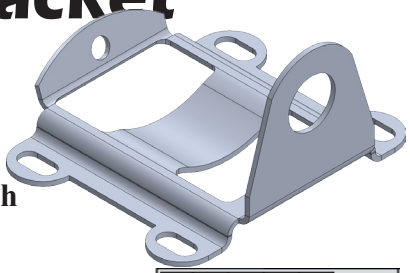
JSS

Motor Mounting Bracket



A. Construction Center Rectangle.

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

Step 2. Click **Top Plane** in the Feature Manager and click **Sketch** from the Context toolbar, **Fig. 1**.

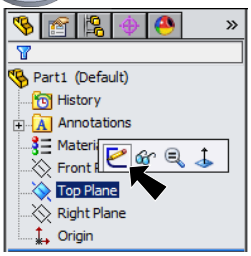


Fig. 1

Step 3. Click **Center Rectangle** (**S**) in the **Rectangle flyout** on the Sketch toolbar.

Step 4. Draw center rectangle starting at the Origin, **Fig. 2** and check **For construction** in the Rectangle Property Manager, **Fig. 3**.

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

Step 6. Dimension **25.4 by 26**, **Fig. 4**.

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

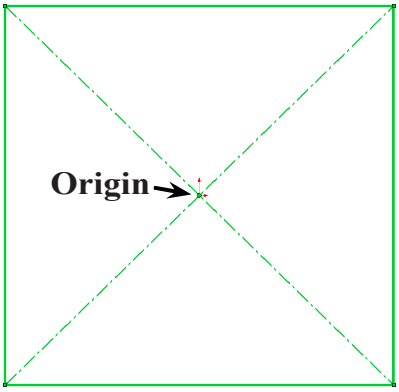


Fig. 2

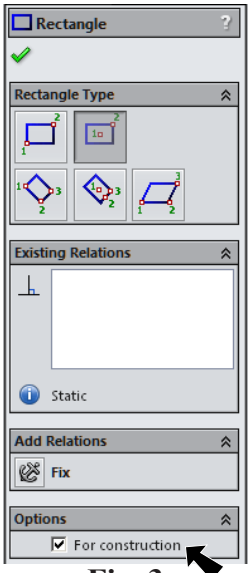


Fig. 3

B. Save as "MOTOR MOUNTING BRACKET".

Step 1. Click File Menu > Save As.

Step 2. Key-in **MOTOR MOUNTING BRACKET** for the filename and press ENTER.

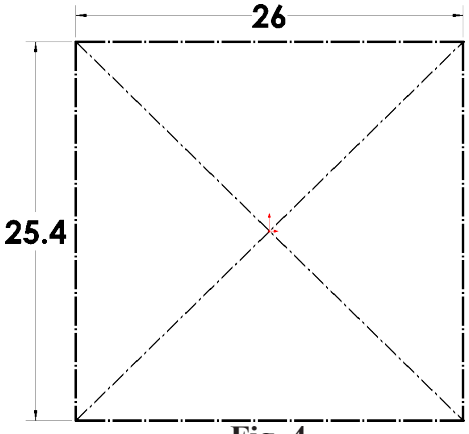


Fig. 4

© Cudacountry.net Tech Ed
http://www.cudacountry.net email:cudacountry@hotmail.com

C. Centerpoint Arc.

Step 1. Click **Centerpoint Arc** in the **Arc flyout** on the Sketch toolbar.

Step 2. Draw **centerpoint arc** in **top right corner**, **Fig. 5**. To draw arc, click Position 1 on horizontal construction line to start arc centerpoint. Click endpoint of construction line, Position 2 to place first arc endpoint. Then move cursor counterclockwise to Position 3 on construction line and click to place second endpoint.

Step 3. Click **Centerline** **(S)** in the **Line flyout** on the Sketch toolbar.

Step 4. Draw **a horizontal centerline across arc**, **Fig. 6**.

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

Step 6. Dimension **radius 3.55** and **.75**, **Fig. 7**.

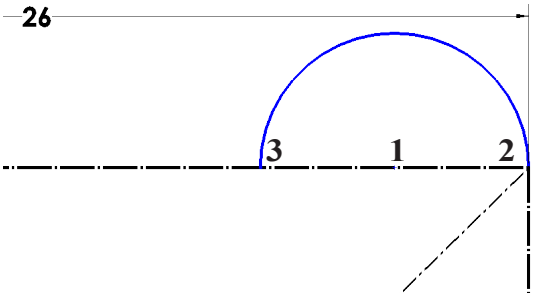


Fig. 5

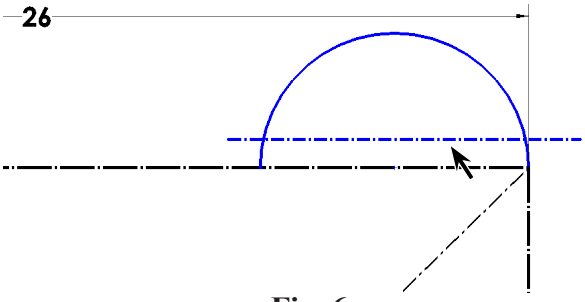


Fig. 6

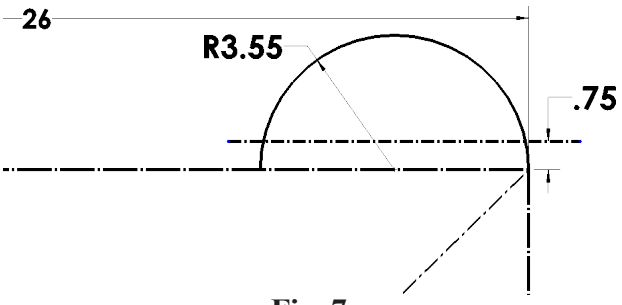


Fig. 7

D. Straight Slot.

Step 1. Click **Straight Slot** on the Sketch toolbar.

Step 2. Draw **slot along centerline**, **Fig. 8**. To draw slot, click Position 1 on horizontal construction line for starting point of slot. Click, Position 2 to specify length of slot. Then move cursor down to Position 3 for width of slot.

Step 3. **Right click graphics area and click Select** from menu to unselect Slot tool.

Step 4. **Ctrl click** the **slot centerpoint and arc centerpoint** of a slot and click **Make Vertical** on the Context toolbar, **Fig. 9**.

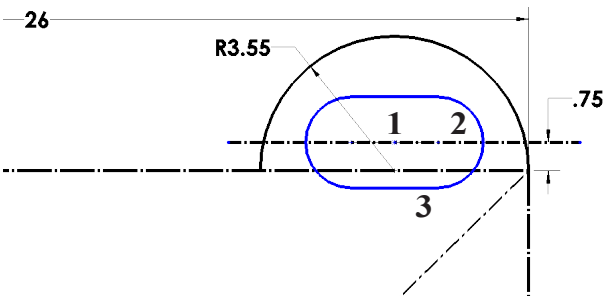


Fig. 8

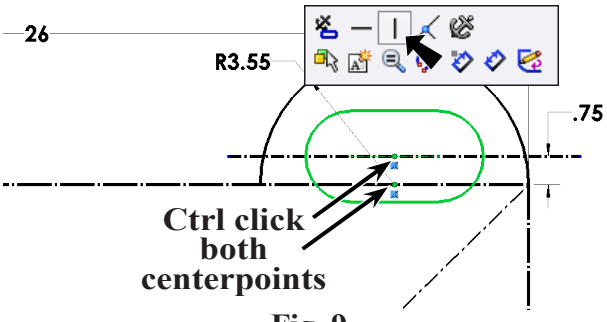


Fig. 9

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

Step 6. Dimension radius **1.2** and length of slot **2.3**, **Fig. 10**.

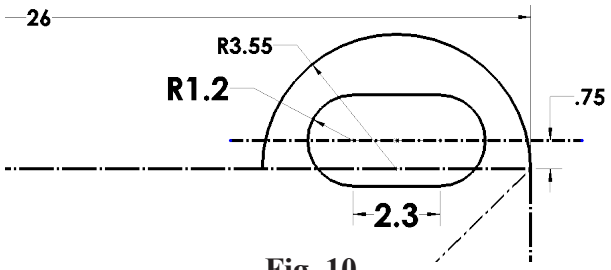


Fig. 10

E. Lines.

Step 1. Click **Line** (**L**) on the Sketch toolbar.

Step 2. Draw **3 lines** starting from top right corner of construction rectangle, **Fig. 11**.

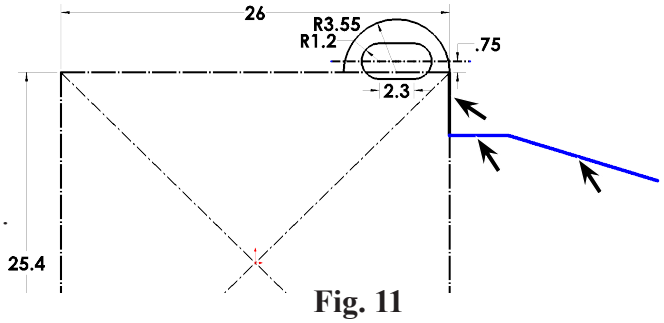


Fig. 11

Step 3. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 4. Add dimensions, **Fig. 12**. To Smart dimension angle, click both lines, then move the cursor down and click. Key-in 163 and press ENTER.

