

# TurboCAD Pro V15.2 – Tracked Transport

Donald B. Cheke



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#### Special Note

All of the work presented within this tutorial is based on TurboCAD Pro V15.2. Although users of previous versions are welcome to try the tutorial it cannot be stated what results will be achieved. Many changes, some subtle and others not so subtle, are made with each program revision. Although many steps and directions would be generic some may not be. The same can be said for tools between versions. Older versions may not have the same tools as Pro V15.2 and if the same tools are available the tools themselves may have been revised and hence, work in a different manner than they previously did.

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## Introduction

For years I have had a strong desire to create a 'truck' with a somewhat realistic body using TurboCAD. I had always assumed that it would entail lofting profiles but it turns out that this was not case for the tracked transport. The tracked transport was a real blast to create and I hope that you will enjoy working through the tutorial as much as I did writing it. There are a number of cool processes involved and it should prove interesting even to those who have had the opportunity to run through many of my other tutorials.

Best regards,  
Don

Within the tutorial the reader will be lead through each keystroke to produce every component of the tracked transport that is illustrated on the cover of the tutorial. The reader will learn how to create all the components using 2D profiles and modified 3D primitive shapes. The reader will learn how to insert standard lighting and how utilize render scene luminance. Additionally, the reader will learn how to render their drawing and save it in a high resolution image format.

This tutorial is in no way intended to teach vehicle design or construction, but rather it is intended to teach the use of some of the tools that TurboCAD has to offer and to introduce the new user to a drawing methodology. The author feels confident that the techniques outlined within the tutorial can help lay the foundation for future successful TurboCAD drawing and illustration for even the newest user.

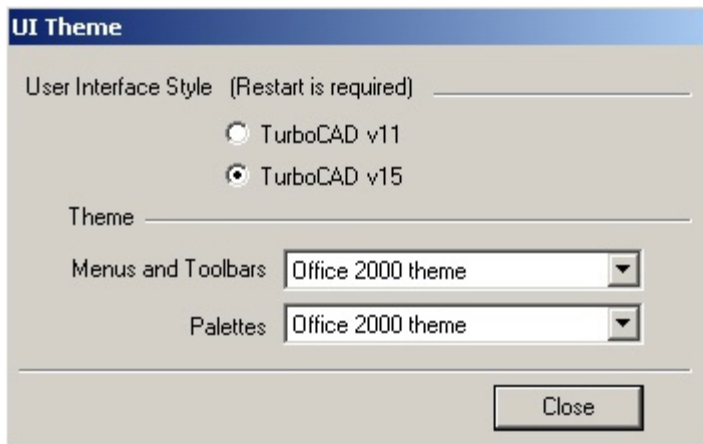
As with any technically advanced software, the user is generally faced with a steep learning curve. It is the hope of the author that the money and time spent working through a Textual Creation tutorial will help ease the learning and allow the reader to come away feeling confident that they made a wise decision.

This tutorial will assume that the reader has the full edition of TurboCAD Pro V15.2 with the current Architectural and Mechanical add-ons, although **no** architectural or mechanical add-on tools will be used during the tutorial that the author is aware of.

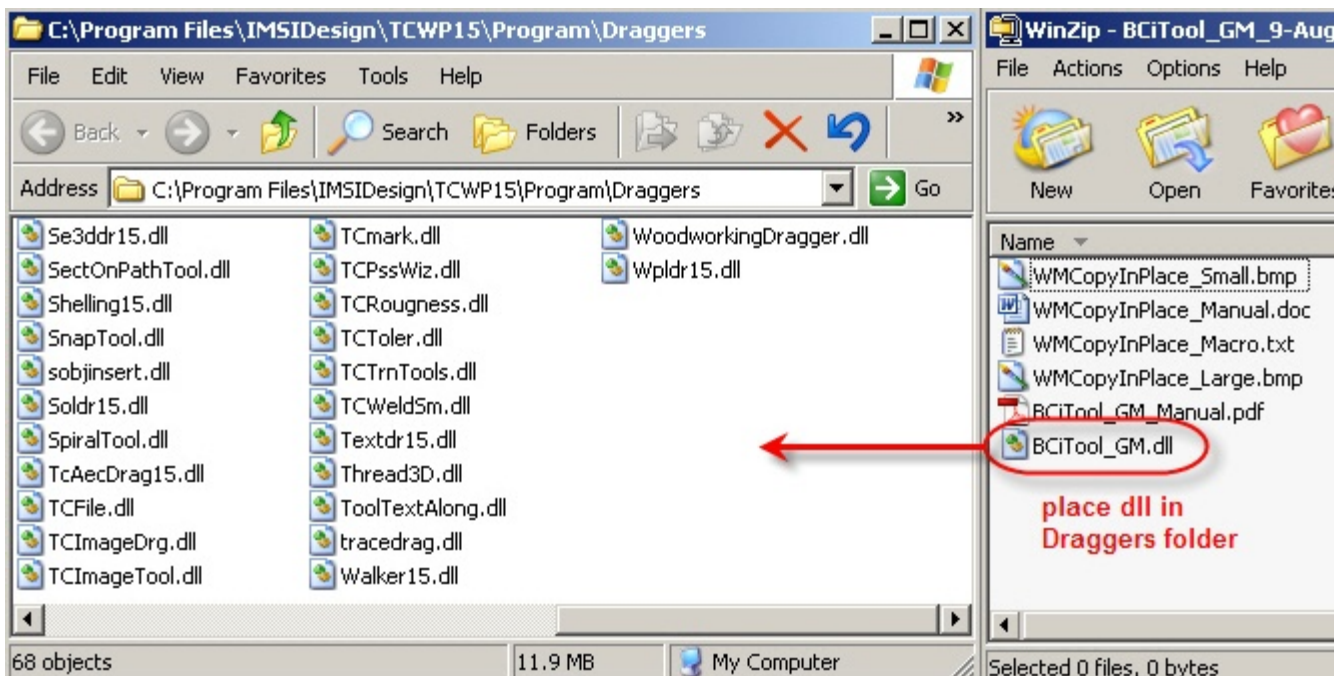
There are many ways to approach a project and it is likely that each person using the program would proceed in very different ways, so be open to alternative methods as experience builds. What is important is that the user becomes familiar with the objects that they wish to model and begin to look at them in a different way than they might otherwise do. What primitive shapes make up the whole? What will be required of these primitive shapes early in the drawing and how will this affect needs further along? What component or components should be started with? Many questions can only be answered through experience, but hopefully some of them will be answered by the time the beginner has worked through this tutorial. There is a great deal covered in this tutorial and the author urges the beginner to be patient, to read very carefully and to take the time necessary to do a good job. Try to enjoy the process as much as you will enjoy the final results.

