

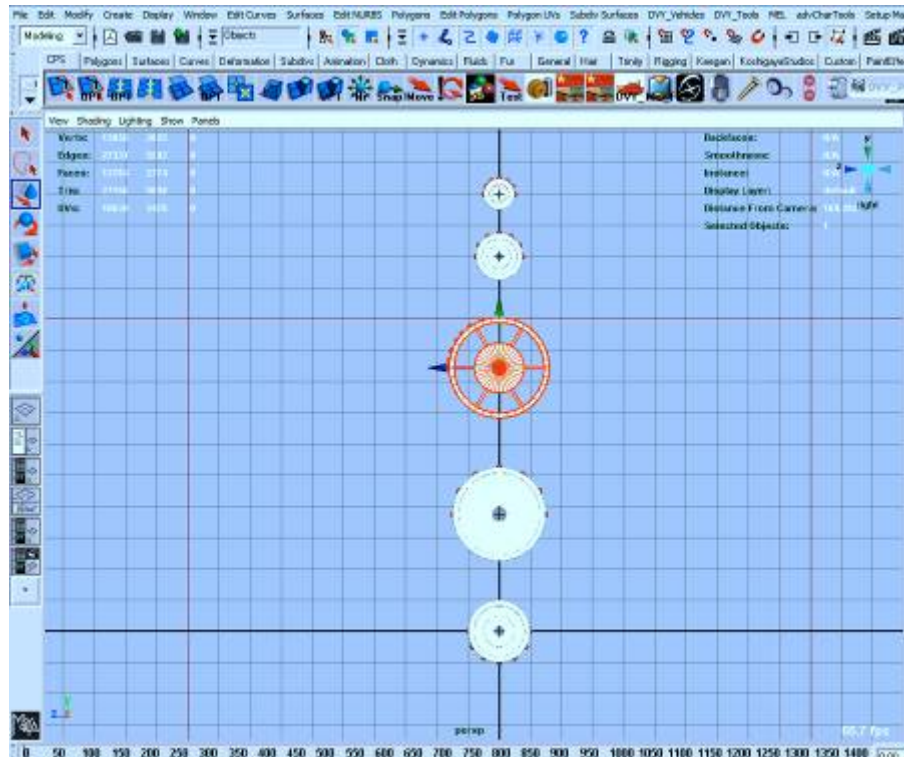
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Davvey's Belt and Pulley Generator Help File.

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1. Start GUI by typing DVY_Pulleys in command line.
2. Select Flat-Belt, Vee-Belt or Toothed-Belt Radio Button to set up relevant Pullets before building Belt.
3. Fill in Belt details then enter data for each Pulley to be setup up to a maximum of 5 Pulleys.
4. As you fill in each field for each Pulley the English equivalent will be calculated automatically.
5. Select style of Pulley and or Flange Options as required. Style of Pulley is Hubbed (default) , Flat Sided or Spoked and Flange Options are None (default), Front, Rear, or Both sides.
6. The recommended Shaft Diameter will be calculated but this can be altered if required. Also the details for flanges on the Pulley will be filled in automatically. The flanges will only be built if the Radio Button option for flanges is selected.
7. Flanged versions of Pulleys are only available for Flat and Toothed Belt Type Pulleys.
8. For Flat and Vee-Belt Pulleys the Pulley outside diameter is entered but for Toothed Belts the number of Teeth per Pulley is entered. The GUI will calculate the actual outside diameter and display it.
9. The Toothed-Belt Pulley outside diameter is calculated using Belt Pitch and number of Teeth required per Pulley.
10. After building the Pulleys the screen will show the following layout. (See Figure 01)

Figure 01.



11. Each pulley has seven Red Spheres Grouped to the transform node which are used later to build the belt path.
12. Move Pulleys 2 - 5 in the Y and Z axis to the correct positions as required (Pulley 1 is locked at 0 0 0).
13. Press Build Belt Path Button to generate a Linear or 1 Degree curve around the Pulleys. Each Sphere on a Pulley will generate a CV and Cluster Handle constrained to the Sphere. Each Sphere's rotation is set at the center of the pulley. (see Figure 02 & 03)

Figure 02.

