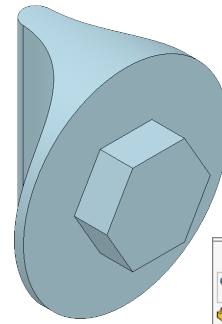





Wind Up Car Key



A. Extrude.

- Step 1. Click File Menu > New, click **Part Metric** and OK.
- Step 2. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 1**.
- Step 3. Click **Circle**  (S) on the Sketch toolbar.

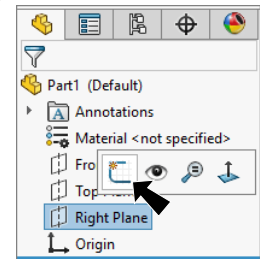





Fig. 1

- Step 4. Sketch **circle** starting at the Origin , **Fig. 2**.
- Step 5. Click **Smart Dimension**  (S) on the Sketch toolbar.
- Step 6. Dimension **diameter 22**, **Fig. 2**.
- Step 7. Click **Features**  on the Command Manager toolbar.

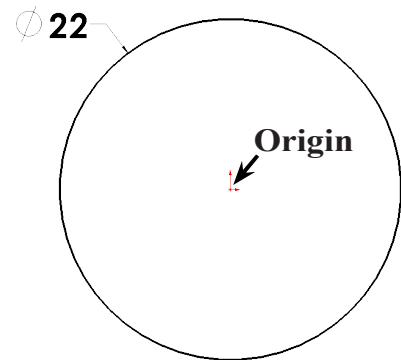
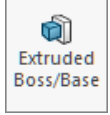





Fig. 2

- Step 8. Click **Extruded Boss/Base**  on the Features toolbar.
- Step 9. In the Property Manager set:
 under Direction 1, **Fig. 3**
Depth  **11**
Reverse Direction 
 click OK  .

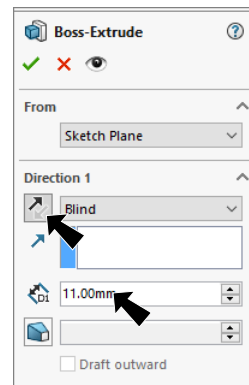


Fig. 3

Direction arrow

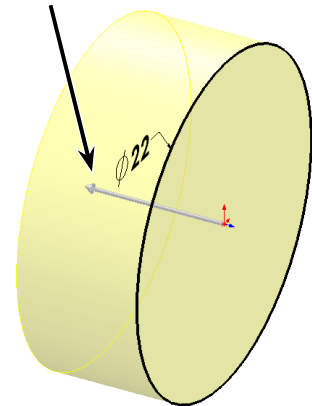




Fig. 4

B. Save as "KEY".

- Step 1. Click File Menu > Save As.
- Step 2. Key-in **KEY** for the filename and press ENTER.

C. Cut.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 5**.

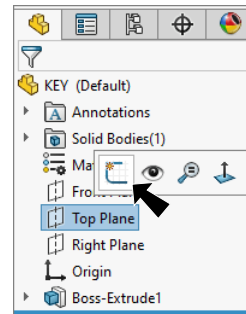


Fig. 5

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

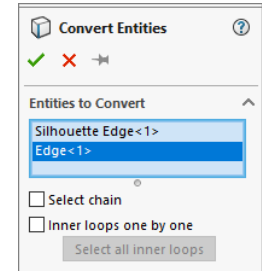


Fig. 6

Step 3. Click **Convert Entities**  on the Sketch toolbar.


Step 4. In the Convert Entities Property Manager: under Entities to Convert, **Fig. 6** click **top silhouette edge and right edge**, **Fig. 7** click OK .



Fig. 7

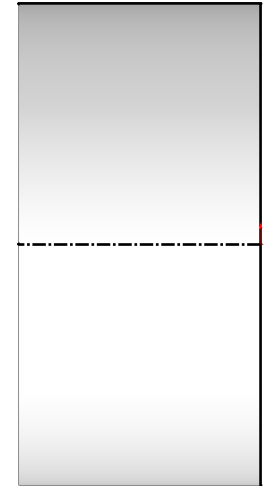





Fig. 8

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

Step 6. Sketch horizontal centerline from the Origin , **Fig. 8**.

