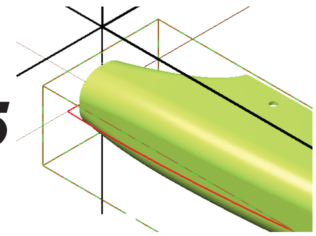
Mastercam X5

Chapter 3

CO2 Shell Car

SolidWorks 11 to Mastercam X5

2011



A. Open File in Mastercam X4.

Step 1. If necessary, save your **body** file in SolidWorks.

Step 2. In Mastercam X5, click File Menu > Open.

Step 3. In the Open dialog box set **Files of type** to **SolidWorks Files**, select your BODY file, **Fig. 1**. Click OK .

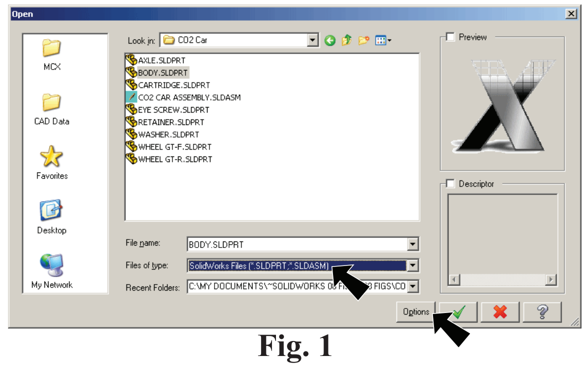


Fig. 1

Step 4. Change to the Isometric View. Use or **Alt-7**.

Step 5. Click Fit or use **Alt-F1** to fit, **Fig. 2**.

B. Confirm Units are Metric.

Step 1. Click the bottom right corner of the display, the units should be **Metric**, **Fig. 2**.

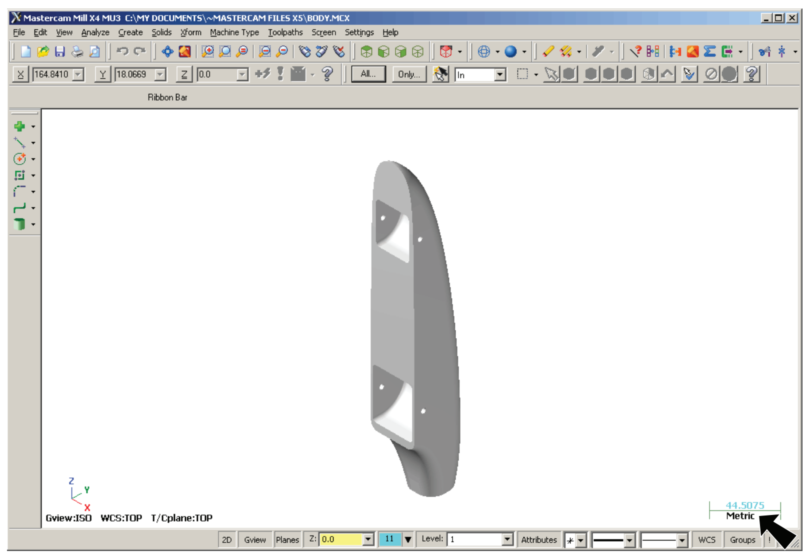


Fig. 2

C. Save Your File.

Step 1. Click File Menu > Save As.

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

D. Change Color.

Step 1. Click the **All** button All... in the General Selection ribbon bar, **Fig. 3**.

Fig. 3

Step 2. Click **All Entities** button **Fig. 4**.

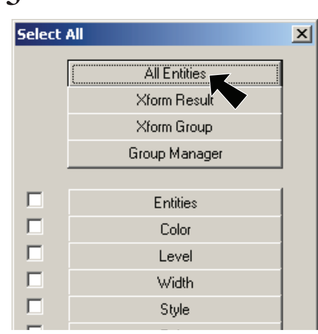


Fig. 4

Step 3. **Right click** the color swatch in the Status Bar at the bottom of the screen, **Fig. 6**. Key-in **24 for green** color number and press ENTER, **Fig 7**.

Right click

Fig. 6

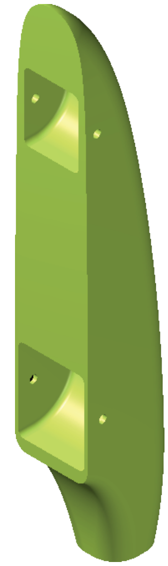


Fig. 7

Step 4. Save . Use **Alt-F S**.

E. Rotate Body Around Axes.

Step 1. Click the down arrow of the Set Planes button in the toolbar and click **Top (WCS)**, **Fig 8**.

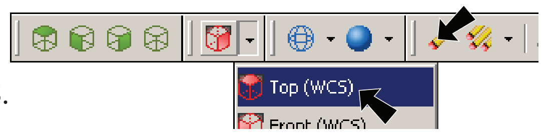


Fig. 8

Step 2. Click Xform Menu > Rotate.

Step 3. Click the solid body to select it and **press ENTER**, **Fig. 9**. The solid will change color with selected.

Body solid

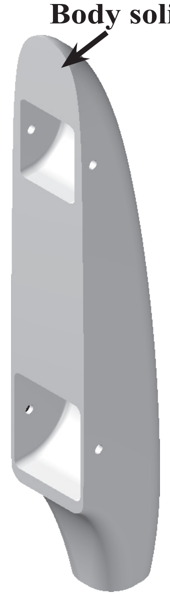


Fig. 9

Step 4. Set: **Move**

1 for Number of Steps

180 for Rotation Angle

Click **Apply** , **Fig. 10**.

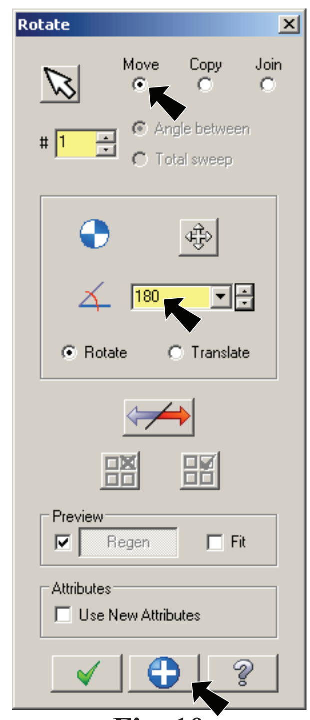


Fig. 10

Step 5. Click the down arrow of the Set Planes button in the toolbar and click **Front (WCS)**, **Fig 11**.

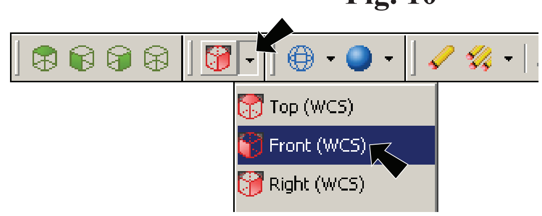


Fig. 11

Step 6. Click the solid body again to select it and **press ENTER**, **Fig. 12**.