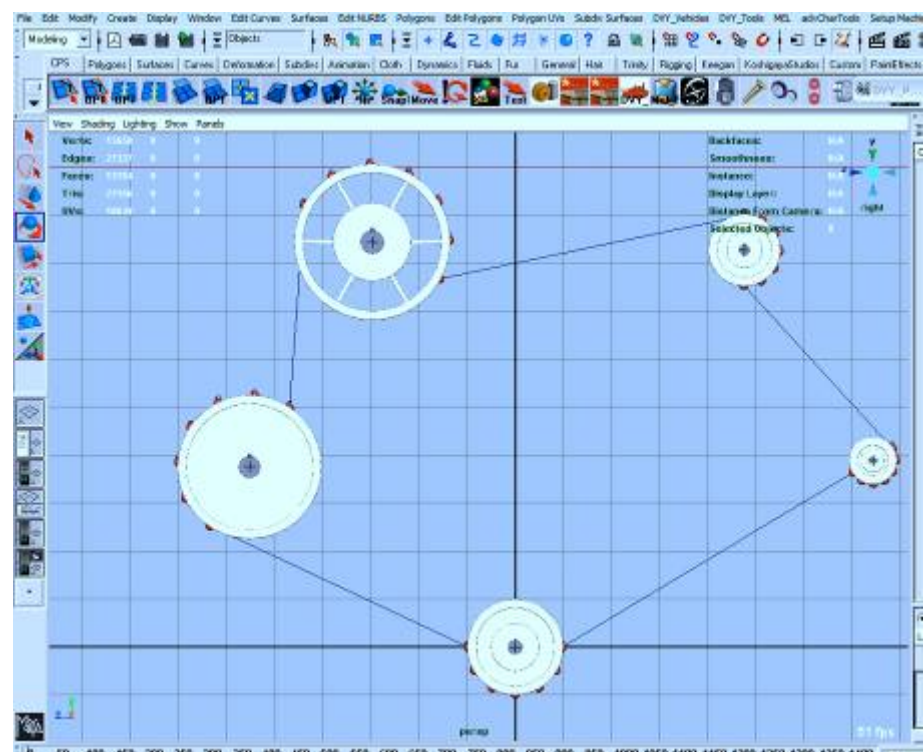
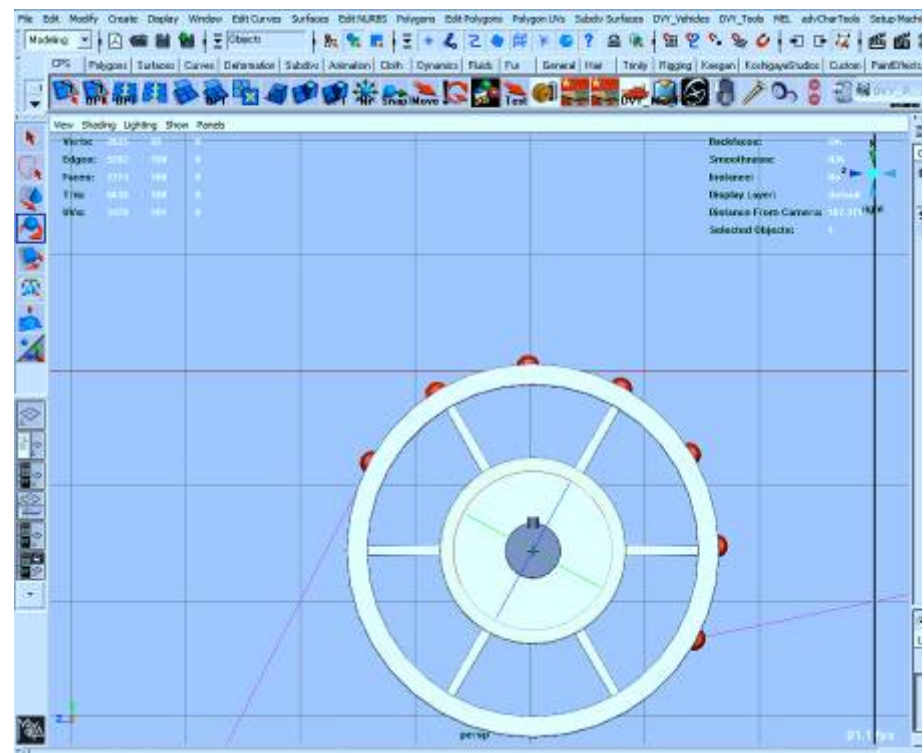


