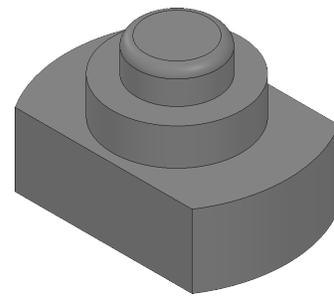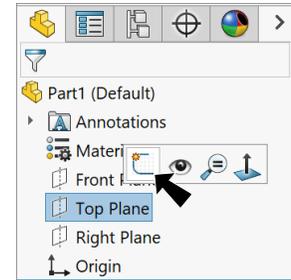# Cluster Wheel Vehicle
Switch

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**.

Step 3.   Click **Center Rectangle** in the **Rectangle flyout** on the Sketch toolbar.
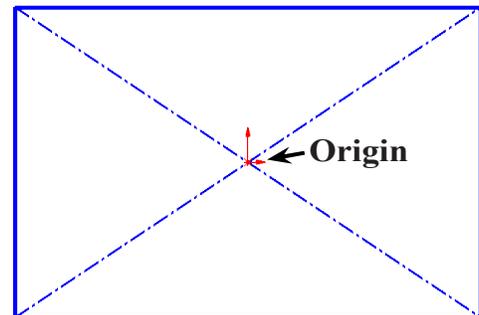
Fig. 1

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

Step 5.   Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 6.   Sketch **vertical centerline from Origin**, **Fig. 3**.

← Origin

Fig. 2

Step 7.   Click **3 Point Arc** (**S**) in the **Arc flyout** on the Sketch toolbar.

Step 8.   Sketch **arc across top and bottom lines with arc tangent with left line**, **Fig. 4**.

Step 9.   **Unselect Arc tool**. To unselect, right click graphics area and click Select from menu.
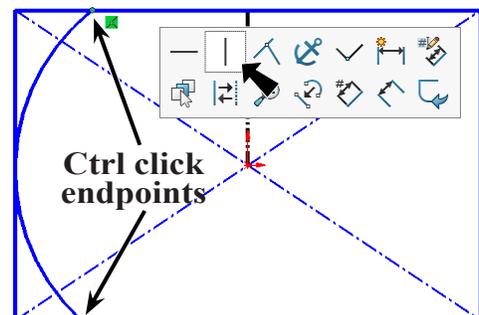
Fig. 3

Step 10. **Ctrl click arc endpoints** to select both. Release Ctrl key and click **Make Vertical** on the context toolbar, **Fig. 5**.

Fig. 4

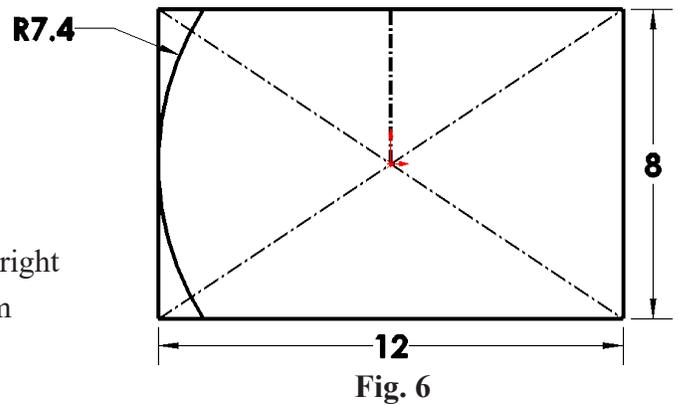**Ctrl click endpoints**
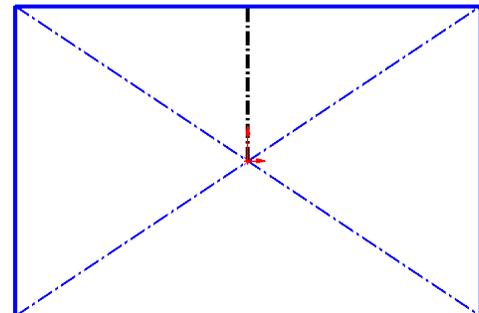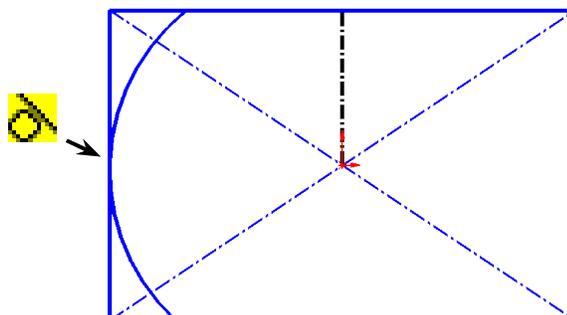
Fig. 5