Step 7. Click **Tangent Arc**  in the **Arc flyout**  on the Sketch toolbar.

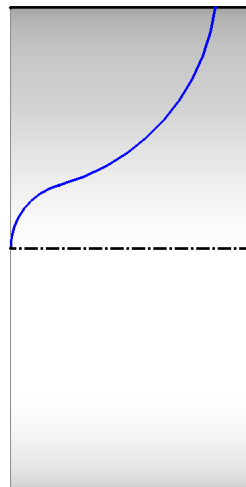


Fig. 9

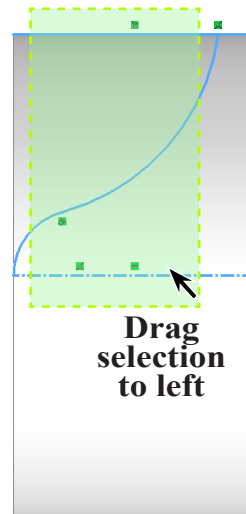


Fig. 10

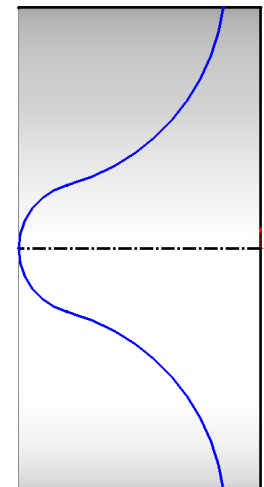
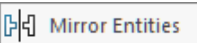


Fig. 11


Step 8. Sketch two chained tangent arcs from left end of centerline to top converted edge, **Fig. 9**.

Step 9. **Right click graphics area and click Select**  from menu to unselect Arc tool.

Step 10. Drag a selection to left to cross centerline, arcs and top converted edge, **Fig. 10**.

Step 11. Click **Mirror Entities**  on the Sketch toolbar, **Fig. 11**.

Step 12. Click **Smart Dimension**

 (S) on the Sketch toolbar.

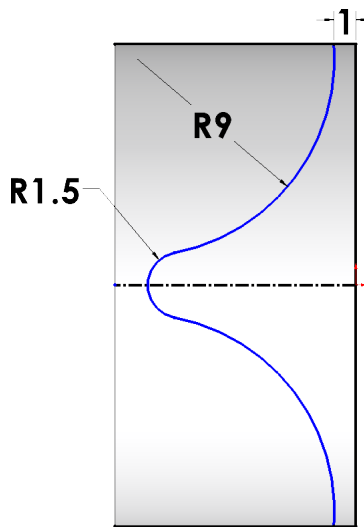



Fig. 12

Step 13. Add dimensions, **Fig. 12**.

Step 14. **Right click graphics area and click Select**  from menu to unselect Smart Dimension.

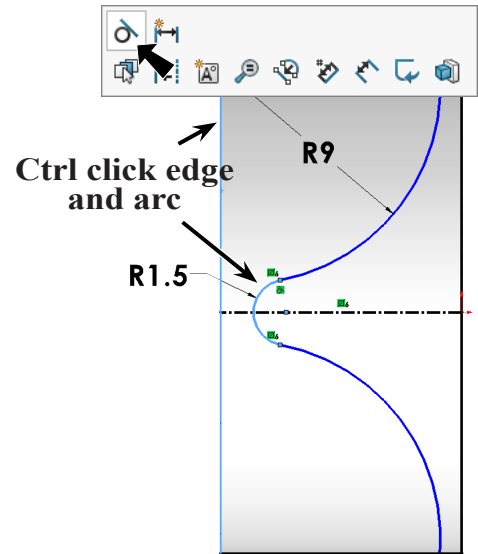



Fig. 13


Step 15. **Ctrl click left edge of extrude and middle arc** to select both. Release Ctrl key and click

Make Tangent  on the context toolbar, **Fig. 13**.