Figure 03.



14. Adjust Position of each Sphere to generate correct Path for the Belt. Each Sphere can overlap another sphere but the centre of each Sphere cannot “Cross” the previous Sphere i.e. each Sphere is numbered sequentially and the Path is built based on this numbering.
15. Continue adjusting Sphere Positions till Belt Path is correct (See Figure 04 & 05)

Figure 04.

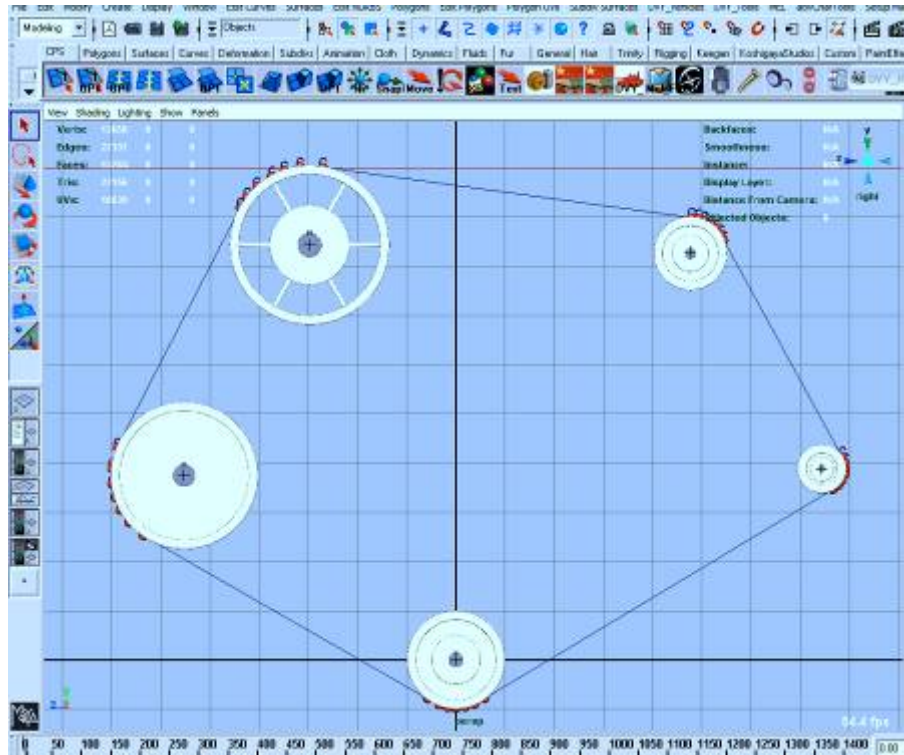
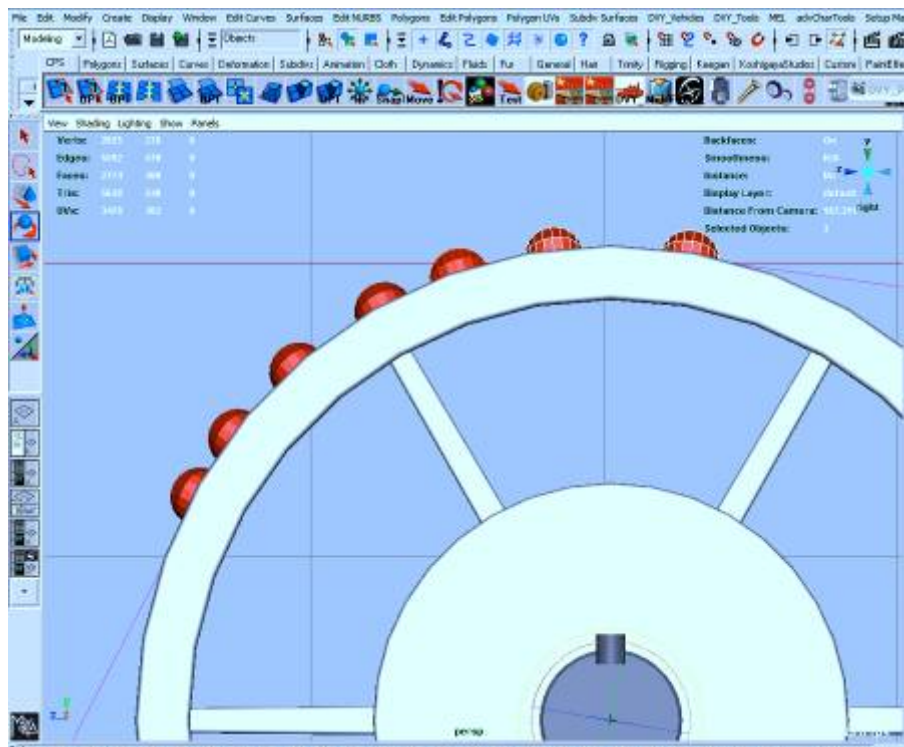
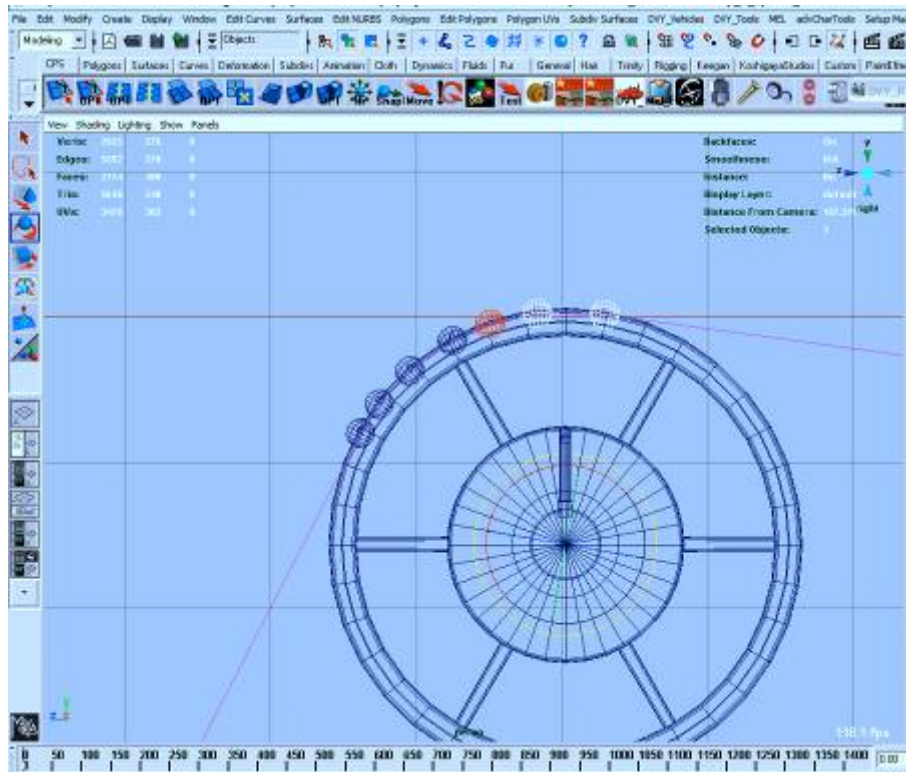