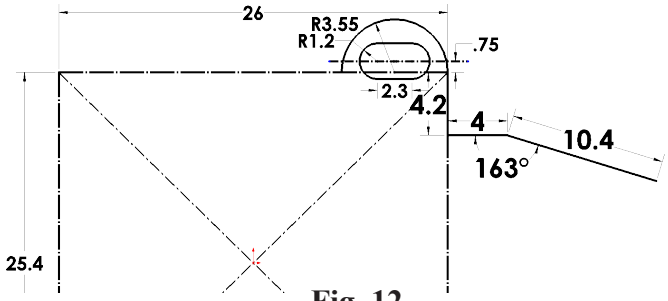


Fig. 12

F. Centerpoint Arc.

Step 1. Click **Centerline** (**S**) in the **Line flyout** on the Sketch toolbar.

Step 2. Draw **horizontal centerline line across Origin**, **Fig. 13**. As you sketch, the cursor changes shape to show coincident and horizontal relations have been created.

Step 3. Draw **vertical centerline up from Origin**, **Fig. 13**.

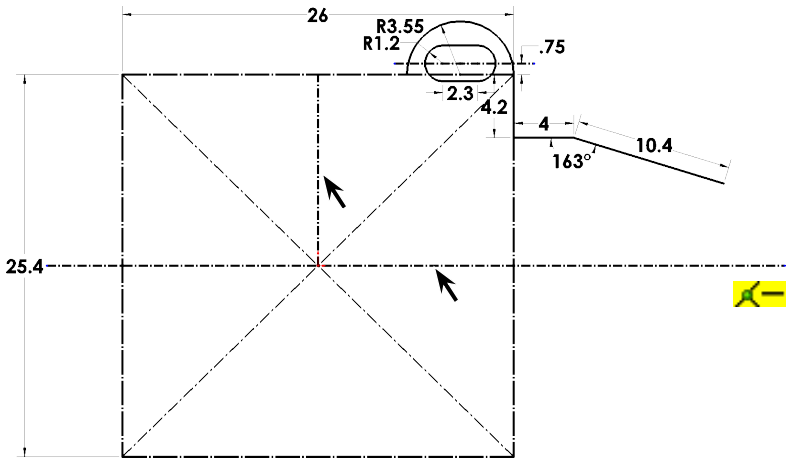


Fig. 13

Step 4. Click **Centerpoint Arc** in the **Arc flyout** on the Sketch toolbar.

Step 5. Draw **centerpoint arc** endpoint of line, **Fig. 14**. To draw arc, click Position 1 on centerline to start arc centerpoint. Click endpoint of line, Position 2 to place first arc endpoint. Then move cursor clockwise to Position 3 on centerline and click to place second endpoint.

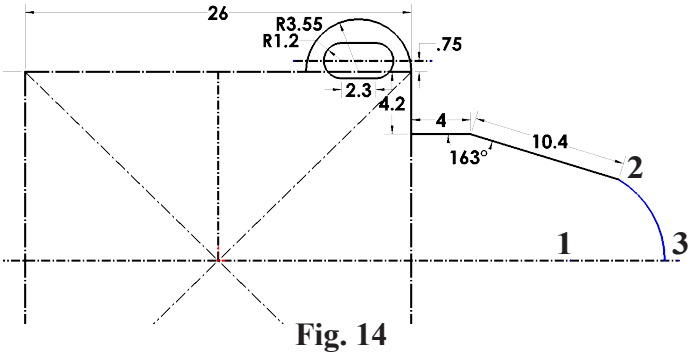
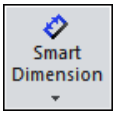


Fig. 14

Step 6. Click **Smart Dimension**  **(S)** on the Sketch toolbar.

Step 7. Dimension **radius 6.35**, **Fig. 15**.

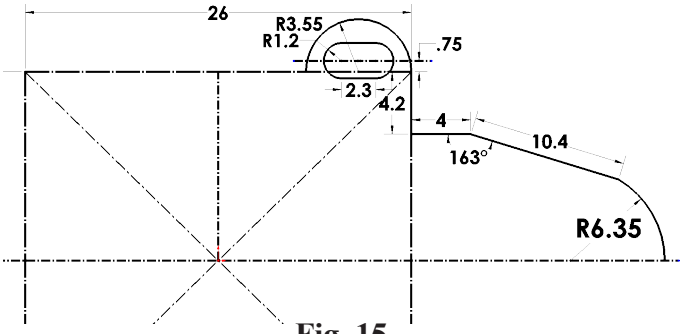


Fig. 15

G. Mirror Horizontally.

Step 1. **Right click graphics area and click Select** from menu to unselect Smart Dimension.

Step 2. **Drag a "trend to right - more conservative" selection to select arc, slot and first vertical line**, **Fig. 16**. Don't include horizontal centerline of slot in your selection.

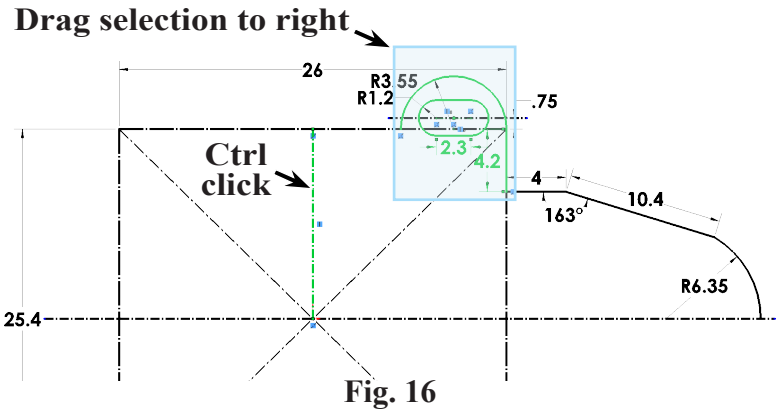


Fig. 16

Step 3. **Ctrl-click vertical centerline** to select centerline, **Fig. 16**.

Step 4. Click **Mirror Entities** on the Sketch toolbar, **Fig. 17**.

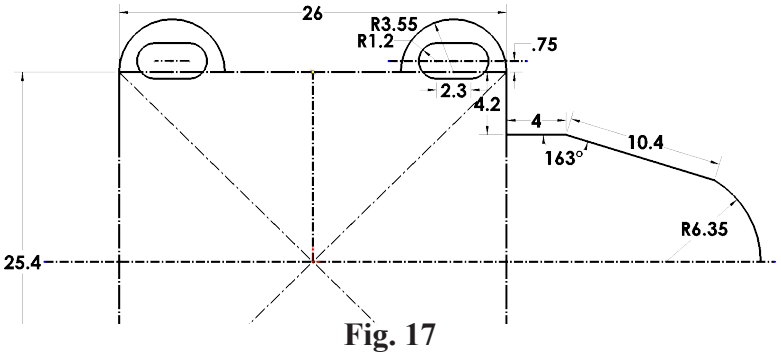


Fig. 17

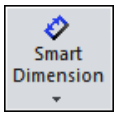
H. Line.

Step 1. Click **Line** **(L)** on the Sketch toolbar.

Step 2. "**Wake up**" bottom endpoint of mirrored vertical line, **Fig. 18**.

Step 3. Draw **horizontal line out to left from endpoint**, **Fig. 19**.

Step 4. Draw **line between arcs**, **Fig. 19**.

Step 5. Click **Smart Dimension** 

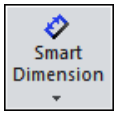
(S) on the Sketch toolbar.

Step 6. Dimension **line 2.8**, **Fig. 20**.

I. Centerpoint Arc.

Step 1. Click **Centerpoint Arc** in the **Arc flyout** on the Sketch toolbar.

Step 2. Draw **centerpoint arc** between endpoint of line and horizontal centerline, **Fig. 21**.

Step 3. Click **Smart Dimension** 

(S) on the Sketch toolbar.

Step 4. Dimension **radius 14**, **Fig. 22**.