Body solid

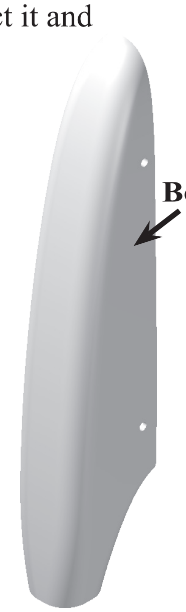


Fig. 12

Step 7. Set: **Move**

-90 for Rotation Angle, **Fig. 13**.

Step 8. Click OK in the Rotate dialog box**.**

Step 9. Click Fit or use **Alt-F1**.

Step 10. **Right click** the drawing area and click Clear Colors from the menu or use **Alt-R C**.

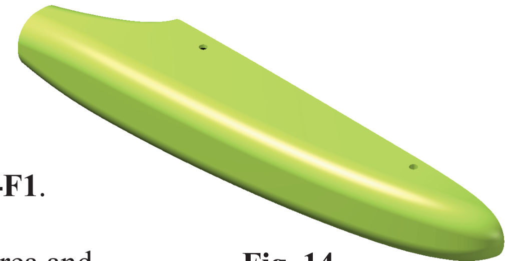


Fig. 14

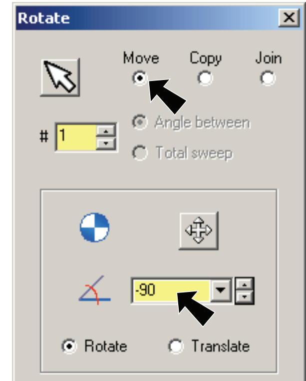


Fig. 13

Step 11. Save. Use **Alt-F S**.

F. Add Levels.

Step 1. Display Level Manager. Use **Alt-Z**.

Step 2. Press **Tab key to move** to the Name Field and key-in **SOLID**, **Fig. 15**.

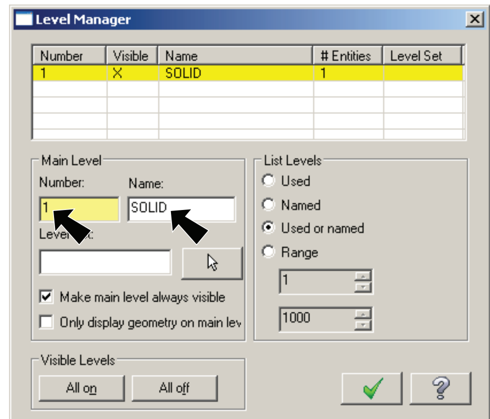


Fig. 15

Step 3. Press **Shift-Tab key** (hold down the Shift key and press Tap key) **to move back** to the Number Field and key-in **2**, **Fig. 16**.

Step 4. Press Tab key to move to the Name Field and key-in **WIREFRAME**, **Fig. 16**.

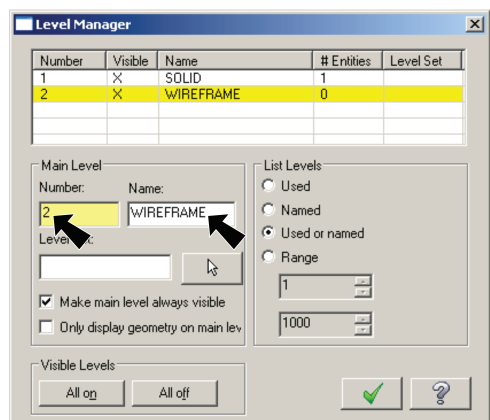


Fig. 16

Step 5. Continue and create **CONTAINMENT** Level as shown here and **Fig. 17**.

1 SOLID
2 WIREFRAME
3 CONTAINMENT

Step 6. Click the **2** in Number column to make **Level 2 WIREFRAME active** and click OK, **Fig. 17**.

Step 7. Save. Use **Alt-F S**.

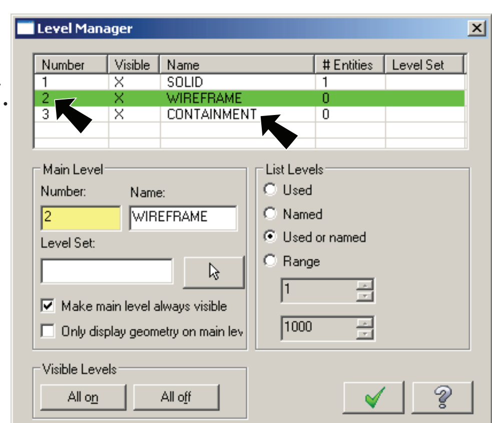


Fig. 17

G. Create Bounding Box.

Step 1. Draw the bounding box **tangerine**. Click the color swatch in the Status Bar at the bottom of the screen. Key-in **94 for tangerine** color number and press ENTER.

Step 2. Click Create Menu > Bounding Box.

Step 3. Set: check **Lines Arcs**
uncheck Center Point, **Fig. 18**

Click OK, **Fig. 19**.

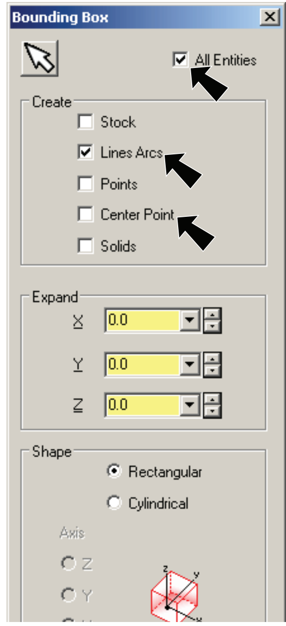


Fig. 18

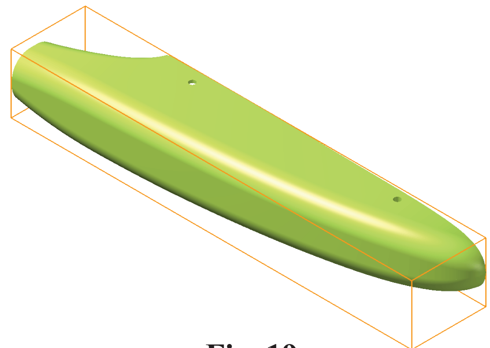


Fig. 19

H. Create Rectangular Shapes.

Step 1. Draw the **rectangular shape green**. Click the color swatch in the Status Bar at the bottom of the screen. Key-in **10 for green** color number and press ENTER.

Step 2. Click Create Menu > Rectangular Shapes.

Step 3. Set: **Base Point**

305 for **Width**

42 for **Height**

Click the Anchor point in the middle of the left side, Fig. 20

Click the down arrow in the Auto Cursor ribbon bar and click **Midpoint**, **Fig. 21**.

Click the **bottom back line** of the bounding box wireframe, **Fig. 22**.

Click OK to close the dialog box.

