

Chapter 21**R CAR****A. OPEN B FILE.**

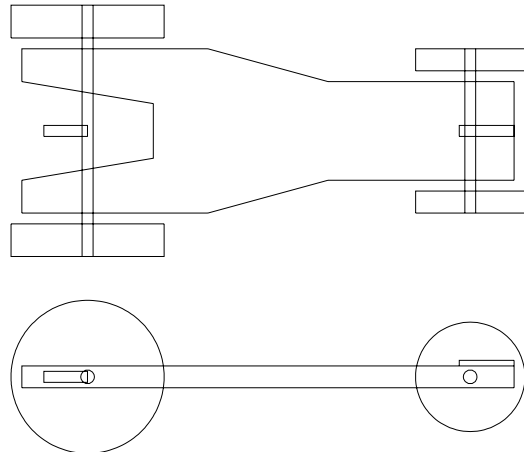
Step 1. When you start a new drawing always start with the B file (blank file). If you started this drawing as the B file go directly to Steps B. If you did not start as the B file complete these Steps:

Step 2. Click the **File** from the Menu Bar.

Step 3. Click **Open** from the File Menu..

Step 4. Click **F1 No** to save current part.

Step 5. Key in **a:b** for the filename and press ENTER.

**B. CREATE A RECTANGLE.**

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F1 LINE.

Step 4. F7 RECTANGLE.

Step 5. F2 WIDTH/HEIGHT.

Step 6. Key in **9** for width and press ENTER.

Step 7. Key in **3** for height and press ENTER.

Step 8. F9 KEY IN.

Step 9. Key in:
Zero (**0**) for coordinate X and press ENTER.
0 for Y and press ENTER.
0 for Z and press ENTER.

Step 10. ESC to Main Menu.

Step 11. Use **ALT-A** to center the rectangle on the screen. Hold down ALT and press A.

C. CHANGE COLOR.

Step 1. Draw the next lines in a different color. Change the color to **green**. Click the color swatch in the side Tool Bar. Click green, number 1.

D. CREATE PARALLEL LINES.

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F1 LINE.

Step 4. F3 PARALLEL.

Step 5. F2 AT A DISTANCE.

Step 6. Key in **3.4** for distance and press ENTER.

Step 7. Move the cursor onto the left side of the rectangle and click to select it as the reference line, see **Fig. 1**.

Step 8. Click inside the rectangle to indicate side.

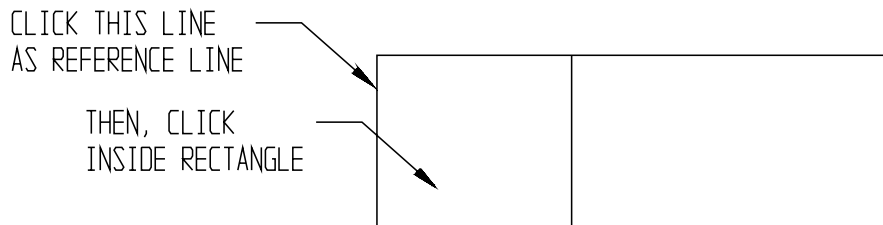


FIG. 1

Step 9. Now, use the right side of the rectangle as the reference line, **Fig 2**. Move the cursor onto the right side of the rectangle and click.

Step 10. Click inside the rectangle to indicate side.

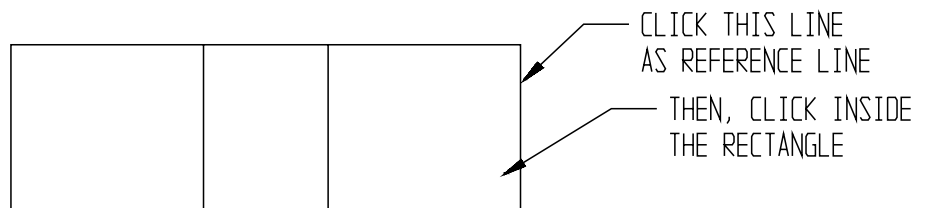


FIG. 2

E. SAVE TO DISK.

- Step 1. At this point it is a good idea to save the drawing. Place a disk in Drive A.
- Step 2. Click the **File** Menu from the Menu Bar.
- Step 3. Click **Save As** from the File Menu.
- Step 3. Key in **rcar** for the filename and press ENTER.
- Step 4. Press ESC for Part Description.