This tutorial assumes that the beginner has studied the desktop to some degree and can locate most of the tools. Since there are endless desktop configurations that can be set up in TurboCAD the author has

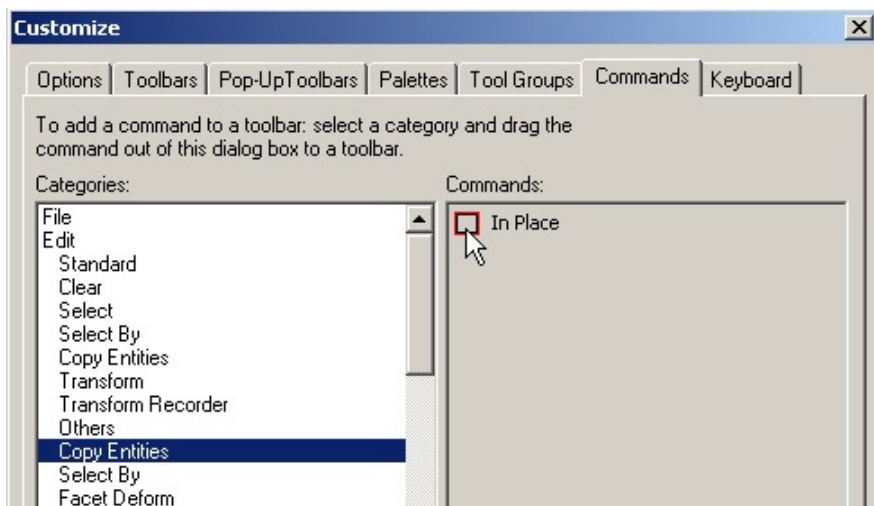
opted to illustrate the required tools with the V15 user interface, and the default toolbars in their undocked format (Office 2000 theme).



This tutorial also utilizes a tool that does not come pre-packed with TurboCAD. It is the Copy in Place tool created by David Bell, based on an original macro by Winston Mitchell. It is available as a free download on the General Macros page at <http://www.bcitool.com/>. Please download it and install it as per the instruction that come with the download. It is truly an indispensable tool. Placement of the dll should be done with TurboCAD shutdown, so the dll will load when TurboCAD is started.



This toolbar does not seem to show up as it once did when it was installed and TurboCAD was started. If this toolbar does not show up for the user, they will need to drag a copy onto an existing toolbar or create a new toolbar when TurboCAD is started. The tool is located under the *second* Copy Entities entry of the Customise dialogue. The category below the second Copy Entities, "Select By", also contains the two other tools that are part of the BCITools\_GM toolbar, should a user wish to add them to a toolbar.

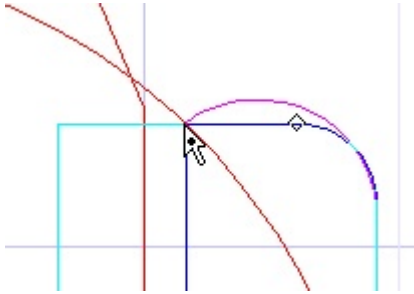


**If the reader is using Microsoft Vista or XP 64 and cannot get the Copy in Place tool to appear or function at all an alternate means of copying in place will be needed. This will be presented further along in the tutorial when the first copy in place is required.**

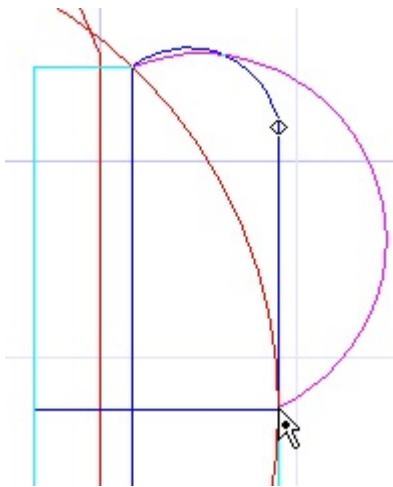
Please remember that any supplied images and files are for use within the tutorial only and may not be shared or sold to others.

The beginner should not overlook the importance of the internet as a resource for material to help understand the dynamics of what they are trying to model. If only to help gain a better understanding of what a user is modeling a Google image search and regular web search is time well spent.

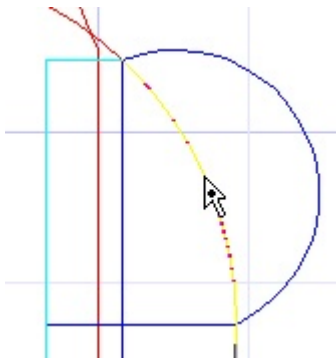
Left mouse click on the upper node of the arc to pick it up. Move the node to the top vertex of the vertical parallel line and V SEKE snap it in place. In progress below.



Left mouse click on the lower node of the arc to pick it up. Move the node to the right vertex of the horizontal parallel line and V SEKE snap it in place. In progress below.