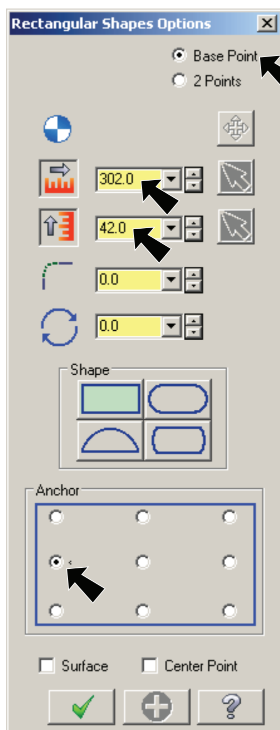


Fig. 20

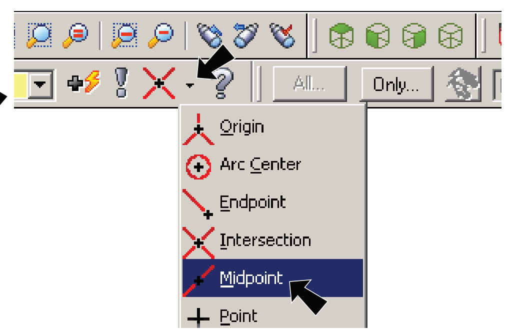


Fig. 21

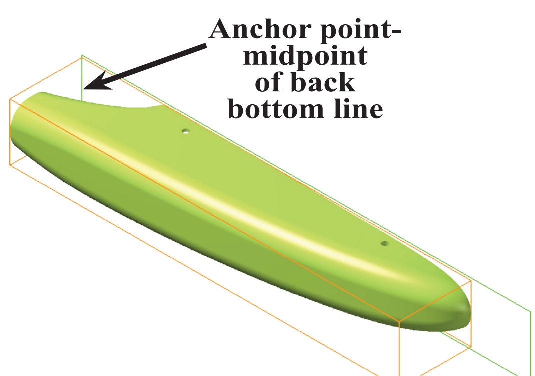


Fig. 22

Step 4. Click Fit or use **Alt-F1** to fit.

I. Delete Orange Bounding Box.

Step 1. Click the All [All...] in the General Selection ribbon bar, **Fig. 23**.

Fig. 23

Step 2. Click **Color** button in the Select All dialog box, **Fig. 24**.

Step 3. Click to place a **check** in **tangerine (94)** check box, **Fig. 24**.

Step 4. Click OK.

Step 5. Press **Delete** key on the keyboard, **Fig. 25**.

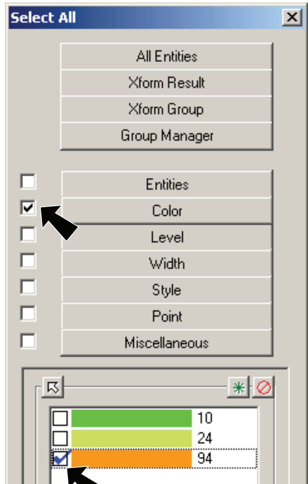


Fig. 24

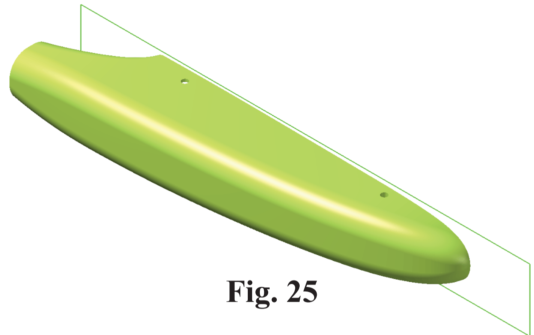


Fig. 25

Step 6. Click Repaint or use **F3** to redraw.

J. Create 3D Wireframe.

Step 1. Click the down arrow of the Set Planes button in the toolbar and click **Top (WCS)**, **Fig 6**.

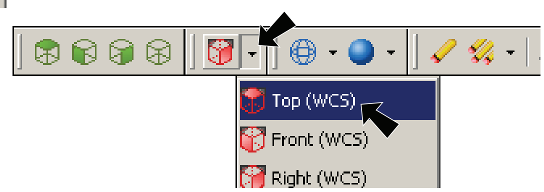


Fig. 26

Step 2. Click Xform Menu > Translate.

Fig. 27

Step 3. Click the down arrow of Selection Methods drop-down list and click Chain, **Fig. 27**.

Step 4. Click a **line** of the rectangle and **press ENTER**.

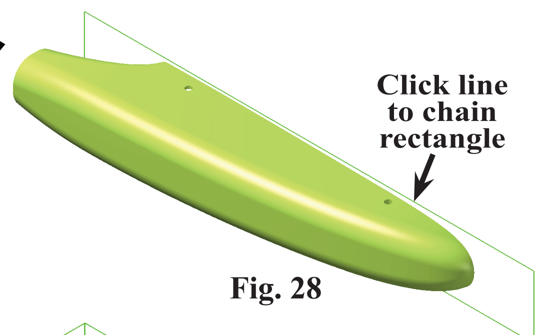


Fig. 28

Step 5. Set: **Join**

Y to -70, **Fig. 29**.

Step 6. Click OK to close the Translate dialog box, **Fig. 30**.

Step 7. **Right click** the drawing area and click Clear Colors from the menu.

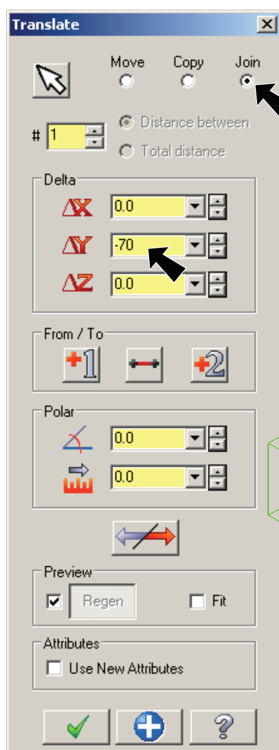


Fig. 29

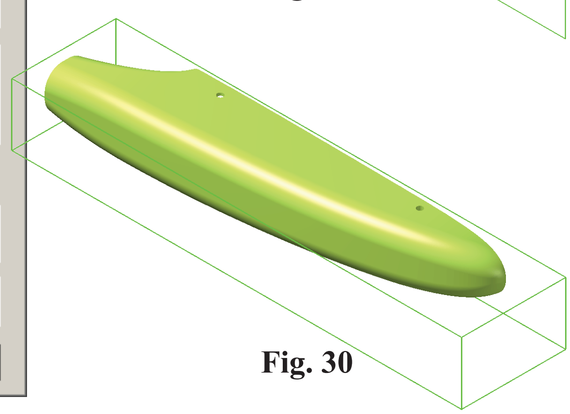


Fig. 30

K. Copy Line.

Step 1. Click the **back rear vertical line** of the wireframe, **Fig. 31**.

Step 2. Click Xform Menu > Translate.

Step 3. Set: **Copy**
Y to -34 , **Fig. 32**.
and **press ENTER**.

Step 4. Click OK to close the Translate dialog box.

Step 5. **Right click** the drawing area and click Clear Colors from the menu or use **Alt-R C**.