Step 11. Click **Smart Dimension** [Smart Dimension] (**S**) on the Sketch toolbar.
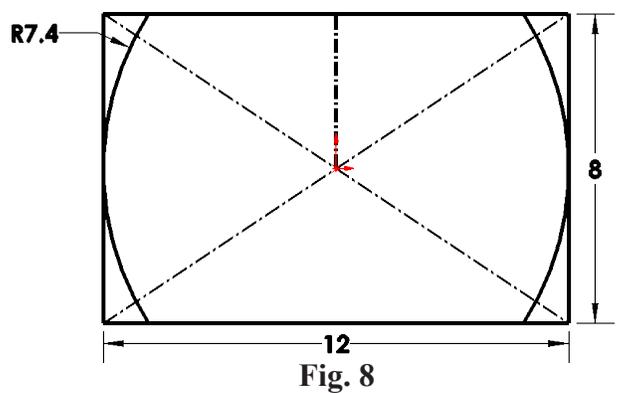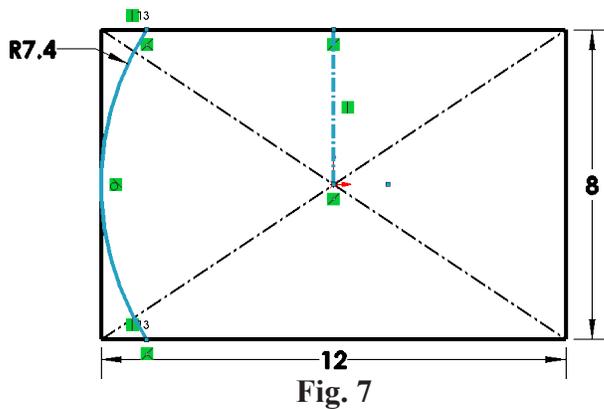
Step 12. Add dimensions, **Fig. 6**.

Step 13. **Unselect Smart Dimension**. To unselect, right click graphics area and click Select [cursor] from menu.
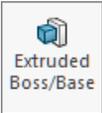
Fig. 6

Step 14. **Ctrl click arc and centerline** to select both, **Fig. 7**.

Step 15. Click **Mirror Entities** [Mirror Entities] on the Sketch toolbar, **Fig. 8**.

Fig. 7

Fig. 8

Step 16. Click **Features** [Features] on the Command Manager toolbar.

Step 17. Click **Extruded Boss/Base** [Extruded Boss/Base] on the Features toolbar.

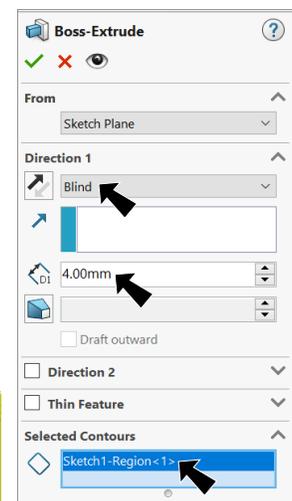Step 18. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 9**
End Condition **Blind**

Depth [D1] **4**
under Selected Contours
click the **contour**, **Fig. 10**
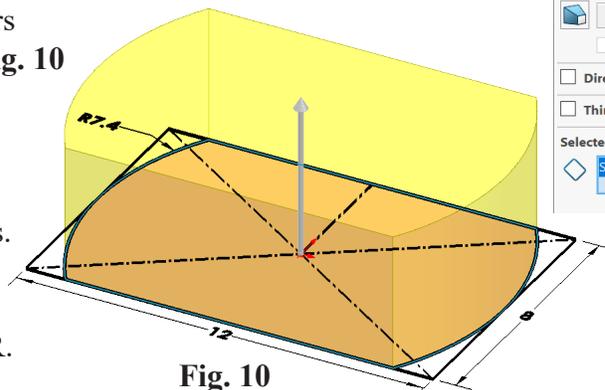click OK [checkmark].

B. Save as "SWITCH".

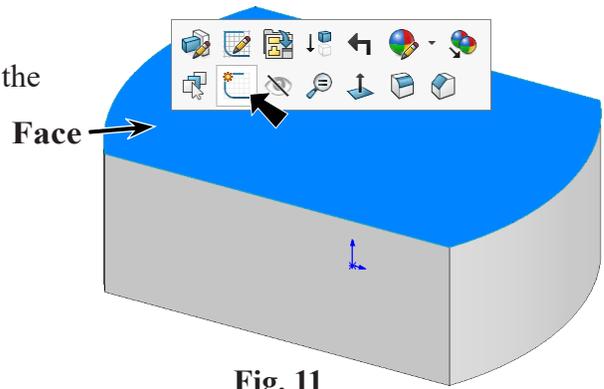Step 1. Click File Menu > Save As.

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

Fig. 9

Fig. 10

C. Extrude2.

Step 1. Click the **top face** and click **Sketch** on the context toolbar, **Fig. 11**.

