Boat Hull Solid

A. Open Boat Block File.

Step 1. Open your **BOAT BLOCK** file.

B. Save As "BOAT HULL SOLID"

Step 1. Click **Save As** (**Ctrl-Shift-S**) on the Quick Access Toolbar QAT.

Step 2. Key-in **BOAT HULL SOLID** for the filename and press ENTER.

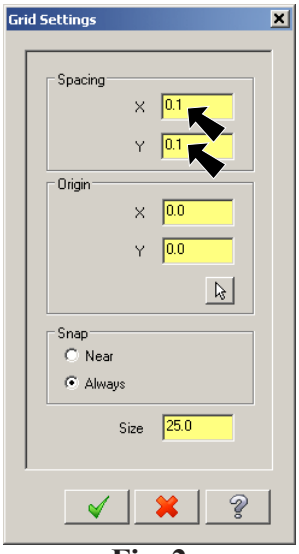


Fig. 2

C. Set Grid and Snap .1.

Step 1. On the View tab VIEW click **Show Grid** and **Snap to Grid**.

Step 2. Click the **Dialog Box Launcher** **(Alt-G)**, **Fig. 1**.

Step 3. In the Grid Settings dialog box:
under Spacing, **Fig. 2**
X and Y Spacing .1
Click OK.

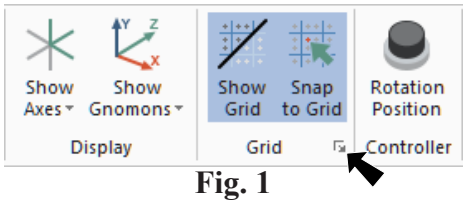


Fig. 1

D. Create Back Rib.

Step 1. Change to the **Front View**. **Right click** in the graphics window and click Front **(Alt-2)**.

Fig. 3

Step 2. **Right click** in the graphics window and on the Mini Toolbar set **Z depth -9**, **Fig. 3**.

Step 3. On the Wireframe tab WIREFRAME click **Line Endpoints**.

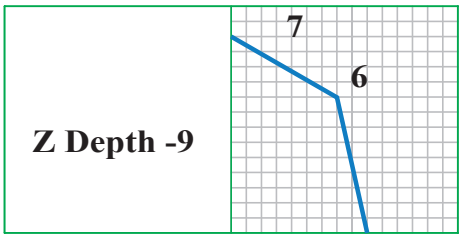


Fig. 4

Step 4. Sketch the **two lines**, **Fig. 4**. When done click **OK and Create New Operation** in the Line Endpoints function panel.

Fig. 5

E. Create Mid Rib.

Step 1. **Right click** in the graphics window and on the Mini Toolbar set **Z depth -4.9**, **Fig. 5**.

Step 2. Sketch the **two lines**, **Fig. 6**. Click OK when done.

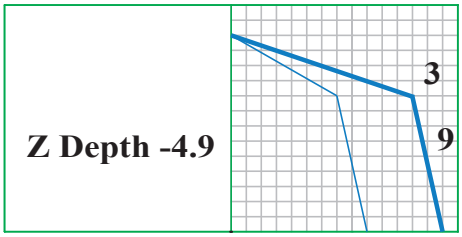


Fig. 6

4-7-16

F. Turn Off Grid and Snap.

Step 1. On the View tab VIEW click **Show Grid** and **Snap to Grid** to unselect.

G. Mirror Rib Lines.

Step 1. Change to the **Isometric View**. **Right click** in the graphics window and click Isometric (WCS) **(Alt-7)**.

Step 2. Click **CPLANE** in Status bar at bottom of the graphics window and click **Front** from the menu, **Fig 7**.

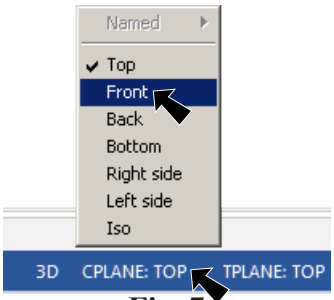


Fig. 7

Step 3. On the Transform tab TRANSFORM click **Mirror**.

Step 4. Click the **4 rib lines** and click **End Selection** End Selection **(ENTER) Fig. 8**.

Step 5. In Mirror dialog box:

Select **Copy** , **Fig. 9**

Click **Select line**

Click **vertical line in rear**, **Fig. 9**

Click OK .