F. CHANGE BACK TO BLUE COLOR.

- Step 1. Draw the chassis **blue**. Change the color to blue. Click the color swatch in the side Tool Bar. Click blue, number 5.

G. DRAW FRONT CHASSIS DETAILS.

- Step 1. ESC to Main Menu.
- Step 2. F1 CREATE.
- Step 3. F1 LINE.
- Step 4. F1 ENDPOINTS.

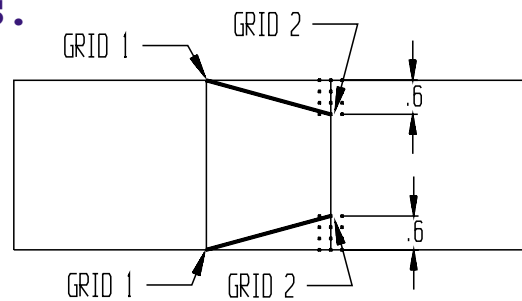


FIG. 3

- Step 5. Use the grid to measure. Each grid equals .2 inches.
- Step 6. Draw lines from the end of 1st green line, Grid 1, to **.6 inches (3 grids)** in, Grid 2, on the 2nd green line, **Fig. 3**. Click to start the line and click to end the line.
- Step 7. Repeat line for the other side of chassis, **Fig. 3**.

- Step 8. Draw a line from Grid 2 to Grid 3, **Fig. 4**.
- Step 9. Repeat line for the other side of chassis, **Fig. 4**.

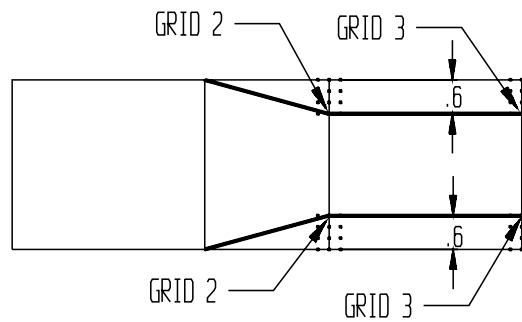


FIG. 4

- Step 10. Delete the green lines. Use **CTRL-Q** to delete lines. Hold down CTRL and press Q. Move the cursor over the green line, select with a click. Select both green lines then press ENTER.
- Step 11. At this point it is a good idea to save the drawing. Use **CTRL-S** to save. Hold down CTRL and press S.

H. DRAW REAR CHASSIS DETAILS.

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F1 LINE.

Step 4. F1 ENDPOINTS.

Step 5. Draw lines from **.6 (3 grids)** down the rear line, Grid 4, to **2.4 (12 grids)** over and **1 inch down (5 grids)**, Grid 5, **Fig 5**.

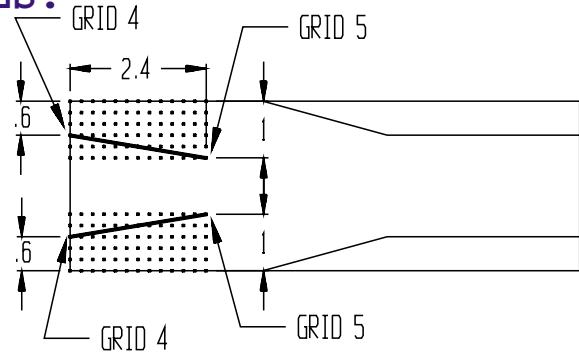


FIG. 5

Step 6. Repeat line for the other side of chassis, **Fig. 5**.

Step 7. Draw a line between the Grid 5's, **Fig 6**.

Step 8. Save the drawing. Use **CTRL-S** to save. Hold down CTRL and press S.

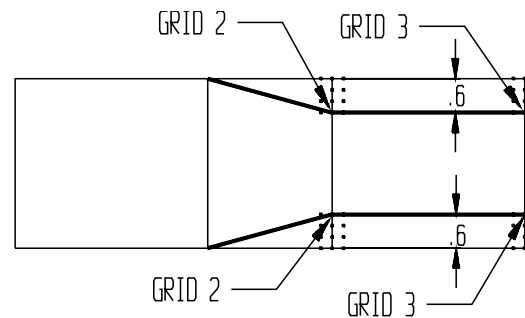


FIG. 4

I. EDIT THE RECTANGLE USING TRIM FIRST.

Step 1. ESC to Main Menu.

