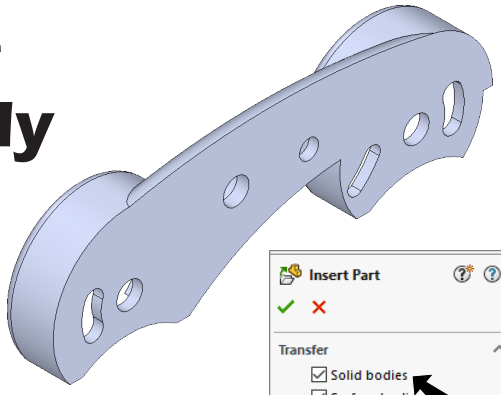
Chapter 25

# Wind Up Car
# Right Body



## A. Mirror Left Part.

Step 1. Open your **LEFT BODY** part file.

Step 2. Click **Right Plane** in the Feature Manager to select the Plane, **Fig. 1**.

Step 3. Click Insert Menu > Mirror Part.

Step 4. In the Insert Part Property Manager set:
under Transfer, **Fig. 2**
check **Solid bodies**
uncheck **Planes**
under Visual Properties
check **Propagate from original**
click OK .

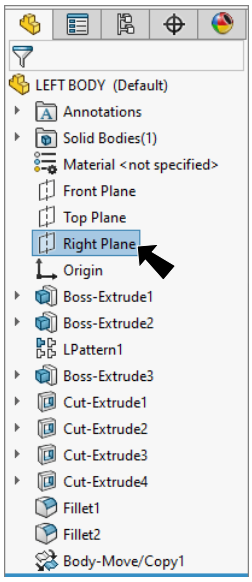



Fig. 1

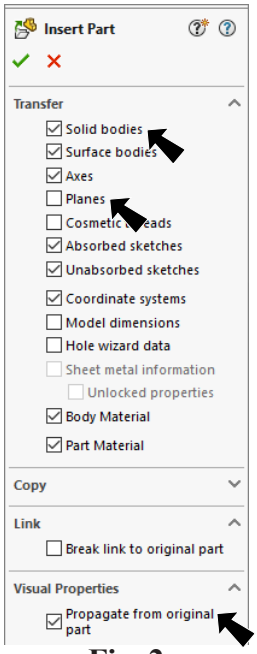



Fig. 2

## B. Save as "RIGHT BODY".

Step 1. Click File Menu > Save As.

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

## C. Cut Idler Hole.

Step 1. Click the **side face of body** and click **Sketch** on the context toolbar, **Fig. 3**.

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

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

Step 4. Sketch **circle centered at the Idler hole**, **Fig. 4**.