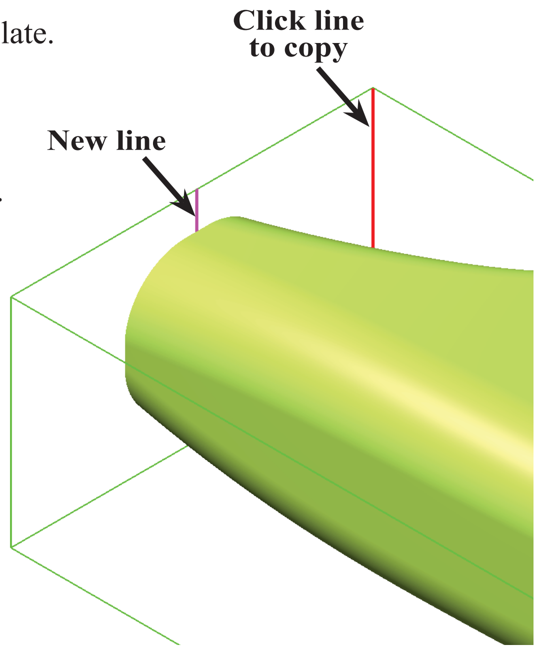


Fig. 31

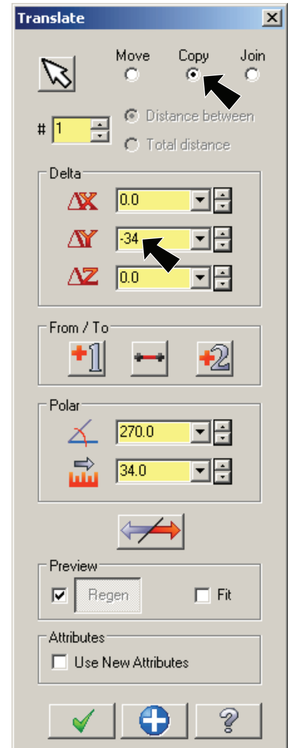


Fig. 32

L. Move to Origin.

Step 1. Display the origin. Use **F9** to show the axes, **Fig. 33**.

Step 2. Click Xform Menu > Move to Origin.

Step 3. Click the down arrow in the Auto Cursor ribbon bar and click Midpoint , **Fig. 34**.

Step 4. Click **copied rear line**, **Fig. 35**.

Step 5. Click Fit or use **Alt-F1** to fit.

Step 6. **Right click** the drawing area and click Clear Colors from the menu or use **Alt-R C**.

Step 7. Note **center of cartridge hole** as new position of origin, **Fig. 36**.

Step 8. Toggle axes off. Use **F9**.

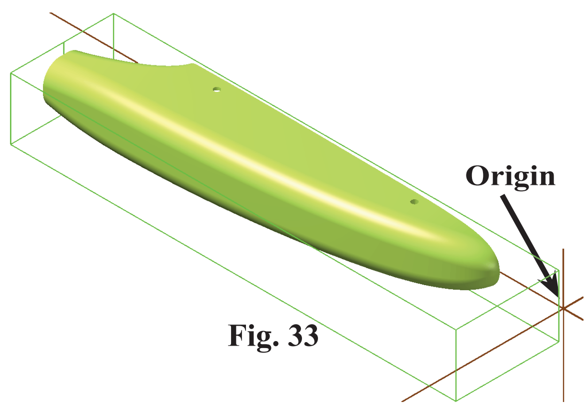


Fig. 33

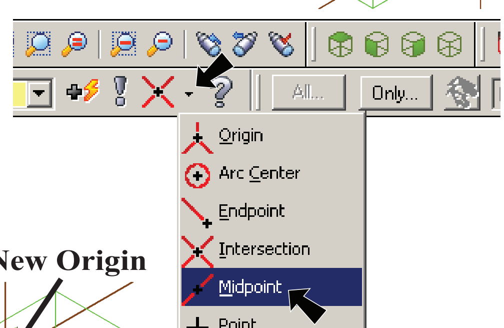


Fig. 34

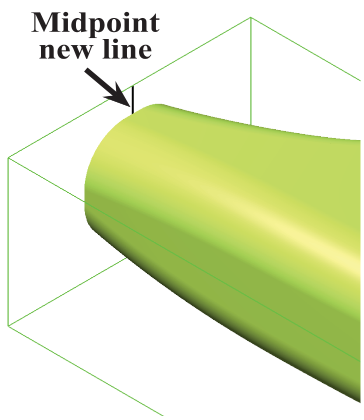


Fig. 35

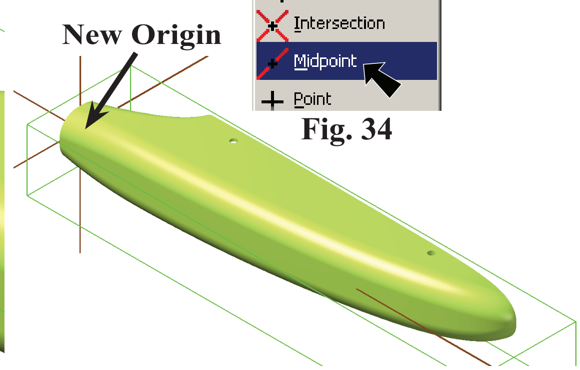


Fig. 36

M. Containment Level Active.

Step 1. Display Level Manager. Use **Alt-Z.**

Step 2. Click the **3** in the Number column to make **Level 3 CONTAINMENT active**, **Fig. 37**. Click OK when done, **Fig. 37**.

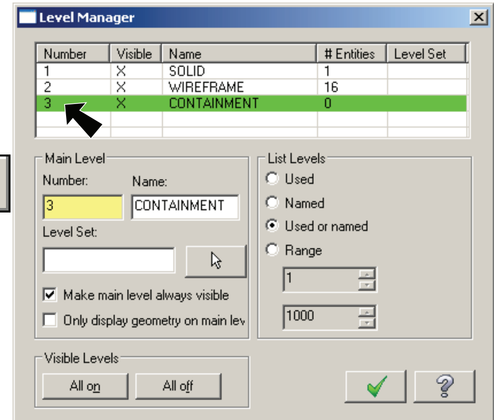


Fig. 37

N. Create Containment.

Step 1. Change to the **Top View**. Use or **Alt-1**.

Step 2. Click Fit or use **Alt-F1** to fit.

Step 3. Draw the containment **red**. Click the color swatch in the Status Bar at the bottom of the screen. Key-in **12 for red** color number and press ENTER.

Step 4. Click Create Menu > Silhouette Boundary.

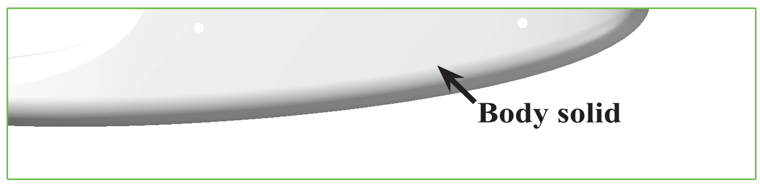


Fig. 38

Step 5. Click the **solid body**, **Fig. 38** and **ENTER** to except selection.