Step 2. F2 EDIT.

Step 3. F1 TRIM.

Step 4. F1 FIRST.

Step 5. To trim first (remove part of) a line, click the line you are to keep, Line 1, **Fig. 7**. Move cursor close to the intersection with Line 2 and click.

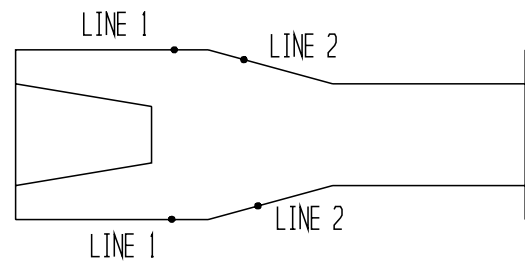


FIG. 7

Step 6. Repeat at the other side of chassis. That is, click the line you are keeping, Line 1, then move cursor close to the intersection with Line 2 and click, **Fig. 7**.

Step 7. Trim Line 3 at Line 4. First click the line you are to keep, Line 3 then click Line 4, **Fig 8**.

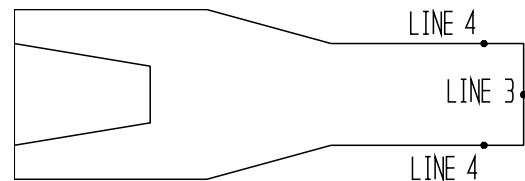


FIG. 8

Step 8. Repeat trimming Line 3 at the other Line 4. First click the line you are to keep, Line 3 then click Line 4, **Fig. 8**.

J. EDIT THE RECTANGLE USING TRIM DIVIDE.

Step 1. ESC to Main Menu.

Step 2. F2 EDIT.

Step 3. F1 TRIM.

Step 4. F4 DIVIDE.

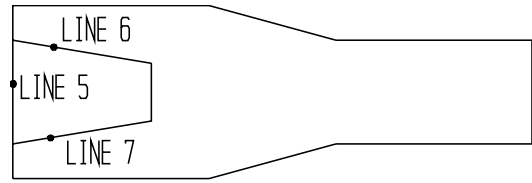


FIG. 9

Step 5. To trim divide (remove the middle of) a line, click the line you are to remove, Line 5, **Fig. 9**. Then, click the ends of the line, Lines 6 and 7.

Step 6. Use CTRL-R to clear temporary markers. Hold down CTRL and press R.

Step 7. Save the drawing. Use **CTRL-S** to save. Hold down CTRL and press S.

K. SCALE DOWN DRAWING.

Step 1. Use **Alt-H** **two** times to reduce the drawing half size twice. Hold down ALT and press H **two times**.

L. CREATE A RECTANGLE.

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F1 LINE.

Step 4. F7 RECTANGLE.

Step 5. F2 WIDTH/HEIGHT.

Step 6. Key in **9** for width and press ENTER.

Step 7. Key in **.4** for height and press ENTER.

Step 8. F9 KEY IN.

Step 9. Key in:
 0 for X and press ENTER.
 -3 for Y and press ENTER.
 0 for Z and press ENTER. **Fig. 10**

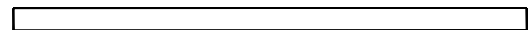
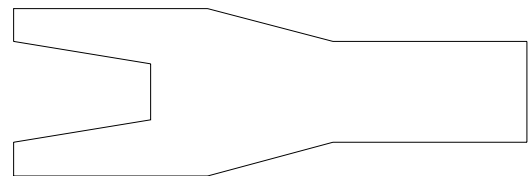


FIG. 10

Step 10. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

Step 11. ESC to Main Menu.

M. WHEELS.

Step 1. Draw the wheels **red**. Change the color to red. Click the color swatch in the side Tool Bar. Click red, number 2.