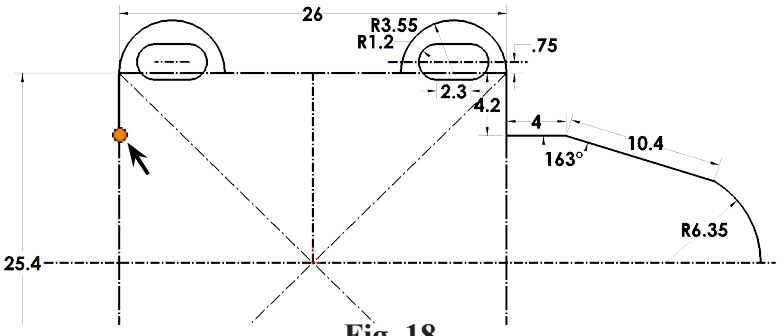


Fig. 18

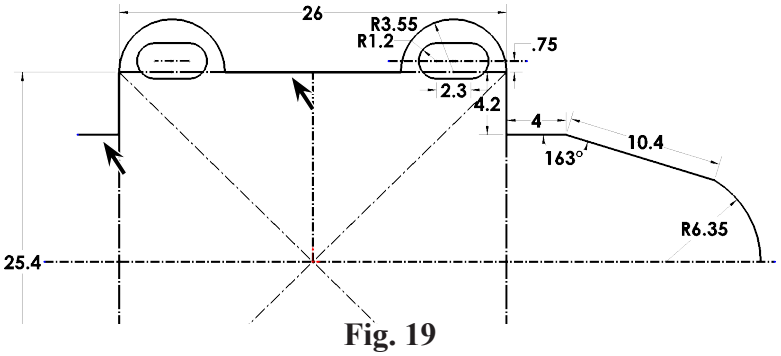


Fig. 19

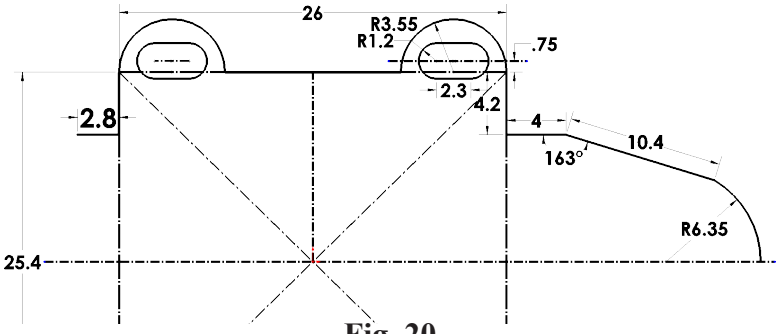


Fig. 20

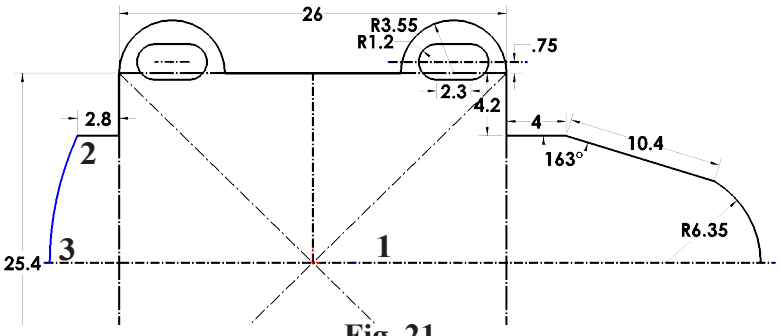


Fig. 21

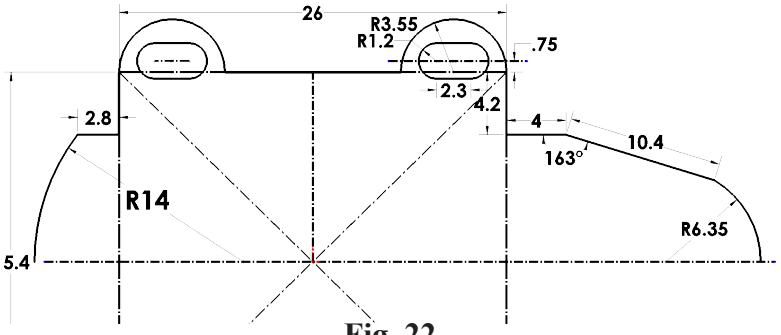


Fig. 22

J. Mirror Vertically.

Step 1. **Right click graphics area and click Select** from menu to unselect Smart Dimension.

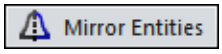
Step 2. Drag a selection to all, **Fig. 23**.

Step 3. **Ctrl click** to unselect:

A Top horizontal construction line of construction rectangle

B Horizontal centerline of slot

C Vertical centerline, **Fig. 24**.

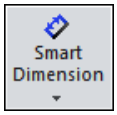
Step 4. Click **Mirror Entities** 

on the Sketch toolbar, **Fig. 25**.

K. Circles.

Step 1. Click **Circle** **(S)** on the Sketch toolbar.

Step 2. Draw **two circles on horizontal centerline**, **Fig. 25**.

Step 3. Click **Smart Dimension** 

(S) on the Sketch toolbar.

Step 4. Add dimensions, **Fig. 25**

Step 5. Save. Use **Ctrl-S**.

Drag selection to right

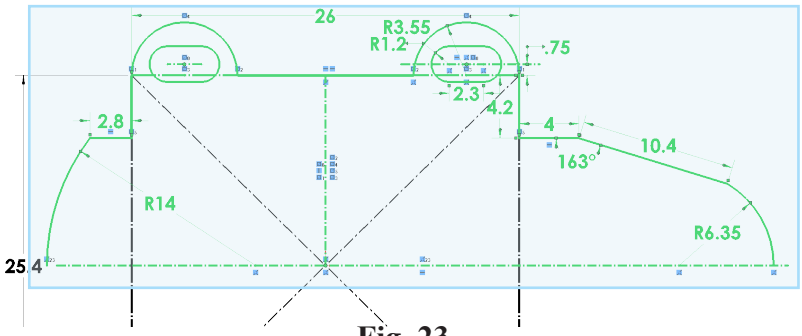


Fig. 23

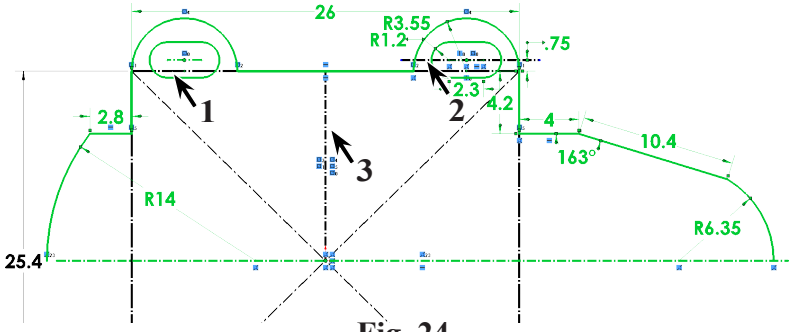


Fig. 24

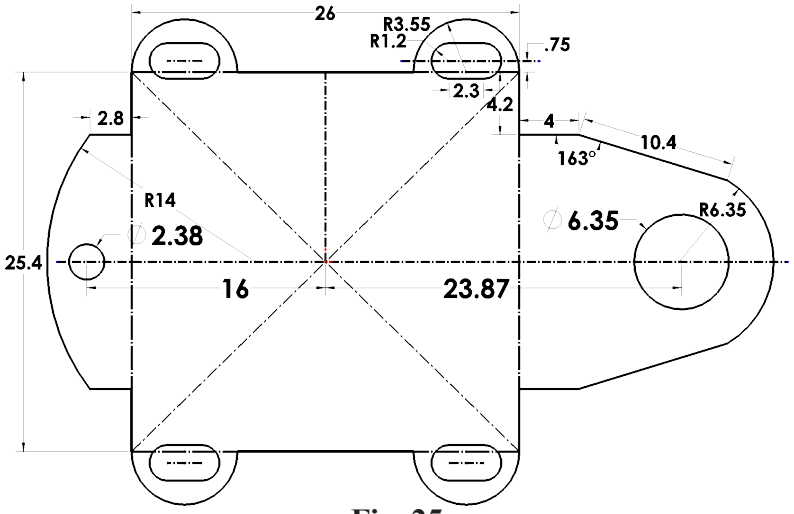


Fig. 25

L. 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 Gauges, **Fig. 26**
check **Use gauge table**
select **Sample Table - Aluminum**
under Sheet Metal Parameters
select **Gauge 24**
Sheet metal should be below sketch, **Fig. 27**
if in opposite direction
check Reverse direction
click OK , **Fig. 28**.

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

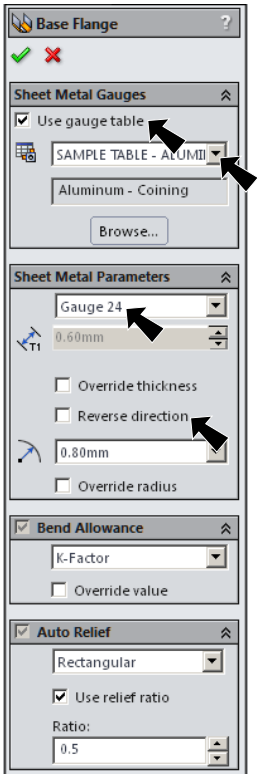


Fig. 26

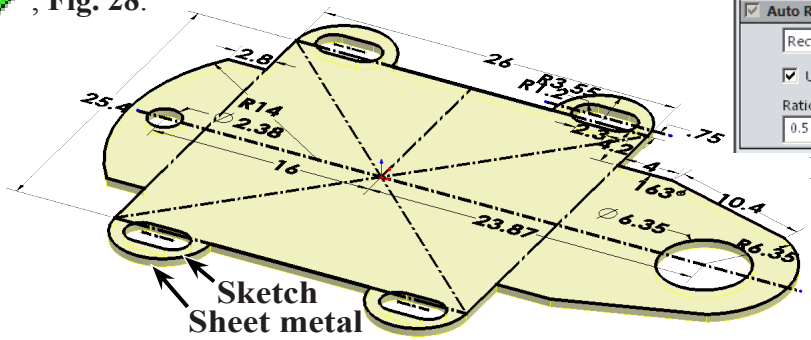


Fig. 27

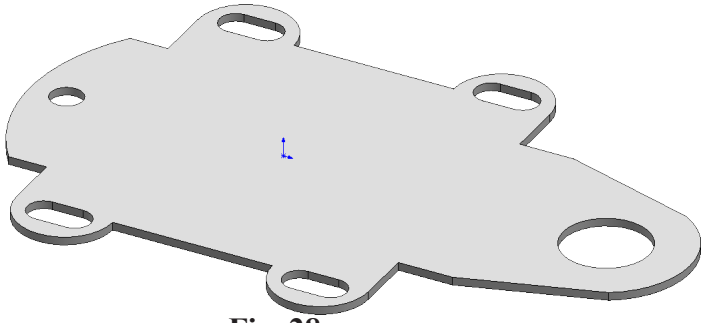


Fig. 28

M. Add My Forming Tools Folder to Design Library.

Step 1. Click the **Design Library** tab in the Task Pane (right side of graphics area), **Fig. 29**.