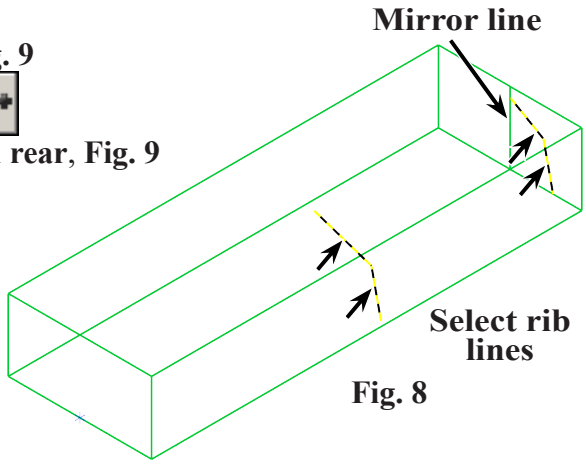


Fig. 8

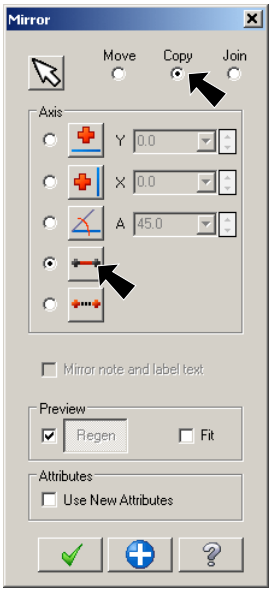


Fig. 9

Step 6. **Right click** the graphics window and click **Clear Colors** .

Step 7. Save **(Ctrl-S)**.

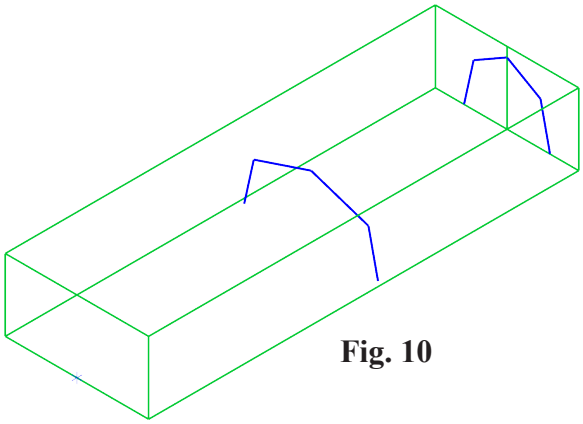


Fig. 10

H. Turn Off Block Level.

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

Step 2. In the Levels Manager:
Click to remove X in Visible column of **BLOCK** level to hide level, **Fig. 11**.

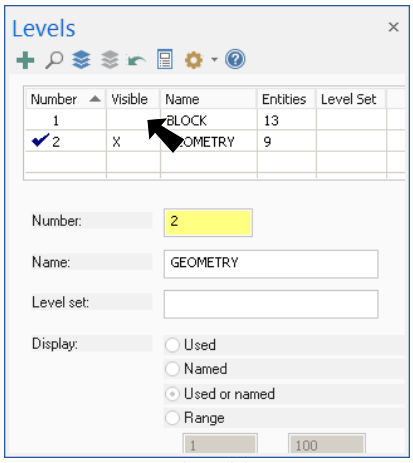


Fig. 11

I. Draw Hull Splines.

Step 1. On the Wireframe tab WIREFRAME click **Line End-points** Spline Manual.

Step 2. Sketch spline across the ends of ribs and Point, **Fig. 12**. Start with the **Point 1, middle rib 2 and finish with rear rib 3**. Be sure to snap to endpoint of rib lines. Press ENTER to end spline.

Step 3. Sketch another **spline across at 1, 4 and 5**, **Fig. 13**.

Step 4. Also, **spline across at rear rib 3 and 5**, **Fig. 14**.

Step 5. Finish with **3 spline across bottom of ribs**, **Fig. 15**.
Click OK when done.

Step 6. Save (**Ctrl-S**).