Face →

Fig. 11

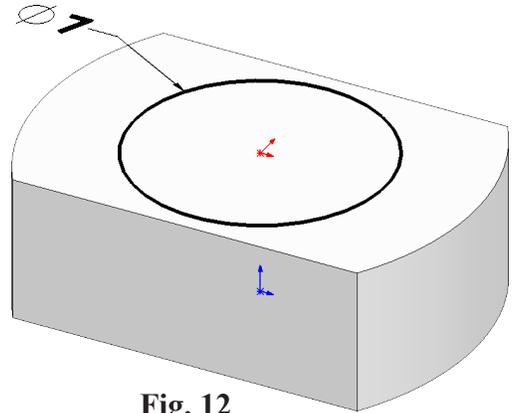Step 2. Click **Circle** (**S**) on the Sketch toolbar.

Step 3. Sketch circle at Origin , **Fig. 12**.

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

Step 5. Dimension **diameter 7**, **Fig. 12**.

Step 6. Click **Features** on the Command Manager toolbar.
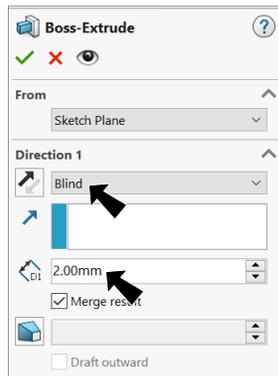
Fig. 12

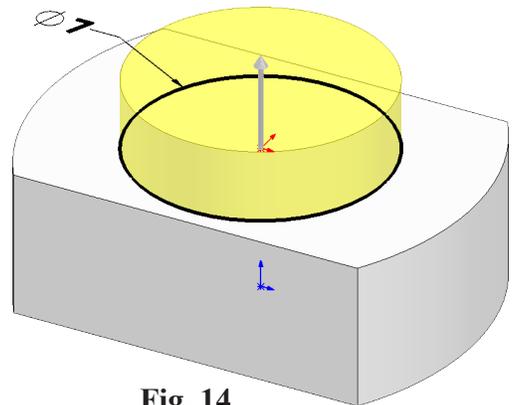Step 7. Click **Extruded Boss/Base** on the Features toolbar.

Step 8. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 13**
End Condition **Blind**

Depth **2**
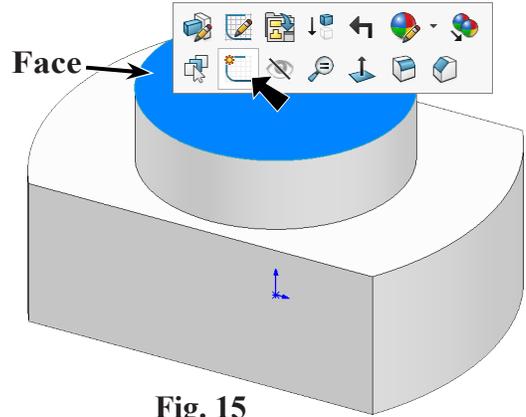click OK .

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

Fig. 13

Fig. 14

D. Extrude3.

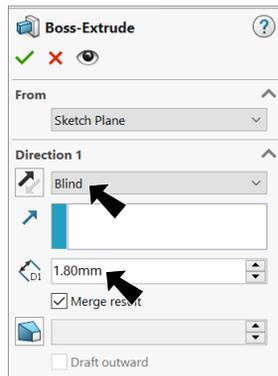**Step 1.** Click the **top face of Extrude2** and click **Sketch** on the context toolbar, **Fig. 15**.

Step 2. Click **Circle** (**S**) on the Sketch toolbar.

Step 3. Sketch circle at Origin , **Fig. 16**.

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

Step 5. Dimension **diameter 4.4**, **Fig. 16**.

Step 6. Click **Features** Features on the Command Manager toolbar.

Step 7. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.
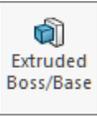
Step 8. In the Boss-Extrude Property Manager set:
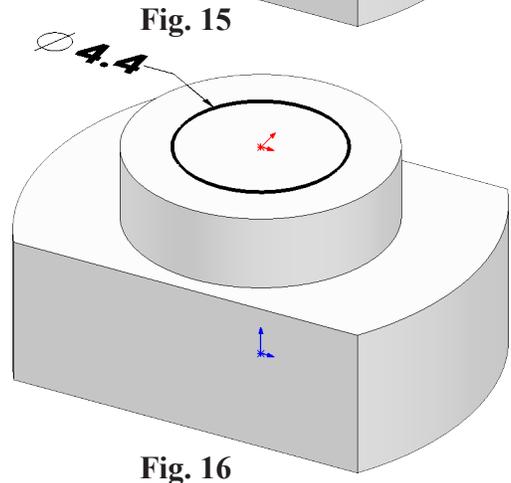under Direction 1, **Fig. 17**
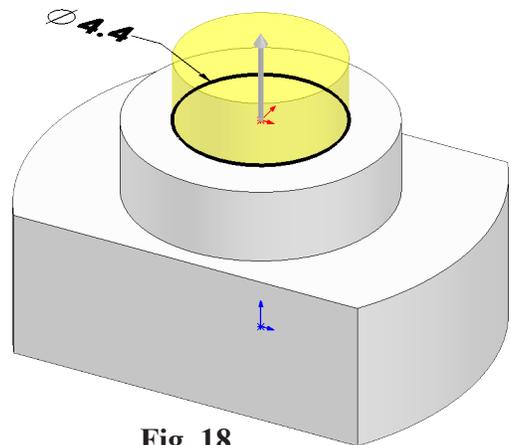End Condition **Blind**

Depth 1.8
click OK .