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

Step 17. Click **Extruded Cut**  on the Features toolbar.

Step 18. In the Cut-Extrude Property Manager set:
uncheck **Thin Feature**
under **Direction 1**, **Fig. 14**
Through All - Both
expand **Selected Contours**
click the **2 contours**

check **Flip side to cut**
The **Direction arrow** should point towards area to be cut away, **Fig. 15**.
If arrow is pointing in wrong direction, uncheck Flip side to cut.
click OK .

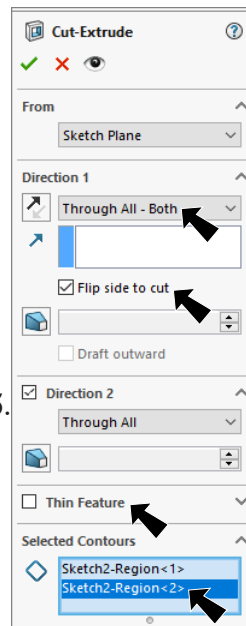


Fig. 14

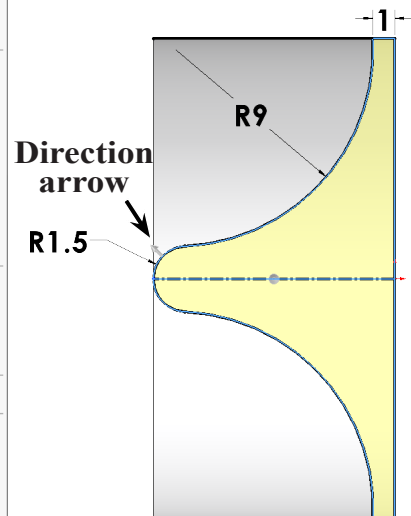




Fig. 15

Step 19. Save  (Ctrl-S).

D. Extrude Hex.

Step 1. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 16**.

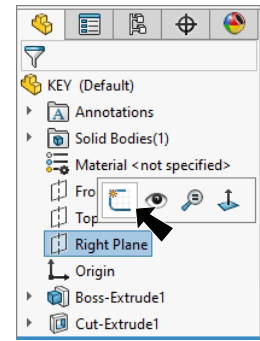



Fig. 16

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

Step 3. Click **Polygon**  on Sketch toolbar.

Step 4. Sketch 6 sided  polygon at Origin , **Fig. 17**.

Step 5. **Right click graphics area and click Select**  from menu to unselect Polygon tool.

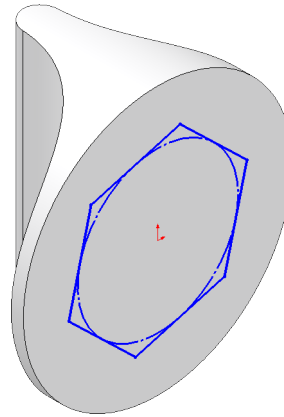



Fig. 17

Step 6. Click **top control polygon segment** and click **Make Horizontal**  on the context toolbar, **Fig. 18**.

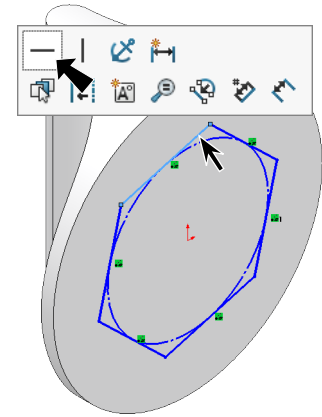


Fig. 18

Step 7. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 8. Dimension **11.7** across corners, **Fig. 19**.

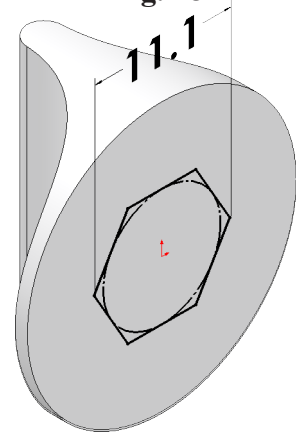


Fig. 19

Step 9. Click **Features**  on the Command Manager toolbar.

