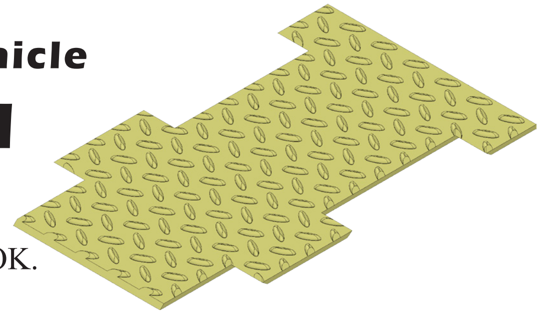
Chapter 30

Cluster Wheel Vehicle
Bed Panel



A. Extrude1.

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

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

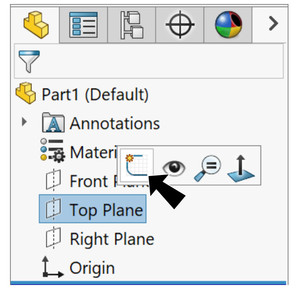


Fig. 1

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

Step 4. Sketch a rectangle at Origin, **Fig. 2**.

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

Step 6. Add dimensions, **Fig. 2**.

Step 7. Click **Features** on the Command Manager toolbar.

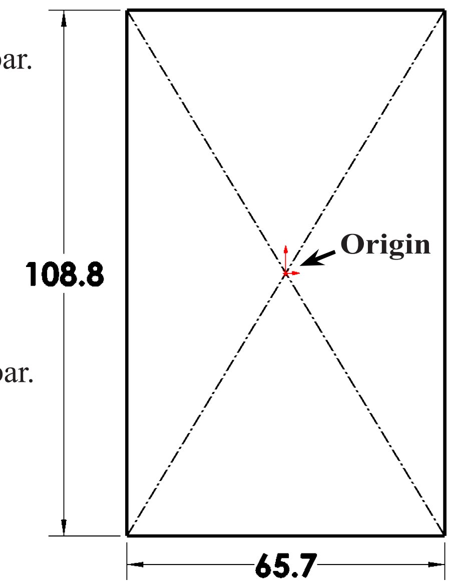


Fig. 2

Step 8. Click **Extruded Boss/Base** on the Features toolbar.

Step 9. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 3**

End Condition **Blind**

Depth 1.2

click OK .

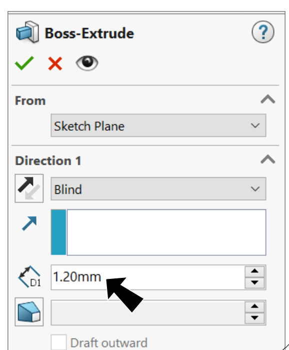


Fig. 3

B. Save as "BED PANEL.

Step 1. Click File Menu > Save As.

Step 2. Key-in **BED PANEL** for filename and press ENTER.

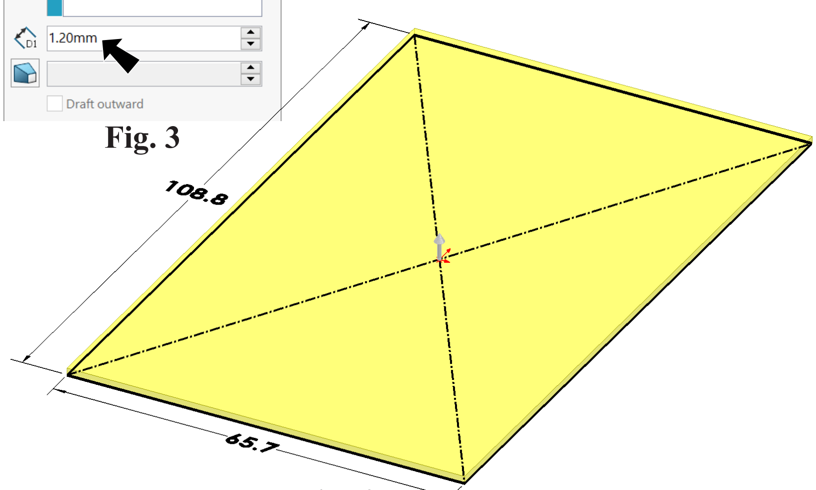


Fig. 4

2/12/25

C. Chamfer.

Step 1. Click **Chamfer** Chamfer on the Features toolbar.

Step 2. In the Chamfer Property Manager set:
under Chamfer Type, **Fig. 5**

select **Angle Distance**
click **top front edge**, **Fig. 6**
under Chamfer Parameters

Distance 1.2
Angle 45º
click OK .

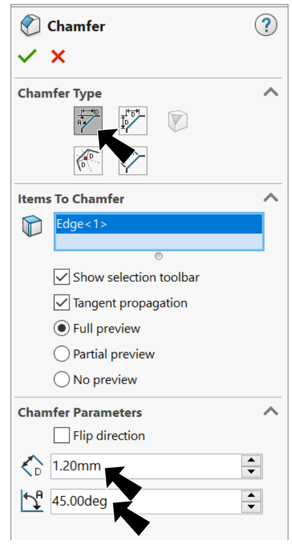


Fig. 5

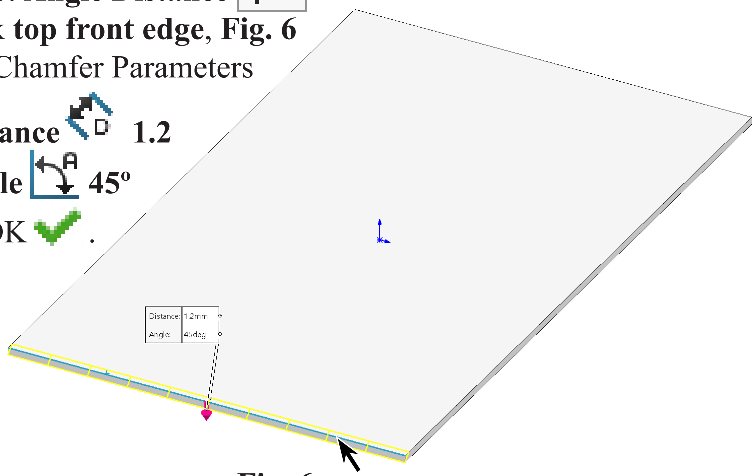


Fig. 6

D. Extruded Cut1 Sketch2 Wheel Wells.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 7**.

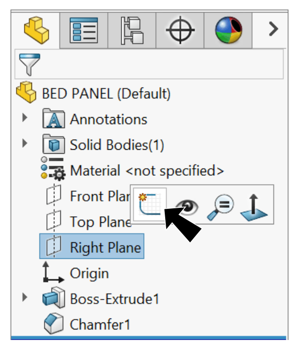


Fig. 7

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

Step 3. Sketch **two circles**, **Fig. 8**.

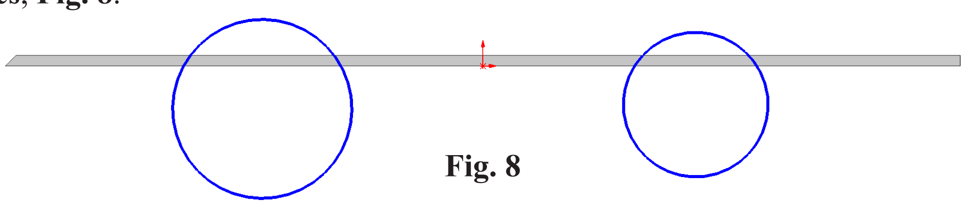


Fig. 8

Step 4. **Unselect Circle tool**. To unselect, right click graphics area and click Select from menu.

Step 5. **Ctrl click both circles** to select both. Release Ctrl key and click **Make Equal** on the context toolbar, **Fig. 9**.

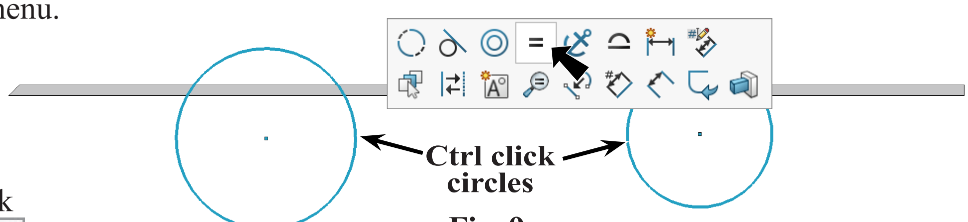
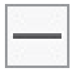


Fig. 9

Step 6. **Ctrl click both circles center-points** to select both. Release Ctrl key and click **Make Horizontal**  on the context toolbar, **Fig. 10**.