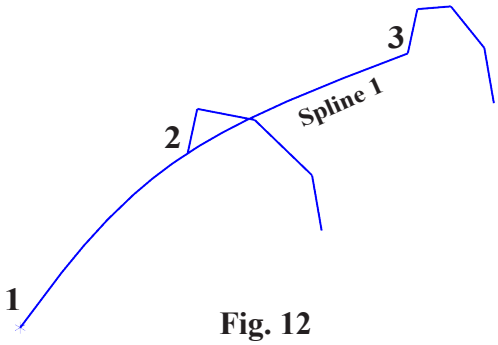


Fig. 12

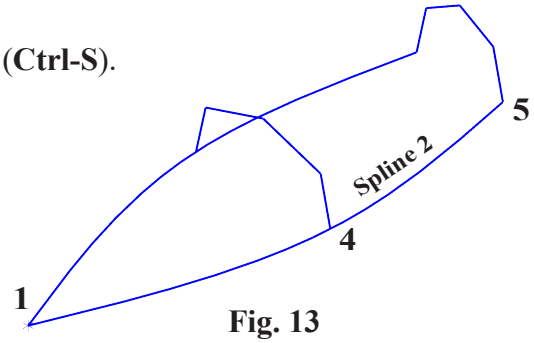


Fig. 13

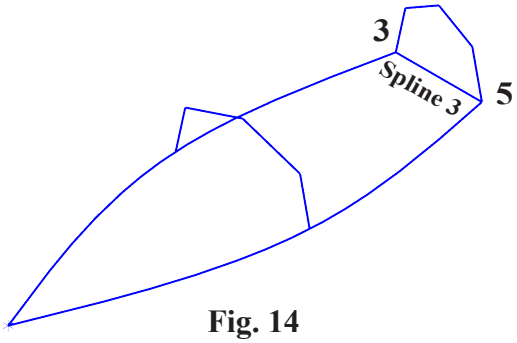


Fig. 14

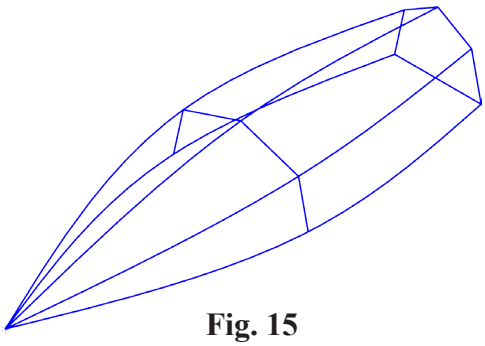


Fig. 15

J. Add Surfaces Level.

Step 1. If necessary, display Level Manager (**Alt-Z**).

Step 2. In the Levels Manager:
Key-in **3** in the Number field, **Fig. 16**
Press **Tab** key to move to the Name Field and key-in **SURFACES**.

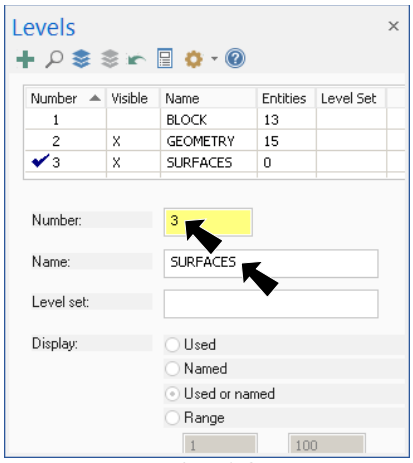
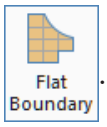


Fig. 16

K. Create Flat Boundary Surfaces (top and rear).

Step 1. On the Surfaces tab SURFACES click Flat Boundary 

.

Step 2. Select **Chain**  **(C)** in Chaining dialog box, **Fig. 17**.

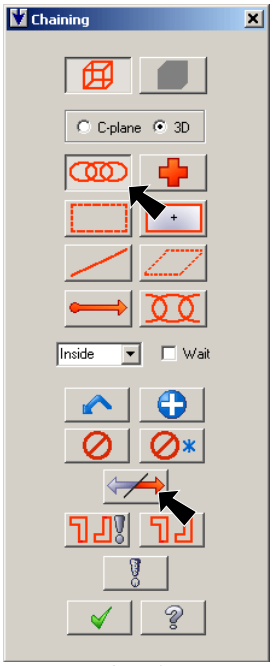


Fig. 17

Step 3. Click **spline on bottom** to define flat boundary 1, **Fig. 18**.

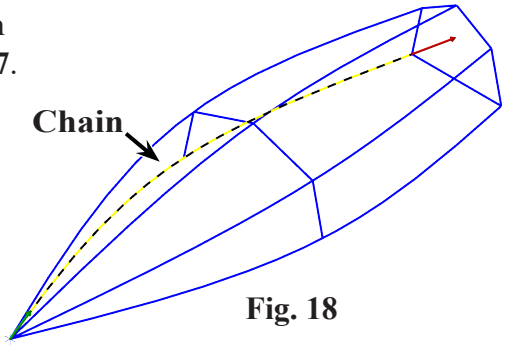


Fig. 18

Step 4. Walk Chain around the bottom rear and other bottom spline in direction of Chain arrows, **Fig. 19**.