Step 6. Check **Arc Fit, Fig. 39** and click OK , **Fig. 40**

Step 7. Click Create Menu > Line > Endpoint. **Alt C L E**

Step 8. Draw a **vertical line down from front end of the solid body**, **Fig. 40**. Press ENTER. Click OK in ribbon bar.

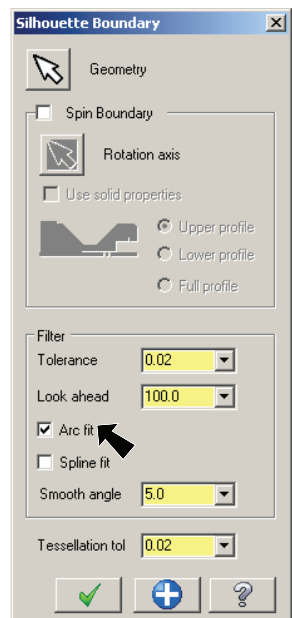


Fig. 39

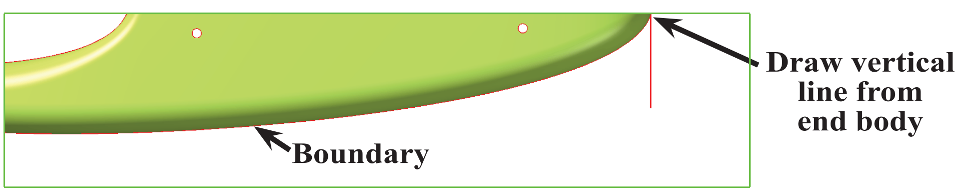


Fig. 40

Step 9. Click Create Menu > Line > Parallel. **Alt C L A**

Step 10. Click the **vertical line** and **click left side of line**, **Fig. 41**. Key-in **6 for Distance** in the ribbon bar, **Fig. 42** and press **ENTER**. Click OK in ribbon bar.

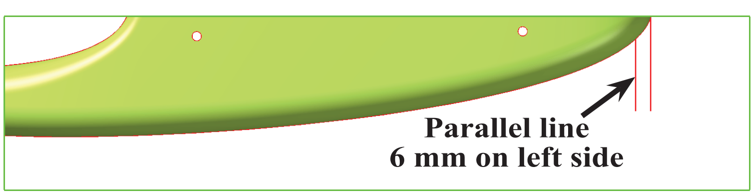


Fig. 41

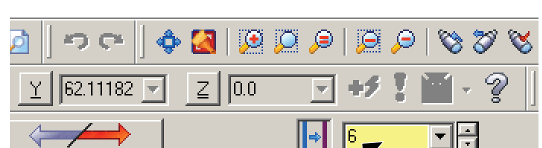


Fig. 42

Step 11. **Delete first vertical line**, **Fig. 43**. Select line and press Delete key.

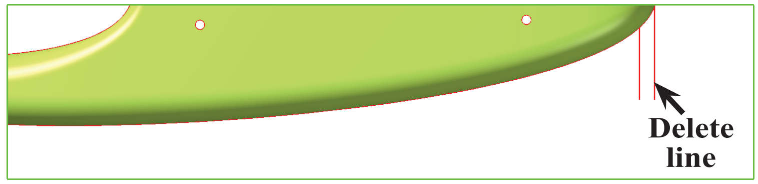


Fig. 43

Step 12. Save . Use **Alt-F S**.

O. Turn off Levels.

Step 1. Display Level Manager. Use **Alt-Z**.

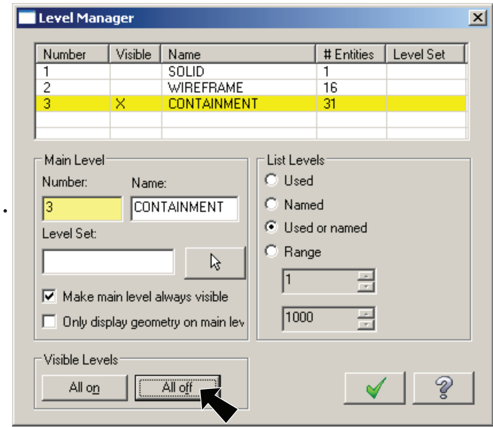
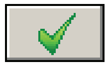


Fig. 44

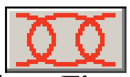
Step 2. **Turn off SOLID and WIREFRAME levels.** Click **All off** button. Click OK  when done, **Fig. 44**.

P. Offset Containment.

Step 1. **Delete the two circles**. To delete, drag a selection around both circles and press the Delete key, **Fig. 45**.

Fig. 45

Step 2. Click Xform Menu > Offset Contour.

Step 3. Click **Partial** button  (**P**) in the Chaining dialog box, **Fig. 46**.

Step 4. Click left end of top arc (under the cartridge hole), **Chain 1**, **Fig. 47**. Click right end of same arc. Click OK  in the Chaining dialog box, **Fig. 46**.

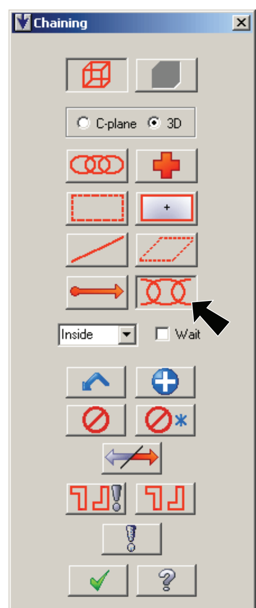


Fig. 46

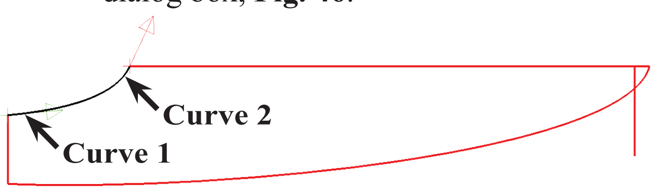


Fig. 47

Step 5. Set: **Move** 

Distance to 7 , **Fig. 48**

Check **Preview Regen**, **Fig. 49**

Click **Apply** .

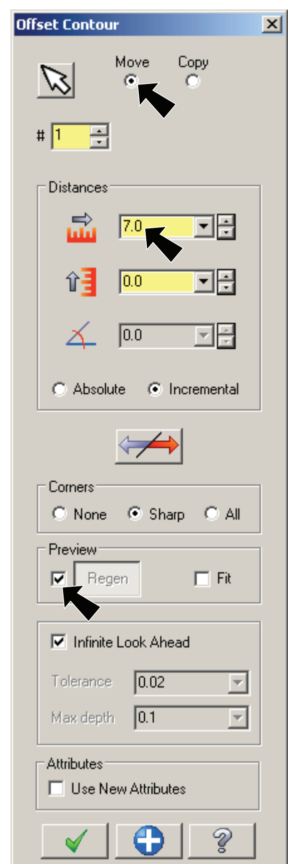


Fig. 48

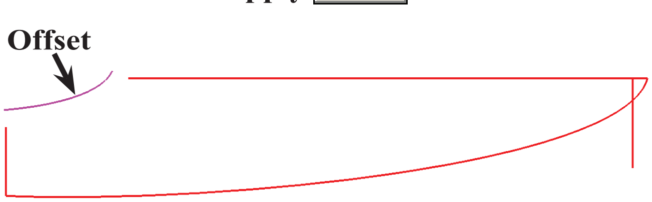


Fig. 49

Step 6. Click **Partial** button (**P**) in the Chaining dialog box, **Fig. 50**.