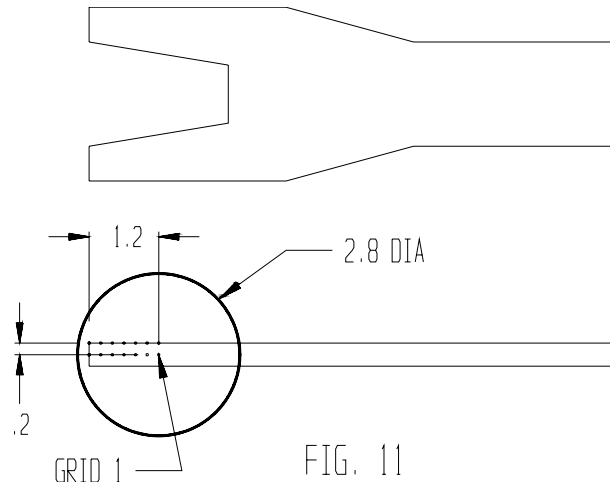
Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F3 CIRCLE.

Step 5. F2 CENTER/DIAMETER.

Step 6. Key in **2.8 for diameter** and press ENTER.

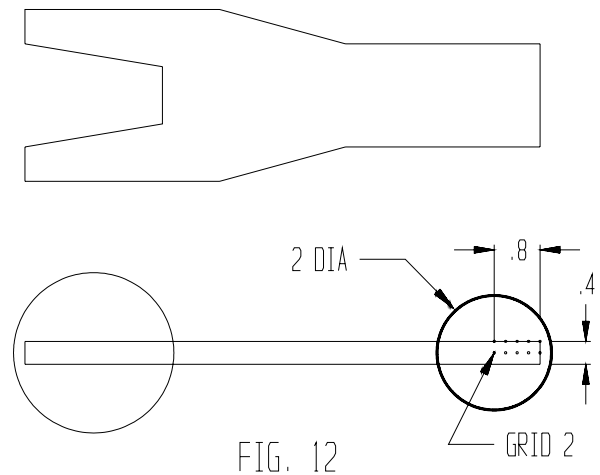


Step 7. Each grid equals .2 inches. Move the cursor to **1.2 inches (6 grids)** in from rear end of Side View and down **.2 (1 grid)**, Grid 1, **Fig. 11** and click.

Step 8. F10 BACKUP to key in new diameter.

Step 9. Key in **2 for diameter** and press ENTER.

Step 10. Move cursor to **.8 inches (4 grids)** in from front end of Side View and down **.2 inches**, Grid 2, **Fig. 12** and click.



Step 11. Save the drawing. Use **CTRL-S** to save. Hold down CTRL and press S.

N. AXLES IN THE SIDE VIEW.

Step 1. Draw the axles **yellow**. Change the color to yellow. Click the color swatch in the side Tool Bar. Click yellow, number 4.

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F3 CIRCLE.

Step 5. F2 CENTER/DIAMETER.

Step 6. Key in **.25** for diameter and press ENTER.

Step 7. Move the cursor to Grid 1, **Fig. 13** and click. Use the grid to measure. Each grid equals .2 inches.

Step 8. Move the cursor to Grid 2, **Fig. 13** and click.

Step 9. Save the drawing. Use **CTRL-S** to save.

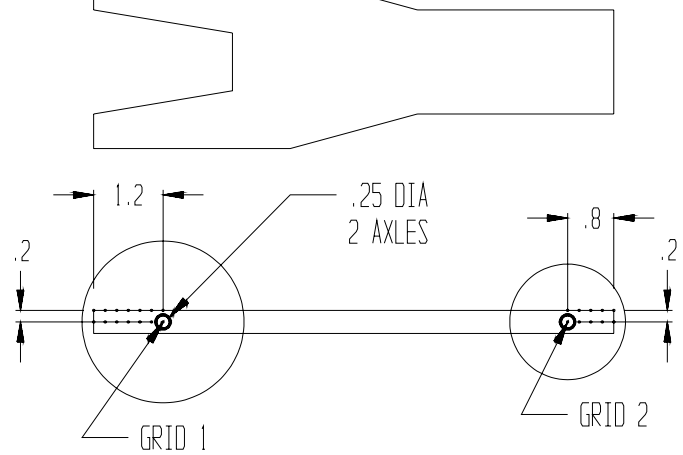


FIG. 13

O. WHEELS IN TOP VIEW.

Step 1. Draw the wheels **red**. Change the color to red. Click the color swatch in the side Tool Bar. Click red, number 2.

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F1 LINE.

Step 5. F7 RECTANGLE.

Step 6. F1 CORNERS.

Step 7. Draw the rear wheels, **Fig. 14**. Start the rectangle with a click at Grid 1, **.8** inches from the chassis, in-line with the rear wheels in the Side View. Move the cursor to stretch the rectangle to Grid 2, **.2** inches from the chassis in-line with the rear wheels in the Side View.