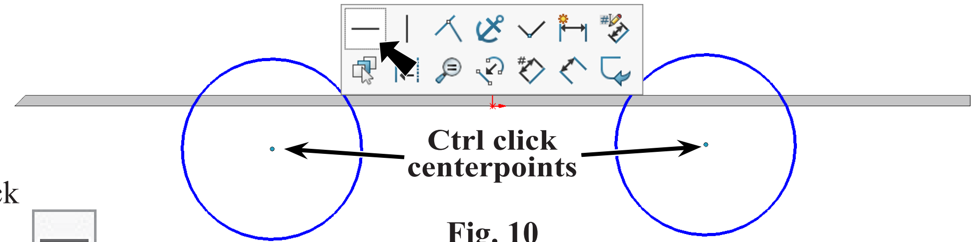
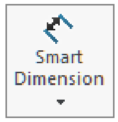


Fig. 10

Step 7. Click **Smart Dimension** 

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

Step 8. Add dimensions, **Fig. 11**.

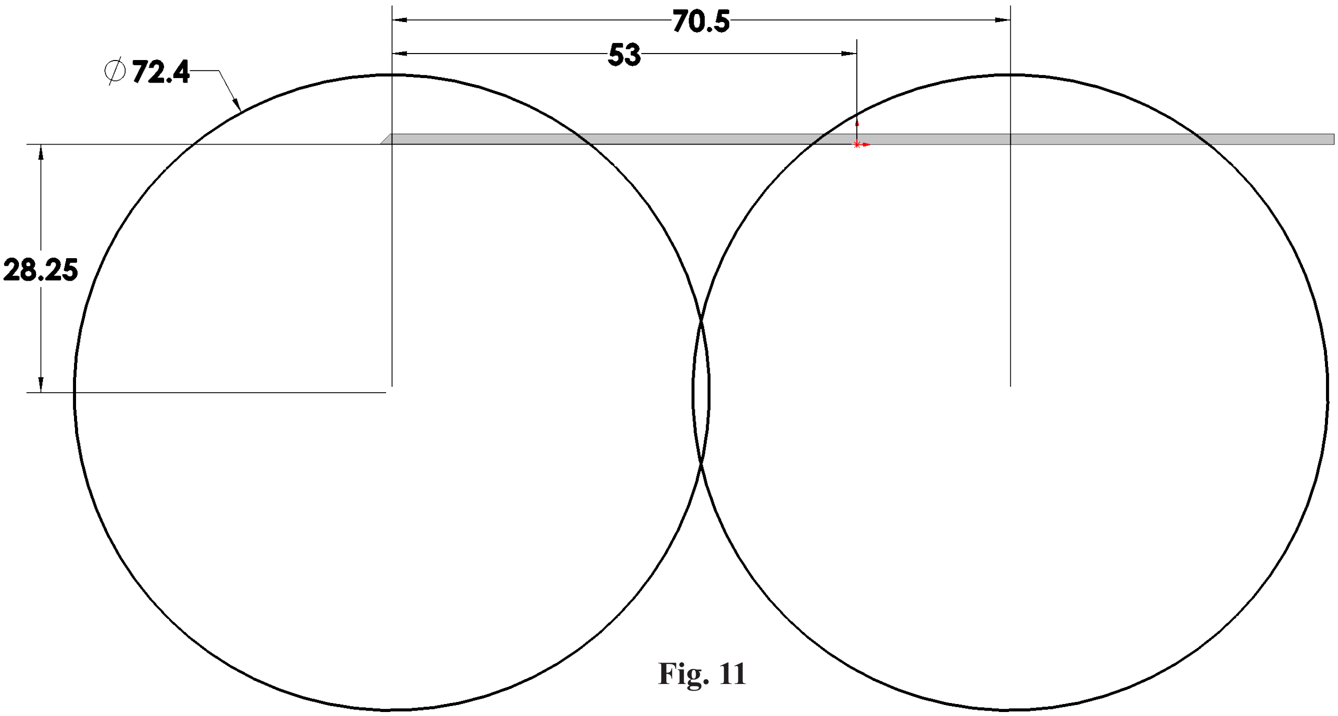


Fig. 11

Step 9. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**)

Step 10. Click **Features** [Features] on the Command Manager toolbar.

Step 11. Click **Extruded Cut** [Extruded Cut] on the Features toolbar.

Step 12. In the Cut-Extrude Property Manager set:

under From, **Fig. 12**

Start Condition **Offset 23.1**

under Direction 1

Reverse Direction

End Condition **Through All**

under Selected Contours

click the **two contours**, **Fig. 13**

click OK .

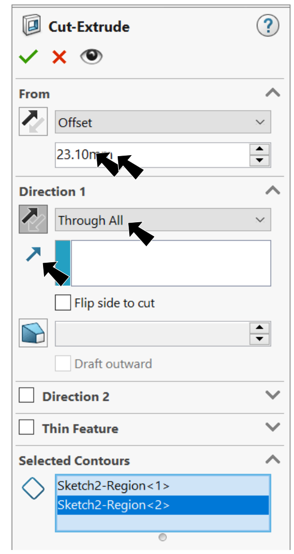


Fig. 12

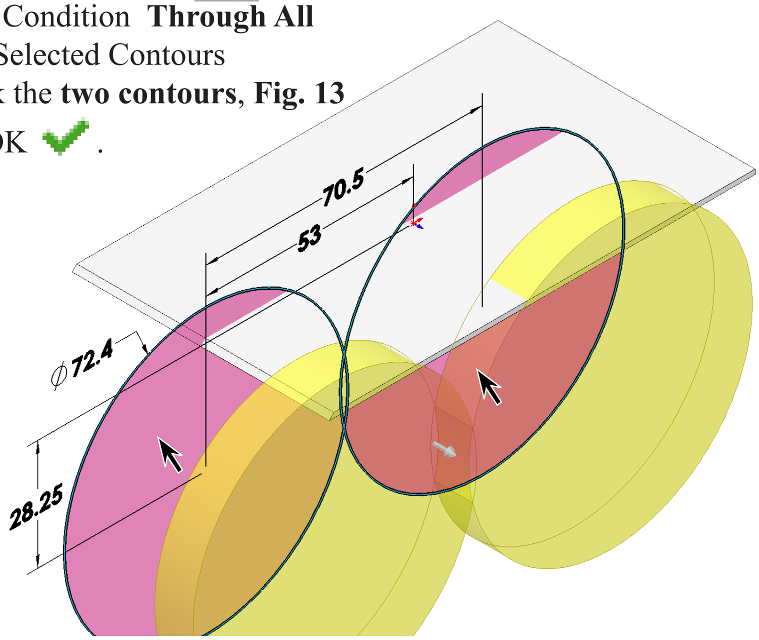


Fig. 13

E. Mirror1 Wheel Wells.

Step 1. **Ctrl click Right Plane** and **Cut-Extrude1** features to select Plane and feature, **Fig. 14**.

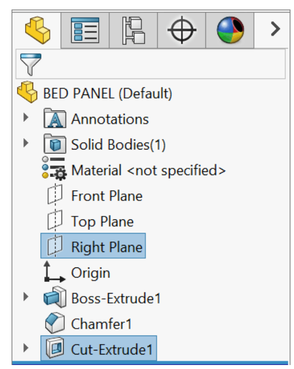


Fig. 14

Step 2. Click **Mirror** [Mirror] on the Features toolbar.

Step 3. In the Mirror Property Manager click OK .

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

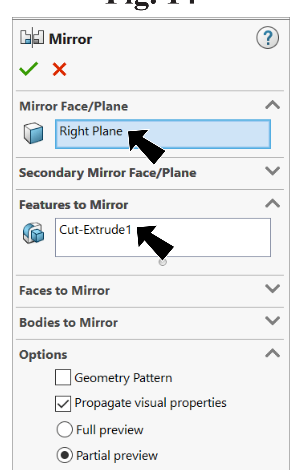


Fig. 15

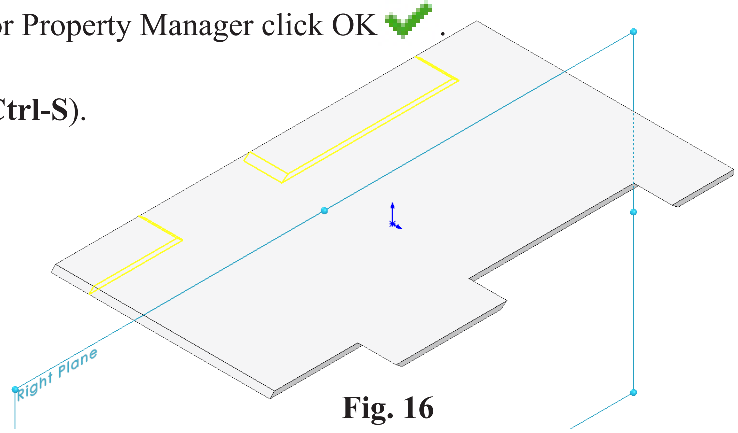


Fig. 16

F. Extrude2 Sketch2 Diamond Tread.

Step 1. Click the **top face** and click **Sketch** on the context toolbar, **Fig. 17**.