Step 2. At the top of the Design Library panel, click **Add File Location** , **Fig. 29**.

Step 3. In the Choose Folder dialog box, navigate to **My Documents/Tech Ed 14-15/My Forming Tools** folder, **Fig. 30.** Click **OK**.

Click **Recent Places** will make it easy to find My Forming Tools folder.

Step 4. **Right click My Forming Tools folder** and click **Forming Tools Folder** from menu, **Fig. 31**.

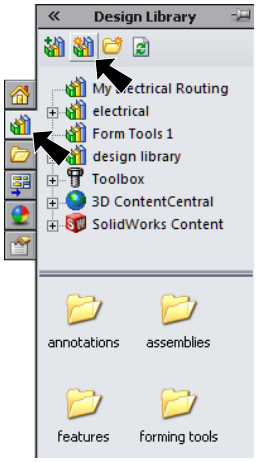


Fig. 29

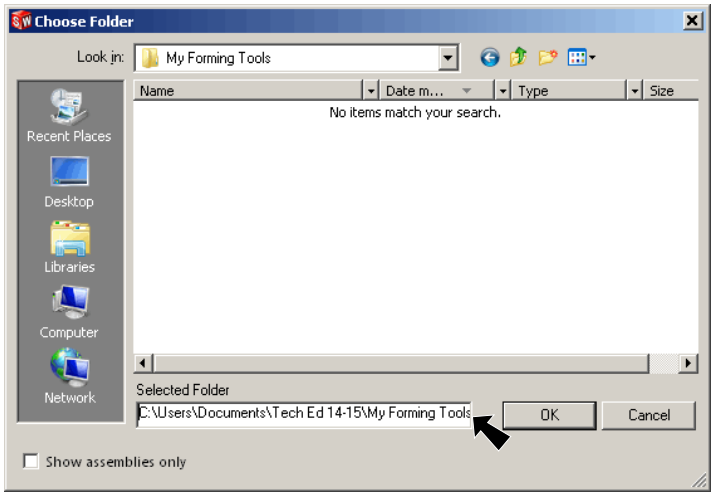


Fig. 30

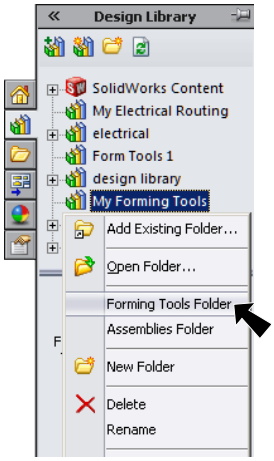


Fig. 31

N. Form Tool Feature.

Step 1. Click **Top** on the Standard Views toolbar. (**Ctrl-5**)

Step 2. In the lower pane of the newly added My Forming Tools folder, drag the Forming Tool 1 file out and place it Motor Mounting Bracket part, **Fig. 32** and **Fig. 33**.

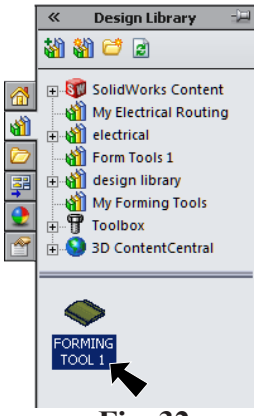


Fig. 32

Step 3. Click the **Position tab** Position at the top of the Form Tool Feature Property Manager, **Fig. 34**.

Step 4. Click **Point** on the Sketch toolbar to **turn off** Point tool.

Step 5. **Ctrl click Origin** of Forming Tool and **Origin** of part to select both, **Fig. 35**. Release Ctrl key and click **Make Coincident** on the Context menu.

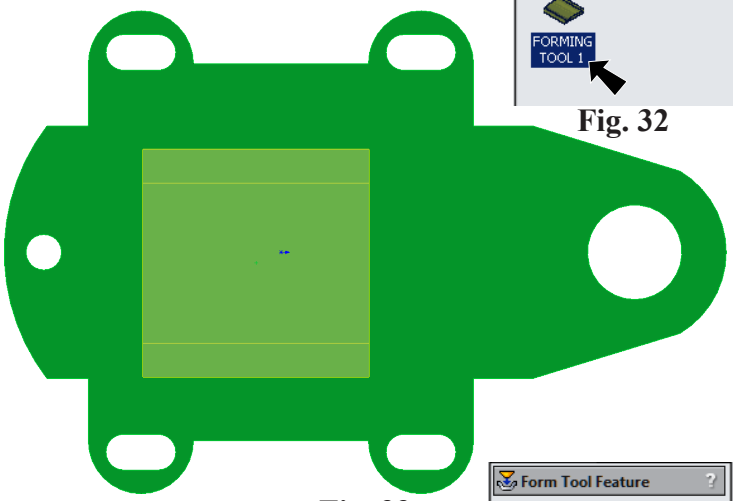


Fig. 33

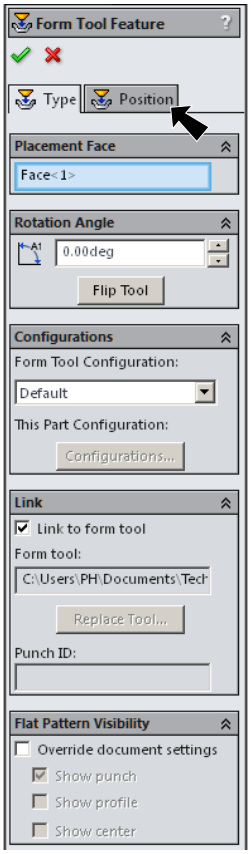


Fig. 34

Step 6. Click OK in the Property Manager.

Step 7. Click OK in the Forming Tool Property Manager, **Fig. 36**.

Step 8. Save. Use **Ctrl-S**.

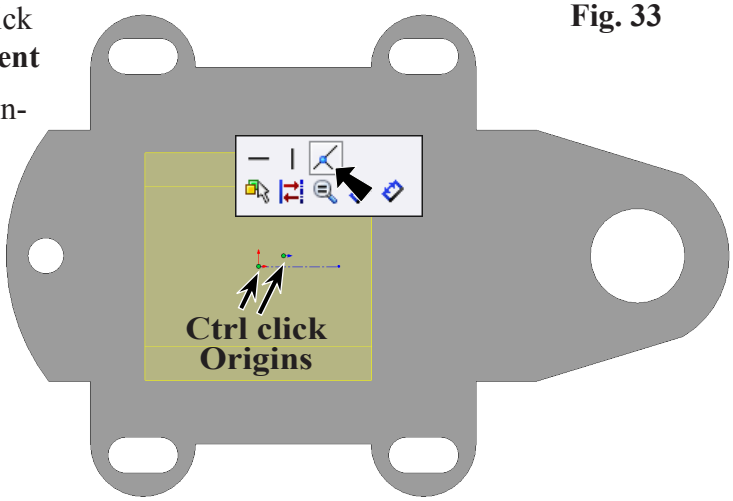


Fig. 35

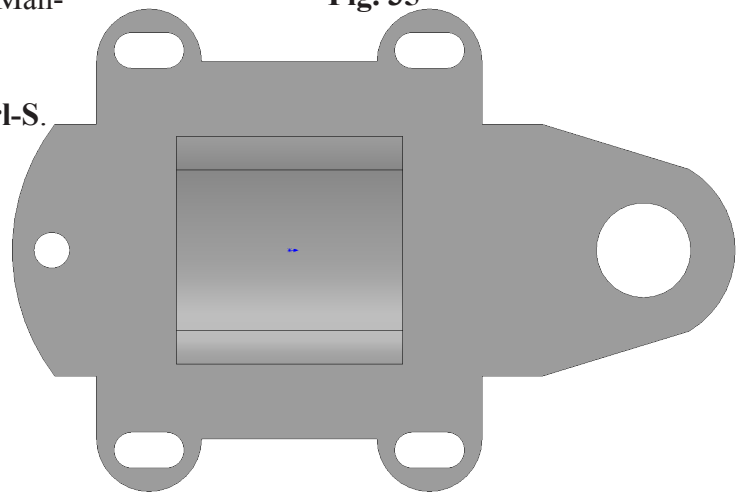


Fig. 36

O. Extruded Cut.

Step 1. Click **Top Plane** in the Feature Manager and click **Sketch** from the Context toolbar, **Fig. 37**.