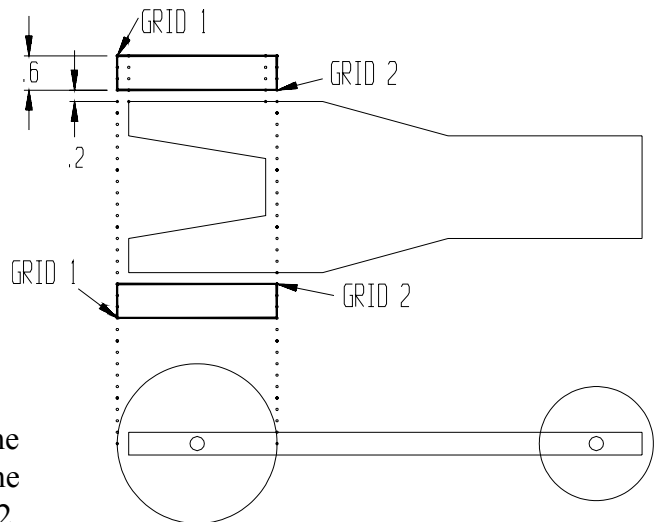


FIG. 14

Step 8. Draw both rear wheels. Keep wheels in-line with wheels in Side View, **Fig. 14**.

Step 9. Draw the front wheels, **Fig. 15**. Make the front wheel wheels **.4** wide. Start the rectangle with a click at Grid 1, **.6** inches from the chassis in-line with the front wheels in the Side View. Move the cursor to stretch the rectangle to Grid 2, **.2** from the chassis in-line with the front wheels in the Side View.

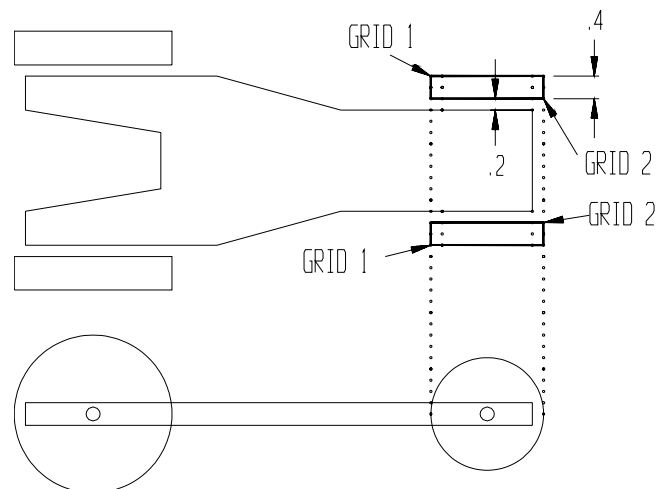


FIG. 15

Step 10. Draw both front wheels.

P. AXLES IN TOP VIEW.

- Step 1. Draw the axles **yellow**. Change the color to yellow. Click the color swatch in the side Tool Bar. Click yellow, number 4.
- Step 2. **Set the Snap to .1**. Use **CTRL-G**. Hold down CTRL and press G. Change the **Snap Properties Increment** to **X = .1 and Y = .1** Click OK.
- Step 3. ESC to Main Menu.
- Step 4. F1 CREATE.
- Step 5. F1 LINE.
- Step 6. F1 ENDPOINTS.
- Step 7. Draw the axles in the Top View, **Fig. 16**. Keep axles in-line with Side View axles.