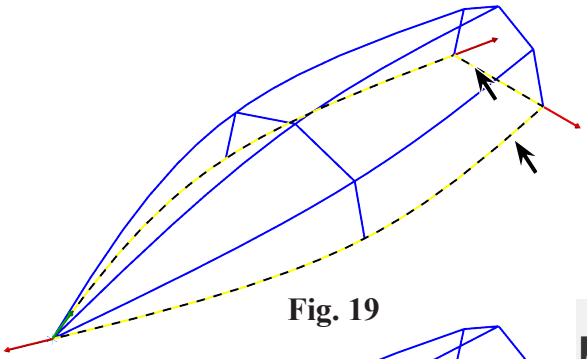


Fig. 19

Step 5. Click OK  in Chaining dialog box.

Step 6. In Flat Boundary Surface function panel press ENTER or click **OK and Create New Operation**  , **Fig. 20**.

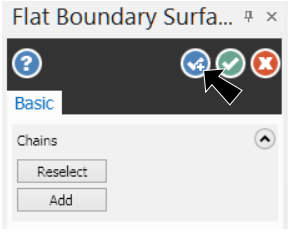


Fig. 20

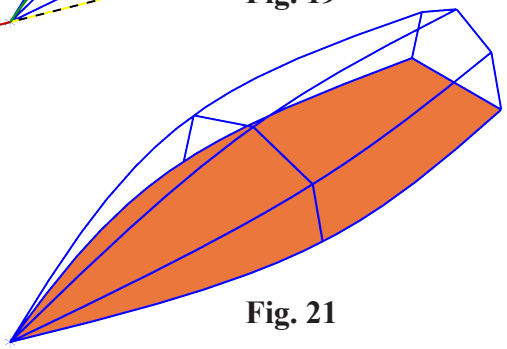


Fig. 21

Step 7. Select **Chain**  (**C**) in Chaining dialog box.

Step 8. Click **line on rear** to define flat boundary 1, **Fig. 22**.

Step 9. Walk Chain around the 3 more lines at rear in direction of Chain arrows, **Fig. 23**.

Step 10. Click OK  in Chaining dialog box.

Step 11. Click **Yes** to Automatically close chain.

Step 12. In Flat Boundary Surface function panel click OK  .

Step 13. Save  (**Ctrl-S**).

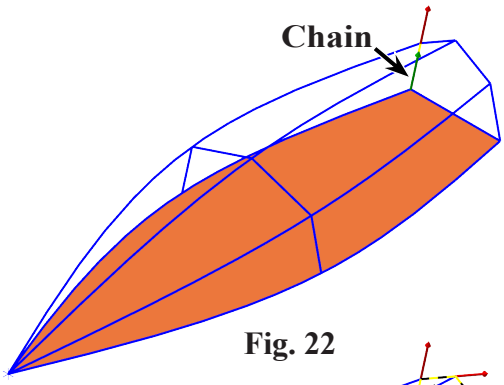


Fig. 22

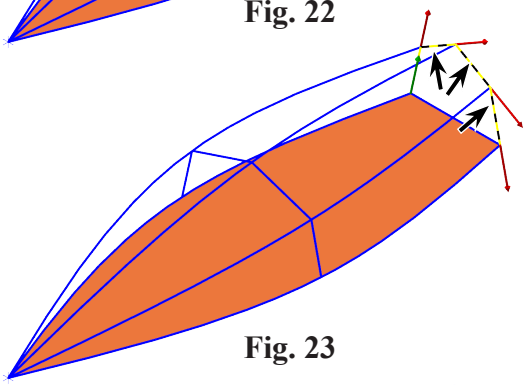


Fig. 23

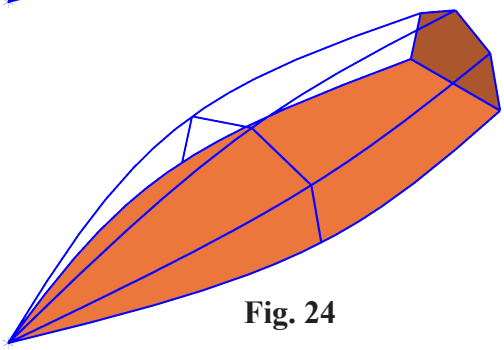
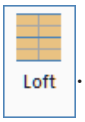
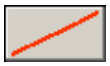


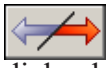
Fig. 24

L. Create Loft Surfaces (sides).

Step 1. On the Surfaces tab SURFACES click Loft 

.