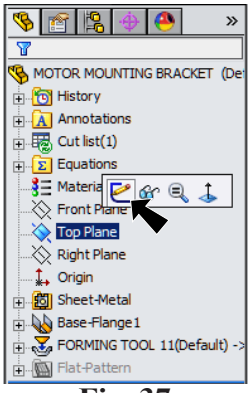


Fig. 37

Step 2. Click **Centerline** **(S)** in the **Line flyout** on the Sketch toolbar.

Step 3. Draw **a horizontal centerline line across Origin**, **Fig. 38**. As you sketch, the cursor changes shape to show coincident and horizontal relations have been created.

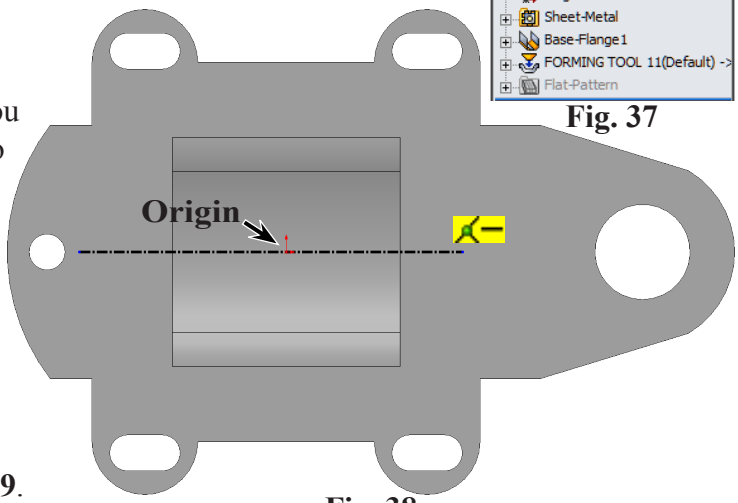


Fig. 38

Step 4. Click **Center Rectangle** **(S)** in the **Rectangle flyout** on the Sketch toolbar.

Step 5. Draw **two** center rectangles, **Fig. 39**. Start rectangles on horizontal centerline.

Step 6. **Right click drawing and click Select** from menu to unselect Rectangle tool.

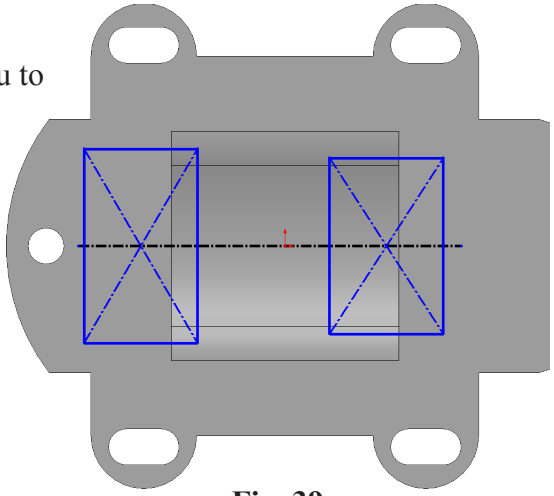


Fig. 39

Step 7. **Ctrl click a vertical line in each rectangle** to select. Release Ctrl key and click **Make Equal** on the Content toolbar, **Fig. 40**.

Step 8. Click **Smart Dimension** **(S)** on the Sketch toolbar.

Step 9. Add dimensions, **Fig. 41**.

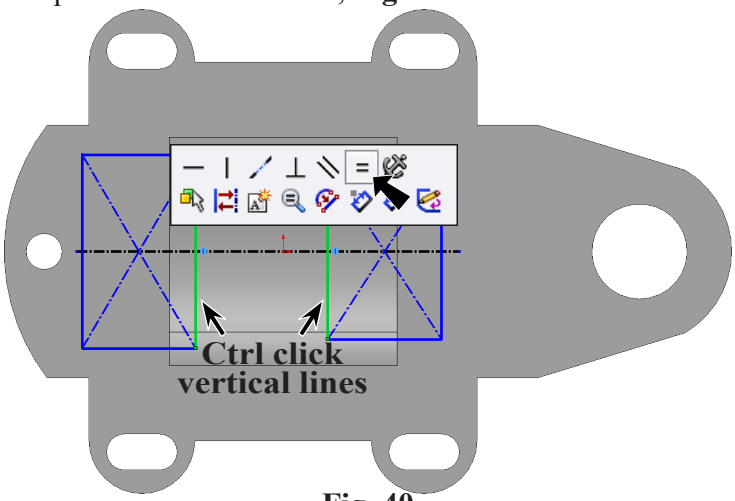


Fig. 40

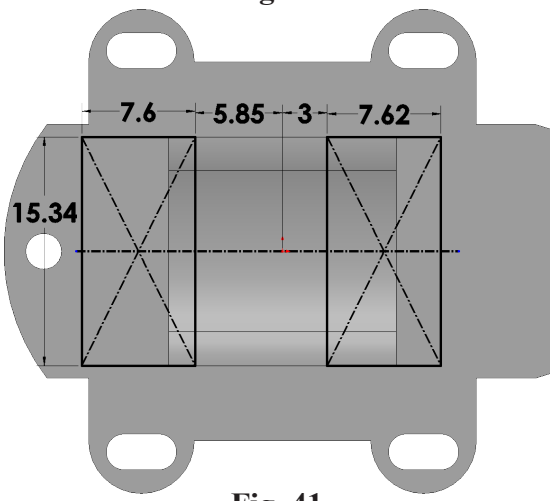


Fig. 41

Step 10. Click **Sketch Fillet** on the Sketch toolbar.

Step 11. In the Sketch Fillet Property Manager set:

Radius **1.5**, **Fig. 42**
click **all corners of rectangle**, **Fig. 43**
click OK to midpoint message
click OK .

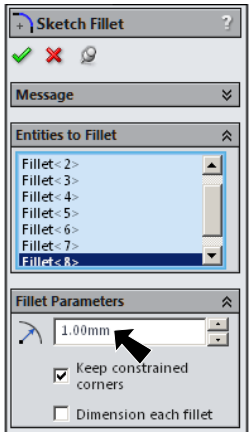


Fig. 42

Step 12. Click **Trimetric** on the Standard Views toolbar.

Step 13. Click **Features** on the Command Manager toolbar.

Step 14. Click **Extruded Cut** on the Features toolbar.

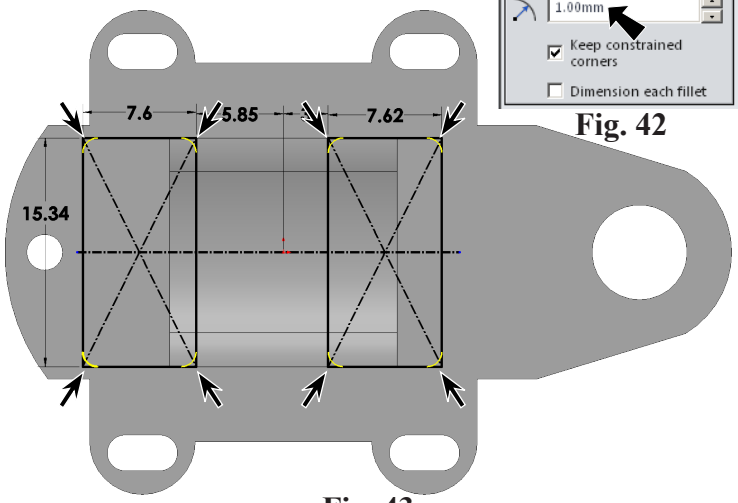


Fig. 43

Step 15. In the Cut-Extrude Property Manager set:

under Direction 1, **Fig. 45**
End Condition
Through All
click OK .

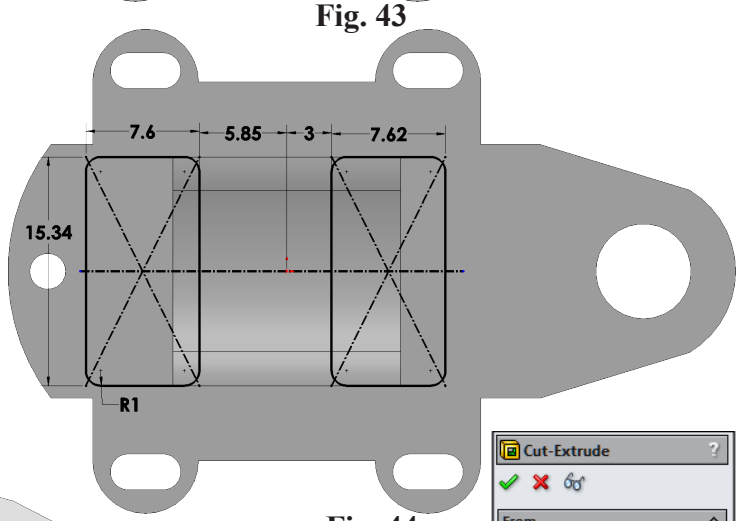


Fig. 44

Step 16. Save. Use **Ctrl-S**.