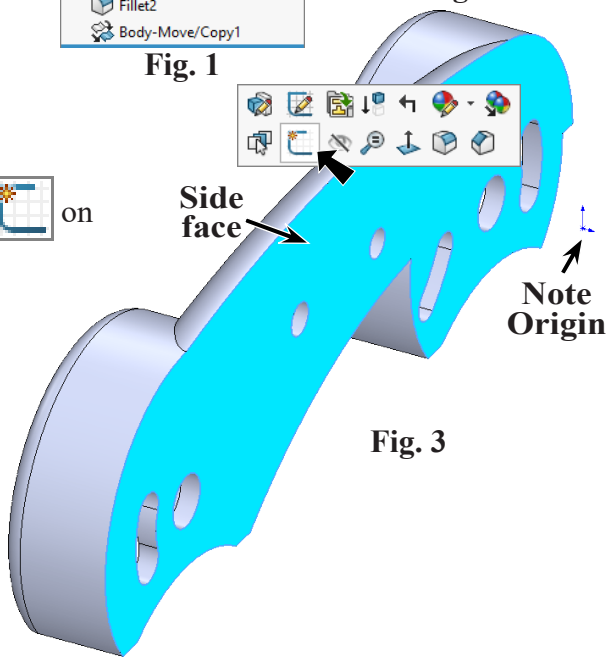



Fig. 3

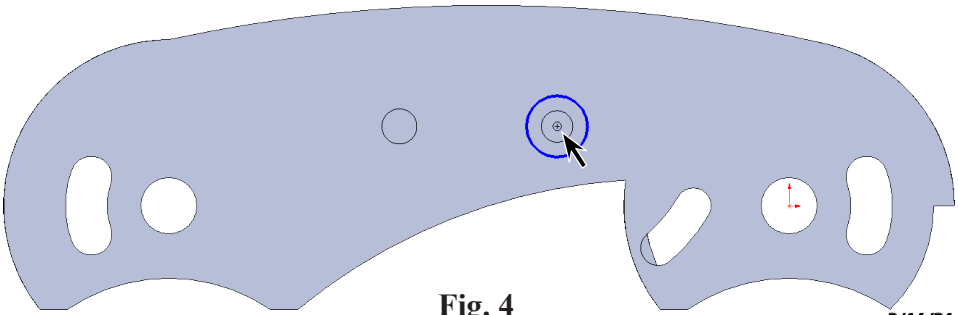


Fig. 4

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

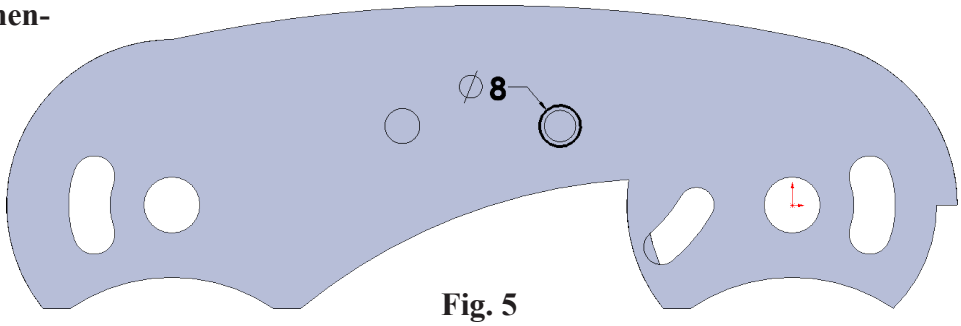



**Fig. 5**

Step 6. Dimension **diameter 8**, **Fig. 5**.

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

Step 8. Click **Extruded Cut** on the Features toolbar.

Step 9. In the Cut-Extrude Property Manager set:
under Direction 1, **Fig. 6**
End Condition **Up To Surface**
click **inside bottom face of hole**, **Fig. 7**
click OK .

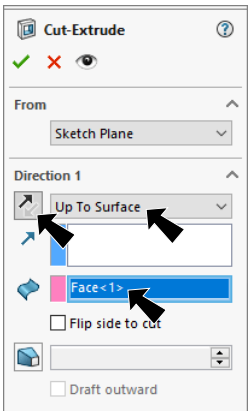



**Fig. 6**

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

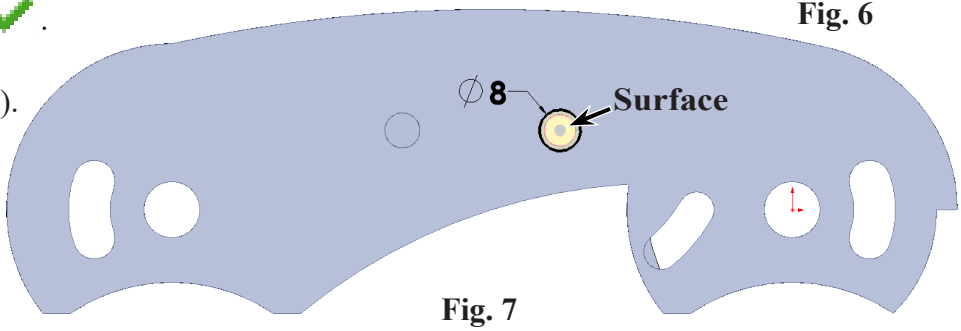
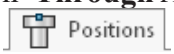



**Fig. 7**

## D. Cut Spring Axle Hole Wizard.

Step 1. Click **Hole Wizard** 

on the Features toolbar.

Step 2. In the Property Manager on the Type tab set:
under Hole Type, **Fig. 8**
select **Counterbore** 
under Standard:
select **ANSI Metric**
under Type:
**Hex Bolt**
under Size:
select **M10**
check **Show custom sizing**
**Through Hole Diameter**  **10.8**
**Counterbore Diameter**  **16.8**
**Counterbore Depth**  **5**
under End Condition **Through All**
click **Positions tab** 

at top of the Property Manager.