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

Fig. 15

⌀ **4.4**

Fig. 16

⌀ **4.4**

Boss-Extrude

From
Sketch Plane

Direction 1
Blind

1.80mm
☑ Merge result

☐ Draft outward

Fig. 17

Fig. 18

E. Fillet Edge.

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

Step 2. In the Fillet Property Manager set:
  select **FilletXpert**, **Fig. 19**

  Radius 🔧 .5
    click **top circular edge**
    click OK ✔ .
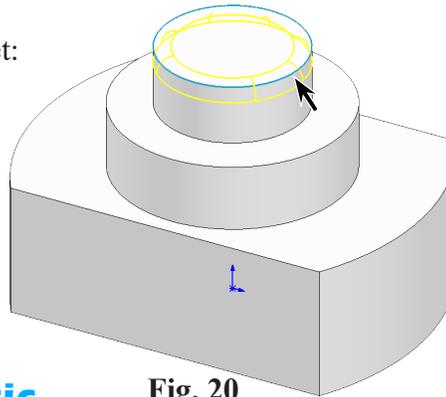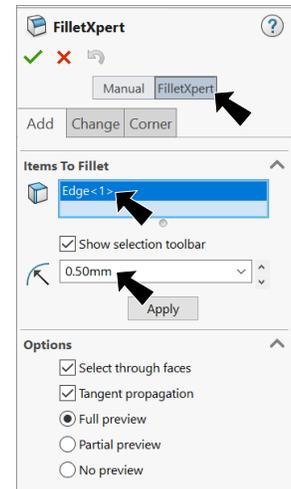
Step 3. Save 💾 (**Ctrl-S**).

Fig. 20

Fig. 19

F. Appearance: Gray Plastic.

Step 1. Click part, click **Appearance Callout** 🎈 on the context toolbar and click **SWITCH** 📦, **Fig. 21**.

Step 2. In the Appearances Task pane, expand **Plastic**, click **Medium Gloss** and in the lower pane select **light gray medium gloss plastic**, **Fig. 22**.
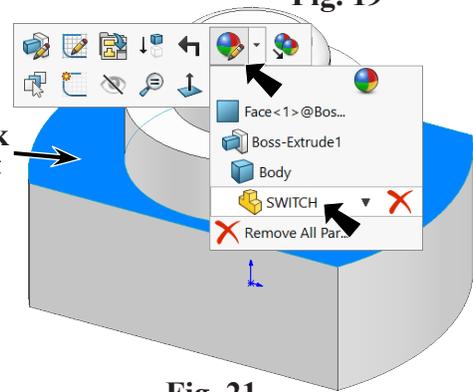
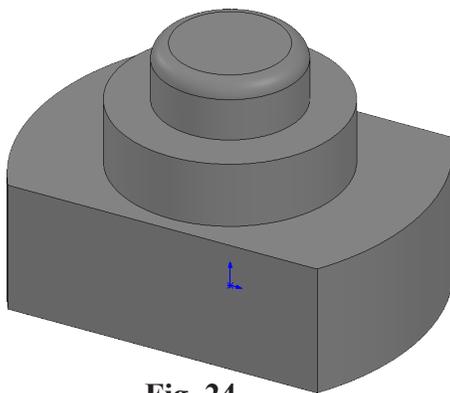**Step 3.** Save 💾 (**Ctrl-S**).