Step 2. Click Single  (**S**) in Chaining dialog box, **Fig. 25**.

Step 3. Chain rib entities on the port side in order, **rear Line** and **middle Line**. Select Lines at the same end, **Fig. 26**. If when chaining the Lines chaining directions arrows do not pointing in the same direction - click Reverse  in the Chaining dialog box.

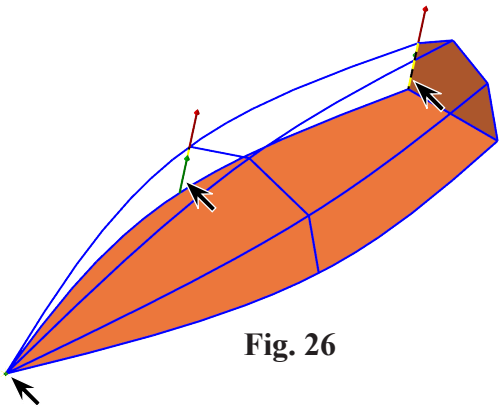


Fig. 26

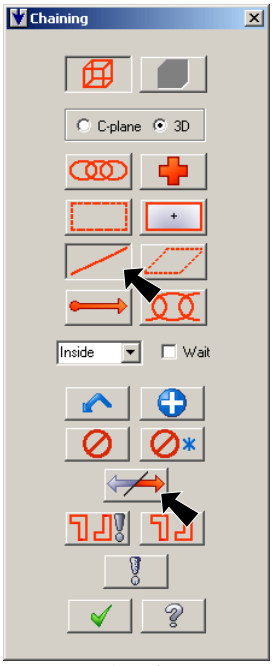


Fig. 25

Step 4. Click Point  (**T**) in Chaining dialog box, **Fig. 27**.

Step 5. Click the **Point**, **Fig. 26**.

Step 6. Click OK  in Chain dialog box.

Step 7. In Surface Loft function panel:
under Entity
select **Lofted**, **Fig. 28**
Click **OK and Create New Operation**  .

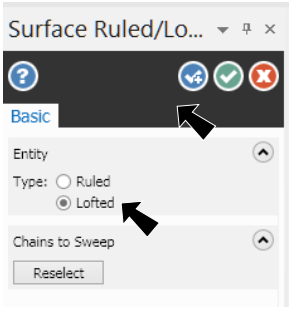


Fig. 28

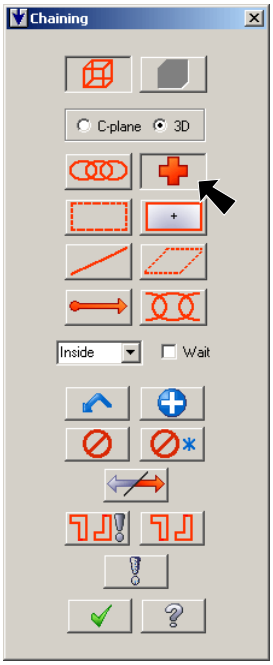
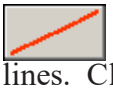


Fig. 27

Step 8. Repeat on starboard side. That is, click Single  (**S**) and selects port rib lines. Click Point  (**T**) and select Point, **Fig. 29**.

Click OK  when done.

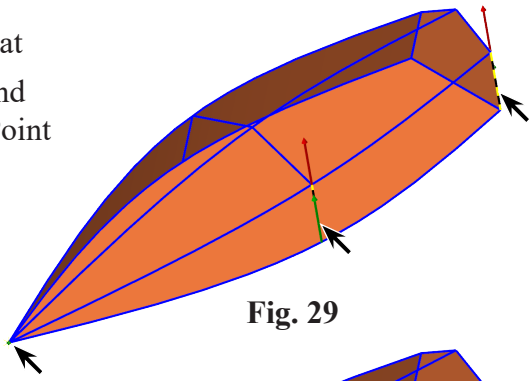


Fig. 29

Step 9. Save  (**Ctrl-S**).

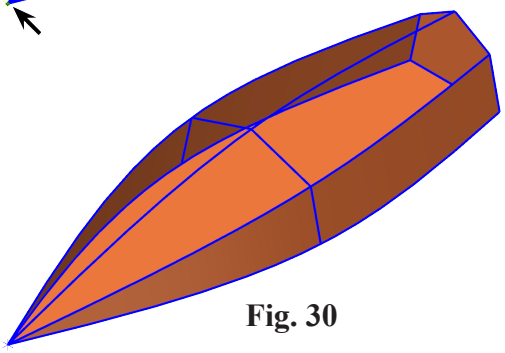


Fig. 30

M. Create Net Surfaces (bottom).

Step 1. On the Surfaces tab SURFACES click Net Net.