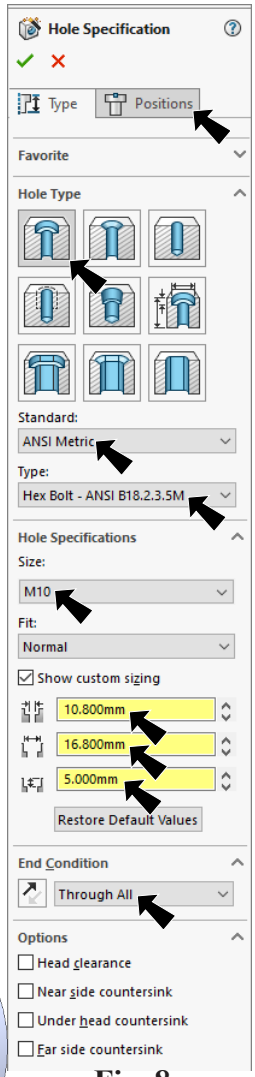


**Fig. 8**

Step 3. Rotate view to view outside face of body and click **outside face** of body for face for holes, **Fig. 9**.

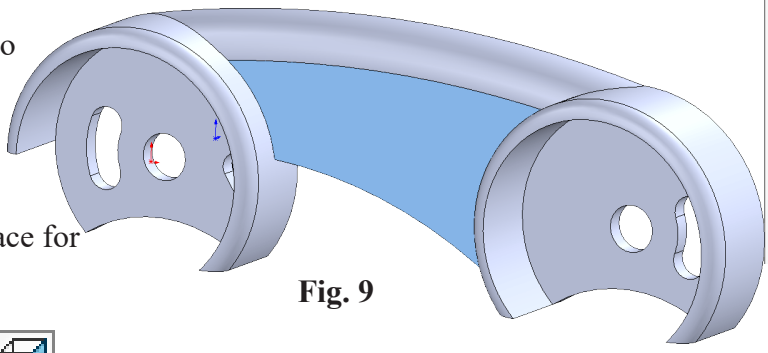


**Fig. 9**

Step 4. Click **Right**  on the Standard Views toolbar. (**Ctrl-4**)

Step 5. Hover cursor over edge of Spring Axle hole to display centerpoint. Then, click centerpoint to create a coincident  mate with hole, **Fig. 10**.

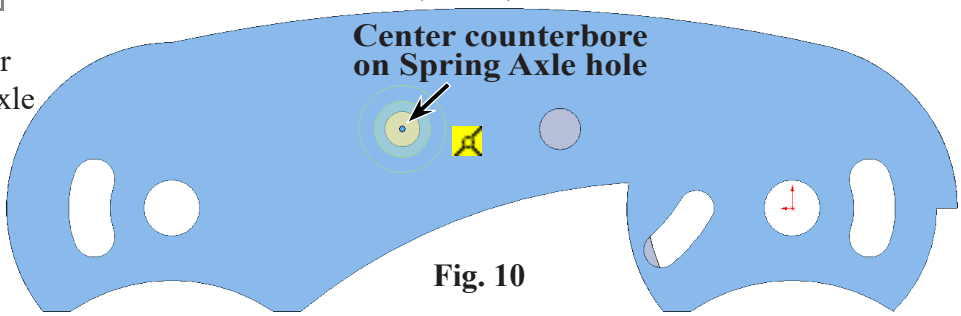


**Fig. 10**

Step 6. Click OK  in Hole Property Manager.

Step 7. Use **Previous View**  on the Standard Views toolbar. (**Ctrl-Shift-Z**) to confirm counterbore, **Fig. 11**.

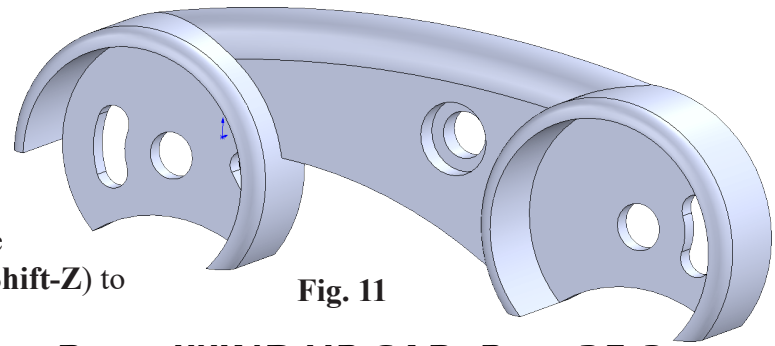


**Fig. 11**

## E. Mate References Cross Member Slots.

Step 1. Click **Right Plane** in the Feature Manager to select Plane, **Fig. 12**.

