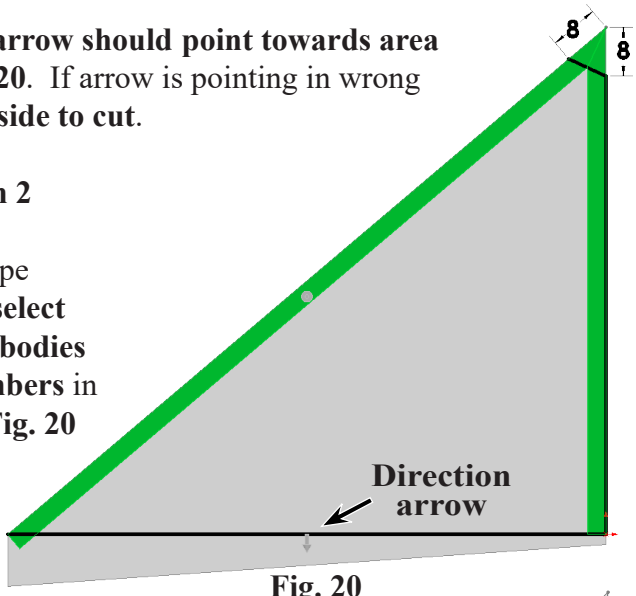


Fig. 20

Step 9. Save. Use **Ctrl-S**.

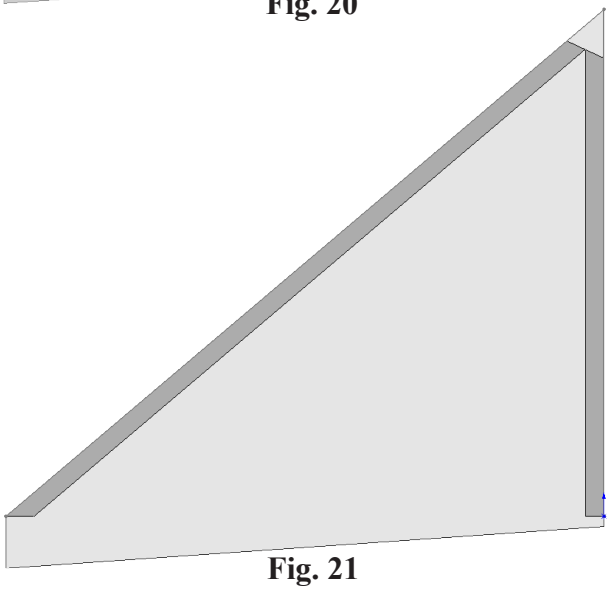


Fig. 21

I. Appearance: Balsa.

Step 1. Click **Sketch2** in the Feature Manager and click **Hide** on the context toolbar, **Fig. 22**.

Step 2. Zoom in around **top tip of V-Stab**, **Fig. 23**. To zoom, place the cursor over top tip of V-Stab area and spin the wheel on mouse back.

Step 3. Click **right side Trailing Edge Member** to select member, click **Appearance Callout** on the context toolbar and click **Body**, **Fig. 24**.