Step 7. Click left end of bottom arc (top of body), **Chain 1.** Click right end of same arc. Click OK in the Chaining dialog box, **Fig. 51**.

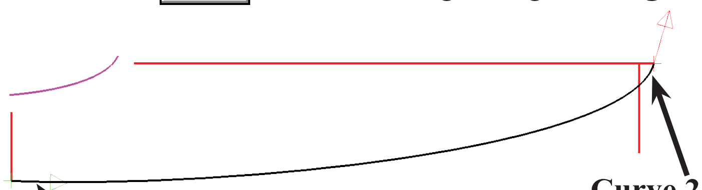


Fig. 51

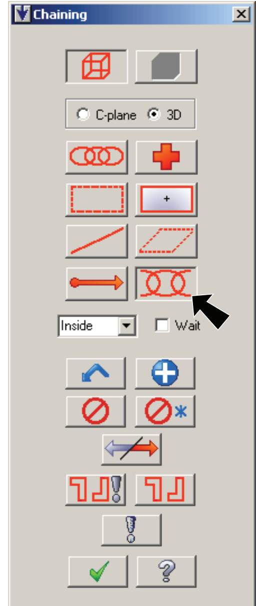


Fig. 50

Step 8. Set: **Move**

Distance to 7 , **Fig. 52**.

Click **Reverse** . The offset should be below the geometry, **Fig. 53**. If the offset is on the wrong side - click Reverse .

Click **OK** .

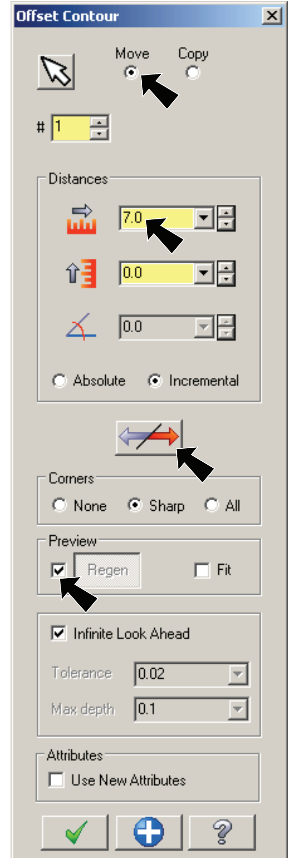


Fig. 52

Fig. 53

Step 9. **Right click** the drawing area and click Clear Colors from the menu or use **Alt-R C**.

Step 10. Save . Use **Alt-F S**.

Q. Trim Lines.

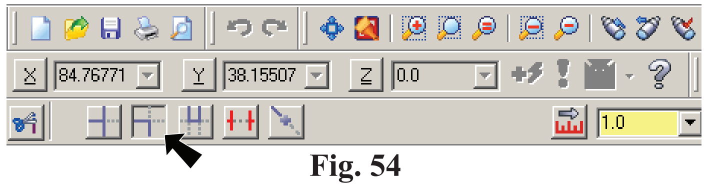
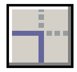


Fig. 54

Step 1 Click Edit Menu > Trim/Break > Trim/Break/Extend. **Alt E T T**

Step 2. Click **Trim 2 Entity** button  (**2**) in the ribbon bar, **Fig. 54**.

Step 3. Trim and extend entities. To trim, click entity on side you want to keep, **Position 1** and **Position 2**, **Fig. 55** and **Fig. 57.** Trim at each intersection. Be sure to click curves close to the expected intersection.

Step 4. Click OK  in ribbon bar when done.

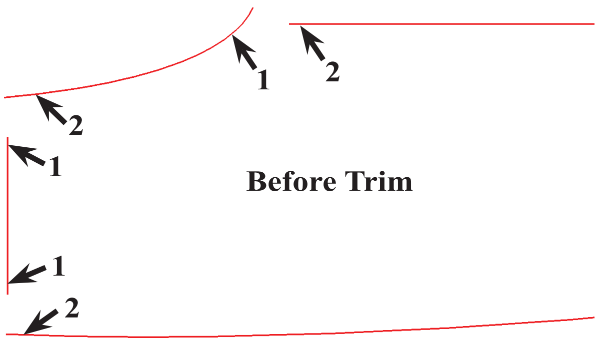


Fig. 55

Fig. 56

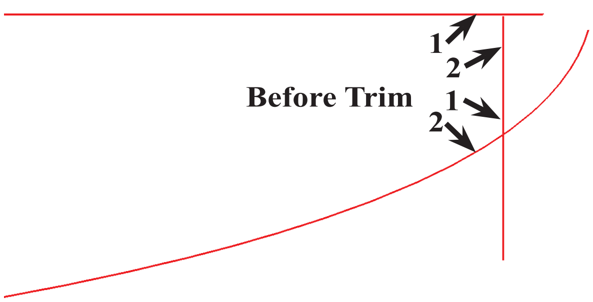


Fig. 57

Fig. 58

Step 5. Delete the remaining curve at front of body, **Fig. 58**. To Delete, drag a selection around curve and use Delete key.

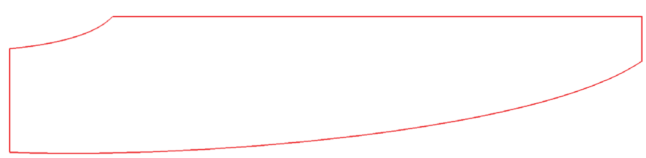
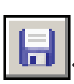
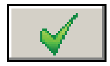


Fig. 59

Step 6. Save . Use **Alt-F S**.

R. Turn On Levels.

Step 1. Display Level Manager. Use **Alt-Z**.

Step 2. **Turn on SOLID and WIREFRAME levels.** To turn on levels, click **All on** button. Click OK  when done, **Fig. 60**.

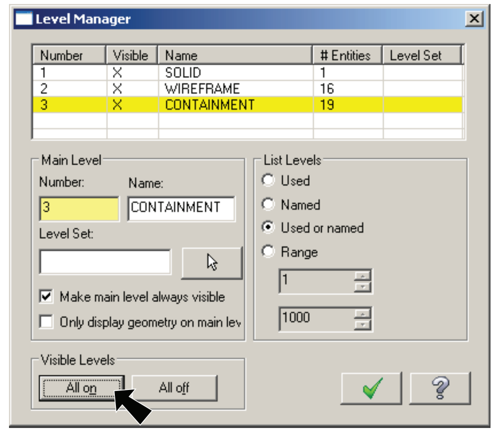
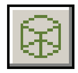


Fig. 60

S. Create WCS LEFT CUT.

Step 1. Change to the Isometric View. Use  or **Alt-7**.