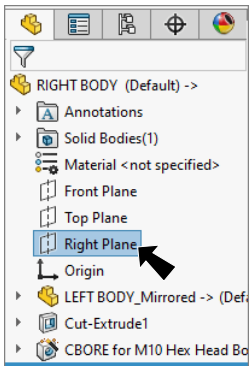



**Fig. 12**

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

Step 3. Use **Up Arrow key two times** to rotate view slightly, **Fig. 14**.

Step 4. Click **Reference Geometry** on the Features toolbar and **Mate Reference** from the menu.

Step 5. In the Mate Reference Manager:

under **Primary** Reference Entity , **Fig. 13**

**Right plane** was preselected

Mate Reference Type **Coincident**

under **Secondary** Reference Entity

click in Entity box

and click **top curved face of rear Slot cut**, **Fig. 14**

Mate Reference Type **Concentric**

under **Tertiary** Reference Entity

click in Entity box

and click **bottom curved face of rear slot cut**

Mate Reference Type **Concentric**

click OK .

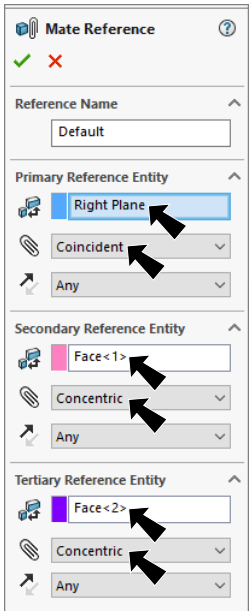



**Fig. 13**

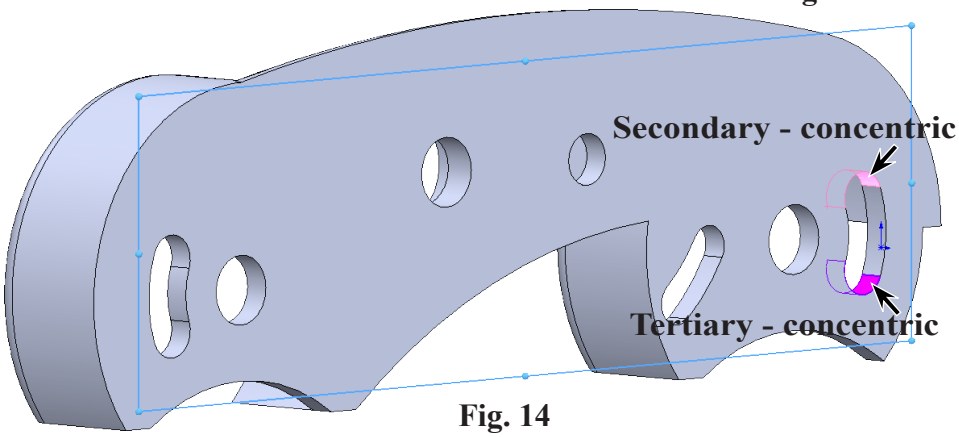



**Fig. 14**

Step 6. Click **Right Plane** in the Feature Manager to select Plane, **Fig. 15**.

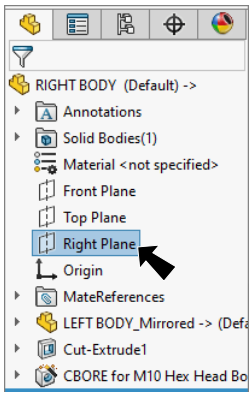
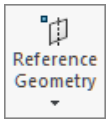


**Fig. 15**

Step 7. Click **Reference Geometry** 

on the Features toolbar and **Mate Reference** from the menu.

Step 8. In the Mate Reference Manager:

under **Primary** Reference Entity, **Fig. 16**

**Right plane** was preselected

Mate Reference Type **Coincident**

under **Secondary** Reference Entity

click in Entity box

and click **bottom curved face of front Slot cut**, **Fig. 17**

Mate Reference Type **Concentric**

under **Tertiary** Reference Entity

click in Entity box

and click **top curved face of front slot cut**

Mate Reference Type **Concentric**

click OK .