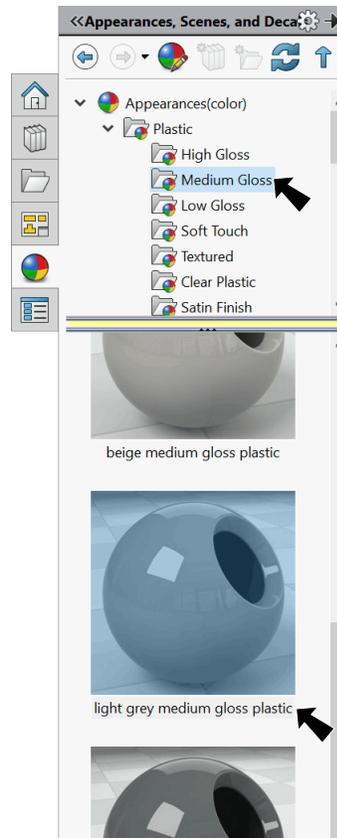**Click part**
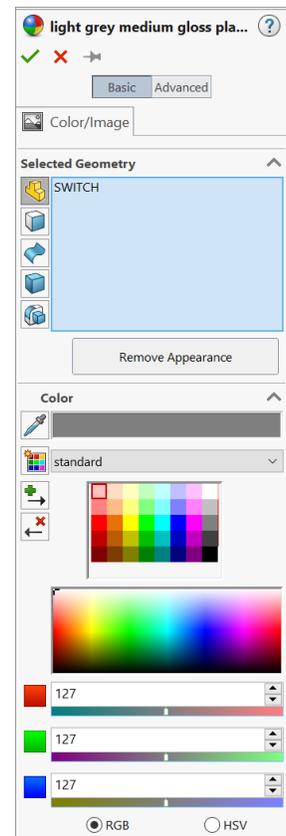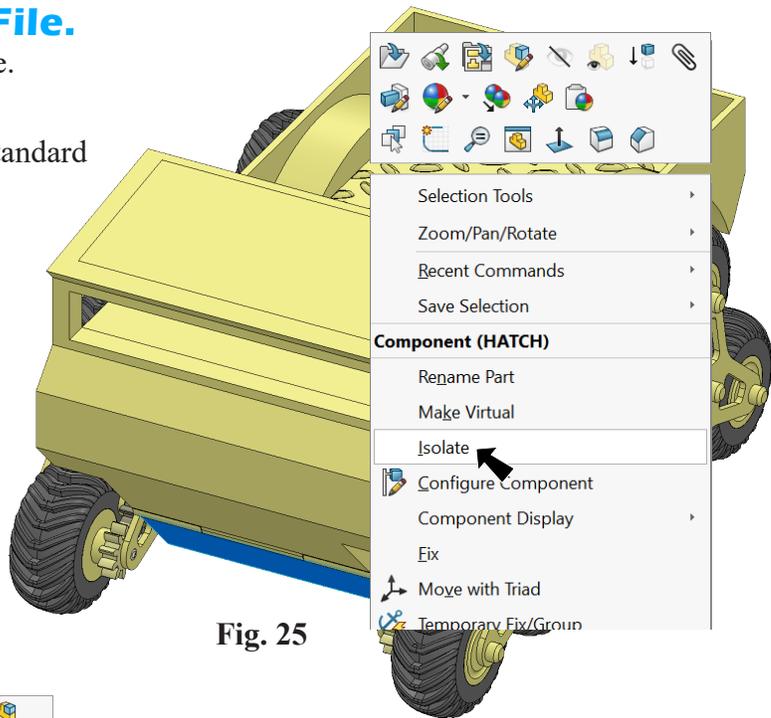
Fig. 21

Fig. 24

Fig. 22

Fig. 23

G. Open CWV Assembly File.

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

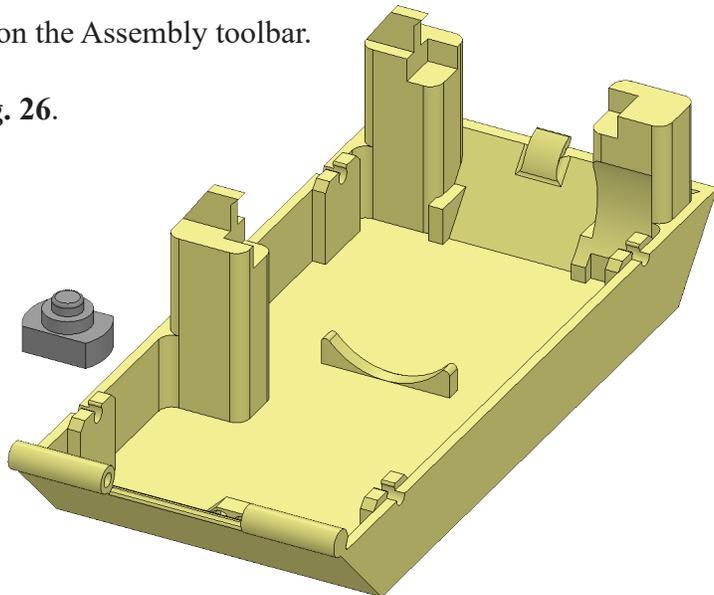Step 2. Click **Trimetric** on the Standard Views toolbar.

Step 3. **Isolate the Chassis** component, **Fig. 25**. To Isolate, Right click **Chassis** in the Feature Manager. **Right click** and click **Isolate** from the menu.