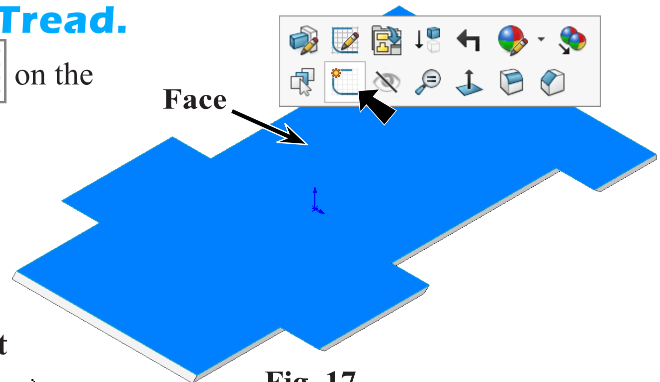


Fig. 17

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

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

Step 4. Sketch **vertical centerline down from the midpoint of top edge**, **Fig. 18**.

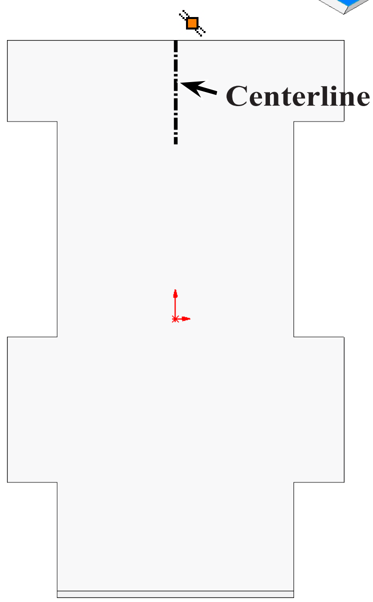


Fig. 18

Step 5. Click **Ellipse** (S) in the **Ellipse flyout** on the Sketch toolbar.

Step 6. In the Ellipse Property Manager check **Add construction lines**, **Fig. 19**.

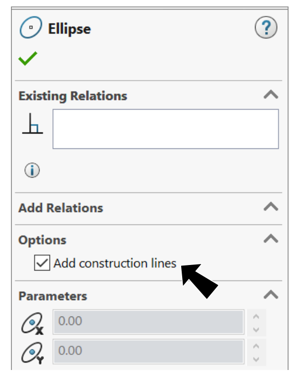


Fig. 19

Step 7. Sketch an **ellipse's major axis rotated slightly counterclockwise direction across the vertical centerline**, **Fig. 20**.

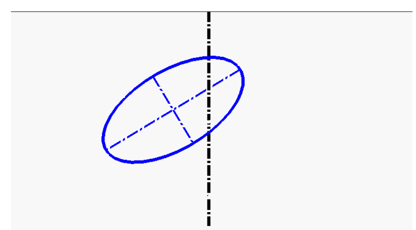


Fig. 20

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

Step 9. Add dimensions, **Fig. 21**. To dimension angle to imaginary line, click long construction line and bottom endpoint of construction line, then click the **right horizontal crosshair** and place dimension.

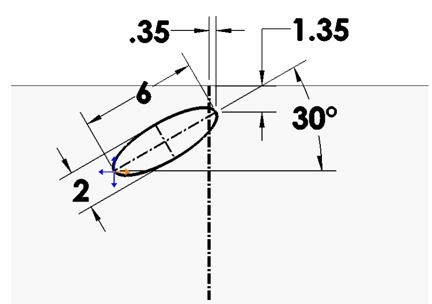


Fig. 21

Step 10. Click **Isometric** on the Standard Views toolbar. **(Ctrl-7)**

Step 11. Click **Extruded Boss/Base** on the Features toolbar.

Step 12. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 22**

End Condition **Blind**

Depth **1**

uncheck **Merge result**

click OK .

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

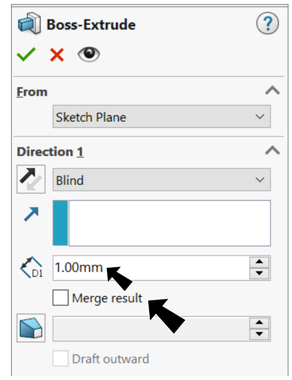


Fig. 22

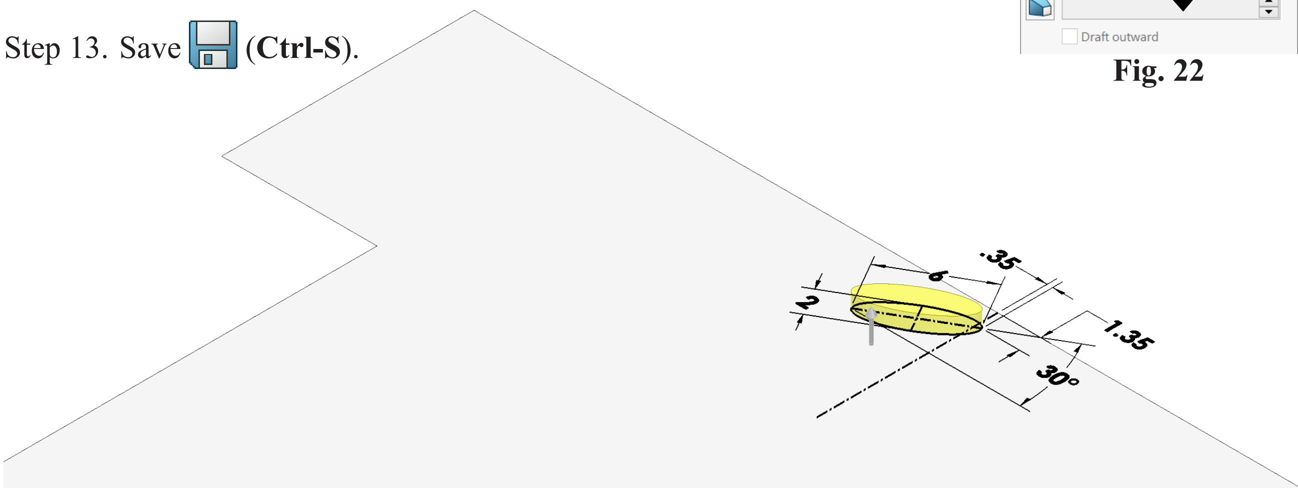


Fig. 23

G. Fillet.

Step 1. Click **Fillet** on the Features toolbar.

Step 2. In the Fillet Property Manager set:

select **FilletXpert**, **Fig. 24**

Radius **.9**

click **top face**, **Fig. 25**

click OK .

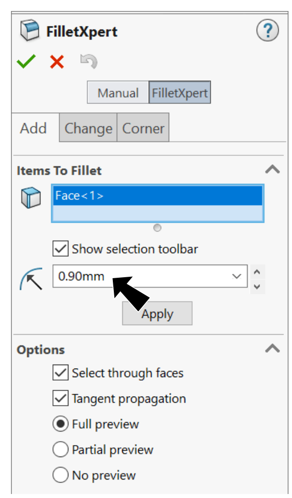


Fig. 24

Fig. 25

H. Linear Pattern1.

Step 1. Click **Linear Pattern** on the Features toolbar.

Step 2. In the Linear Pattern Property Manager set:
under Direction 1, **Fig. 26**
click a **side edge** , **Fig. 27**
Spacing D1 **3.75**
Number of Instances # **2**
under Bodies
click the **Fillet1 body**
click OK .