Figure 05



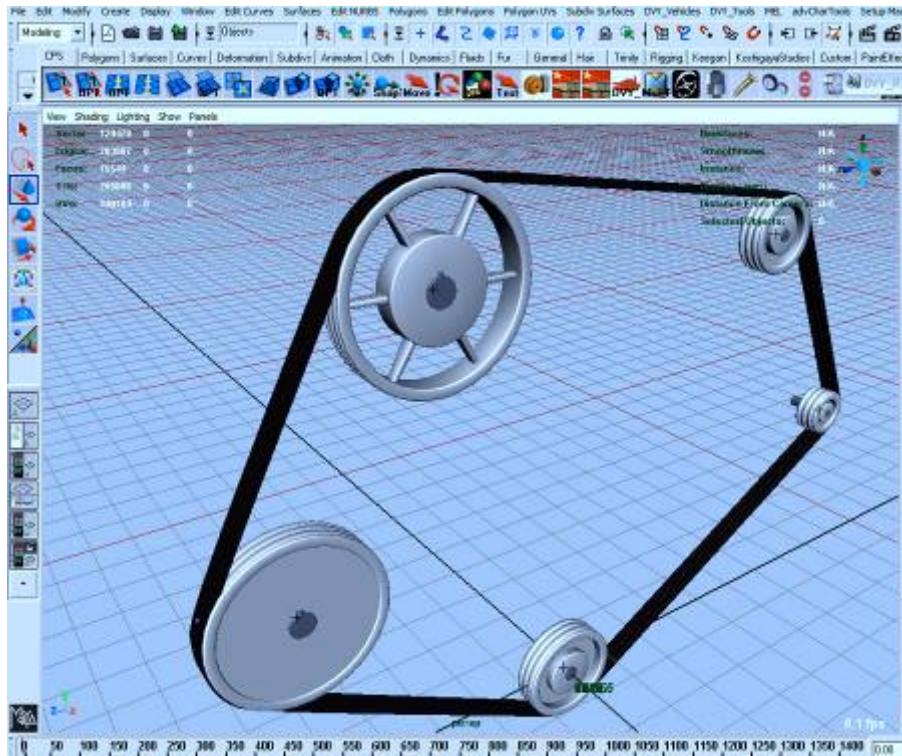
16. For best results try to space the spheres evenly around the circumference of the pulley over the Belt Path area (See Figure 06).
17. Once you are satisfied with Belt Path Please save the file at this point as it is quicker to reopen this file and readjust path if required later.

Figure 06



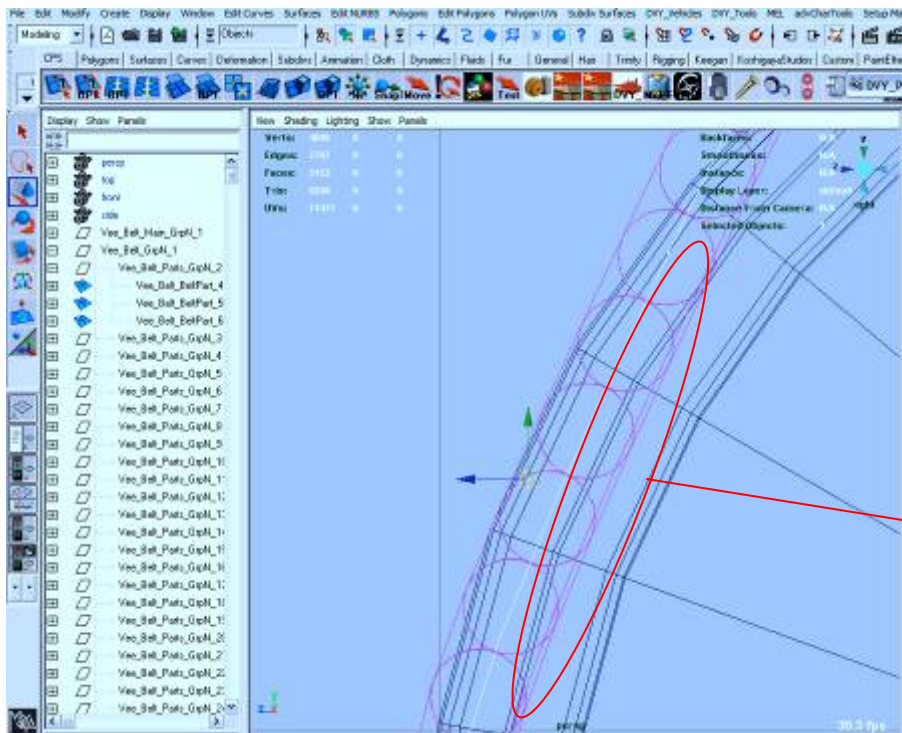
18. Once Spheres have been positioned select Pulley Group Top Node and press the “Build Belt” Button. A Progress Window will appear and the script will build the Belt or Belts as required. **Note this can take some time depending upon the Belt Length as there can be a large number of calculations and sections to build so Please Be Patient.**
19. See Figure 07 as an example of a completed Belt and Pulley layout