Step 2. Select **Chain** (**C**) in Chaining dialog box.

Step 3. Click **"keel" spline** to select chain 1, **Fig. 31**.

Step 4. Walk Chain around the rear and side spline in direction of Chain arrows, **Fig. 32**.

Step 5. Click OK in Chain dialog box.

Step 6. In Surface Net function panel press ENTER or click **OK and Create New Operation**.

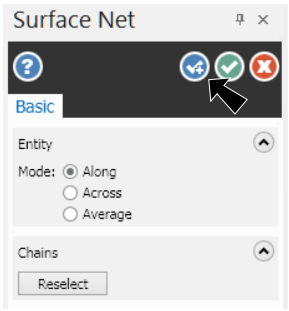


Fig. 33

Step 7. Click **"keel" spline** to select chain 1, **Fig. 34**.

Step 8. Walk Chain around the rear and side spline in direction of Chain arrows, **Fig. 35**.

Step 9. Click OK in Chain dialog box.

Step 10. In Surface Net function panel click OK.

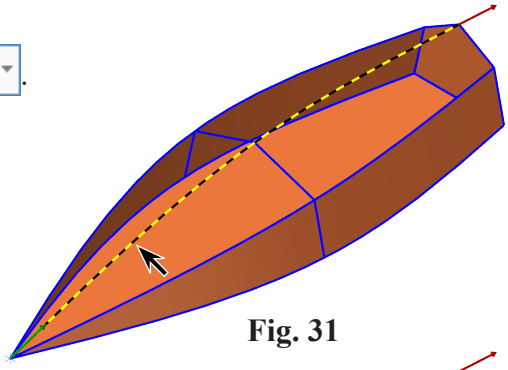


Fig. 31

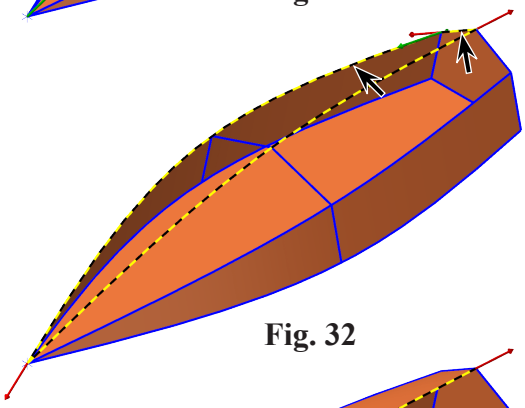


Fig. 32

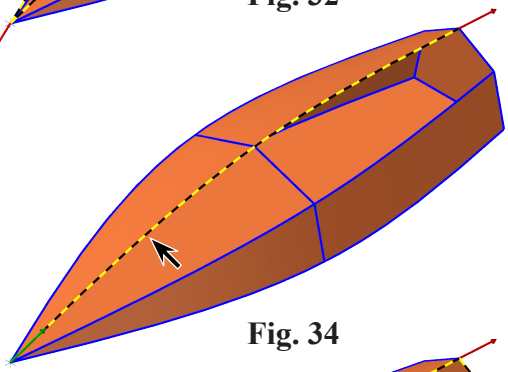


Fig. 34

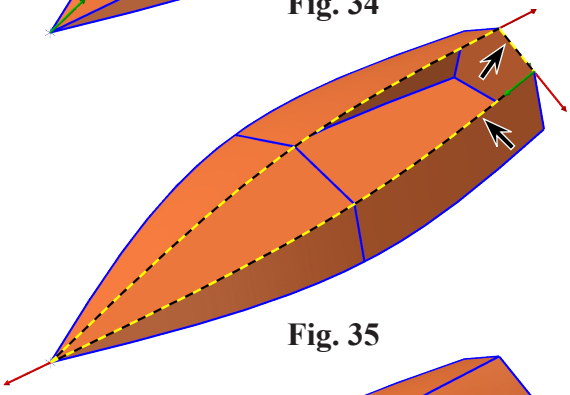


Fig. 35

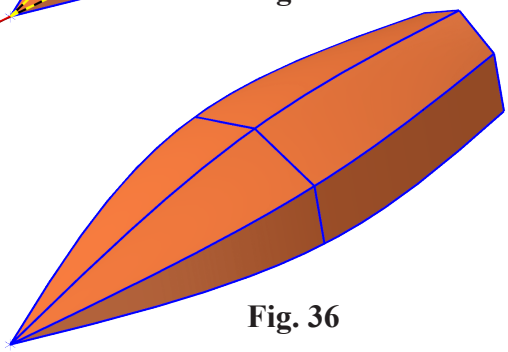


Fig. 36

N. Add Solids Level.

Step 1. In the Levels Manager (**Alt-Z**):
Key-in **4** in Number field, **Fig. 37**
Press **Tab** key to move to Name Field and key-in **SOLIDS**
Click to remove X in Visible column of **GEOMETRY** level to hide level.