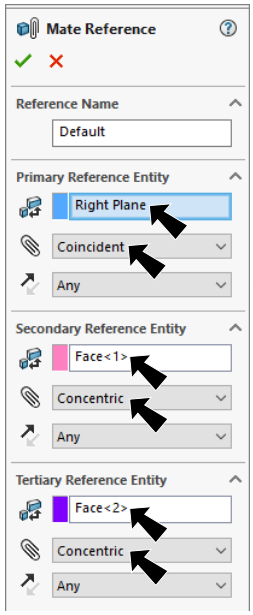


**Fig. 16**

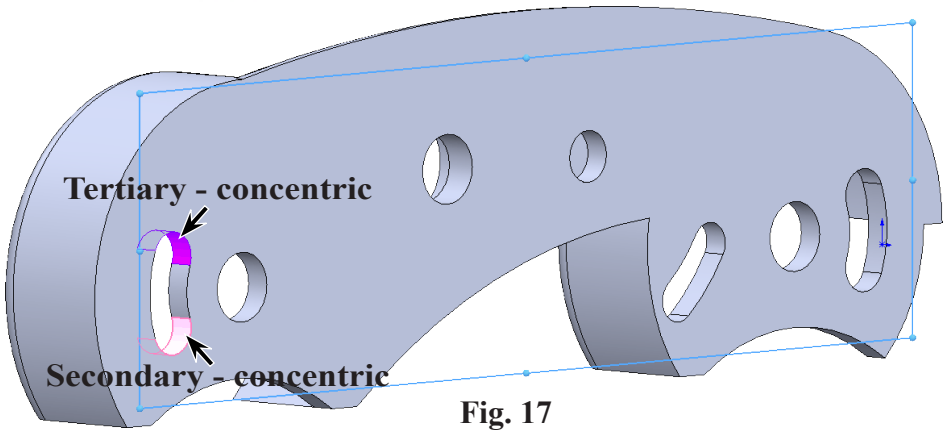
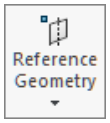


**Fig. 17**

## F. Mate References Axle Holes.

Step 1. Click **Right Plane** in the Feature Manager to select Plane.

Step 2. Click **Reference Geometry** 

on the Features toolbar and **Mate Reference** from the menu.

Step 3. In the Mate Reference Manager:
under Primary Reference Entity, **Fig. 18**
**Right plane** was preselected
**Mate Reference Type** **Coincident**
under **Secondary** Reference Entity
click in Entity box
and click **cylindrical face of an Axle hole**, **Fig. 19**
click OK .

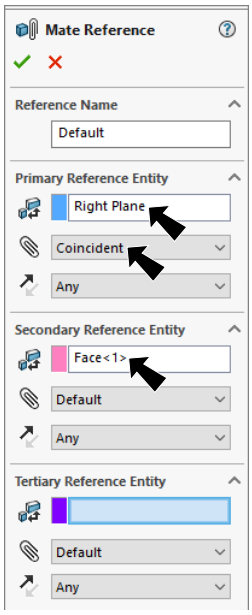
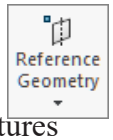


**Fig. 18**

Step 4. Click **Right Plane** in the Feature Manager to select Plane.

Step 5. Click **Reference Geometry** 

on the Features toolbar and **Mate Reference** from the menu.

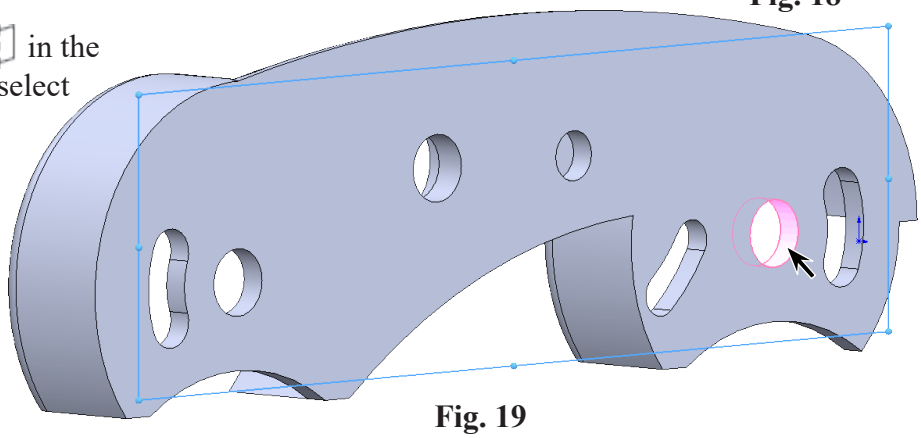


**Fig. 19**

Step 6. In the Mate Reference Manager:
under Primary Reference Entity, **Fig. 18**
**Right plane** was preselected
**Mate Reference Type** **Coincident**
under **Secondary** Reference Entity
click in Entity box
and click **cylindrical face of the other Axle hole**, **Fig. 20**
click OK .