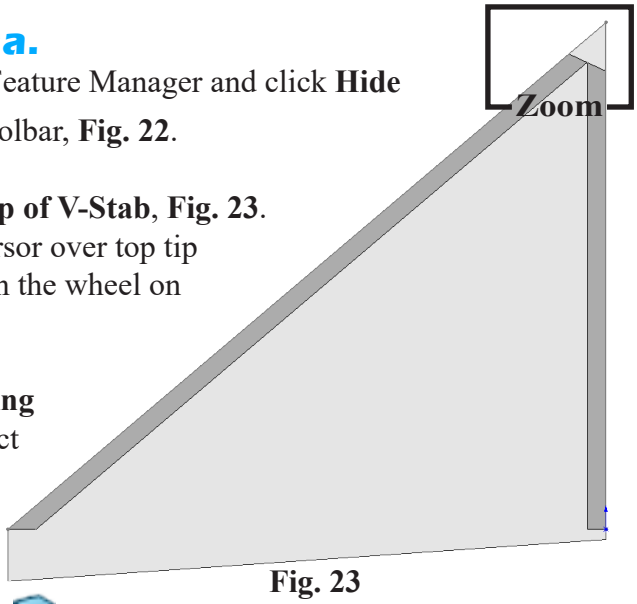


Fig. 23

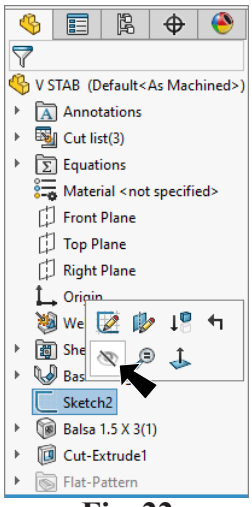


Fig. 22

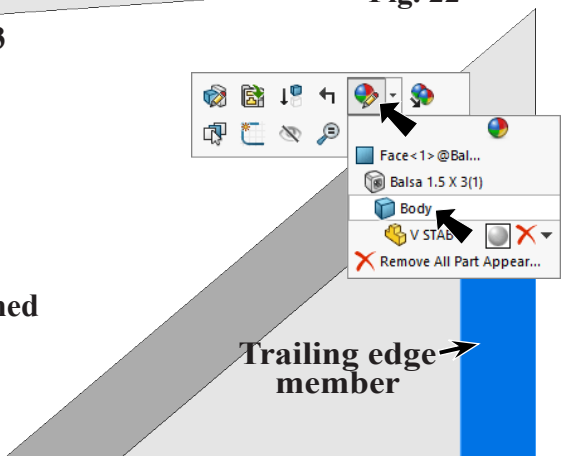


Fig. 24

Step 4. In the Appearances Task pane,
expand **Appearances**, **Fig. 25**
expand **Organic**
expand **Wood**
click **Beech** and in the lower pane select **polished beech 2d**.

Step 5. Over in the Appearances Property Manager set:
click **Mapping tab** Mapping, **Fig. 26**

under Mapping controls
click **Box mapping**
click **Small mapping size**

Click **Keep Visible** and OK, **Fig. 26**.
The Push Pin on allows other selections.

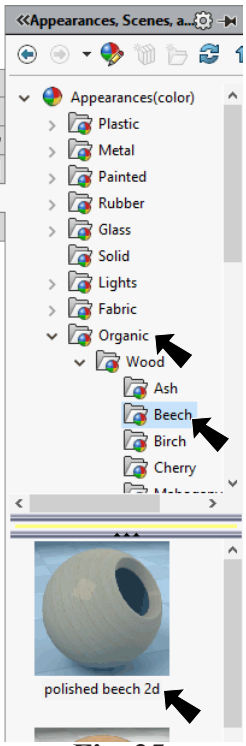


Fig. 25

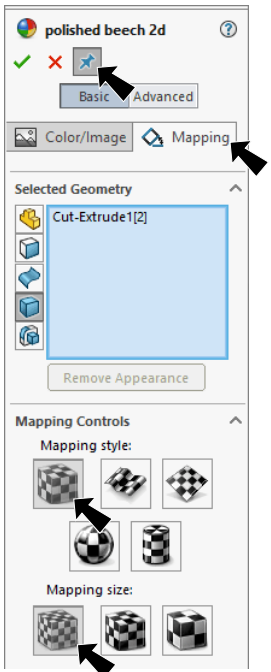


Fig. 26

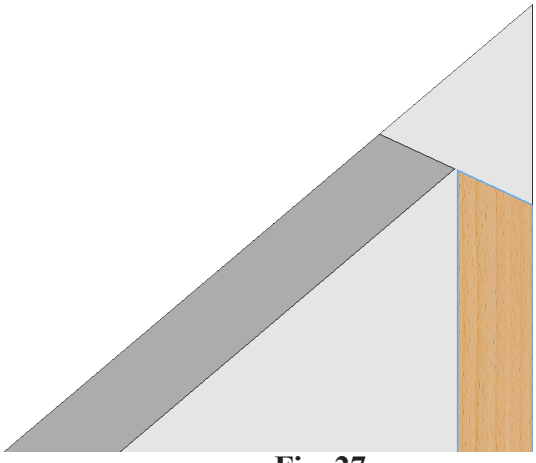


Fig. 27

Step 6. Still in the Appearances Property Manager set:
under Selected Geometry, **Fig. 28**
click **left side Leading Edge Member**
under Mapping controls
click **Planar mapping**
Axis direction **Current View**
Rotation 45
click **Small mapping size**
click OK and click Cancel.

