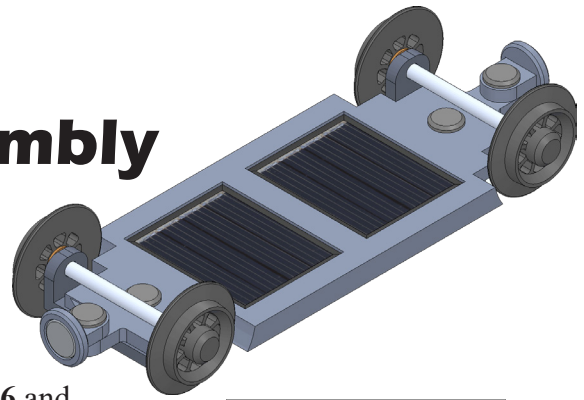


Solar Train Flat Car Assembly



A. Insert Deck and Solar Panel.

Step 1. Click New  on the Standard toolbar, click Assembly Metric  and OK.

Step 2. Ctrl click your DECK and SOLAR PANEL 30 x 36 and click Open from the Open dialog box.

Step 3. In the Begin Assembly Property Manager set:

click **Keep Visible** , **Fig. 1**
under Part/Assembly in Insert
select **DECK** to highlight it.
under Options

Only fix first component

Click OK  in the Property Manager. This will place Deck origin at the assembly origin and fix the position so Deck cannot move. This fixed component should have a (f) before its name in the Feature Manager  (f) DECK<1>.

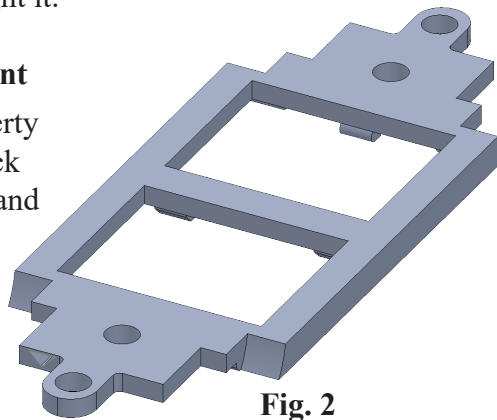


Fig. 2

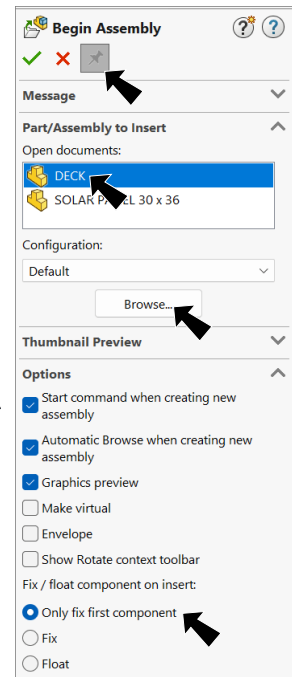


Fig. 1

Step 4. In the Begin Assembly Property Manager:
under Part/Assembly in Insert, **Fig. 3**
select **SOLAR PANEL** to highlight it.

Step 5. Place the Solar Panel in the graphic area, **Fig. 4**.

Step 6. Click OK  in the Property Manager.

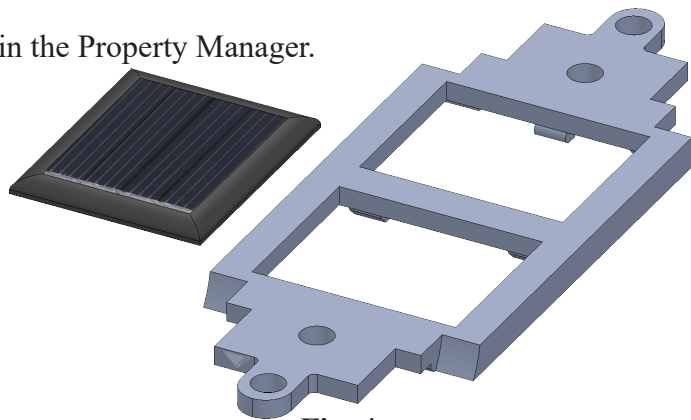


Fig. 4

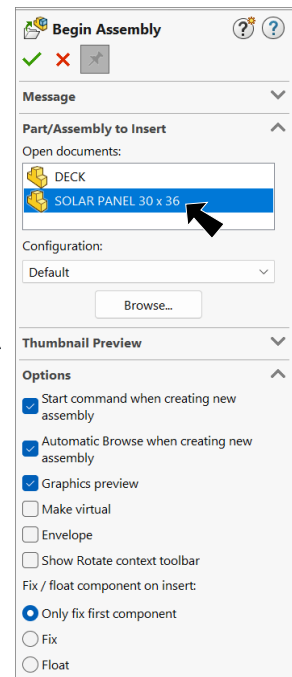


Fig. 3

B. Save as "FLAT CAR ASSEMBLY".

Step 1. Click File Menu > Save As.