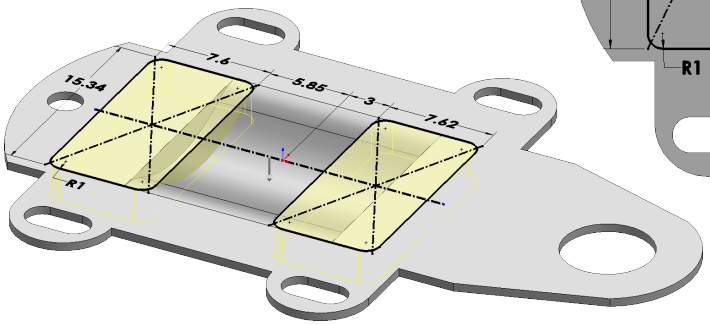


Fig. 46

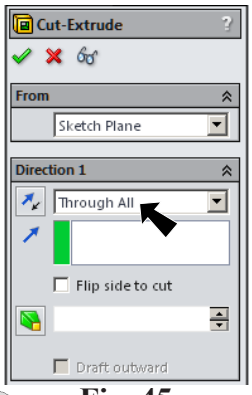


Fig. 45

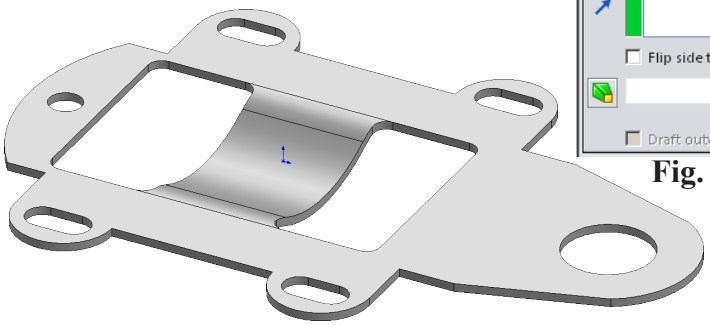


Fig. 47

P. Sketched Bend 1.

Step 1. Click the **top face** and click **Sketch** on the Context toolbar, **Fig. 48**.

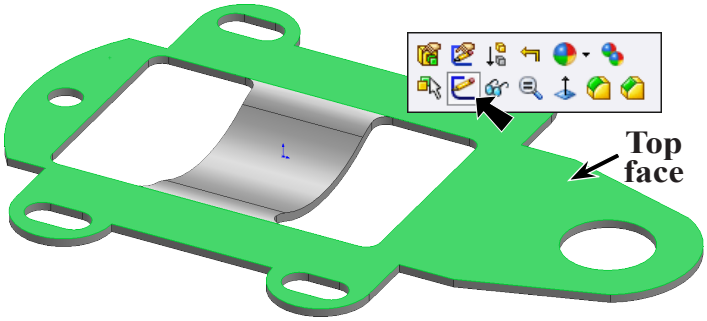


Fig. 48

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

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

Step 4. Draw **line across between corners**, **Fig. 49**.

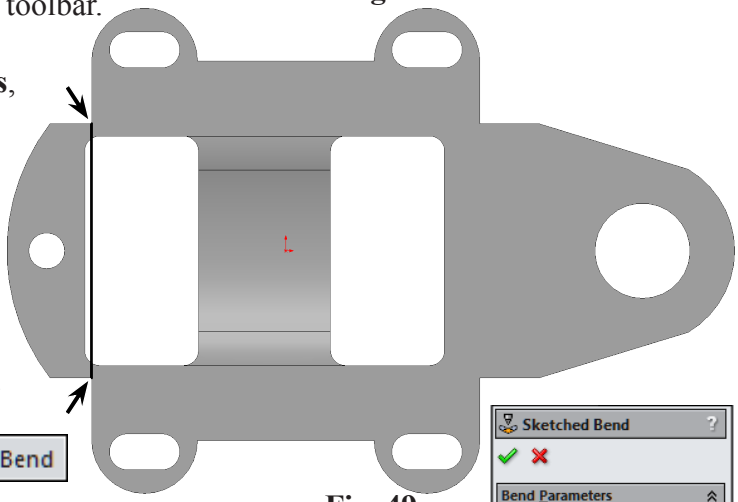


Fig. 49

Step 5. Click **Trimetric** on the Standard Views toolbar.

Step 6. Click **Sheet Metal** on the Command Manager toolbar.

Step 7. Click **Sketched Bend** on the Sheet Metal toolbar.

Step 8. In the Sketched Bend Property Manager set:

in the **Fixed Face** box, **Fig. 50**
click the **face of sheet metal right of line**, **Fig. 51**

Bend position: **Bend Outside**
Bend Angle 70

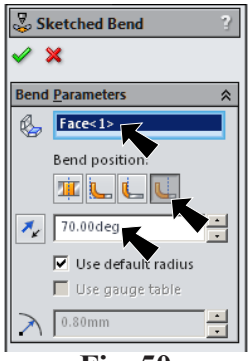


Fig. 50

The Direction arrow should point up, **Fig. 51**. If arrow is pointing in wrong direction, click **Reverse Direction**, **Fig. 50**.

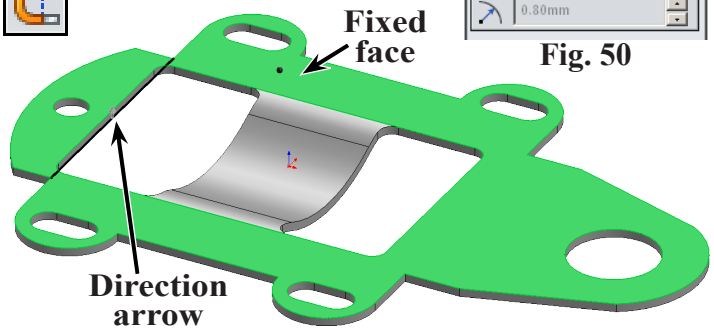


Fig. 51

Click OK, **Fig. 52**.

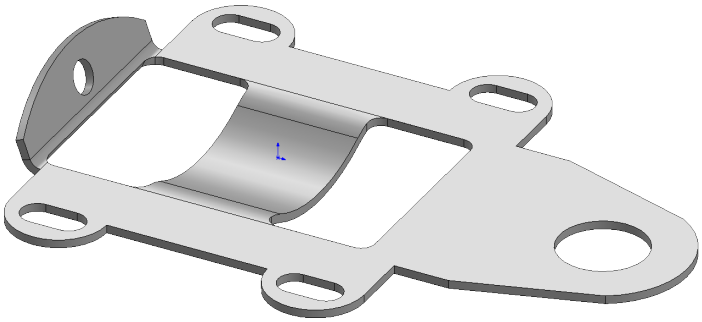


Fig. 52

Q. Jog 1.

Step 1. Click the **top face** and click **Sketch** on the Context toolbar, **Fig. 53**.

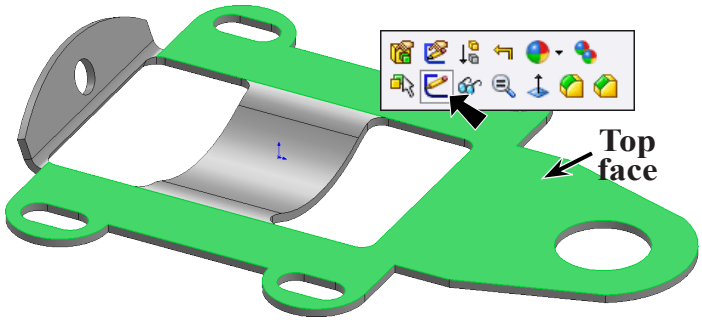


Fig. 53

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

Step 3. Draw **line across below extruded cut**, **Fig. 54**. Use coincident and horizontal relations.

Step 4. Click **Smart Dimension** **(S)** on the Sketch toolbar.

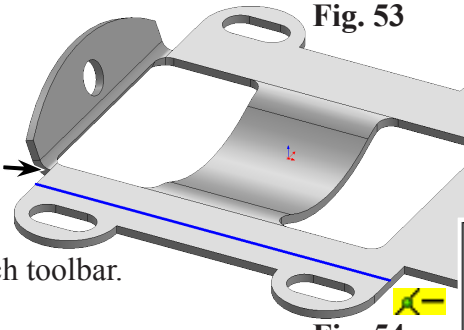


Fig. 54

Step 5. Add **.13** dimension to corner at edge of bend, **Fig. 54** and **Fig. 55**.

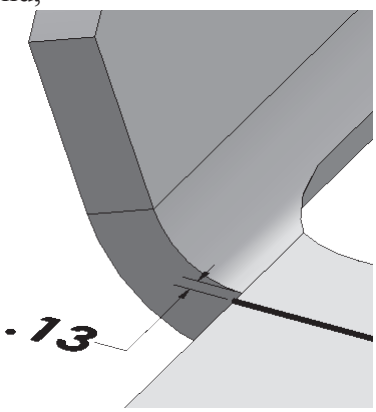


Fig. 55

Step 6. Click **Jog** on the Sheet Metal toolbar.