Left mouse click on the green node of the arc to pick it up. Move the node to the arc of the red circle and N SEKE snap it in place. In progress below.



Press the Space Bar to exit the tool.

Left the large red circle and the two parallel lines and delete them.

## Cab Profiles to 3D

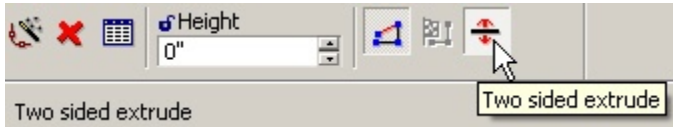
It is now time to extrude the profiles and intersect them to make the first two components of the cab.

Switch to Isometric SE view.

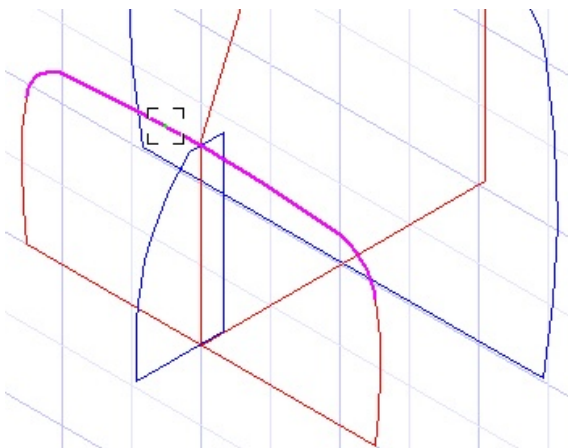
Select the Simple Extrude tool from the 3D Object toolbar.



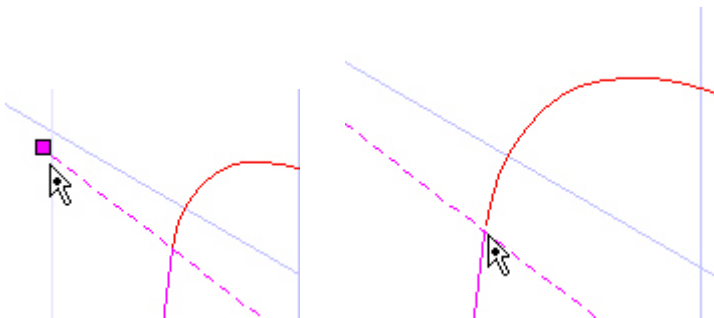
Select the Use Compound Profile option and the Two sided extrude option.



Select one line of the forward front red profile as the object to extrude (all should select).



*If it doesn't all select, select the Edit tool from the Select toolbar. Select the segments, one at a time, left mouse click on the start and end nodes and V SEKE snap them to the ends of the next arc.*



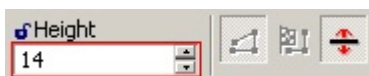
*If need be, select the Simple Extrude tool from the 3D Object toolbar again.*

Select one line of the forward front red profile as the object to extrude (all should select).

If need be, select Finish Selection of Profile.



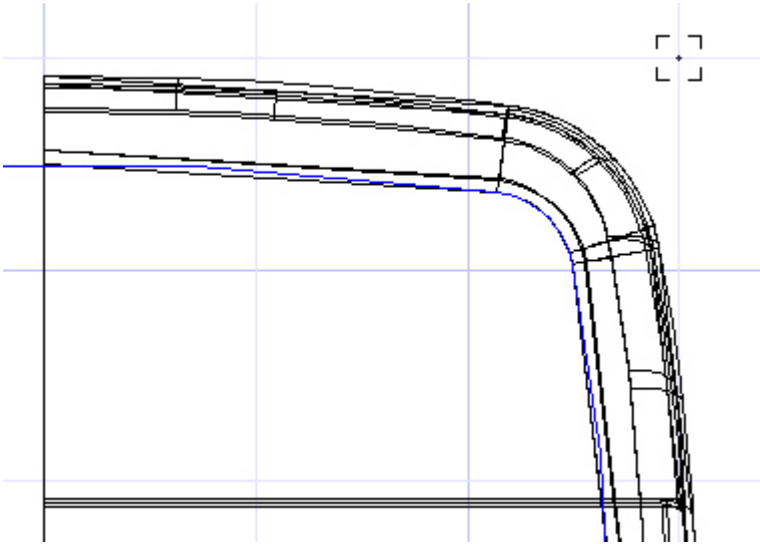
Tab into the Inspector Bar and enter 14 in the Height field (14 in each direction). Press Enter.



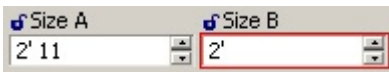
Turn off the Use Compound Profile option.

Select the Rectangle tool from the Line toolbar.

G SEKE snap the first point of the rectangle to the grid as indicated in the picture below.

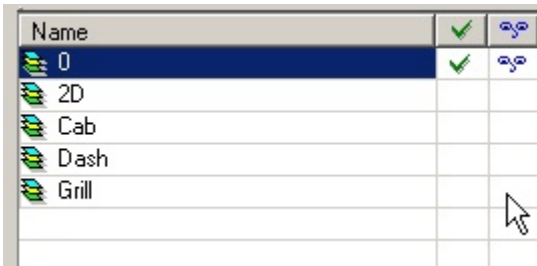


Move the cursor in a left downwardly direction for a short distance and then Tab into the Inspector Bar and enter 2' 11 in the Size A field and 2' in the Size B field. Press Enter.



Press the Space Bar to exit the tool.

Create three new layers called Cab, Dash and Grill and then turn them off.



Switch to Isometric SE view.

Select the cab and assign it to the Cab layer.

Select the dash and assign it to the Dash layer.