Step 2. Key-in FLAT CAR ASSEMBLY for the filename and press ENTER.

C. Mate: Solar Panel <1>.

Step 1. Click **Isometric**  on the Standard Views toolbar. (Ctrl-7)

Step 2. Click **Right Plane**  in the Feature Manager and **Mate**  on the context toolbar, **Fig. 5**.

Step 3. In the flyout Feature Manager design tree, expand **Solar Panel** and click **Front Plane** , **Fig. 6**.

Step 4. Click Add/Finish Mate  to add **Coincident**  mate.

Step 5. In the flyout Feature Manager design tree click **Front Plane**  and expand **Solar Panel** and click **Right Plane** , **Fig. 8**.

Step 6. Click **Distance**  in Mate pop-up, **Fig. 9**. Set **distance 16** and press ENTER. The Panel should be positioned over first cut in Deck, **Fig. 10**. If positioned in opposite direction,

click **Flip Dimension**  in the Mate pop-up. Click Add/Finish Mate  to add Distance mate.

Step 7. Click the **top face of Deck** and **top face of Solar Panel**, **Fig. 11**.

Step 8. Click **Distance**  in Mate pop-up, **Fig. 12**. Set **distance .6** and press ENTER. Panel should be positioned in Deck, if opposite click **Flip Dimension**  in the Mate pop-up. Click Add/Finish Mate  to add Distance mate.

Step 9. Click OK  in the Property Manager.

Step 10. Save  (Ctrl-S).