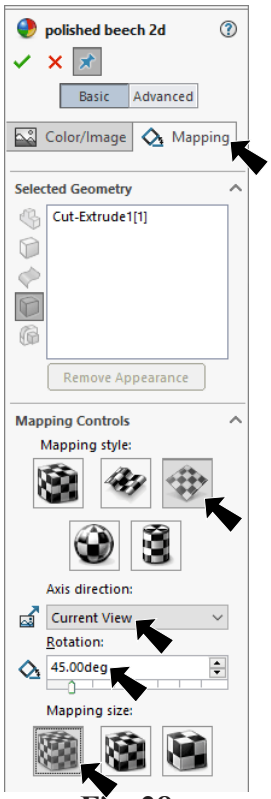


Fig. 28

Step 7. Save. Use **Ctrl-S**.

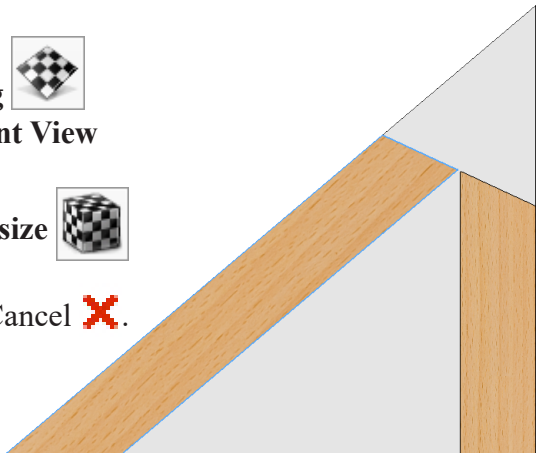


Fig. 29

J. Sketched Bends 1.

Step 1. Click **face** of sheet metal and click **Sketch** on the context toolbar, **Fig. 30**.

Step 2. Click off of face to unselect face.

Step 3. Click **Convert Entities** on the Sketch toolbar.

Step 4. In the Convert Entities Property Manager:
click **end edge of Member**, **Fig. 32**
click OK .

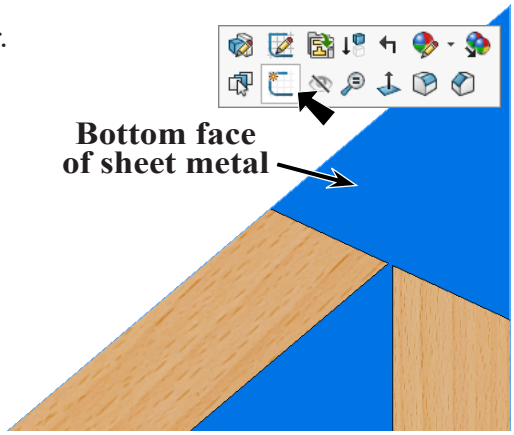


Fig. 30

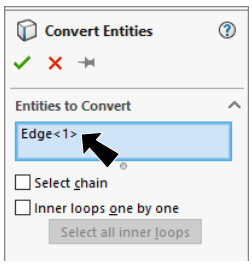


Fig. 31

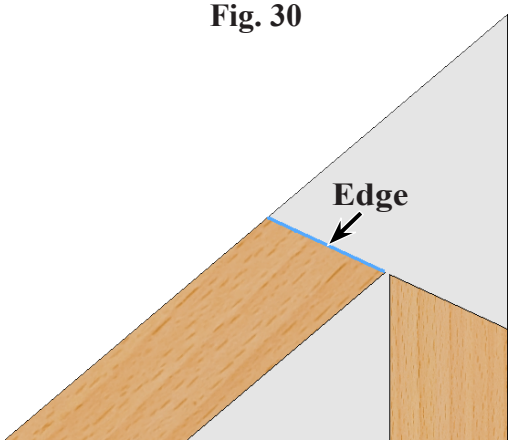


Fig. 32

Step 5. Click **Offset Entities**

on the Sketch toolbar.