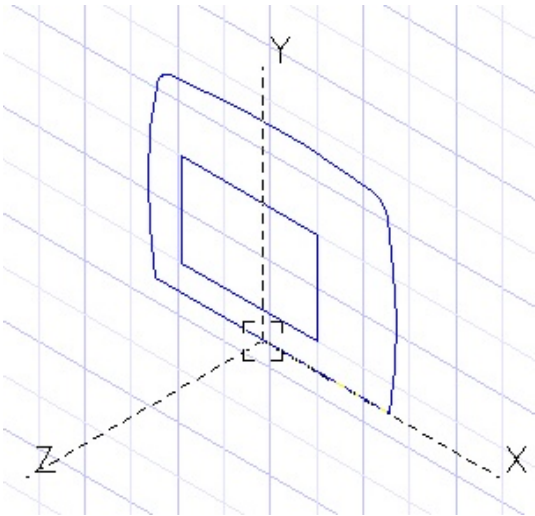
Select the grill and assign it to the Grill layer.

Select the dash profile and assign it to the 2D layer.

Select the Workplane by Entity tool from the Workplane toolbar.



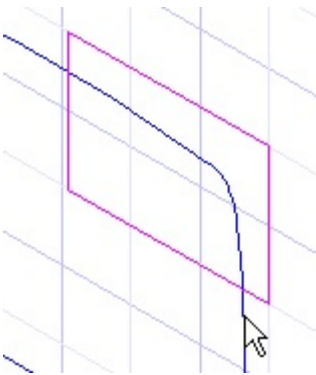
Left mouse click the large blue profile. In progress below.



Select the smaller blue profile and then select Place on Workplane from the Format menu at the top of the TurboCAD desktop.

Select the Trim tool from the Modify toolbar.

Select the rectangle as the trim line. Left mouse click the larger profile below the rectangle to trim it. In progress below.



Press Esc to reset the Trim tool.

Select the trimmed profile as the trim line. Left mouse click the rectangle to the right of the trimmed profile to trim it. In progress below.



Press the Space Bar to exit the tool.

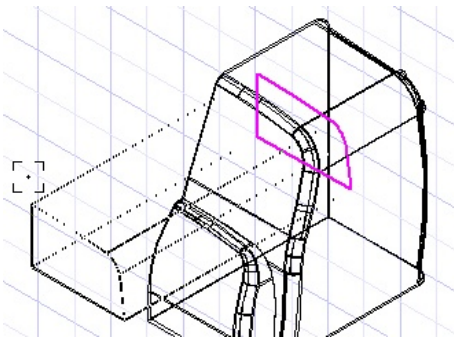
Turn on the Cab layer.

Select the Simple Extrude tool from the 3D Object toolbar.

Select the Use Compound Profile option.

Select one line of the profile as the object to extrude (all should select).

Move the cursor forward past the front of the cab and left mouse click to define the extent of the extrusion. In progress below.



Press Ctrl + K to open the Select by Colors dialogue. Select Blue and click OK.

Assign the selection to the 2D layer.

Select the Cab and the Extrusion.

Select the Copy in Place tool from the BCiTool\_GM toolbar 1X.



The only indication that a copy has been made is the users knowledge that they have left mouse clicked the tool icon.

If the user does not have the Copy in Place tool then select the Make Copy tool from the right mouse click local menu or from the Inspector Bar (providing the user has a large enough monitor) to turn it on.

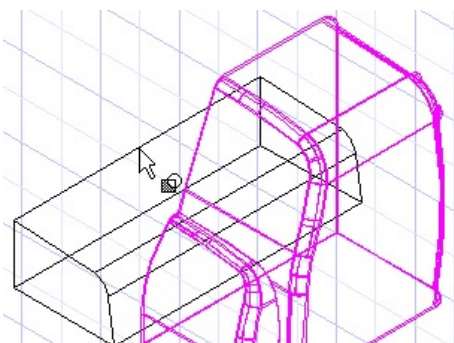


Tab into the Scale X field on the Inspector Bar but do not change the number. Simply press Enter.

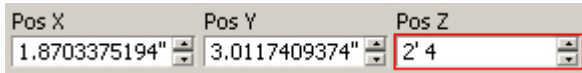


Select the Make Copy tool to turn it off.

Select the 3D intersect tool from the Boolean & Facet toolbar. Select the cab and the extrusion to create an intersected object. In progress below.

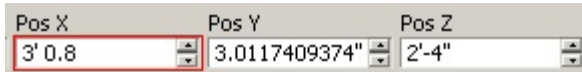


With the handle still selected, Tab into the Inspector Bar and enter 2' 4 in the Z Position field. Press Enter.

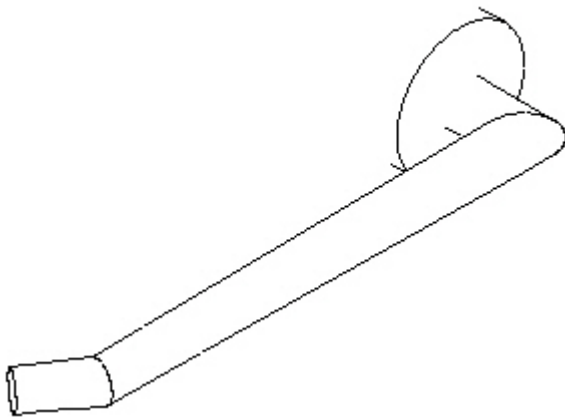


The handle must be moved into the door so only a small amount of the cylinder is visible.

Place the cursor over the line that leads to the X rotation handle and left mouse click to pick up the handle. Move the cursor so the handle moves into the door and keep an eye on the X Position field to get an idea what to enter. Tab into the Inspector Bar and enter 3' 0.8 in the X Position field. Press Enter.



Press Esc to deselect the selection.



Select the Wireframe tool icon from the Render toolbar.