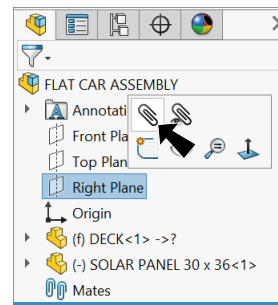


Fig. 5

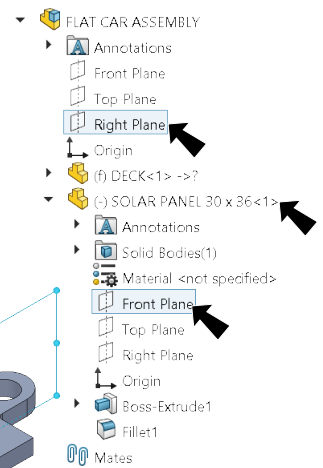


Fig. 6

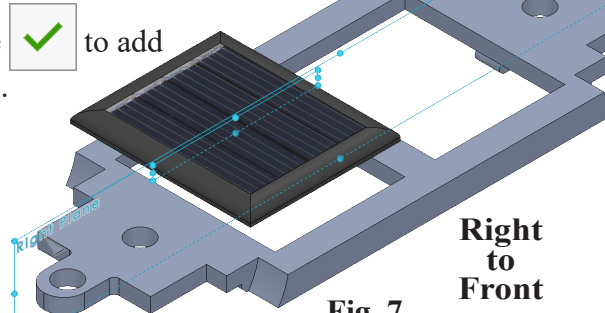


Fig. 7



Fig. 9

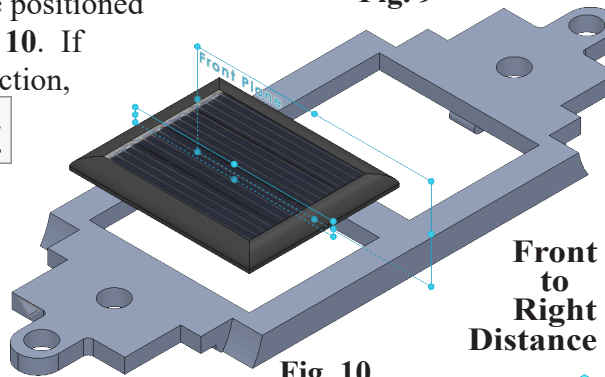


Fig. 10

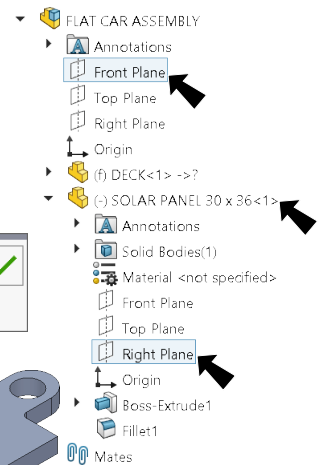


Fig. 8

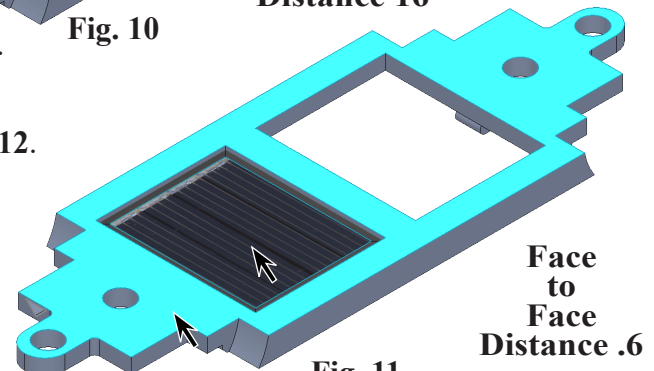


Fig. 11



Fig. 12

D. Copy with Mates Solar Panel <2>.

Step 1. **Right click** Solar Panel component in the Feature Manager and click **Copy with Mates** on menu, **Fig. 13**.

Step 2. In the Copy with Mates Property Manager:

Step 1: Select Component, **Fig. 14**

Preselected

click **Next** 

Step 3. Still in Copy with Mates Property Manager:

Step 2: Mates, **Fig. 15**

under Mates

 **Concentric** (Right plane)
check **Repeat**, **Fig. 16**

 **Distance** (Top plane)
check **Repeat**, **Fig. 17**
click **Flip Dimension** 

 **Distance** (Front plane)
check **Repeat**, **Fig. 18**

click **OK**  and click **Cancel** .

Step 4. Save 
(Ctrl-S).

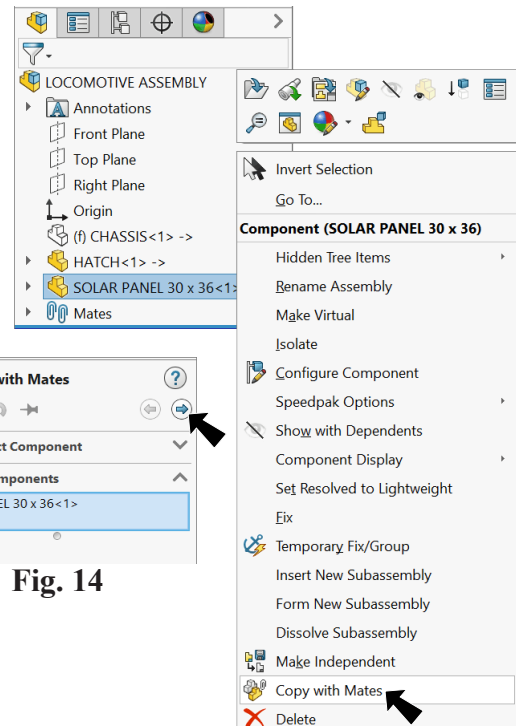


Fig. 14

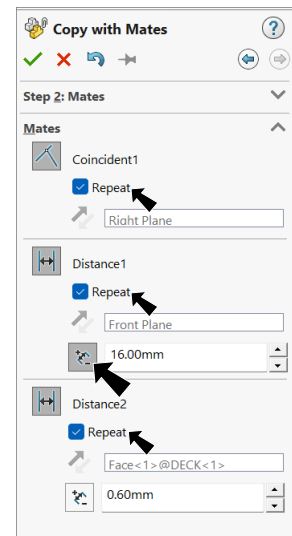
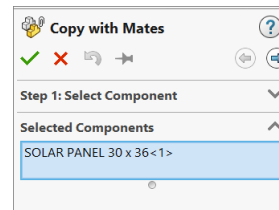