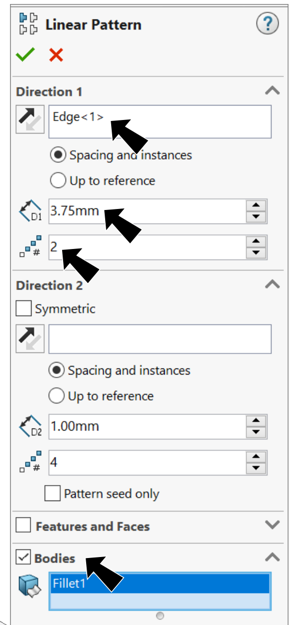


Fig. 26

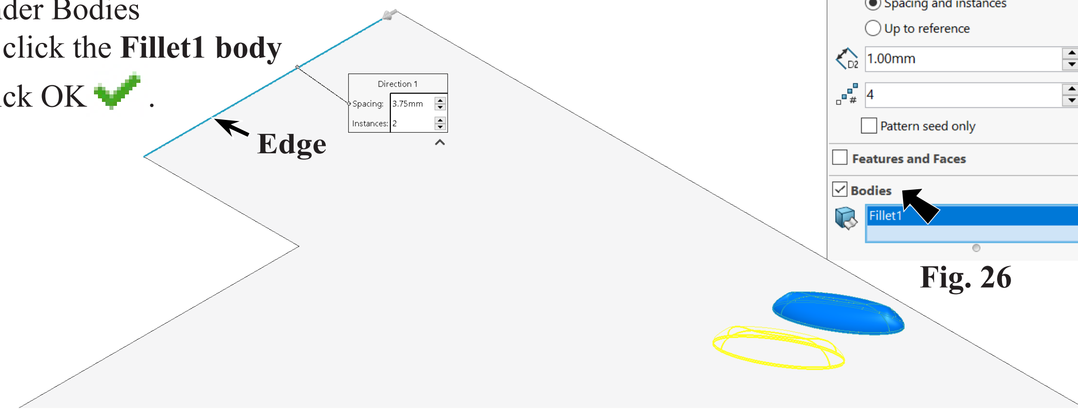


Fig. 27

I. Mirror2 Body.

Step 1. Expand Solid Bodies folder in the Feature Manager. **Ctrl click LPattern1 body and Right Plane** to select Body and Plane, **Fig. 28**.

Step 2. Click **Features** Features on the Command Manager toolbar.

Step 3. Click **Mirror** Mirror on the Features toolbar.

Step 4. In the Mirror Property Manager click OK

Step 5. Save **(Ctrl-S)**.

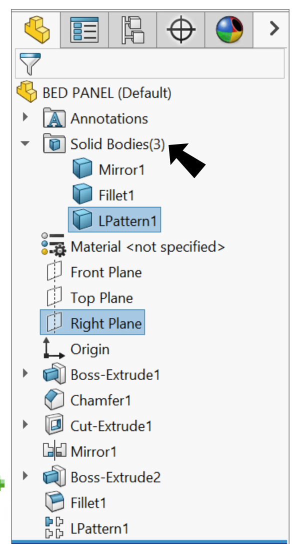


Fig. 28

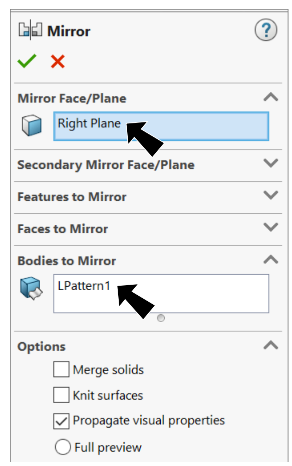


Fig. 29

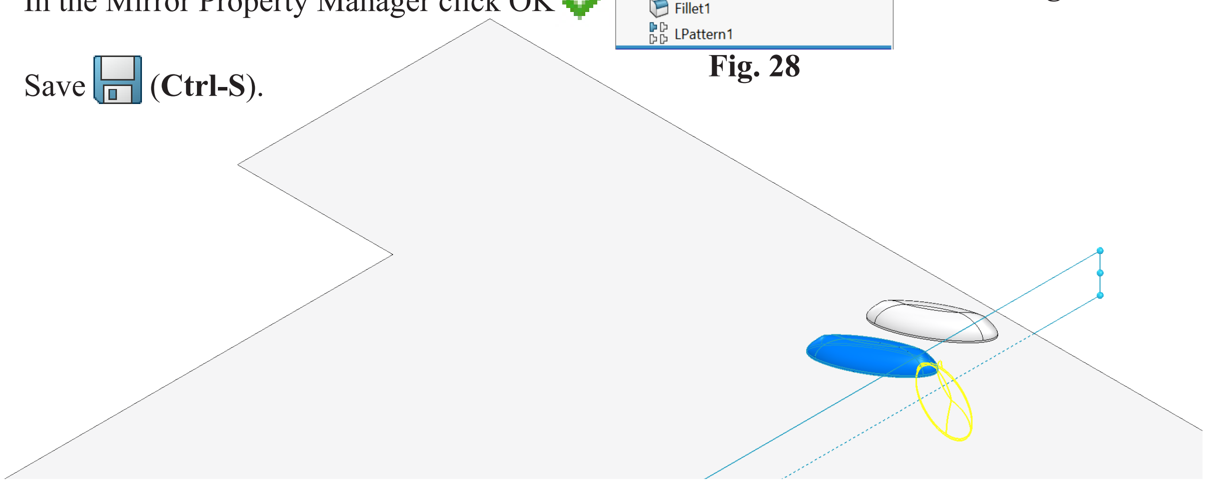


Fig. 30

J. Linear Pattern2.

Step 1. **Hide LPattern1** body, **Fig. 31**. To hide, expand Solid Bodies folder in the Feature Manager. Click **LPattern1** and **Hide** on the context toolbar.

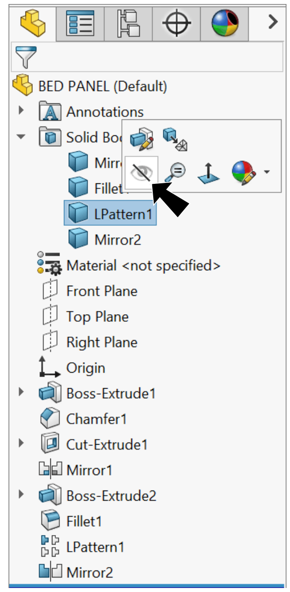


Fig. 31

Step 2. Click **Linear Pattern** on the Features toolbar.

Step 3. In the Linear Pattern Property Manager set:
under Direction 1, **Fig. 32**
click a **side edge, Fig. 33**
Spacing 8
Number of Instances 14
check Bodies
click **both bodies Fillet1 and Mirror2**
click OK .

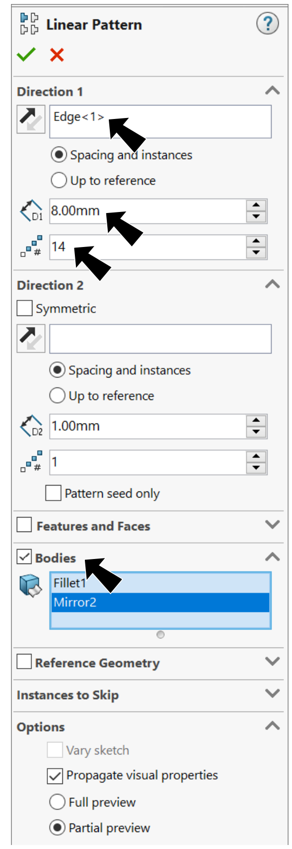


Fig. 32

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

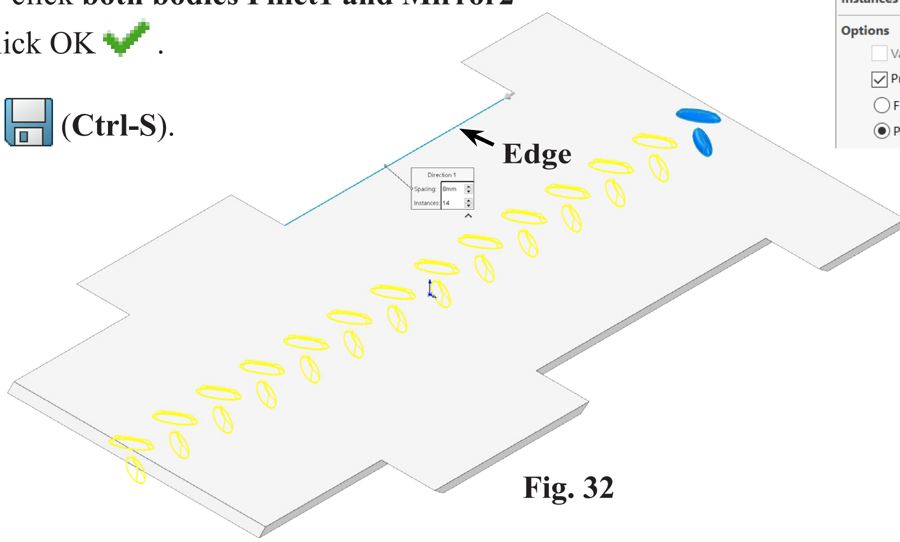


Fig. 32

K. Linear Pattern3.

Step 1. Click **Linear Pattern** on the Features toolbar.