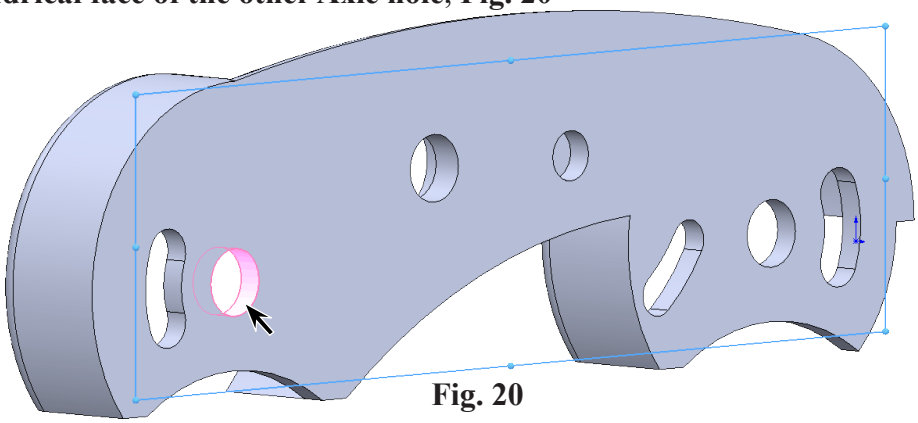
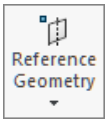


**Fig. 20**

## G. Mate References Idler.

Step 1. Click **Right Plane** in the Feature Manager to select Plane.

Step 2. Click **Reference Geometry** 

on the Features toolbar and **Mate Reference** from the menu.

Step 3. In the Mate Reference Manager:
under Primary Reference Entity, **Fig. 21**
**Right plane** was preselected
**Mate Reference Type** **Coincident**
under **Secondary** Reference Entity
click in Entity box
and click **cylindrical face of Idler hole**, **Fig. 22**
click OK .

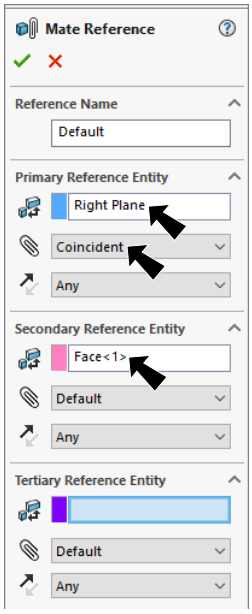



**Fig. 21**

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

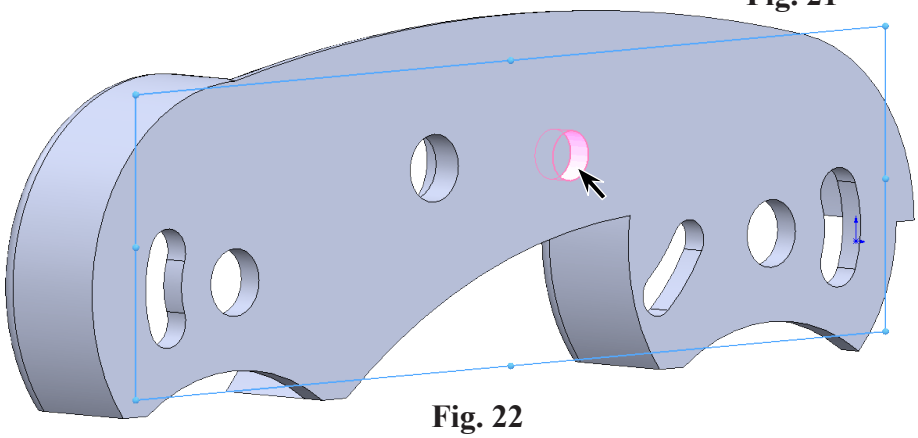


**Fig. 22**