Fig. 15

Concentric Repeat

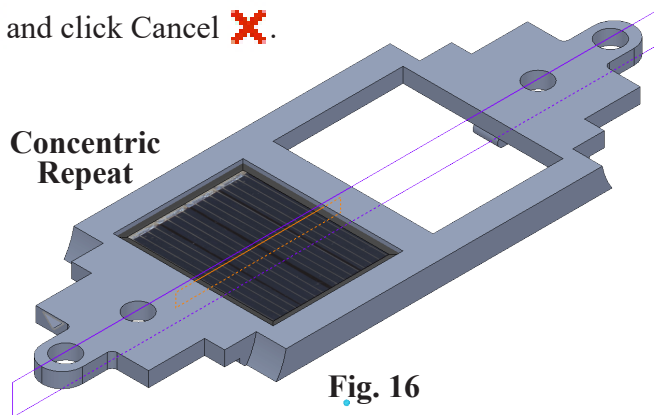


Fig. 16

Distance Repeat

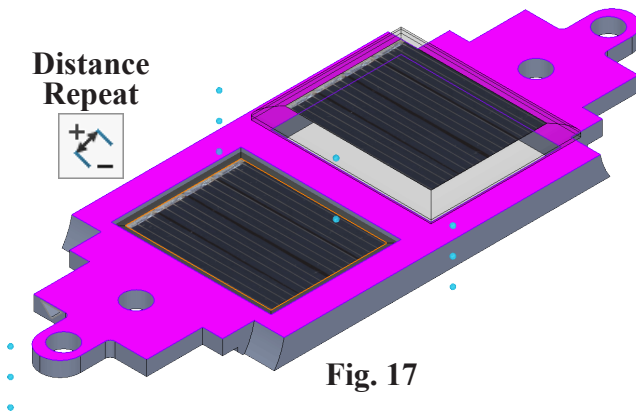


Fig. 17

Distance Repeat

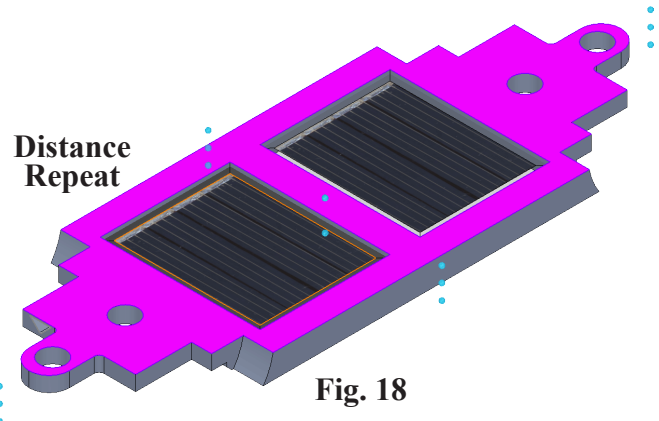


Fig. 18

E. Indent Solar Panels into Deck.

Step 1. Click **Deck**  component in the Feature Manager and click **Edit Part**  on the context toolbar, **Fig. 19**.

Step 2. Click Insert Menu > Features > Indent.

Step 3. In the Indent Property Manager:
under Selections, **Fig. 20**

Target body:

click **Deck**, **Fig. 21**

Tool body region:

click **Solar Panel <1>**

check **Cut**

under Parameters

Clearance .1

click OK .

Target

Tool

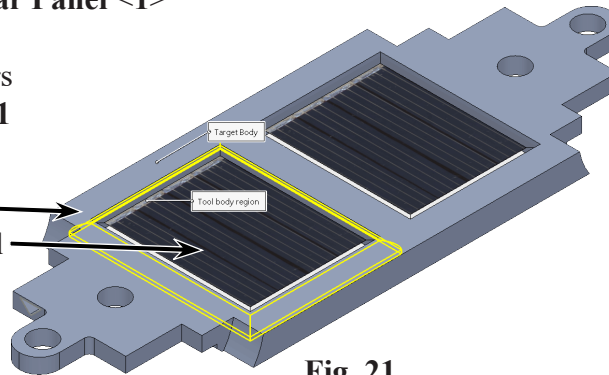


Fig. 21

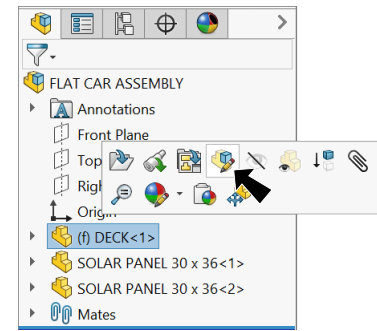


Fig. 19

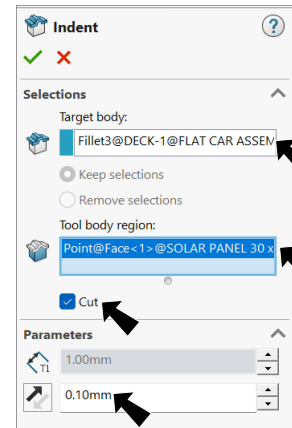


Fig. 20

Step 4. **Repeat** with other panel:
Click Insert Menu > Features > Indent.

Step 5. In the Indent Property Manager:
under Selections, **Fig. 22**

Target body:

click **Deck**, **Fig. 23**

Tool body region:

click **Solar Panel <2>**

check **Cut**

under Parameters

Clearance .1

click OK .