Fig. 25

H. Insert Switch.

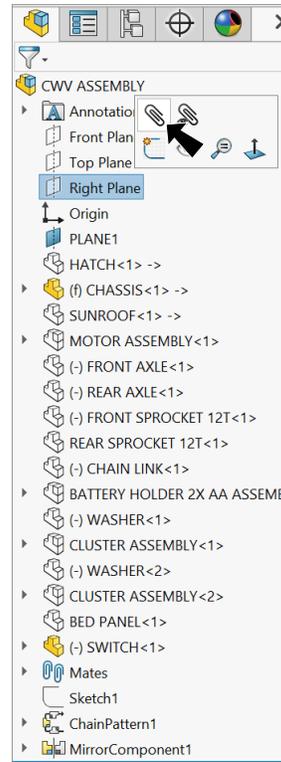Step 1. Click **Insert Components** on the Assembly toolbar.
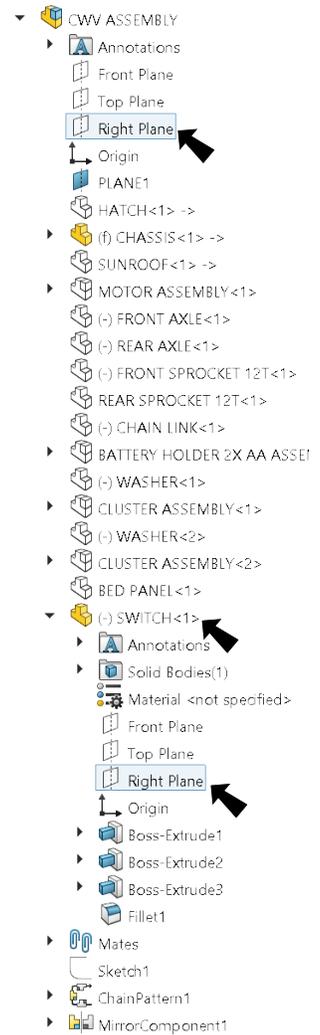
Step 2. Browse, Open Switch and place, **Fig. 26**.

Fig. 26

I. Mate: Switch.

Step 1. Click **Right Plane** in the Feature Manager and **Mate** on the context toolbar, **Fig. 27**.

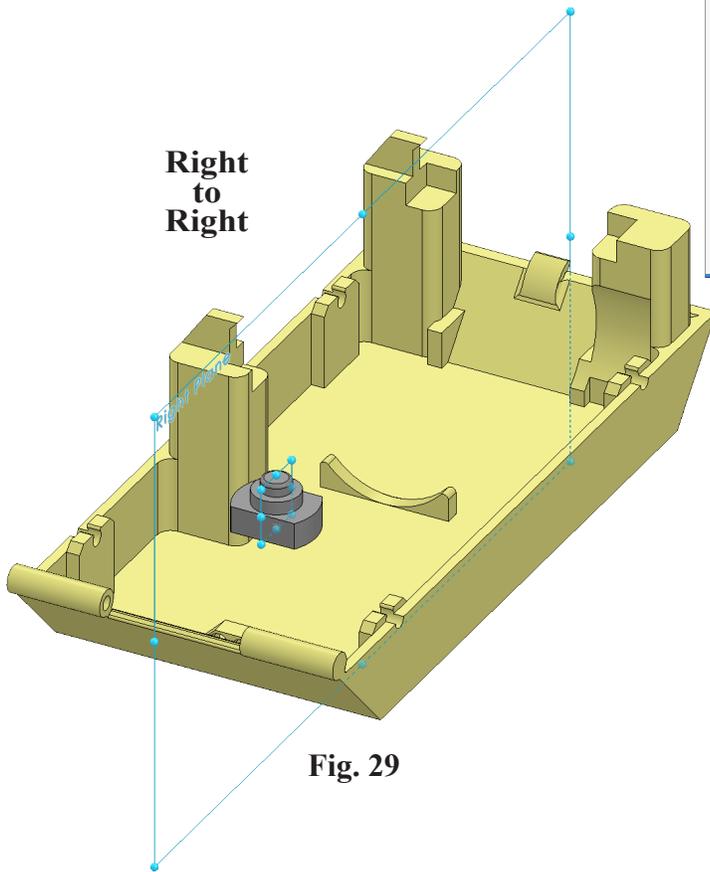**Step 2.** Expand the flyout Feature Manager design tree, expand **Switch** and click **Right Plane**, **Fig. 28**.

Right to Right

Fig. 27

Fig. 28

Fig. 29

Step 3. Click **top face of Extrude1 of Switch** and **front face of Chassis**, **Fig. 30**.