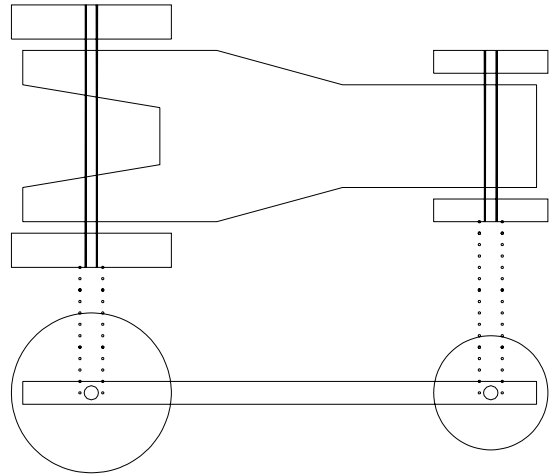


FIG. 16

Q. DRAW NAIL IN BOTH VIEWS.

- Step 1. Draw the nail **green**. Change the color to green. Click the color swatch in the side Tool Bar. Click green, number 1.
- Step 2. Zoom in to draw the nail in the Top View. Use **ALT-W**. Hold down ALT and press W. Move the cursor to just outside the top rear corner of the chassis and click to start the 1ST WINDOW CORNER, **Fig. 17**. Stretch the window to surround the rear of the chassis. Click to set 2ND WINDOW CORNER, **Fig. 17**.
- Step 3. ESC to Main Menu.
- Step 4. F1 CREATE.
- Step 5. F1 LINE.
- Step 6. F1 ENDPOINTS.
- Step 7. Draw the nail in the Top View. Follow the dimensions in **Fig. 18**.
- Step 8. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

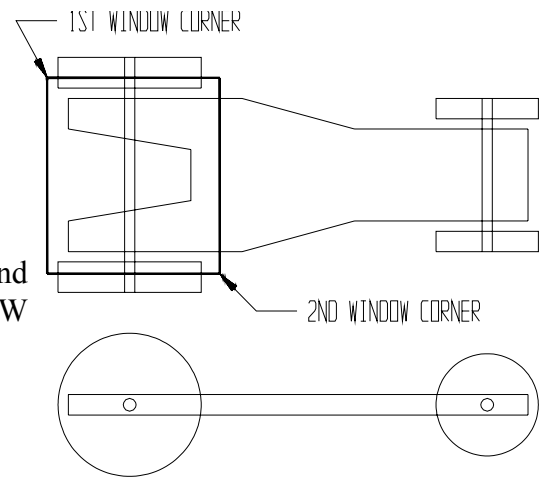


FIG. 17

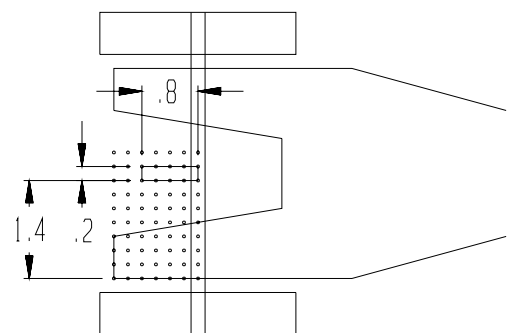
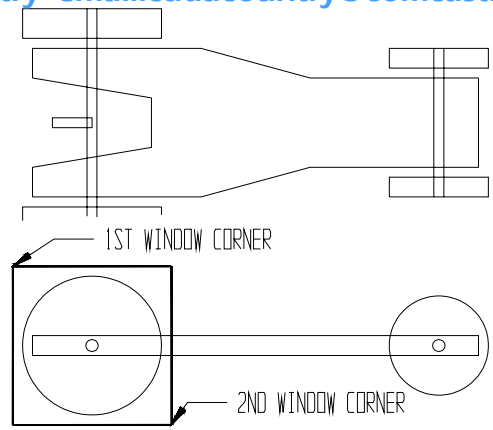


FIG. 18

Step 9. Zoom in on the rear wheel in the Side View. Use **ALT-W**. Hold down ALT and press W. Move the cursor to just outside the rear wheel in the Side View and click to start the 1ST WINDOW CORNER, **Fig. 19**. Stretch the window to surround the wheels. Click to set 2ND WINDOW CORNER, **Fig. 19**.



Step 10. Draw the nail in the Side View. Follow the dimensions in **Fig. 20**.

Step 11. Use **ALT-A** to center the drawing on the screen.

Step 12. Save the drawing. Use **CTRL-S** to save.

R. DRAW RUBBER BAND HOLD DOWN.

Step 1. Draw the rubber band hold down **purple**. Change the color to purple. Click the color swatch in the side Tool Bar. Click purple, number 6.