Target

Tool

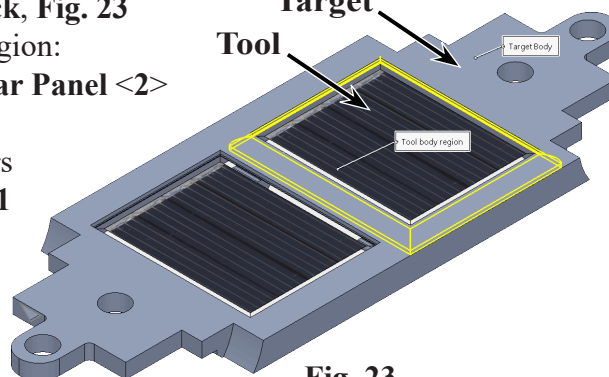


Fig. 23

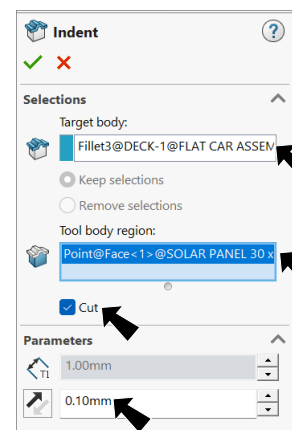
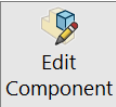


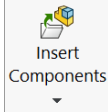
Fig. 22

Step 6. Click **Edit Component**  on the Features toolbar to exit.

Step 7. Save All  (**Alt-F L**).

F. Insert Car Bogie Assembly.

Step 1. Click **Insert Components**



on the Assembly toolbar.

Step 2. Select your **Car Bogie Assembly** file and Open.

Step 3. Click to place **Car Bogie Assembly**, **Fig. 24**.

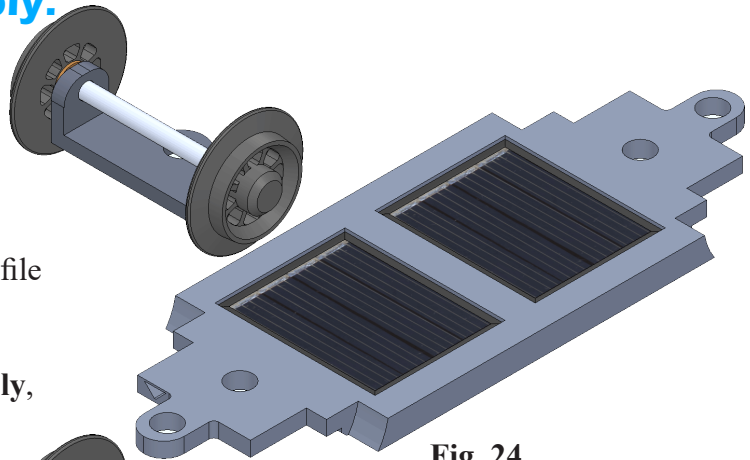


Fig. 24

G. Mate: Bogie Assembly.

Step 1. Click **Mate** on the Assembly toolbar.



Step 2. Click a **cylindrical face of Pin hole in Bogie** and a **cylindrical face of Pin hole in Deck**, **Fig. 25**.

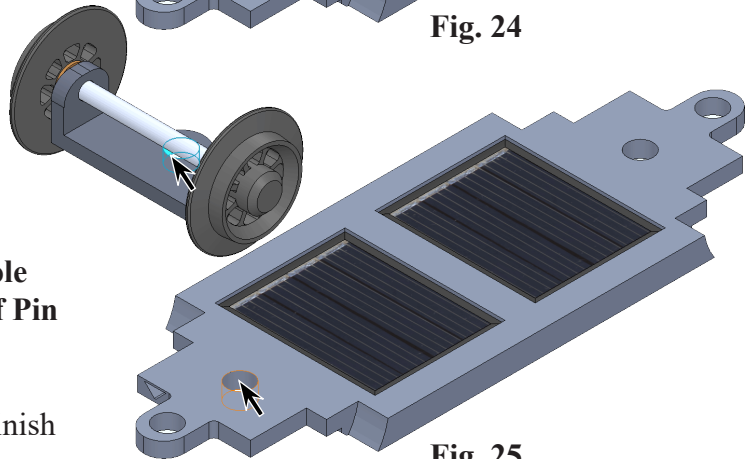


Fig. 25

Step 3. Check **Lock Rotation** and Add/Finish Mate  in Mate pop-up toolbar to add a **Concentric**  mate, **Fig. 26**.



Fig. 26

Step 4. Click **top face of Bogie Bracket** and **hide top face of Deck**, then click **bottom face of Pin space Extrude in Deck**, click **chamfer at end of hole in Wheel**, **Fig. 27**. To hide face, hover cursor over face and press **Alt** key.