Step 4. Click **Distance** 〔⊬〕 and **Flip Mate Alignment** 〔↗〕 in Mate pop-up, **Fig. 31**. Set **distance .8** and press ENTER. The Switch should positioned just inside the front of Chassis, **Fig. 30**. If positioned in opposite direction, click **Flip Dimension** 〔⤢〕 in the Mate pop-up. Click Add/Finish Mate 〔✔〕 to add Distance mate.
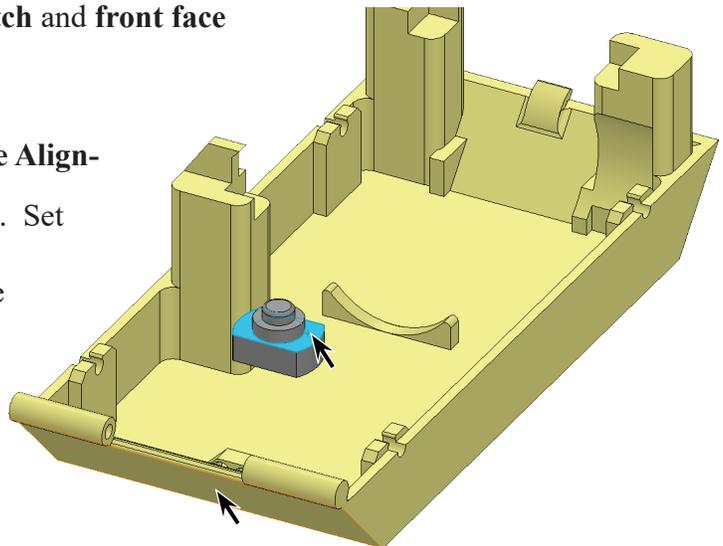
Fig. 30

0.80mm

Fig. 31

Step 5. Click **top face of Switch** and **bottom front edge of Chassis**, **Fig. 32**.

Step 6. Click **Distance** 〔⊬〕 in Mate pop-up, **Fig. 33**. Set **distance 13** and press ENTER. The Switch into of Chassis, **Fig. 34**. If positioned in opposite direction, click **Flip Dimension** 〔⤢〕 in the Mate pop-up.

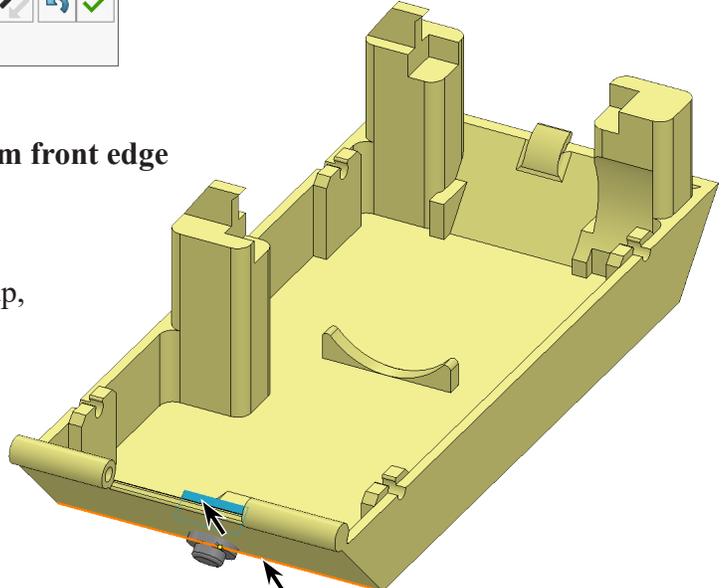Click Add/Finish Mate 〔✔〕 to add Distance mate.

Fig. 32

13.00mm

Fig. 33

Step 7. Click OK 〔✔〕 in the Property Manager.
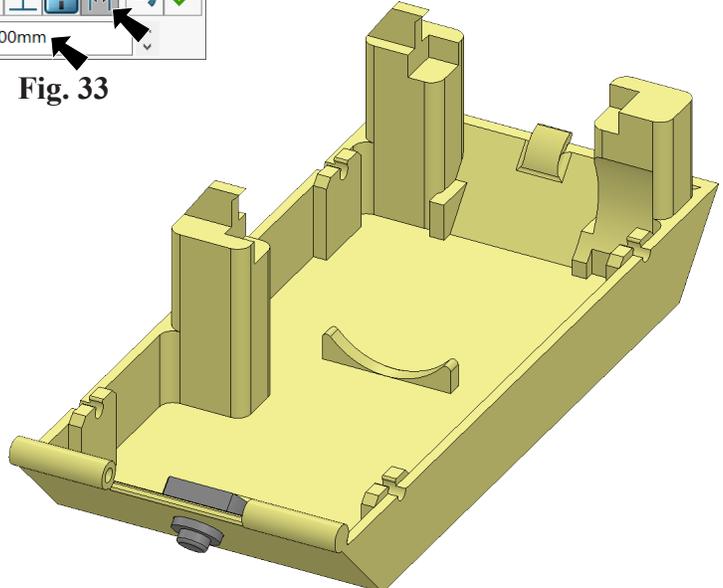
Step 8. Save 〔💾〕 (**Ctrl-S**).
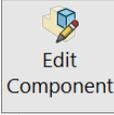
Fig. 34

J. Indent Switch into Chassis.

Step 1. Click **Chassis** component in the Feature Manager and click **Edit Part** on the context toolbar, **Fig. 35**.
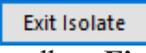
Step 2. Click Insert Menu > Features > Indent.