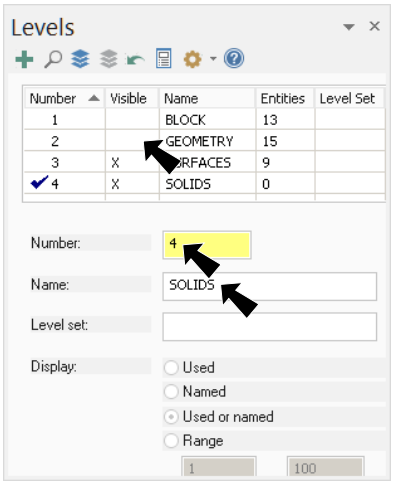


Fig. 37

O. Surfaces Into Solid.

Step 1. On the Solids tab SOLIDS click **From Surfaces** From Surfaces.

Step 2. Use **Ctrl-A** to select all and click **End Selection** End Selection **(ENTER)**, **Fig. 38**.

Step 3. In the From Surfaces function panel:
under Original surface, **Fig. 39**
Select **Keep**
Confirm **6 surfaces**
Click OK .

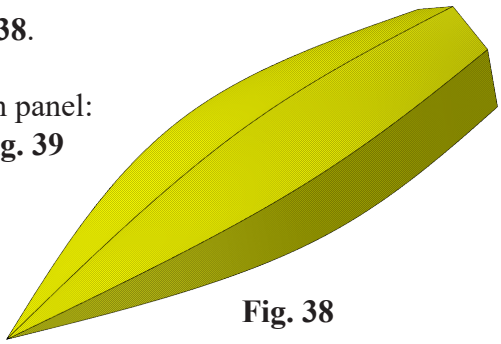


Fig. 38

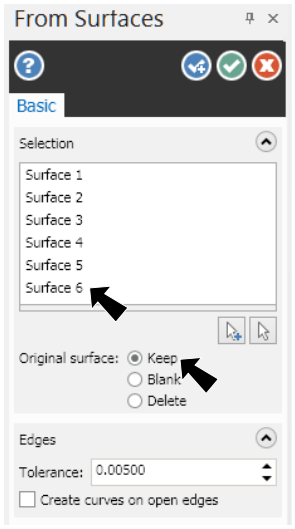


Fig. 39

P. Turn Off Surfaces Level.

Step 1. In the Levels Manager (**Alt-Z**):
Click to remove X in Visible column of **SURFACES** level, **Fig. 40**.
Confirm only 1 entity in the SOLIDS level.

Step 3. Save (**Ctrl-S**).

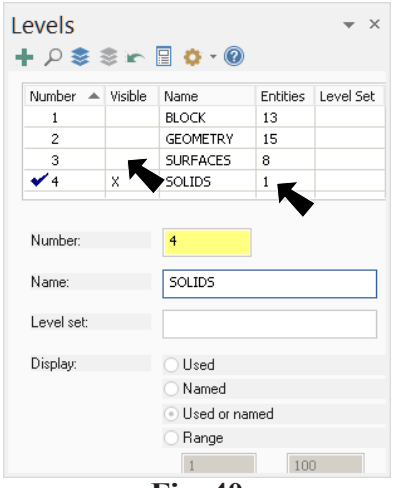


Fig. 40

Q. Shell Solid.

Step 1. Rotate view to view **top of hull**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 41**.

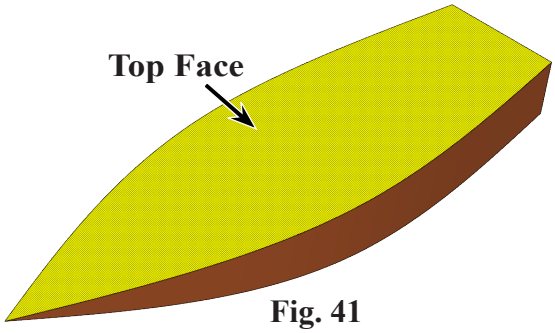


Fig. 41

Step 2. On the Solids tab SOLIDS click **Shell** Shell.