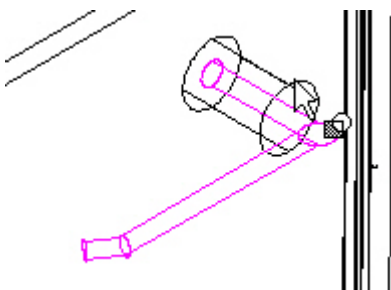
Press Ctrl + K to open the Select by Colors dialogue. Select Blue and click OK.

Assign the selection to the 2D layer.

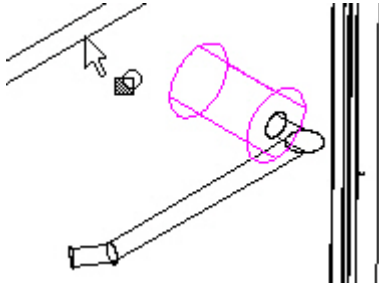
Select the 3D Subtract tool from the Boolean & Facet toolbar.

Select the Don't remove the subtrahend option.

Select the handle as the object to subtract from and then select the cylinder as the object to subtract. In progress below.



Select the cylinder as the object to subtract from and then select the door as the object to subtract. In progress below.



Press the Space Bar to exit the tool.

Select the cylinder and then select Explode 1X from the Format menu at the top of the TurboCAD desktop.

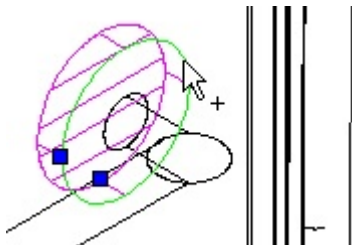
Select the inner cylinder cutoff and press Delete to remove it.

Select the Fillet Edges tool from the 3D Modify toolbar.

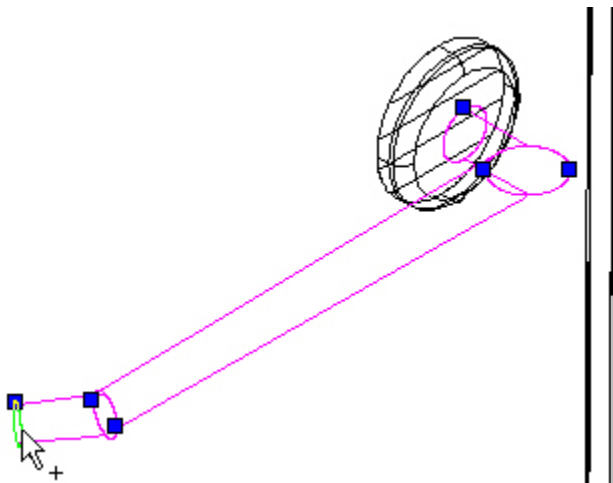
Tab into the Inspector Bar and enter .15 in the Start Radius field. Press Enter.



Select the cylinder object as the object to fillet. Place the cursor over the forward circle and then double click the same circle to select the edge and perform the fillet. In progress below.

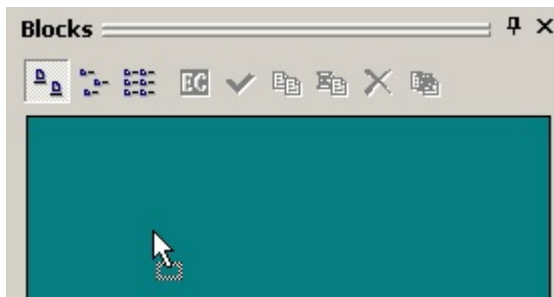


Select the handle object as the object to fillet. Place the cursor over the end circle and then double click the same circle to select the edge and perform the fillet. In progress below.

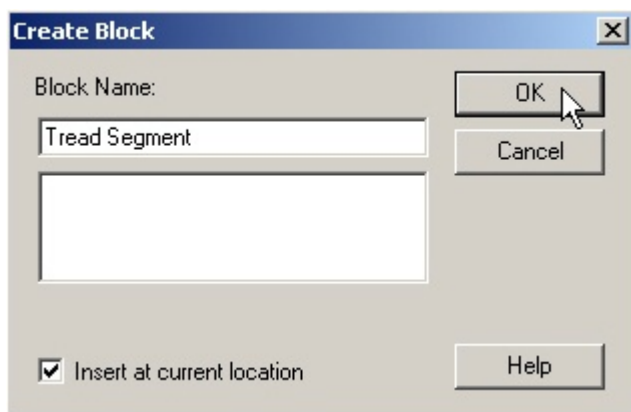


Select the tread segment.

With the segment still selected, left mouse click on the reference point of the selection and hold down the mouse button. Drag the cursor to the Blocks palette tab and when the palette opens continue dragging the cursor to the main area of the palette. When the move cursor is in place release the mouse button. In progress below.

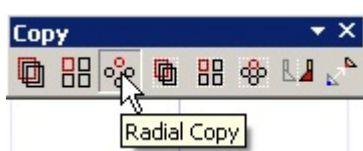


Type Tread Segment in the Block Name field of the Create Block dialogue that opens and then click OK.

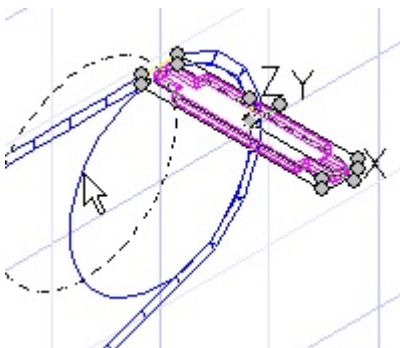


The block is created and a block is placed back in the original location. This is not something that the user will see occurring. The block has remained selected.

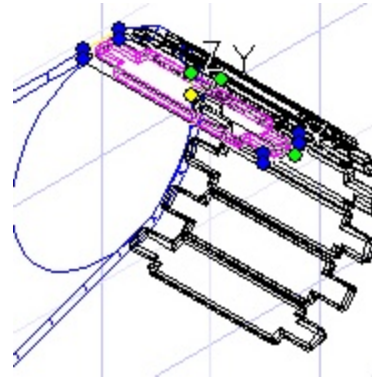
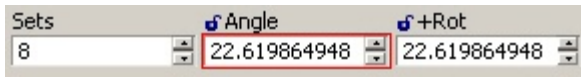
With the tread block selected, select the Radial Copy tool from the Copy toolbar.