Step 2. Click **WCS** in the Status Bar at the bottom of the screen and **View Manager** from the menu, **Fig. 61**.

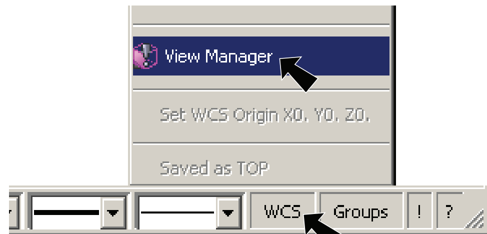


Fig. 61

Step 3. With the Top View selected, click **Copy** button in the View Manager dialog, **Fig. 62**.

Step 4. Rename COPY OF TOP to **LEFT CUT**. To rename, slowly click the view name and key-in the new name, **Fig. 63**.

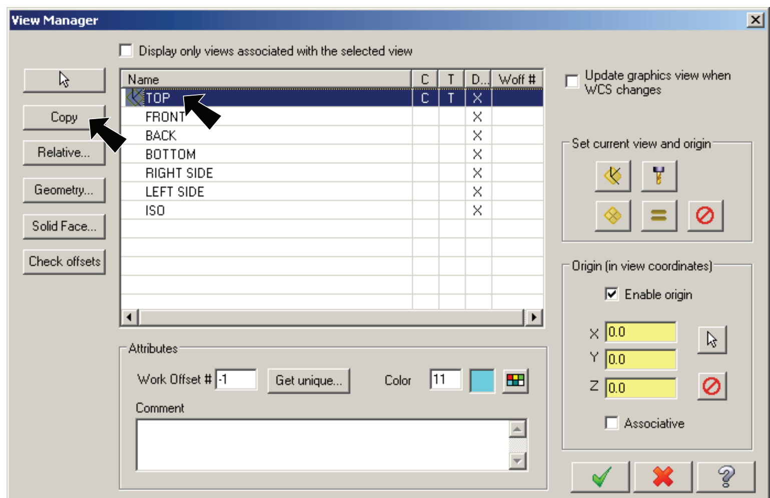


Fig. 62

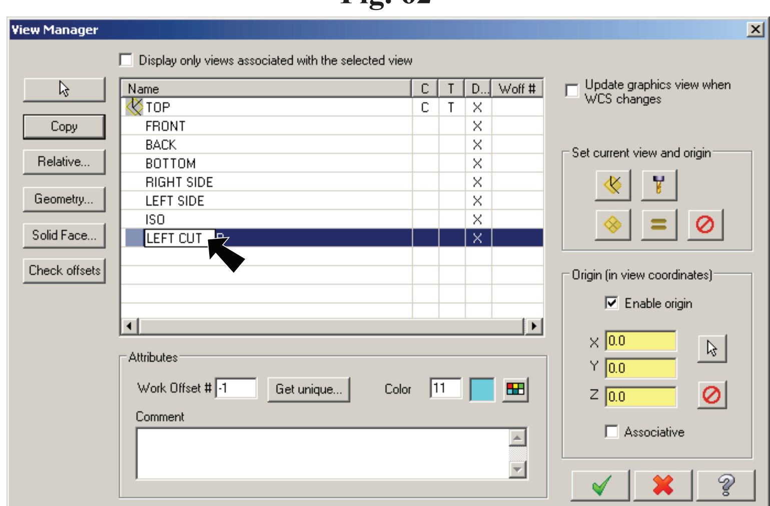
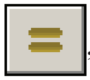
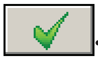


Fig. 63

Step 5. Set:

Origin X to 0
Origin Y to 0
Origin Z to 34, Fig. 64.

Step 6. Click the **Set All** button , **Fig. 64**.

Step 7. Click OK .

Step 8. Check the origin. Use **F9** to show the axes, **Fig. 65**.

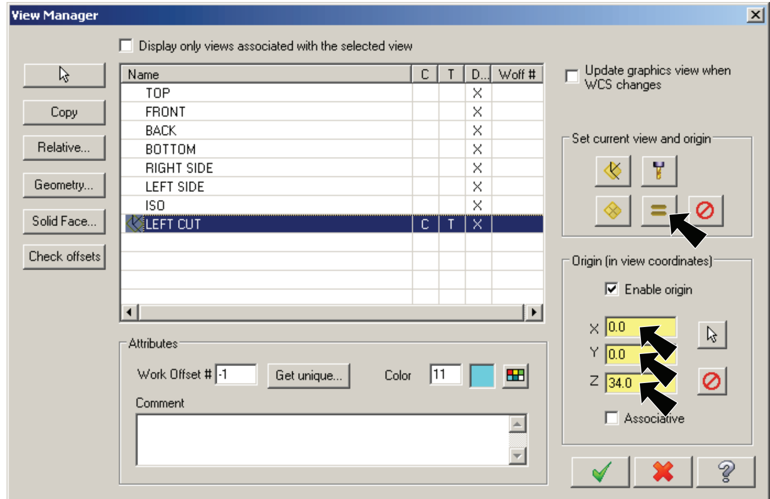


Fig. 64

T. Create WCS BOTTOM CUT.

Step 1. Use the **Alt and down arrow** and **Alt and left arrow** keys on keyboard to rotate view as shown in **Fig. 66**.

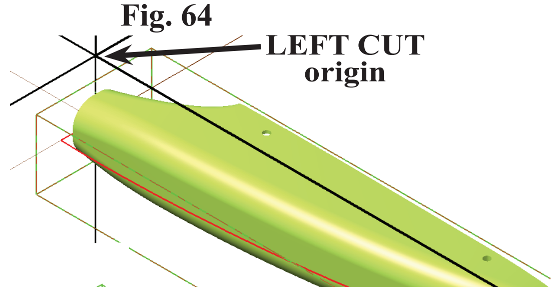
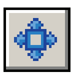


Fig. 65

Step 2. Click Fit  or use **Alt-F1** to fit.

Step 3. Click **WCS** in the Status Bar at the bottom of the screen and **View Manager** from the menu, **Fig. 67**.

Step 4. Click the **Solid Face** button in the View Manager dialog, **Fig. 68**.