Step 3. In the Indent Property Manager:
under Selections, **Fig. 36**
Target body:
click **Chassis**, **Fig. 37**
Tool body region:
click **Switch**
check **Cut**
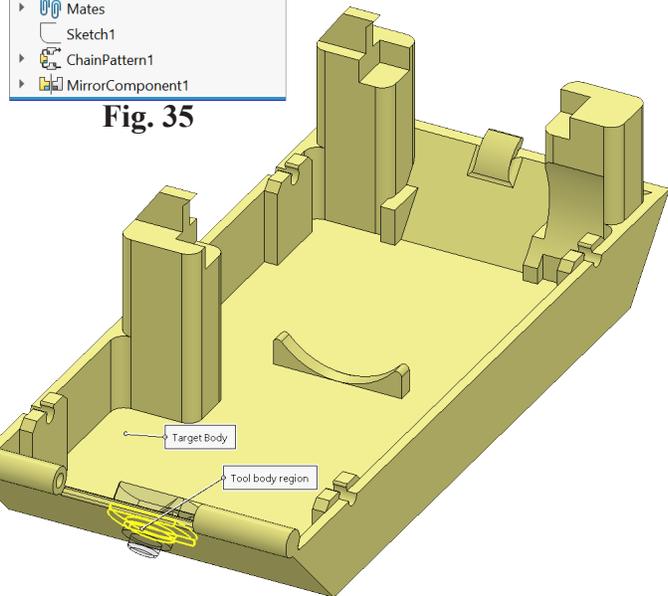under Parameters
Clearance .13
click OK ✔ .
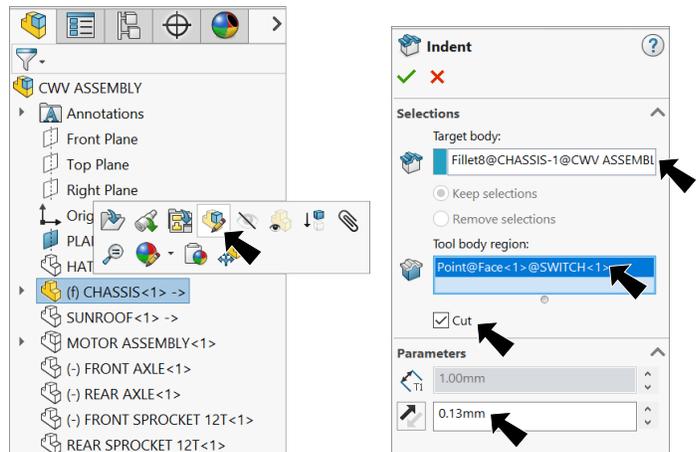
Step 4. Click **Edit Component** on the Features toolbar to exit.

Step 5. Exit Isolate. To Exit, click **Exit Isolate** on the Isolate pop-up toolbar, **Fig. 38**.
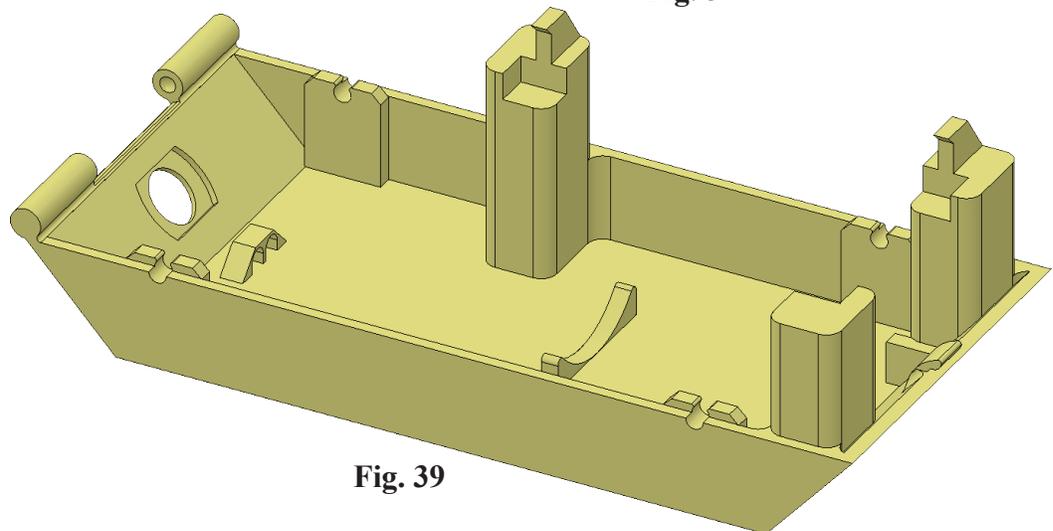
Step 6. Save All (**Alt-F L**).

Fig. 35

Fig. 36

Fig. 38

Fig. 37

Fig. 39