Step 2. In the Linear Pattern Property Manager set:
  under Direction 1, **Fig. 34**
    click **top edge**, **Fig. 35**
    Spacing **10**
    Number of Instances **4**
  under Direction 2
    check **Symmetric**
  check Bodies
    drag a selection to **select all the little bodies**
  click OK .

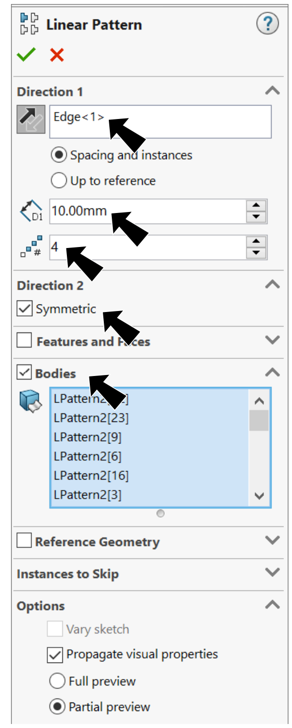


Fig. 34

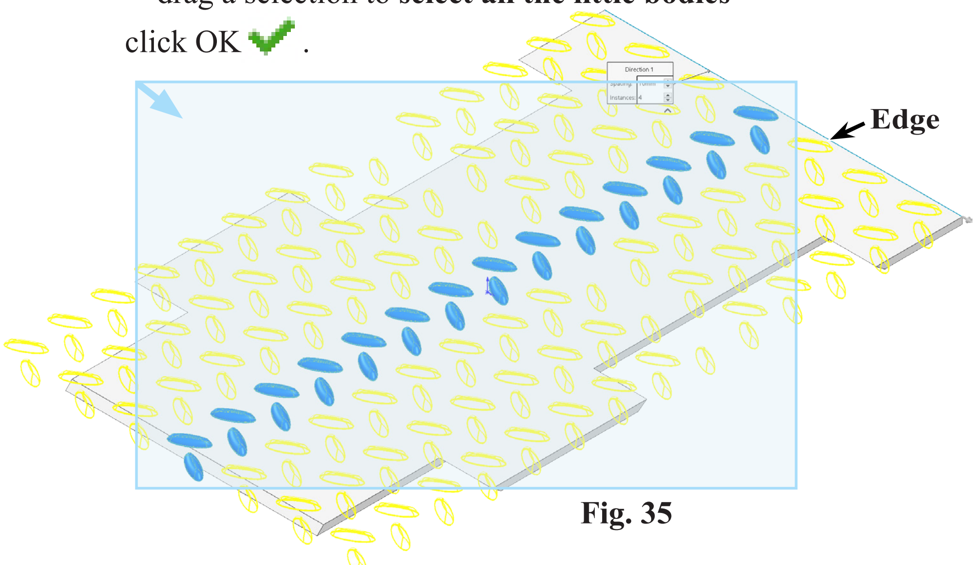


Fig. 35

L. Delete Bodies.

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

Step 2. Click Insert Menu > Features > Delete/Keep Bodies.

Step 3. In the Delete/Keep Property Manager:
  under Type, **Fig. 36**
    select **Delete Bodies**
  under Bodies to delete
    click **bodies completely**
    outside Extrude1, **Fig. 37**
  click OK .

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

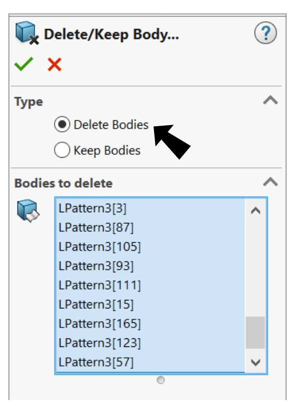


Fig. 36

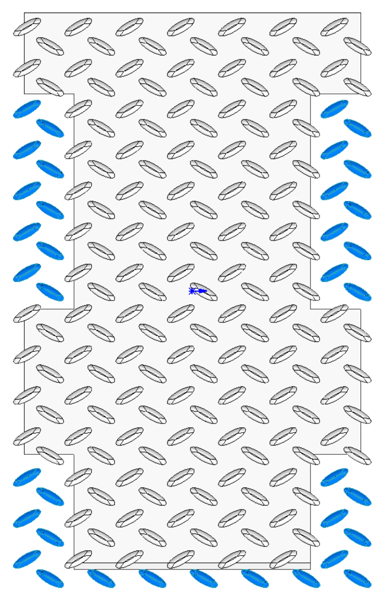


Fig. 37

M. Extruded Cut1 Sketch2 Wheel Wells.

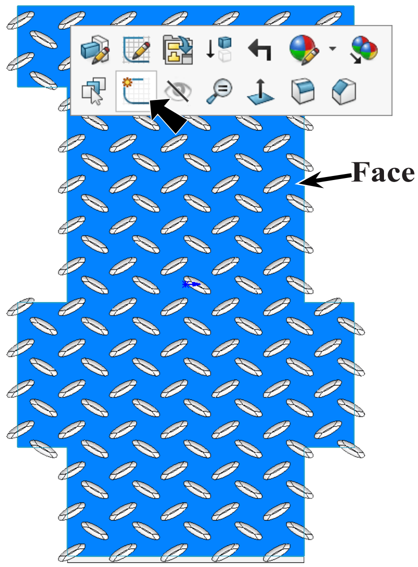


Fig. 38

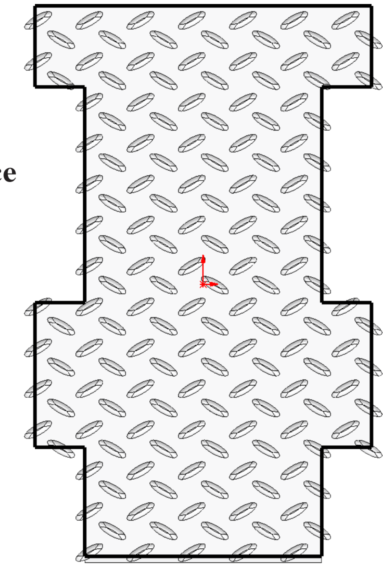


Fig. 39

Step 1. Click **top face** and click **Sketch** on the context toolbar, **Fig. 38**.

Step 2. With the face still selected, click **Convert Entities** on the Sketch toolbar, **Fig. 39**.

Step 3. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**)

Step 4. Click **Features** on the Command Manager toolbar.

Step 5. Click **Extruded Cut** on the Features toolbar.

Step 6. In the Cut-Extrude Property Manager set:

under Direction 1, **Fig. 40**

Reverse Direction

End Condition **Through All**

check **Flip side to cut**

click **Draft** **45º**

check **Draft outward**

click OK .