Step 6. In the Offset Entities Property Manager set:
under Parameters, **Fig. 33**

Distance **1.535**
check **Reverse**
click **converted edge line**, **Fig. 34**.

The yellow offset should on above of original line. If it is not, uncheck Reverse.

Click **Keep Visible** and OK .

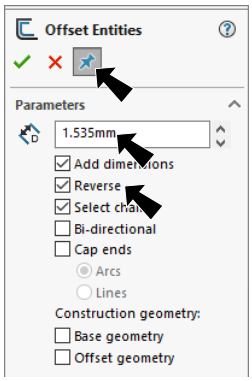


Fig. 33

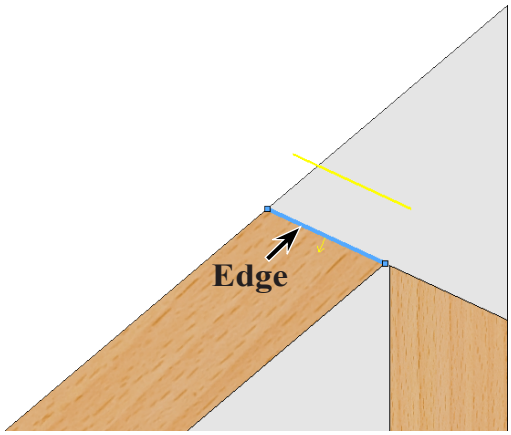


Fig. 34

Step 7. In the Offset Entities Property Manager set:
under Parameters, **Fig. 35**

Distance **2.8**
click **offset line**, **Fig. 36**
click OK **twice**.

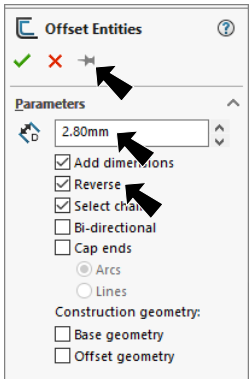


Fig. 35

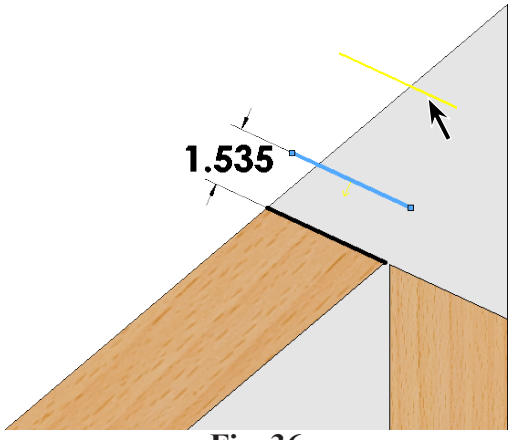


Fig. 36

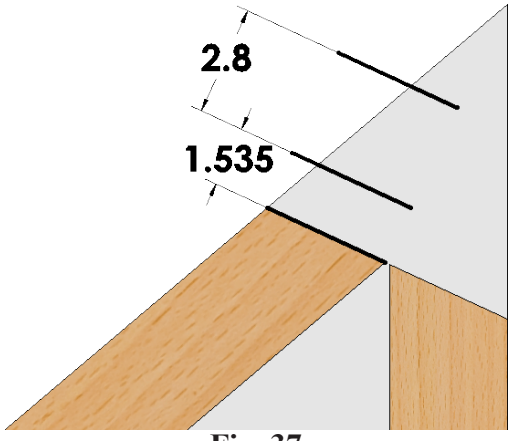


Fig. 37

Step 8. Click **Sheet Metal** Sheet Metal on the Command Manager toolbar.

Step 9. Click **Sketched Bend** Sketched Bend on the Sheet Metal toolbar.

Step 10. In the Sketched Bend Property Manager set:
under Bend Parameters, **Fig. 38**
in the **Fixed Face** box
click **face of sheet metal inboard of bend lines**, **Fig. 39**
Bend position:
Material Outside
Bend Angle 90

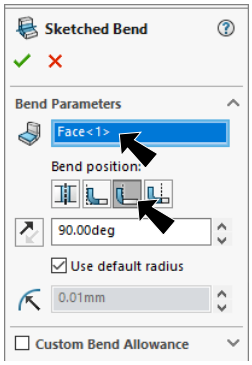


Fig. 38

The Direction arrow should point toward member, **Fig. 39**. If arrow is pointing in wrong direction, click **Reverse Direction** .
click OK .