Step 3. In the Solid Selection dialog box, select **Face** and unselect others, **Fig. 42**.

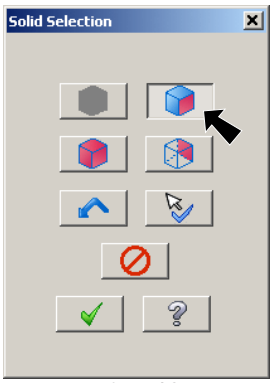


Fig. 42

Step 4. Click the top face of the hull, **Fig. 41** and click OK in the Solid Selection dialog box.

Step 5. In the Shell function panel:
under Operation, **Fig. 43**
select **Direction 1**
under Shell Thickness
Thickness .05
Direction arrow should point down
Click OK .

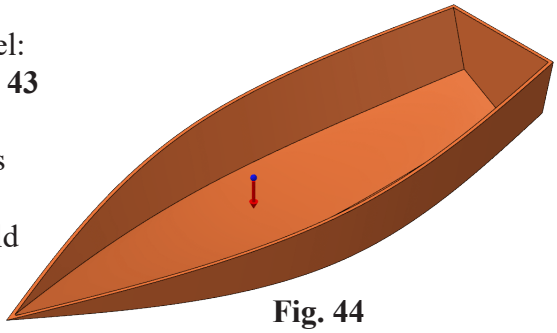


Fig. 44

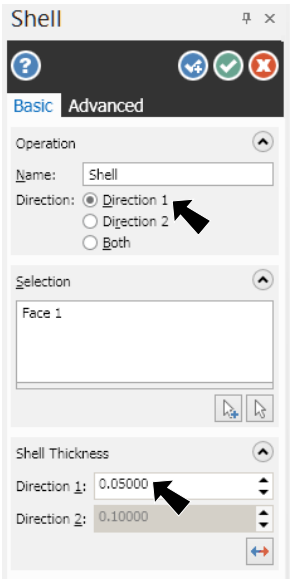


Fig. 43

Step 6. Save (**Ctrl-S**).

R. Change Solid Color.

Step 1. On the Model Prep tab MODEL PREP click **Clear All** Clear All and click **Set Feature** Set Feature.

Step 2. In the Coloors Dialog box:
Key-in **54** in Current color field, **Fig. 45**
Click OK .

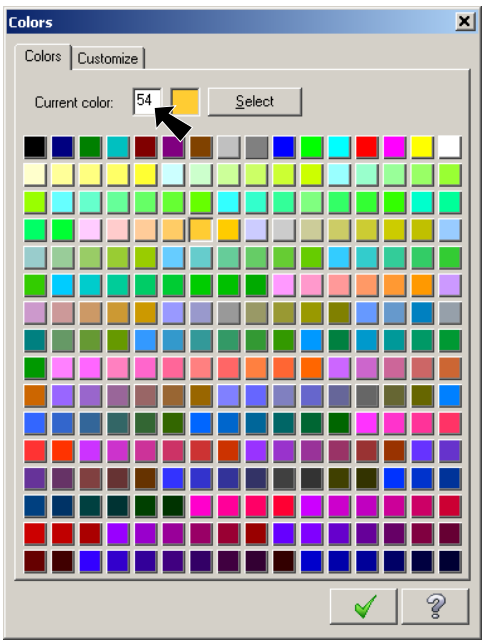


Fig. 45

Step 3. Click **inside hull** to select shell feature and click **outside hull** for solid feature **Fig. 46**. Press Escape.

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

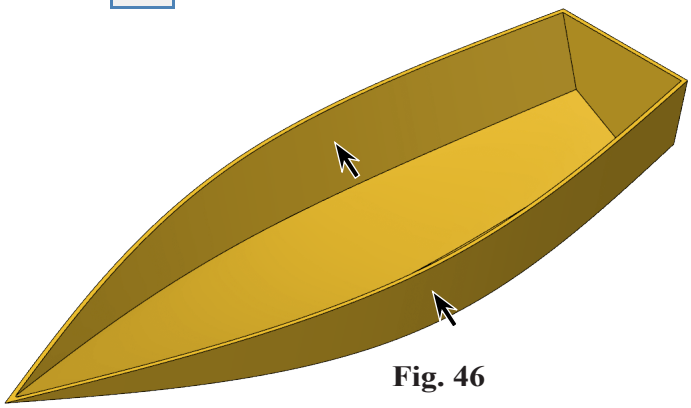


Fig. 46