C SEKE snap the back circle to define the radial axis. In progress below.



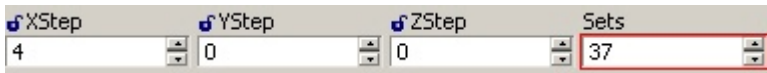
Tab into the Inspector Bar and enter 8 in the Sets field and enter the previous angle number in the Angle field. Press Enter.



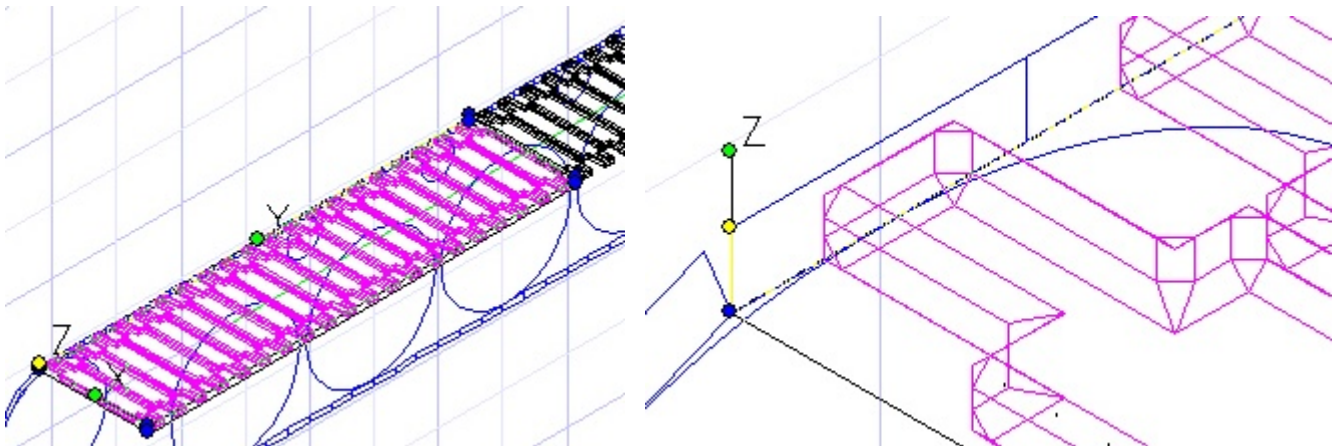
Turn off the Cab and Grill layer.

With the tread block still selected, select the Linear Copy tool from the Copy toolbar.

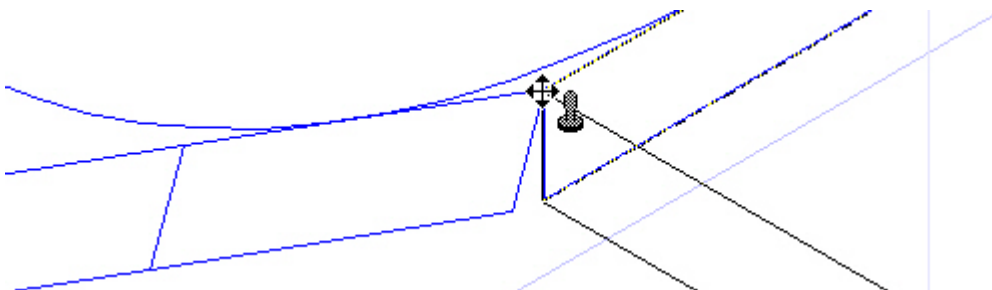
Tab into the Inspector Bar and enter 4 in the X Step field, 0 in the Y Step field, 0 in the Z Step field and 37 in the Sets field. Press Enter.



Select the last twenty tread segments. Press D SEKE and relocate (V SEKE) the reference point to the top left corner of the blue rectangle at the far left tread segment. Close-up on the right, below.

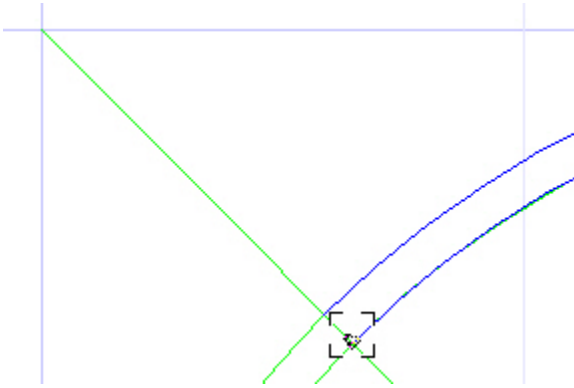


Right mouse click and select Rubber Stamp from the local menu. Move the cursor to the upper left corner of the first parallel tread profile of the lower 20 and V SEKE snap the selection in place. In progress below.



Press Esc to exit the Rubber Stamp tool.

Move the cursor around the arc and I SEKE snap at the intersection of the angled line and the inner circle.