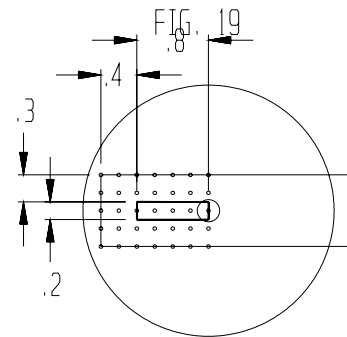


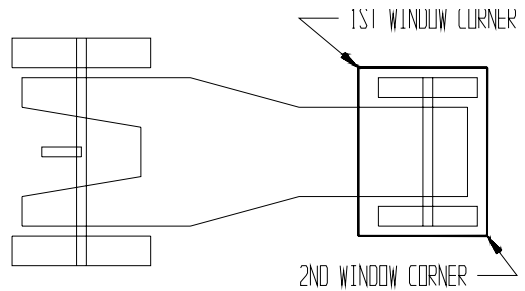
FIG. 20

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F1 LINE.

Step 5. F1 ENDPOINTS.



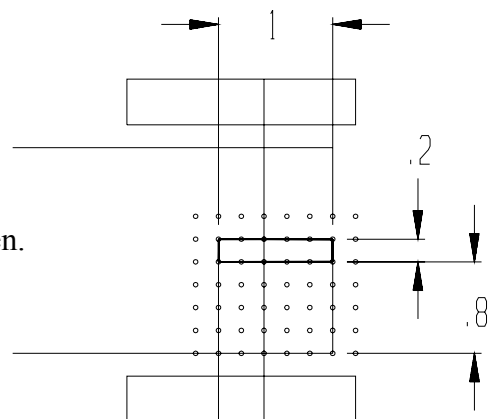
Step 6. Zoom in on the front wheels in the Top View. Use **ALT-W**. Hold down ALT and press W. Move the cursor to just outside the front wheels in the Top View and click to start the 1ST WINDOW CORNER, **Fig. 21**. Stretch the window to surround the wheels. Click to set 2ND WINDOW CORNER, **Fig. 21**.



FIG. 21

Step 7. Draw the rubber band holder in the Top View. Follow the dimensions in **Fig. 22**.

Step 8. Use **ALT-A** to center the drawing on the screen.



Step 9. Zoom in on the front wheel in the Side View. Use **ALT-W**. Hold down ALT and press W. Move the cursor to just outside the front wheel in the Side View and click to start the 1ST WINDOW CORNER, **Fig. 23**. Stretch the window to surround the wheel. Click to set 2ND WINDOW CORNER, **Fig. 23**.

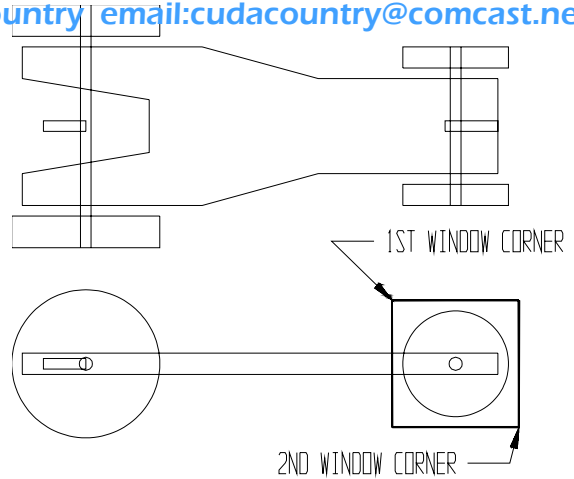


FIG. 23

Step 10. Draw the rubber band holder in the Side View. Follow the dimensions in **Fig. 24**.

Step 11. Use **ALT-A** to center the drawing on the screen.

Step 12. Save the drawing. Use **CTRL-S** to save.

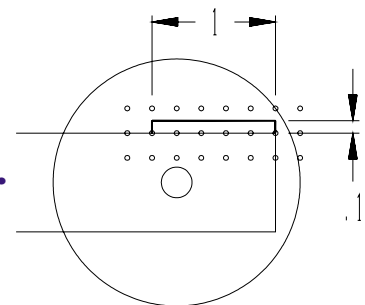


FIG. 24

S. ADD YOUR NAME(s) TO THE DRAWING.

Step 1. ESC to Main Menu.

Step 2. F3 DETAIL.

Step 3. F2 NOTE.

Step 4. F1 KEY-IN.

Step 5. Lock the Caps, key in: DRAWN BY: FIRST AND LAST NAME AND FIRST AND LAST NAME AND PERIOD 1 (your period number).

Step 6. Click OK.

Step 7. Center the text bar at the bottom of the drawing and click.

Step 8. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

Step 9. Save the drawing. Use **CTRL-S** to save.