Step 7. In the Jog Property Manager set:

under Selections, **Fig. 56**

in the **Fixed Face** box click **top face of sheet metal above line**, **Fig. 57**

under Jog Offset

Offset Distance **2.3**

Dimension position **Outside Offset**

under Job Position

Bend Outside

under Job Angle

Bend Angle **90**

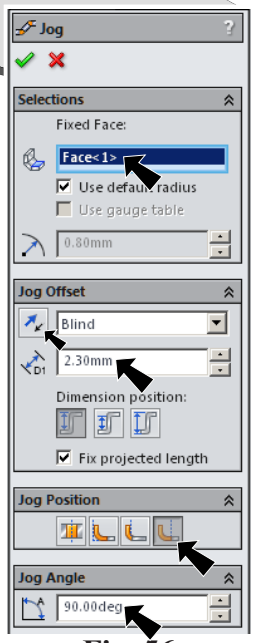


Fig. 56

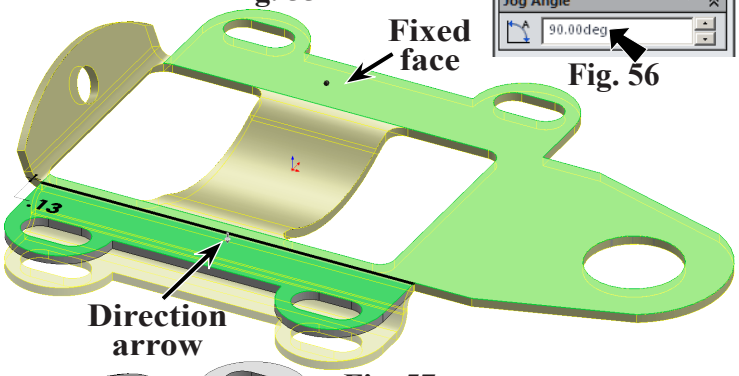


Fig. 57

The Direction arrow should point **down**, **Fig. 57**. If arrow is pointing in wrong direction, click **Reverse Direction**, **Fig. 56**.

Click OK.

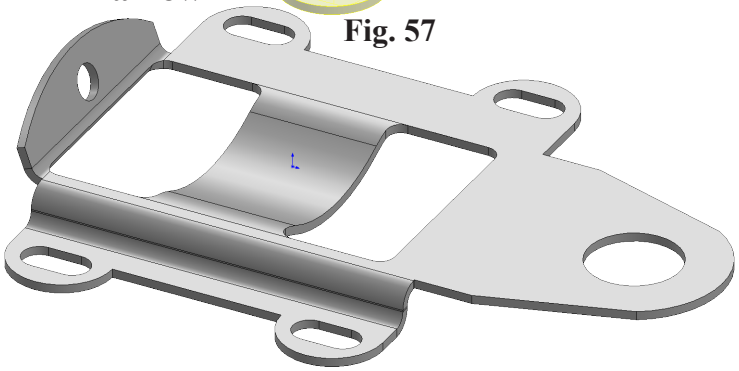


Fig. 58

R. Jog 2.

Step 1. Click the **top face** and click **Sketch** on the Context toolbar, **Fig. 59**.

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

Step 3. Draw **line across above extruded cut**, **Fig. 60**. Use coincident and horizontal relations.

Step 4. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 5. Add **.13** dimension to corner at edge of bend, **Fig. 60** and **Fig. 61**.

Step 6. Click **Jog** on the Sheet Metal toolbar.

Step 7. In the Jog Property Manager set:
under Selections, **Fig. 62**
in the **Fixed Face** box click **top face of sheet metal below line**, **Fig. 63**
under Jog Offset
Offset Distance **2.3**
Dimension position
Outside Offset
under Job Position
Bend Outside
under Job Angle
Bend Angle **90**

The Direction arrow should point **down**, **Fig. 63**. If arrow is pointing in wrong direction, click **Reverse Direction**, **Fig. 62**.

Click OK.

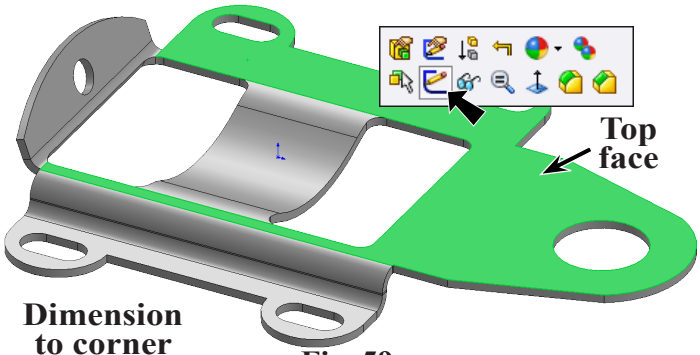


Fig. 59

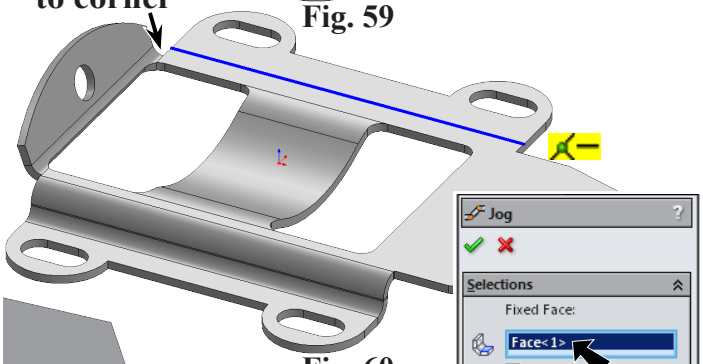


Fig. 60

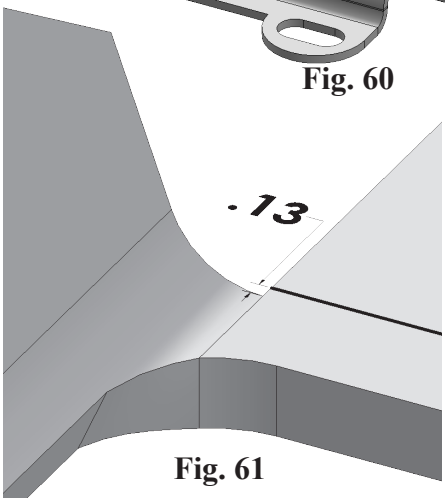


Fig. 61

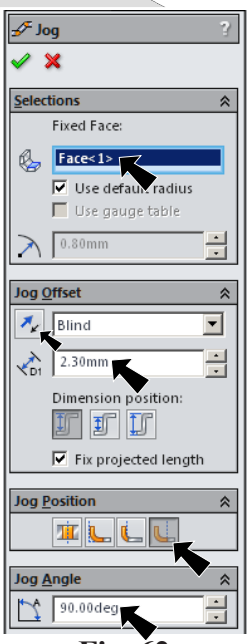


Fig. 62

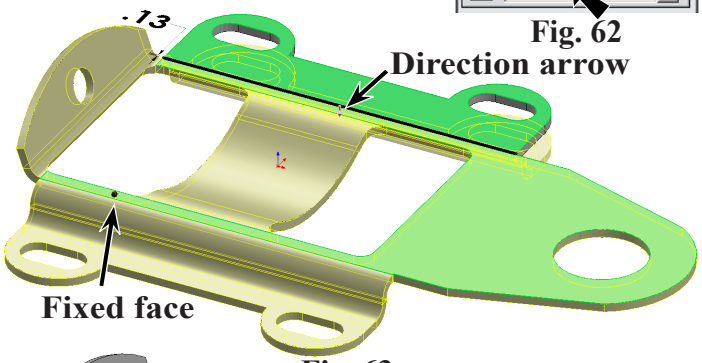


Fig. 63

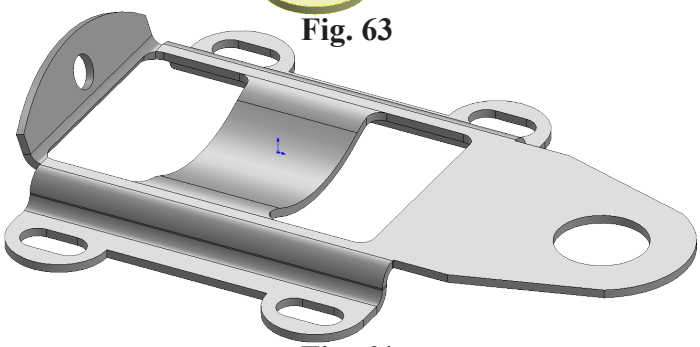


Fig. 64

S. Sketched Bend 2.

Step 1. Click the **top face** and click **Sketch** on the Context toolbar, **Fig. 65**.

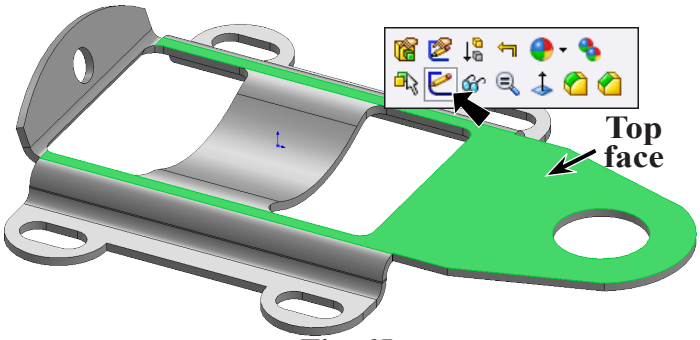


Fig. 65

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

Step 3. Draw **line across between corners-not the jog geometry**, **Fig. 66** and **Fig. 67**.