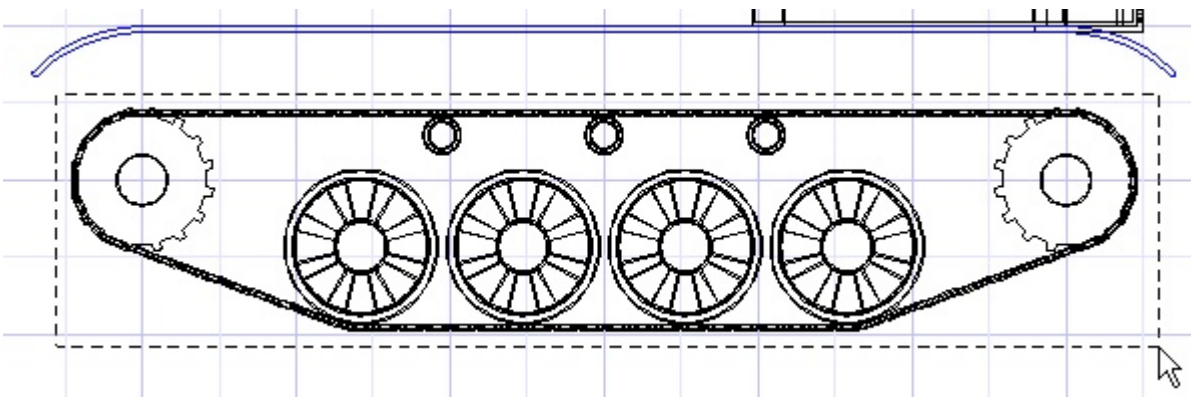
Right mouse click and select Close from the local menu.

Press Ctrl + K to open the Select by Colors dialogue. Select Green and click OK.

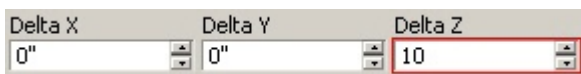
Press Delete to remove the trace aids.

The top of the track is currently 12" away from the bottom on the splash guard profile. It should be 2" away.

Drag the selection cursor around all the track components to select them. In progress below.



Tab into the Inspector Bar and enter 10 in the Delta Z field. Press Enter to move the selection up.

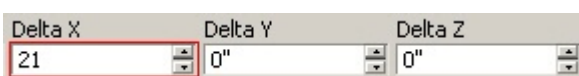


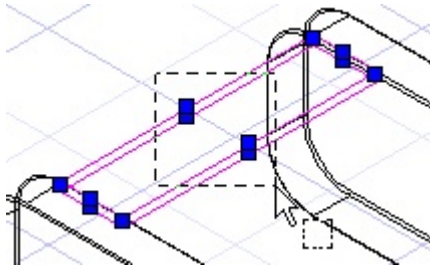
Press Esc to deselect the selection.

Select the splash guard profile.

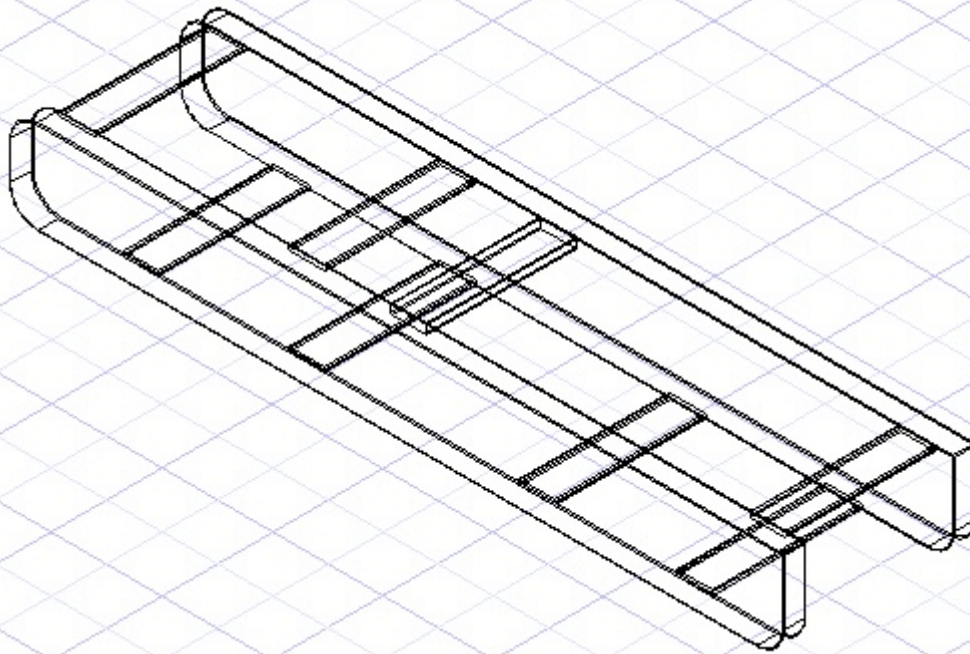
Switch to Front view.

Tab into the Inspector Bar and enter 21 in the Delta X field. Press Enter to move it over.



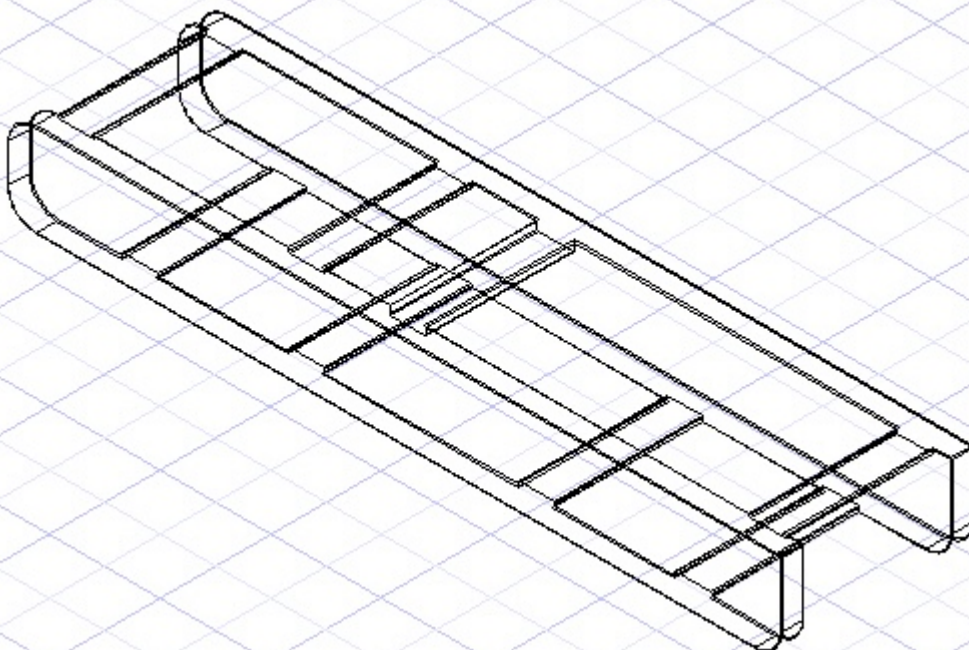


All cross members done.