Step 10. Click **Extruded Boss/Base**  on the Features toolbar.

Step 11. In the Property Manager set:
under Direction 1, **Fig. 20**

Depth  **3.5**
click OK .

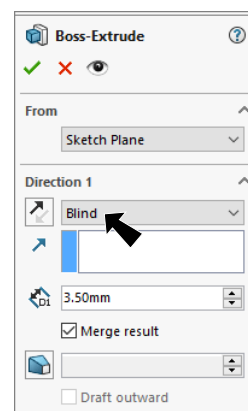


Fig. 20

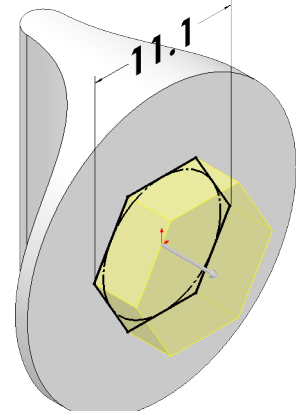


Fig. 21

E. Appearance.

Step 1. Click part, click **Appearance Callout**  on the context toolbar and click **KEY** , Fig. 22.

Step 2. In the Appearances Task pane, expand **Plastic**, click **High Gloss** and in the lower pane select **white high gloss plastic**, Fig. 23.

Step 3. In the Appearances Property Manager set:
under Color, Fig. 24
set RGB values
R 173
G 205
B 217
click OK .

Step 4. Save  (Ctrl-S).

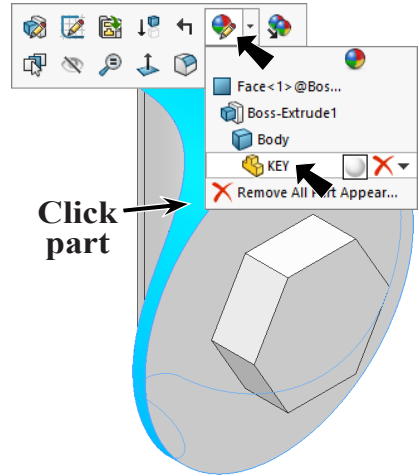


Fig. 22

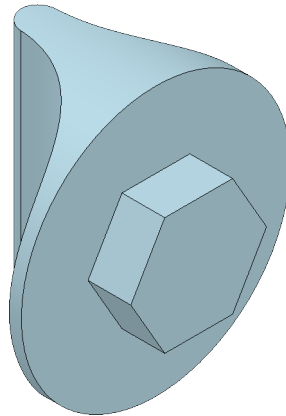


Fig. 25

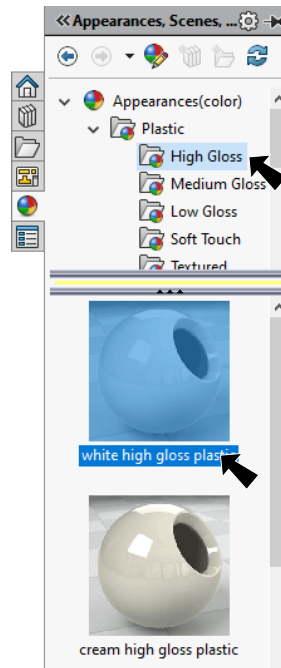


Fig. 23

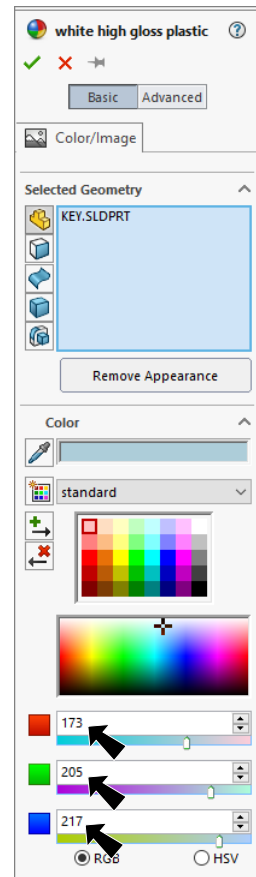


Fig. 24