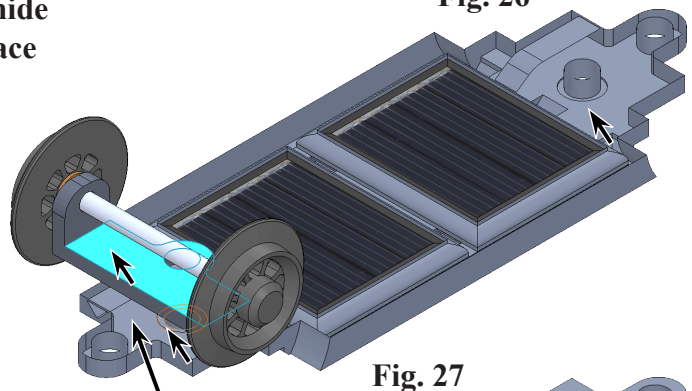


Fig. 27

Step 5. Click Add/Finish Mate  to add **Coincident**  mate.

Step 6. Click OK  in the Property Manager.

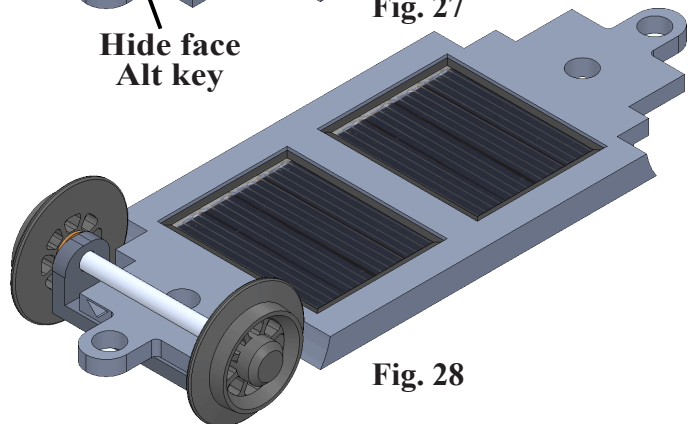
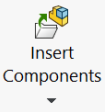


Fig. 28

H. Insert Coupler Assembly.

Step 1. Click **Insert Components**  on the Assembly toolbar.

Step 2. Select your **Coupler Assembly** file and Open.

Step 3. Click to place **Coupler Assembly**, **Fig. 29**.

Step 4. Save  (Ctrl-S).

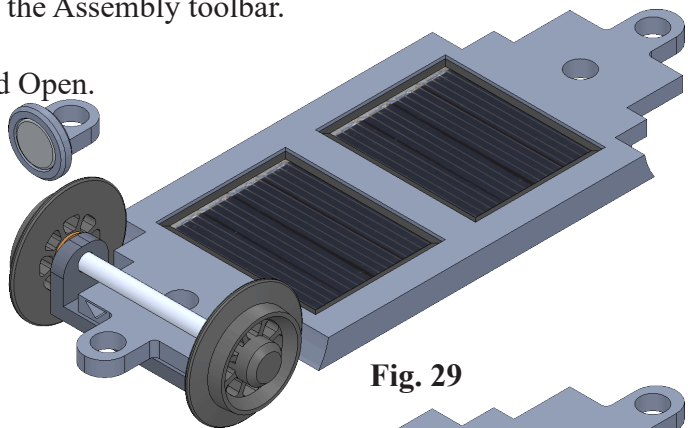


Fig. 29

I. Mate: Coupler Assembly.

Step 1. Click **Mate**  on the Assembly toolbar.

Step 2. Click a **cylindrical face of Pin hole in Coupler** and **cylindrical face of Coupler Pin hole in Deck**, **Fig. 30**.

Step 3. Check **Lock Rotation** and Add/Finish Mate  in Mate pop-up toolbar to add a **Concentric**  mate, **Fig. 31**.

Step 4. Click **top face of Deck** and **hide side face of Coupler**, then click **bottom face of Coupler**, **Fig. 32**. To hide face, **Alt** key.

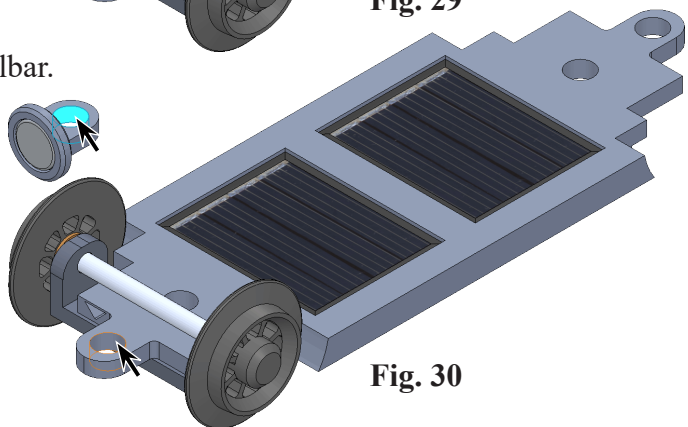


Fig. 30



Fig. 31

Step 5. Click Add/Finish Mate  to add **Coincident**  mate.