Select the 3D Add tool from the Boolean & Facet toolbar.

Using left mouse clicks add all the components of the chassis together.

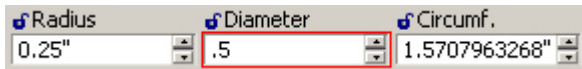


Press the Space Bar to exit the tool.

Select and delete the box.

Select the Circle Center & Point tool from the Circle/Ellipse toolbar.

V SEKE snap the first point of the circle to the upper vertex of the spline (it will snap at 0). Tab into the Inspector Bar and enter .5 in the Diameter field. Press Enter.

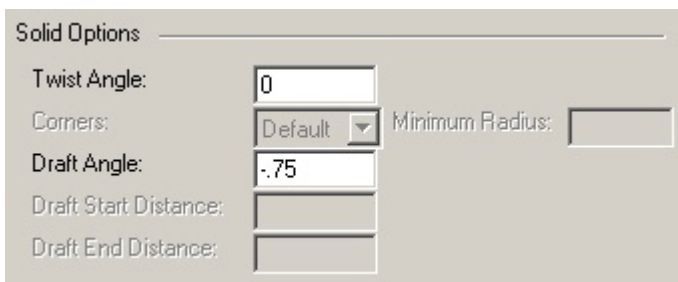


Press the Space Bar to exit the tool.

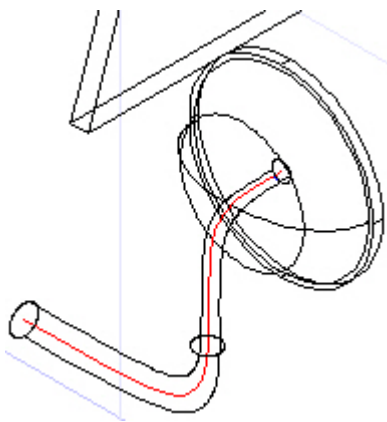
Select the circle. Left mouse click on the reference point of the selection to pick it up. Move the cursor to the upper vertex of the spline and V SEKE snap it in place.

Select the Sweep tool from the 3D Object toolbar.

Right mouse click on the Sweep tool icon to open the Properties dialogue for the tool. Under the Sweep shape tab enter a Draft Angle of -.75. Click OK.



Select the circle as the object to sweep and then select the polyline as the path. Click OK at the warning.



Press Ctrl + K to open the Select by Colors dialogue. Select Blue and Red and then click OK.

Assign the selection to the 2D layer.

Turn on the Headlight layer.

Select the hemisphere at the mirror.

Right mouse click and select Rubber Stamp from the local menu.

Select the splash guard. Open the Materials palette. Locate the Lacquer Category and double click the Mora Metallic TV Blue to apply the material to the selection.



Open the Block palette. Select Finish Edit Content icon at the top of the palette.

Turn off the Splash Guards layer and turn on the Chassis, Transfer Case, Drive Shafts and Drive Axels layers.

Select the all the visible components. Open the Materials palette. Locate the Cast Category and double click the TV Cast thumbnail to apply the material to the selection.



With the objects still selected, select the Quality Rendering icon from the Render toolbar.

Press Esc to deselect the selection after it renders.



Select the Wireframe render icon to end the render.

Turn off the four 3D layers and turn on the Bumper layer.

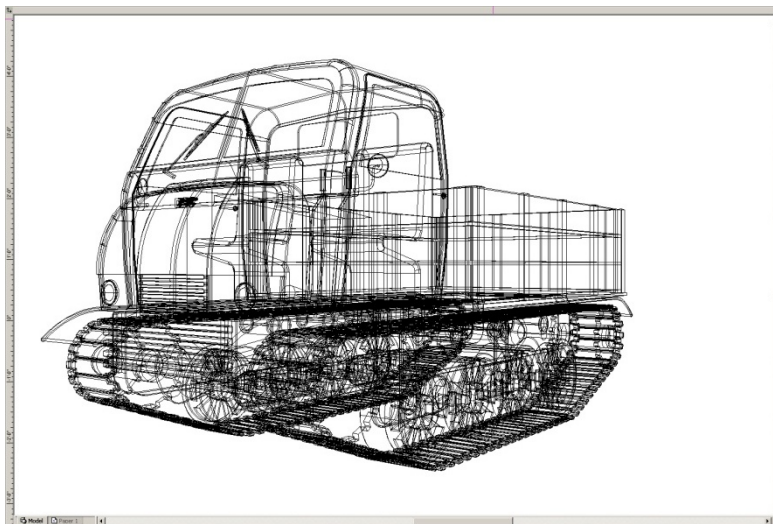
Select the bumper components.



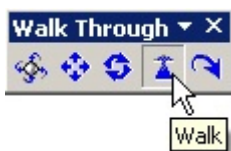
Select Look To Drawing Center from the View / Camera menu at the top of the TurboCAD desktop.



Left mouse click in the drawing and hold the mouse button down. Move the cursor to the left to turn the model to a position similar to the image below.



Select the Walk tool from the Walkthrough toolbar.



Left mouse click in the drawing and hold the mouse button down. Move the cursor to the left and then straight down to move the model to a position similar to the image below.