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

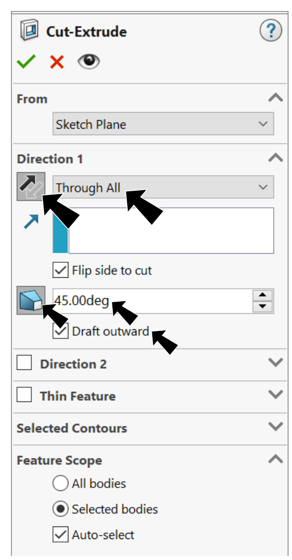


Fig. 40

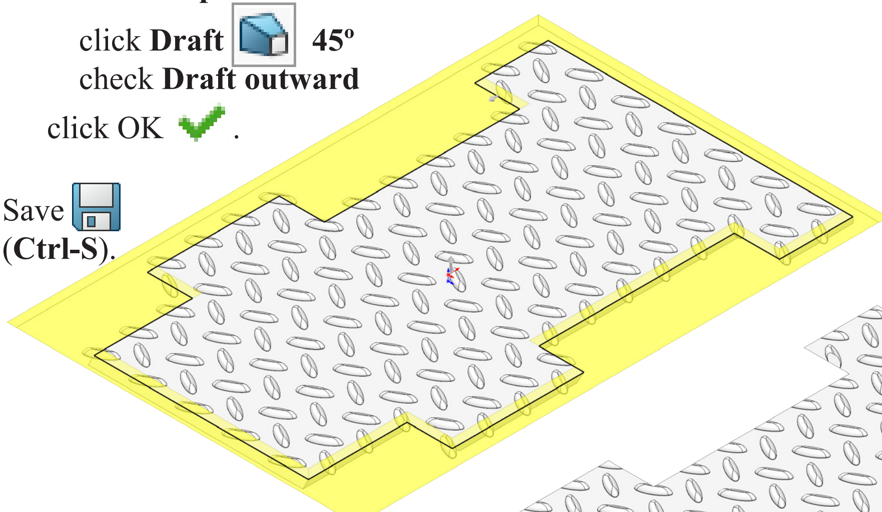


Fig. 41

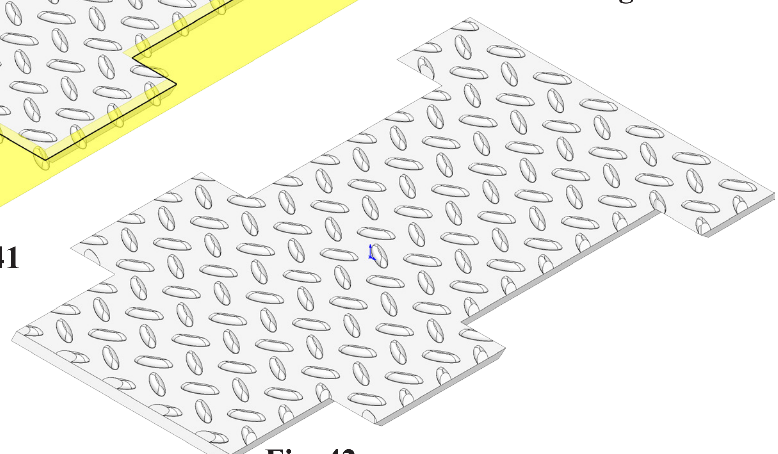


Fig. 42

N. Combine Bodies.

Step 1. Click Insert Menu > Features > Combine.

Step 2. In the Combine Property Manager:
under Operation Type, **Fig. 43**
select **Add**
select all - drag a selection
or **Ctrl-A**, **Fig. 44**
click OK ✔.

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

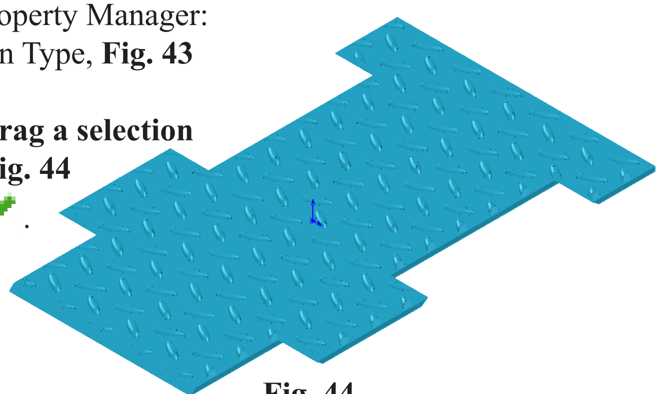


Fig. 44

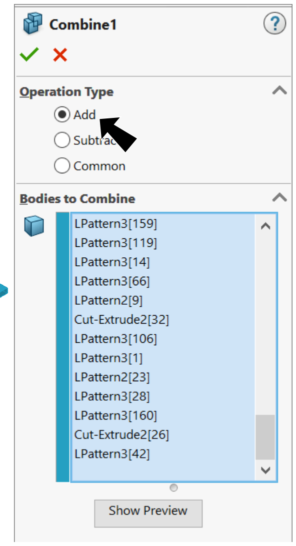


Fig. 43

O. Appearance: Green.

Step 1. Click part, click **Appearance Callout** on the context toolbar and click **BED PANEL**, **Fig. 45**.

Step 2. In the Appearances Task pane at the bottom select **CWV** and in the lower pane select **army green plastic**, **Fig. 46**.

Step 3. Click OK ✔ in Property Manager.

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

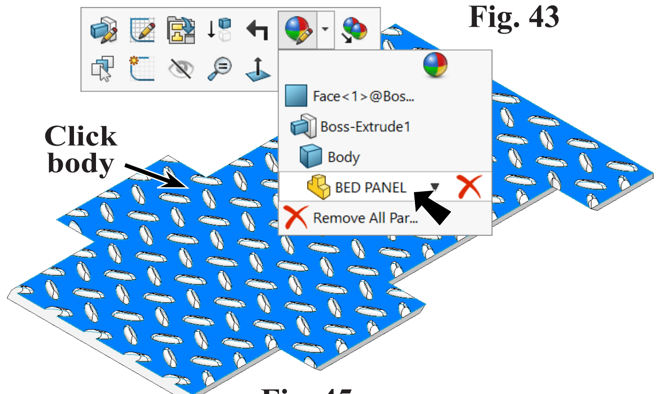


Fig. 45

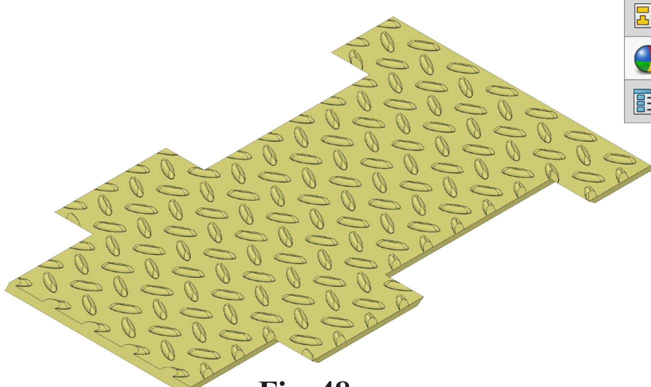


Fig. 48

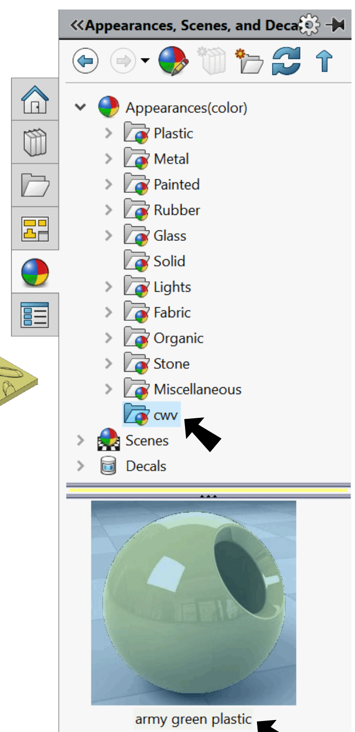


Fig. 46

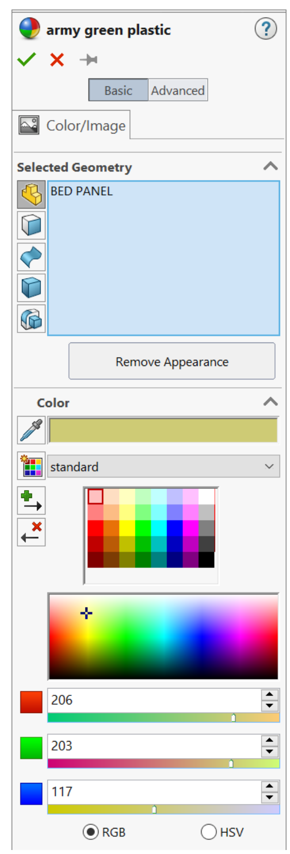


Fig. 47

P. Open CWV Assembly File.

Step 1. Open your **CWV Assembly** file.

Step 2. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**)

Step 3. **Isolate the Hatch** component, **Fig. 49**. To Isolate, **Right click Hatch** in the graphics area and click **Isolate** from menu.