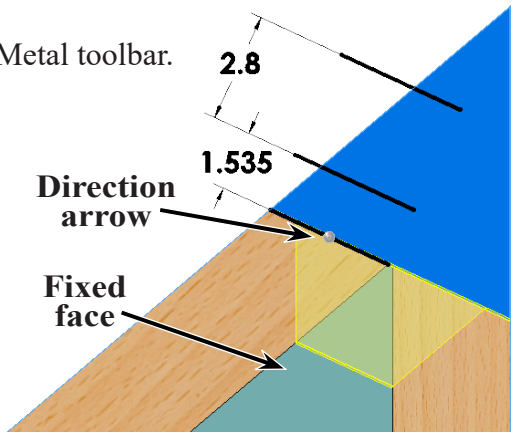


Fig. 39

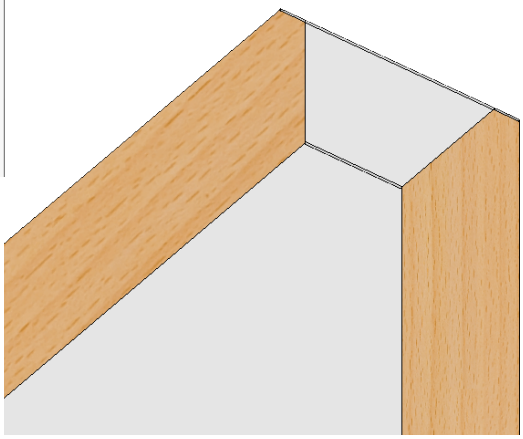


Fig. 40

Step 11. Save. Use **Ctrl-S**.

K. Sketched Bend 2.

Step 1. Use **up arrow** on keyboard to rotate view to view **face of bend on inside**, **Fig. 41**.

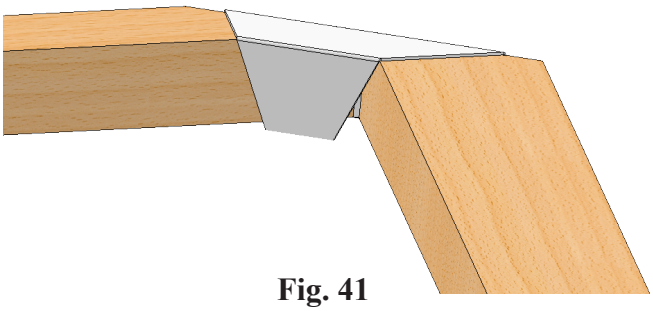


Fig. 41

Step 2. Click **face inside** of sheet metal and click **Sketch** on the context toolbar, **Fig. 42**.

Step 3. Click off of face to unselect face.

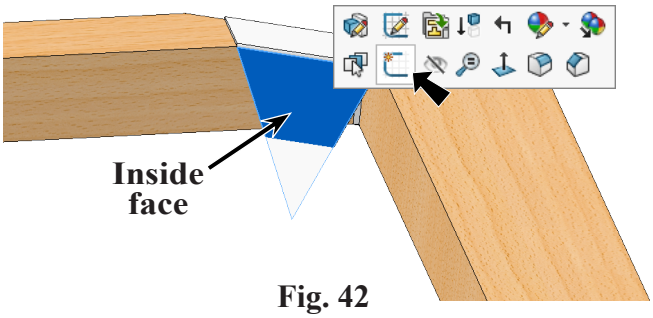


Fig. 42

Step 4. Click **Convert Entities**

on the Sketch toolbar.

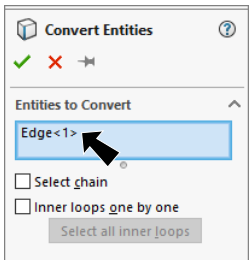


Fig. 43

Step 5. In the Convert Entities Property Manager:
click **edge of Member**, **Fig. 44**
click OK ✔ .