Step 6. Click OK  in the Property Manager.

Step 7. Save  (Ctrl-S).

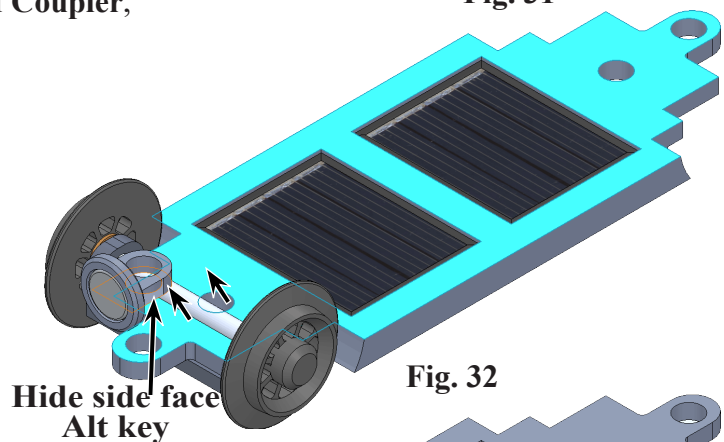


Fig. 32

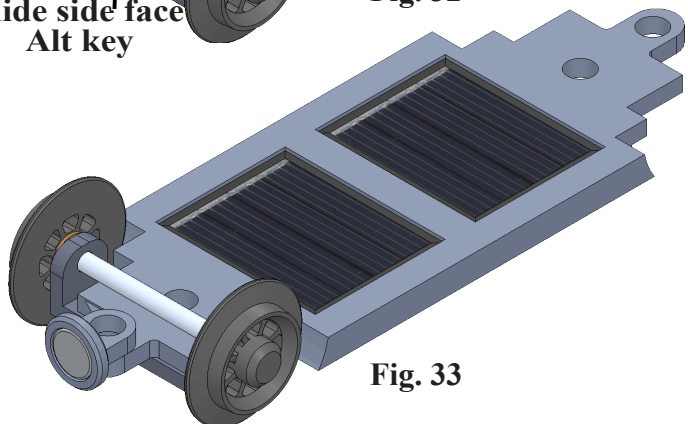
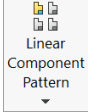


Fig. 33

J. Mirror Bogie Assembly and Coupler Assembly Front Plane.

Step 1. Ctrl click Front Plane , Bogie Assembly  and Coupler Assembly  component in the Feature Manager to select plane and components, Fig. 34.

Step 2. Click **Mirror Components**  in the **Linear Component Pattern flyout**  on the Assembly toolbar.

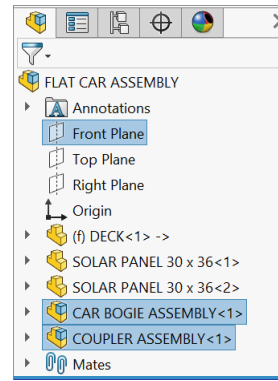


Fig. 34

Step 3. In the Mirror Property Manager:
Step 1: Selections all were preselected
click **Next**  **Fig. 35.**

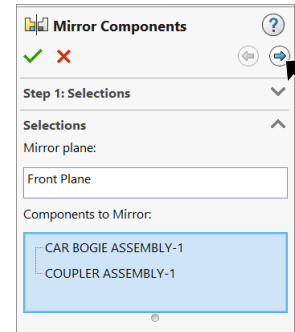


Fig. 35

Step 4. In the Mirror Components Property Manager click **OK** .

Step 5. Save  (Ctrl-S).