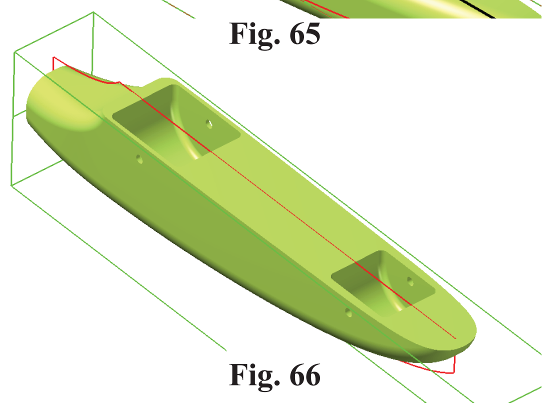


Fig. 66

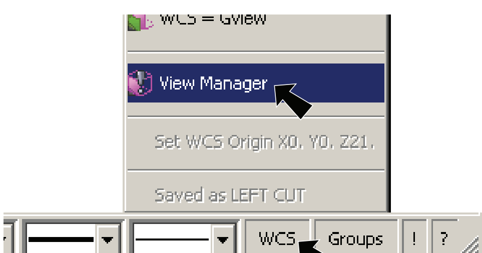


Fig. 67

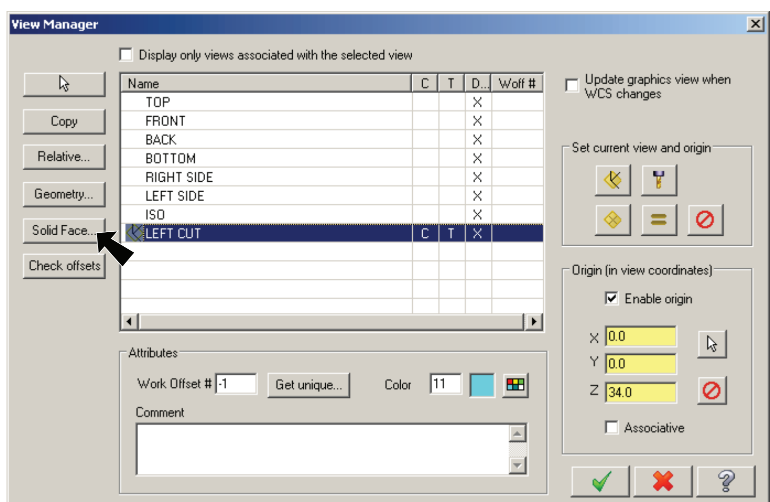


Fig. 68

Step 5. Click **bottom face** of the body solid, **Fig. 69**.

Step 6. Set X axes should point to the front of body and Y axes to right, **Fig. 69**. This should be View 1, **Fig. 70**. Click OK in the Select view dialog box.

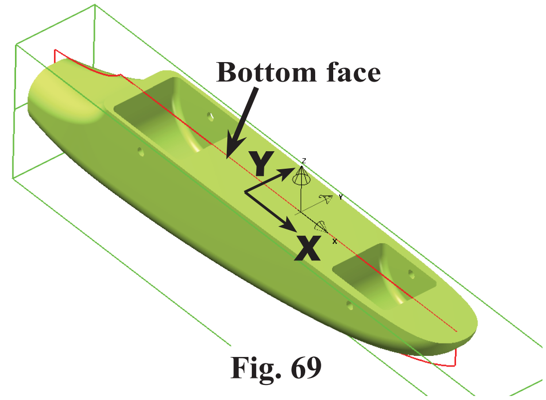


Fig. 69

Step 7. Key-in **BOTTOM CUT** for new view name in the New View dialog and click OK, **Fig. 71**.

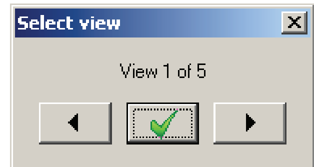


Fig. 70

Step 8. Set:

Origin X to 0
Origin Y to 0
Origin Z to 34, Fig. 72.

Step 9. Click the **Set All** button, **Fig. 72**.

Step 10. Click OK, **Fig. 72**.

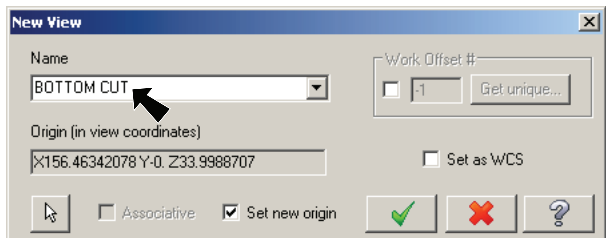


Fig. 71

Step 11. Change to the Isometric View. Use or **Alt-7**.

Step 12. Click Fit or use **Alt-F1** to fit.

Step 13. Check the origin. Use **F9** to show the axes, **Fig. 73**. Then, **F9** again to hide axes.

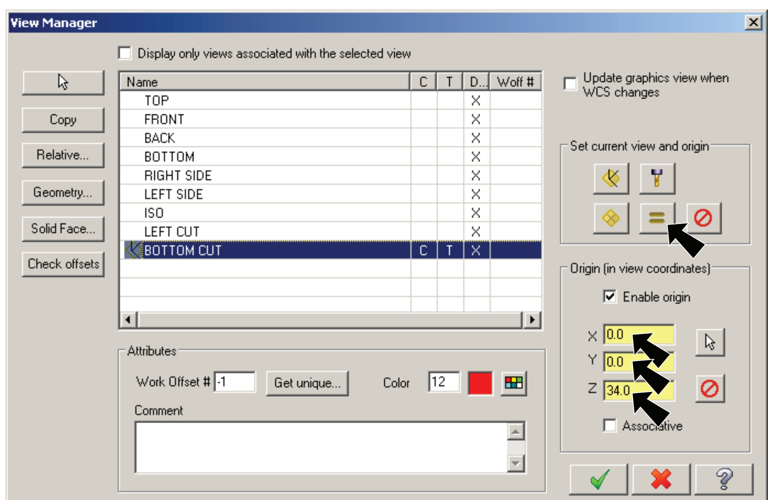


Fig. 72

Step 14. Save. Use **Alt-F S**.

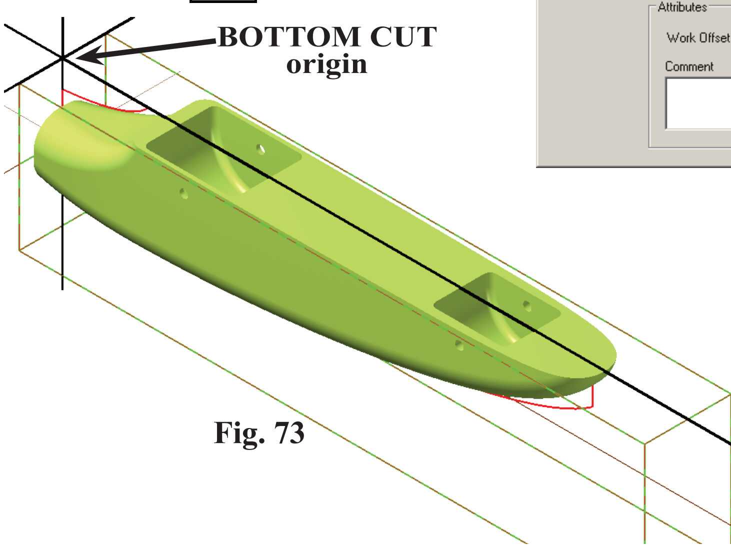


Fig. 73