Figure 07.



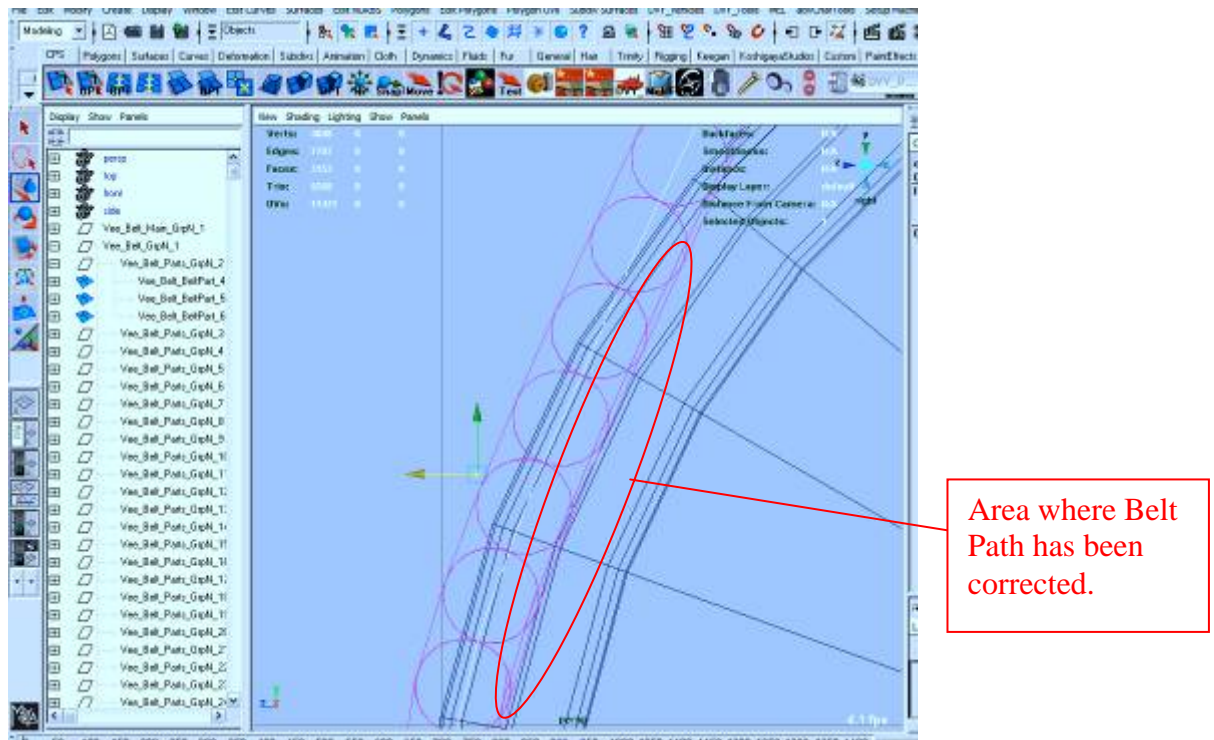
20. Once the script has finished building the Belt or Belts the Belt Path around each Pulley can be adjusted slightly to correct any areas where the belt does not exactly follow the Pulley Diameter.
21. These adjustments are done by selecting the Belt Path Curve and setting Maya in Component Mode and adjust the Belt Path Curve CV's as required. Note only minor adjustment can be done this way. If the Belt path is badly out of line please start from Building Belt Path section again (Line 17). See Figures 08 & 09 for example of this type of adjustment.