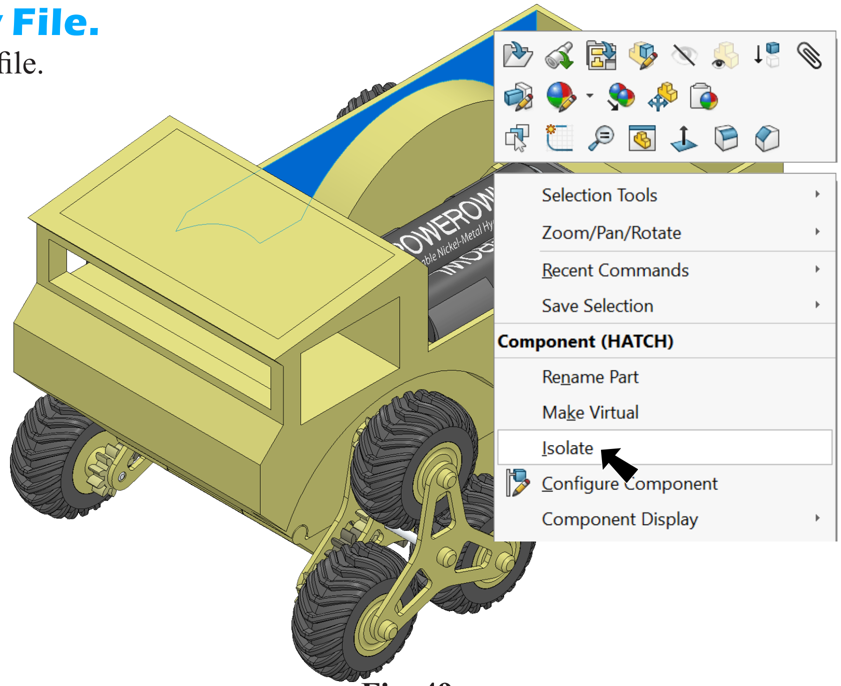
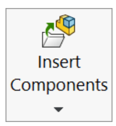


Fig. 49

Q. Insert Bed Panel.

Step 1. Click **Insert Components**


on the Assembly toolbar.

Step 2. Browse, Open Bed Panel and place, **Fig. 50**.

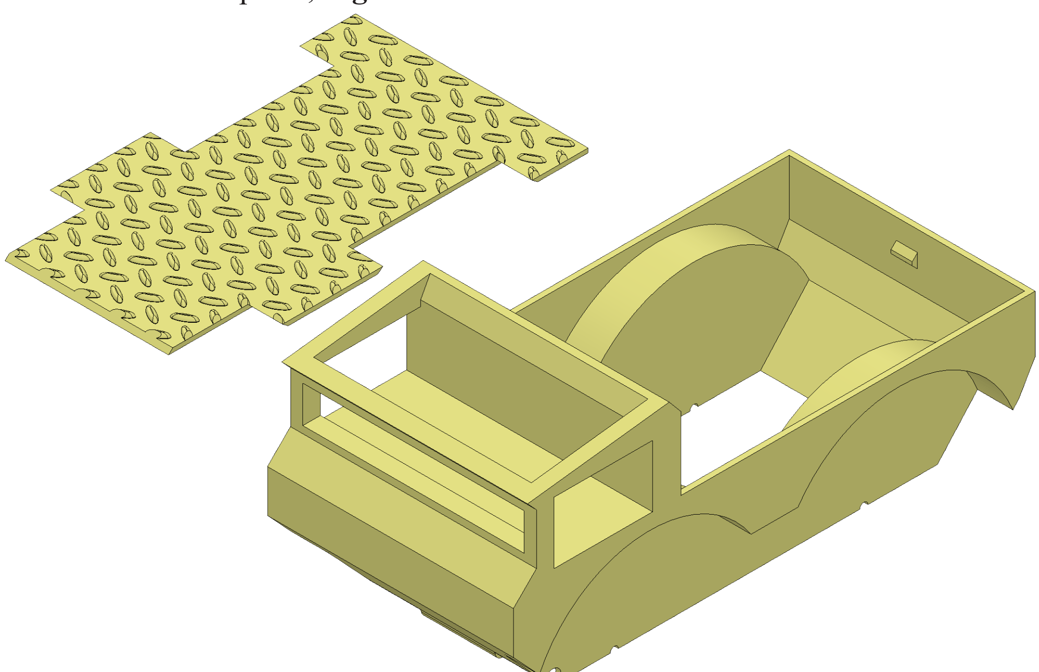


Fig. 50

R. Mate: Panel.

Step 1. Click **Right Plane** in the Feature Manager and **Mate** on the context toolbar, **Fig. 51**.

Step 2. Expand the flyout Feature Manager design tree, expand **Panel** and click **Right Plane**, **Fig. 52**.

Step 3. Click Add/Finish Mate in Mate pop-up toolbar to add a **Coincident** mate.

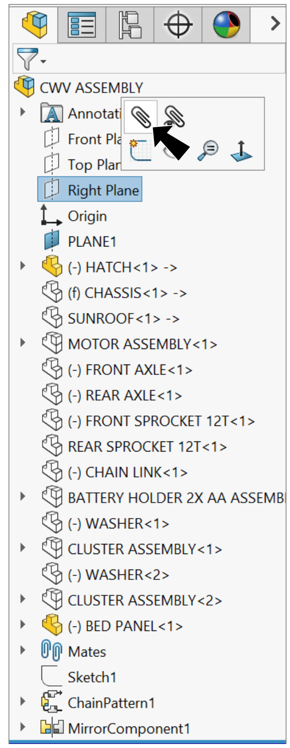


Fig. 51

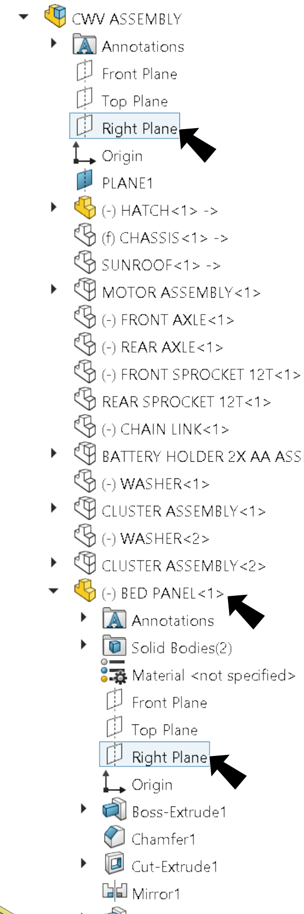


Fig. 52

Right to Right

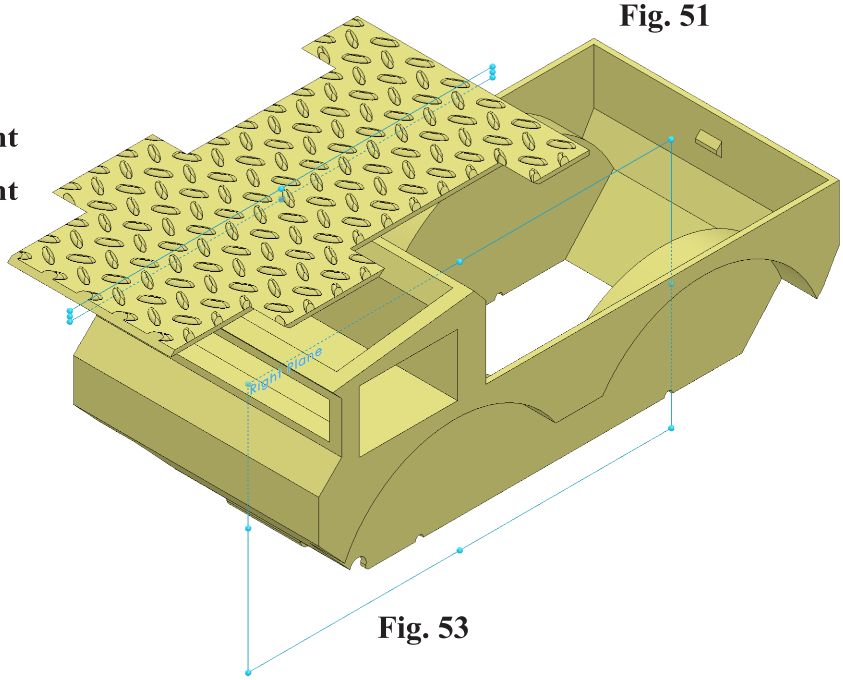


Fig. 53

Step 4. Expand **Hatch** in flyout Feature Manager design tree and click **Top Plane**. Expand **Panel** and click **Top Plane**, **Fig. 54**.

Step 5. Click **Distance** in Mate pop-up, **Fig. 55**. Set **distance 41** and press ENTER. The Panel should positioned down into the Hatch, **Fig. 56**. Click Add/Finish Mate to add Distance mate.