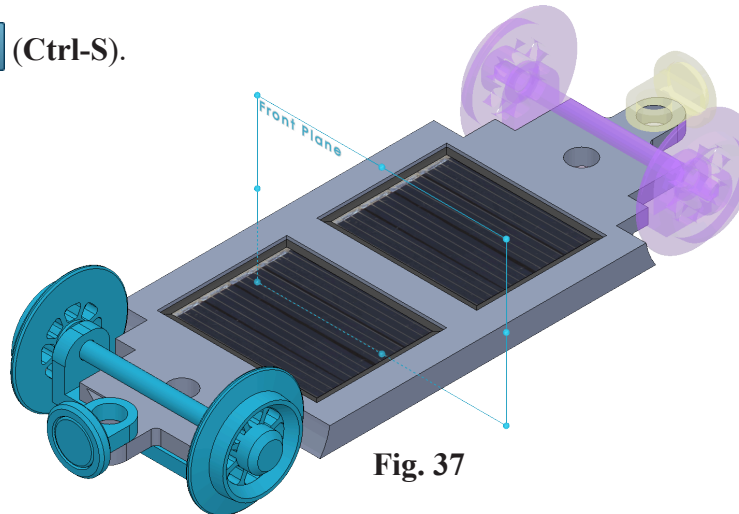


Fig. 37

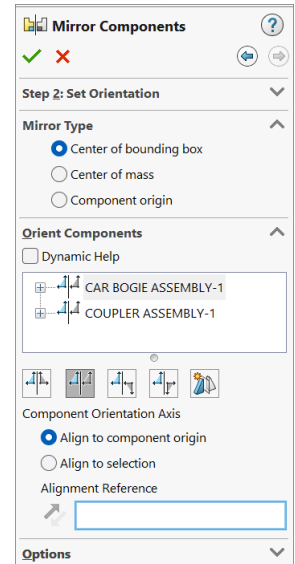
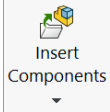


Fig. 36

K. Insert Stud Pins.

Step 1. Click **Insert Components**  on the Assembly toolbar.

Step 2. Select your **Stud Pin** file and Open.

Step 3. In the Begin Assembly Property Manager set:
click **Keep Visible** , **Fig. 38**.

Step 4. Move the **tip of your cursor to the edge of a Pin hole**, **Fig. 39**.
When the Pin snaps into place and cursor changes to Concentric and Coincident mate , release the Pin.

Step 5. Continue and place a Pin in each hole, **Fig. 39**.

Step 6. Click OK  in the Property Manager when done.

Step 7. Save  (Ctrl-S).

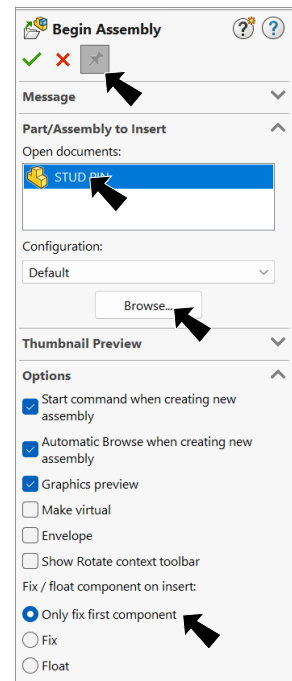


Fig. 38

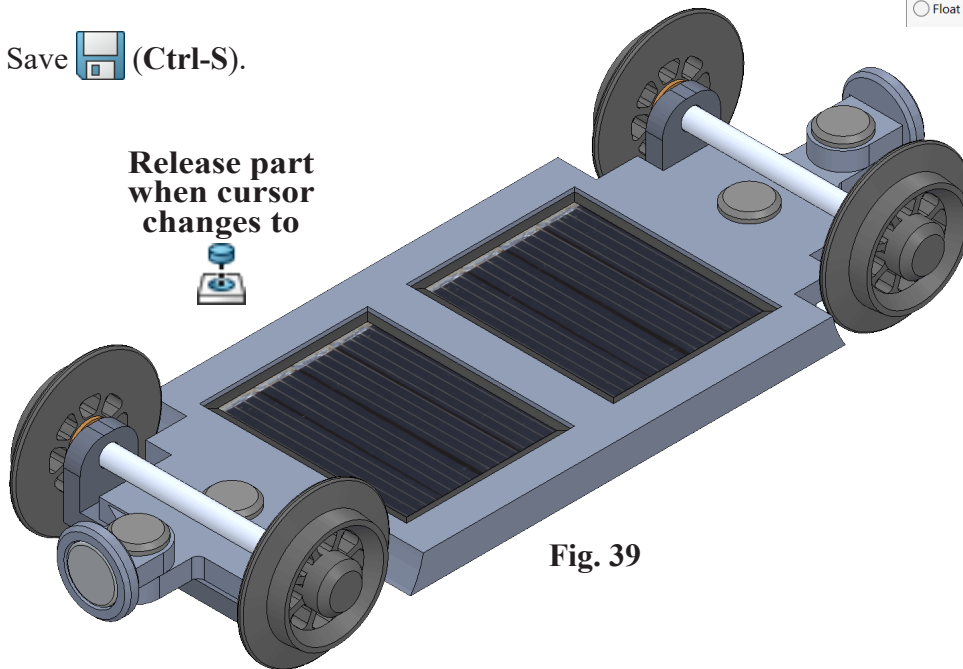


Fig. 39