Figure 08



Area where Belt is penetrating the Pulley Groove.

Figure 09



22. Once any Path errors have been adjusted if required. Select Group Top Node and press the “Rig Belt” Button. The script will then Rig all Pulleys and Belts to allow correct rotation of Pulleys and Belts.
23. In the case of Toothed-Belts the engagement of Toothed Pulley and Belt can be adjusted for each Pulley by setting the Pulley Rotation attribute for each Pulley. This is located in the Channel Box of the Pulley Group Top Node (See Figure 10 & 11).
24. Once rigging is completed all attributes will be Locked and Non Keyable except the Pulley Group Top Node Rotation and Translation. The Belt or Belts and Path are Rigged to move when the Pulley Top Node is moved.

Figure 10.

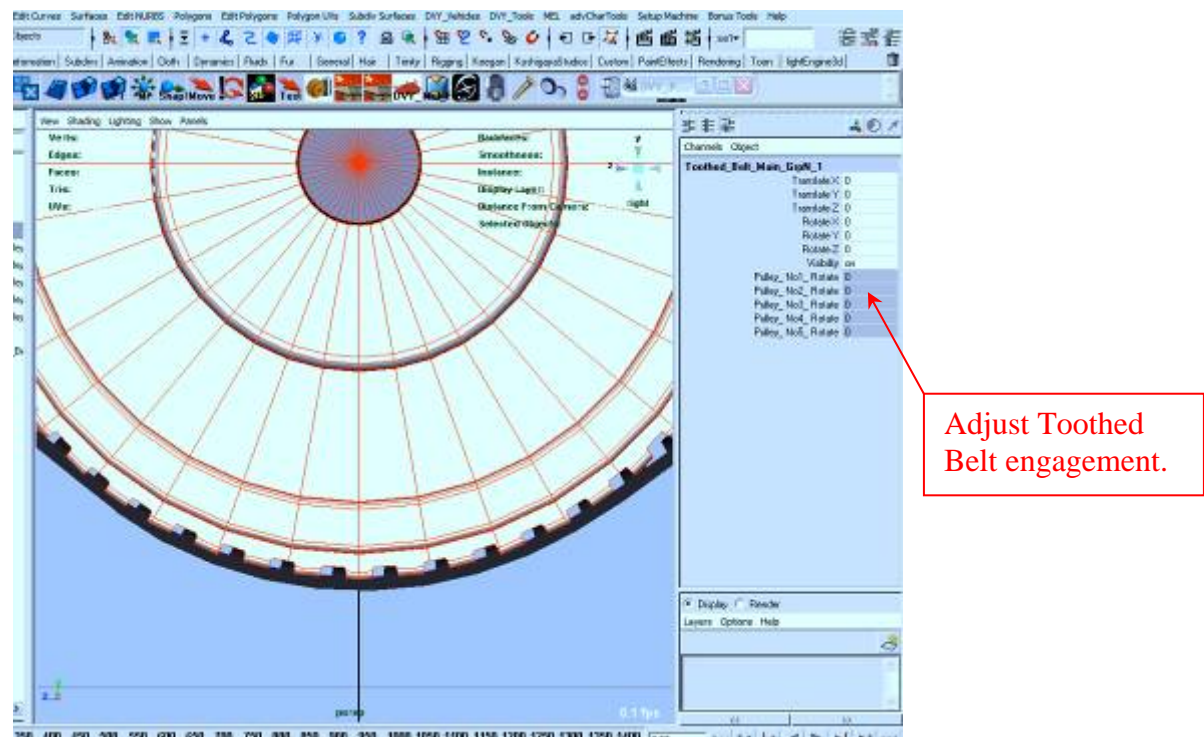


Figure 11.