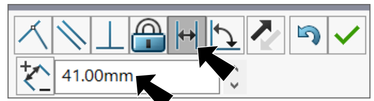


Fig. 55

Hatch Top Plane
to
Bed Panel Top Plane
Distance 41

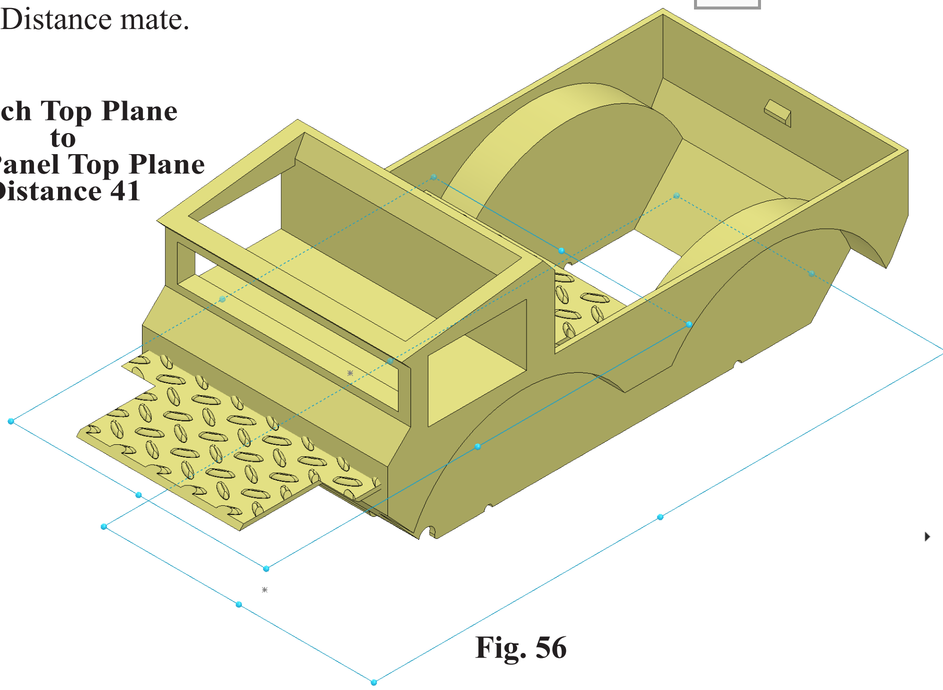


Fig. 56

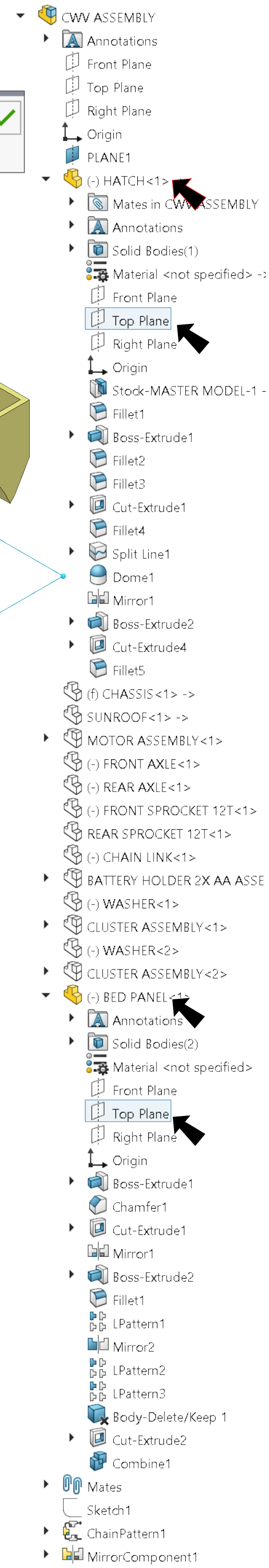


Fig. 54

Step 6. Click **inside rear face of Hatch bed**, **hide top face of Panel** and click **rear face of Panel**, **Fig. 57**. To hide face, hover cursor over face and press **Alt key**.

Step 7. Click Add/Finish Mate in Mate pop-up toolbar to add a **Coincident** mate.

Step 8. Click OK in the Property Manager.

Step 9. Exit Isolate. To Exit, click **Exit Isolate** Exit Isolate on the Isolate pop-up toolbar, **Fig. 59**.

Step 10. Save **(Ctrl-S)**.

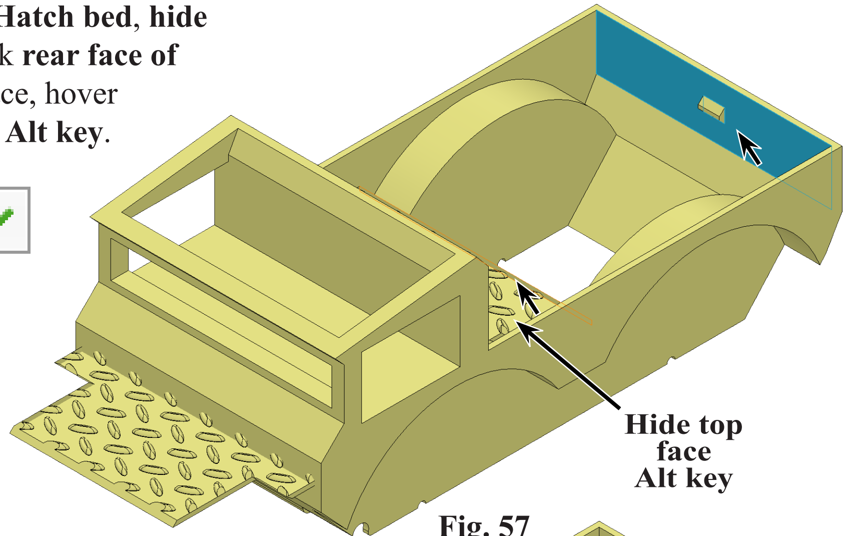


Fig. 57

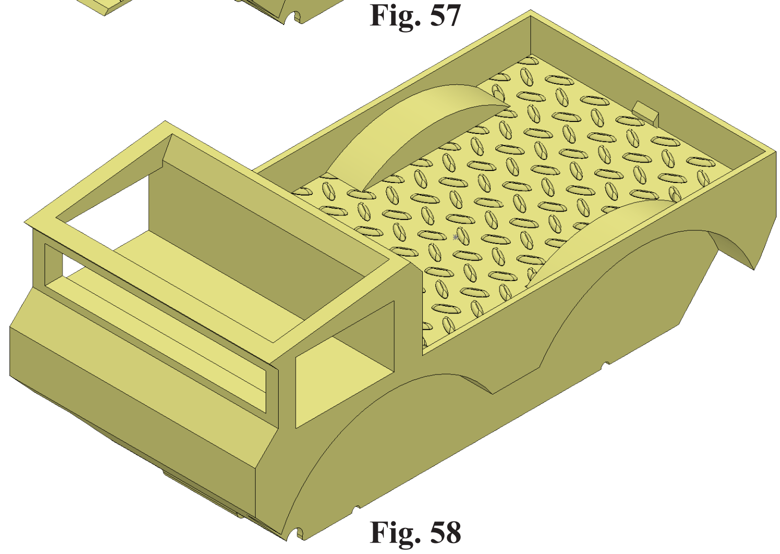


Fig. 58

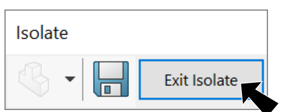


Fig. 59

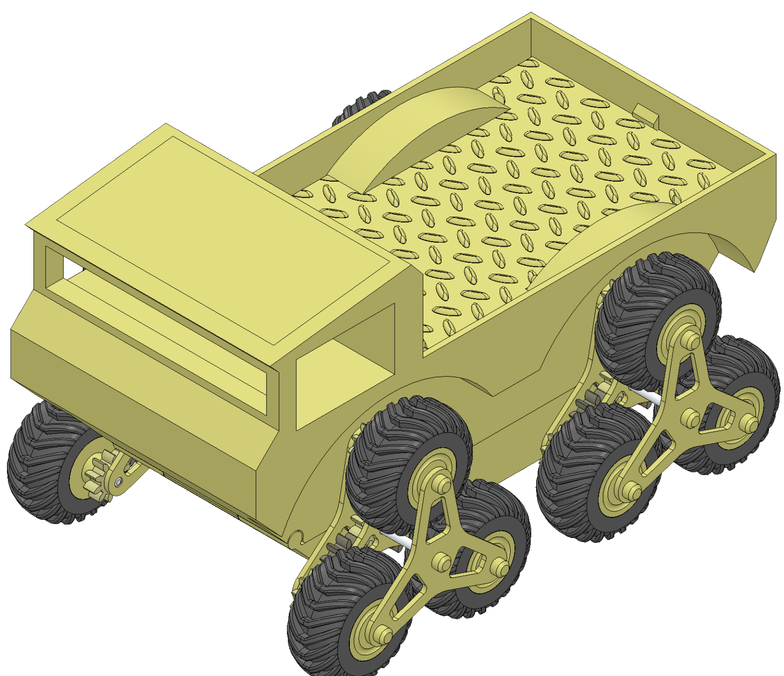


Fig. 60