Step 6. Click **Sheet Metal**

on the Command Manager toolbar.

Step 7. Click **Sketched Bend**

on the Sheet Metal toolbar.

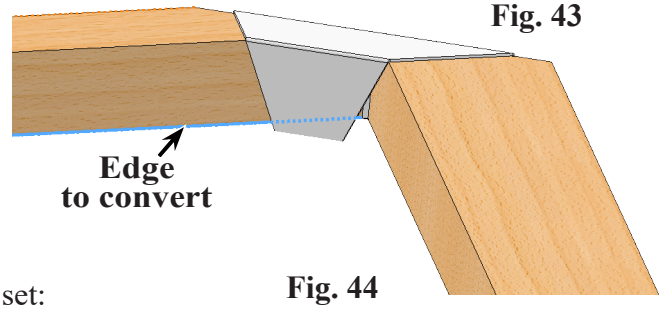


Fig. 44

Step 8. In the Sketched Bend Property Manager set:
under Bend Parameters, **Fig. 45**
in the **Fixed Face** box
click **face of bend on inside**, **Fig 46**
Bend position: **Material Inside**
Bend Angle 90
click OK ✔ .

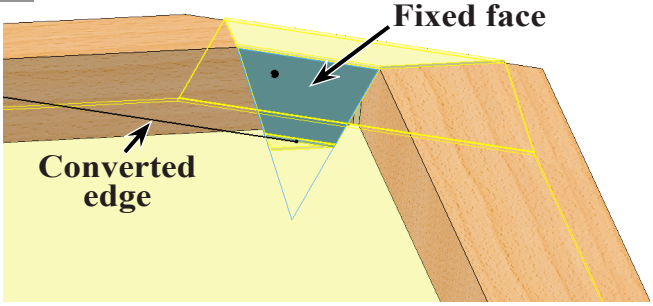


Fig. 46

Step 9. Save. Use **Ctrl-S**.

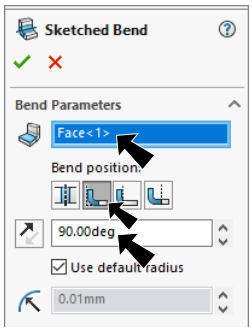


Fig. 45

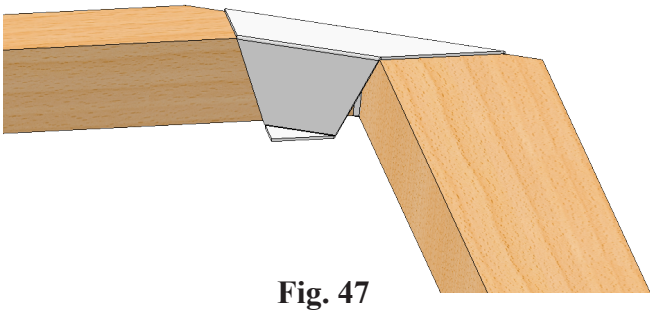


Fig. 47

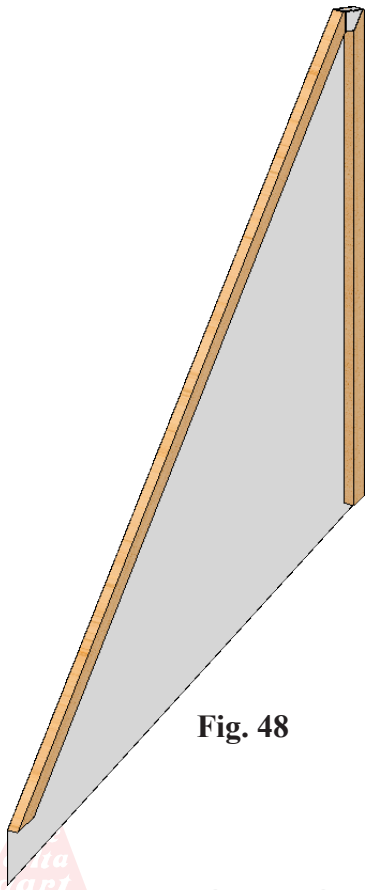


Fig. 48