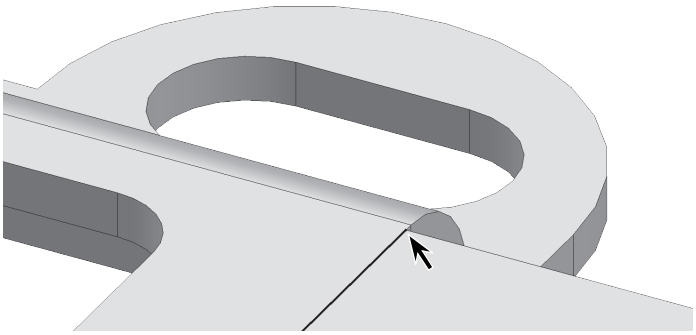


Fig. 66

Step 4. Click **Sketched Bend** Sketched Bend on the Sheet Metal toolbar.

Step 5. In the Sketched Bend Property Manager set:

in the **Fixed Face** box, **Fig. 68**
click **face of sheet metal left of line**, **Fig. 69**
Bend position:

Bend Outside
Bend Angle 90

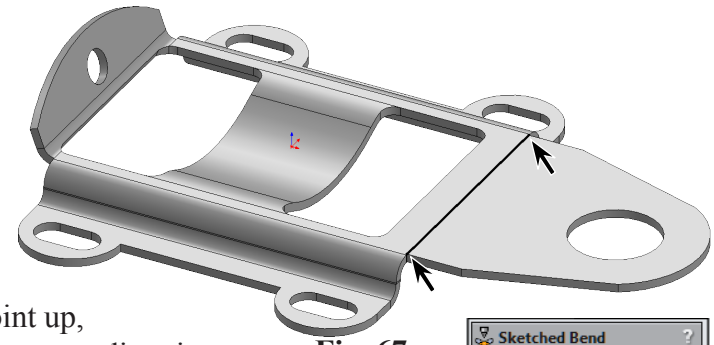


Fig. 67

The Direction arrow should point up, **Fig. 69**. If arrow is pointing in wrong direction, click **Reverse Direction**, **Fig. 68**.

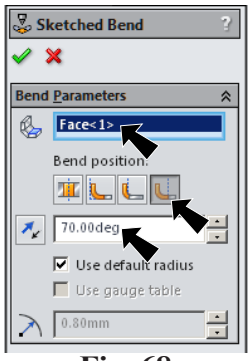


Fig. 68

Click OK, **Fig. 70**.

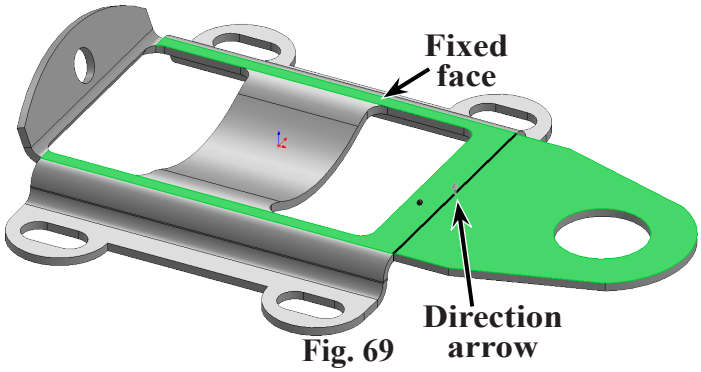


Fig. 69

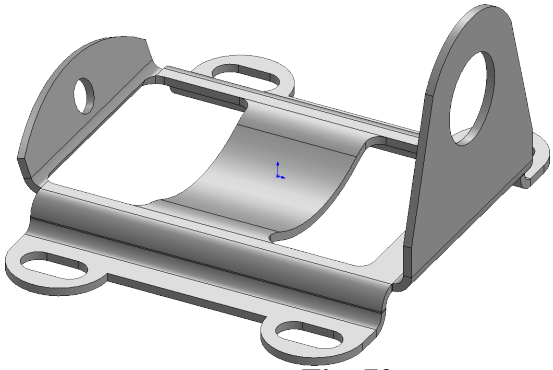


Fig. 70

T. Material: Plain Carbon Steel.

Step 1. **Right click Material** in the Feature Manager and click **Edit Material**, **Fig. 71**.

Step 2. **Expand Steel** in the material tree and select **Plain Carbon Steel**. Click **Apply** and **Close**.

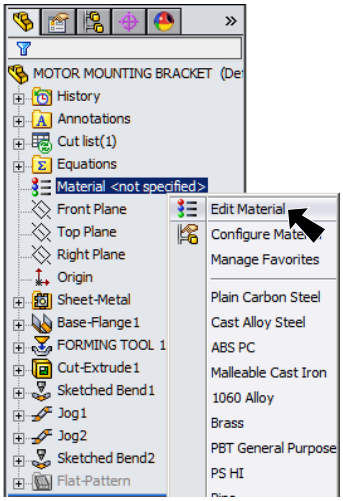


Fig. 71

U. Flatten Sheet Metal.

Step 1. Confirm sheet metal will flatten. Toggle **Flatten** Flatten on the Sheet Metal toolbar to flatten.

Step 2. Suppress **FORMING TOOL 1** in the Feature Manager, **Fig. 71**. To suppress the feature, **ctrl click** Forming Tool 1 and click **Suppress** from menu.

Step 3. Be sure to unsuppress Forming Tool and unflatten sheet metal before continuing. Save.

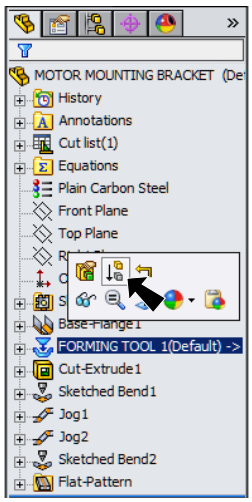
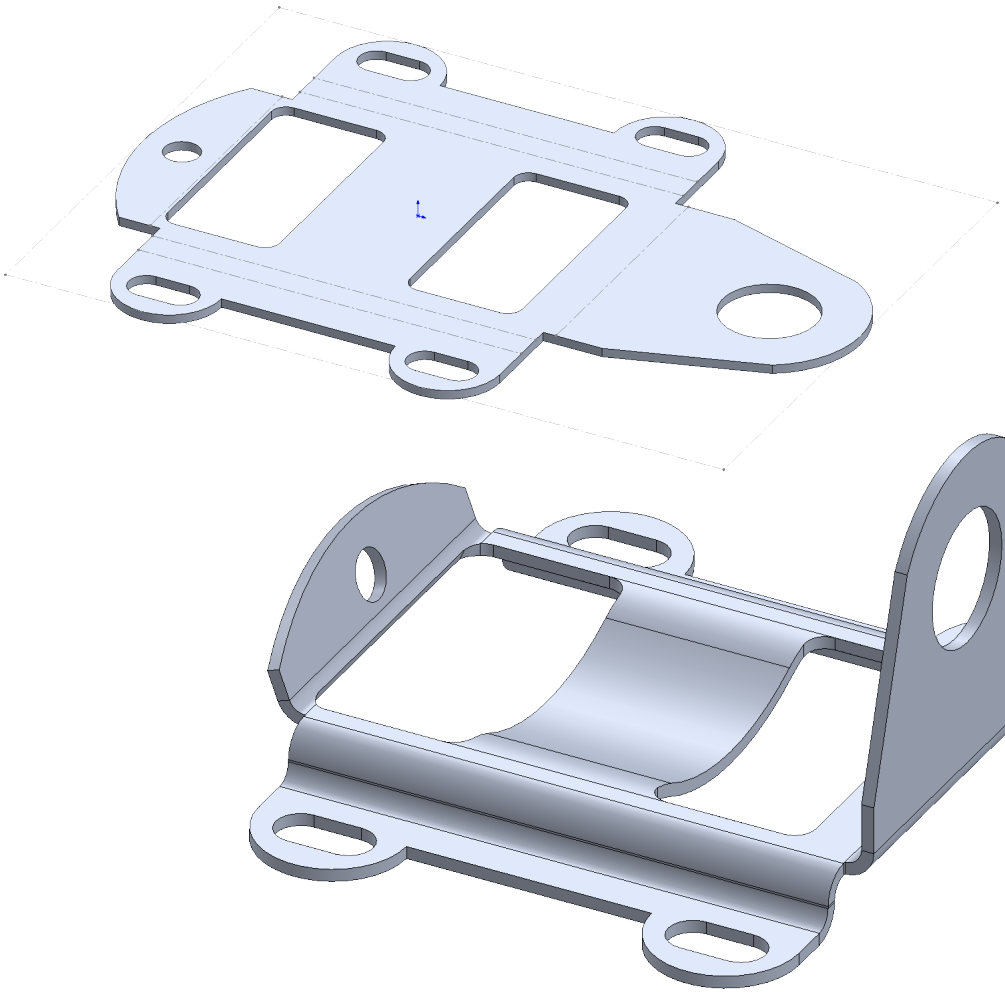



Fig. 71