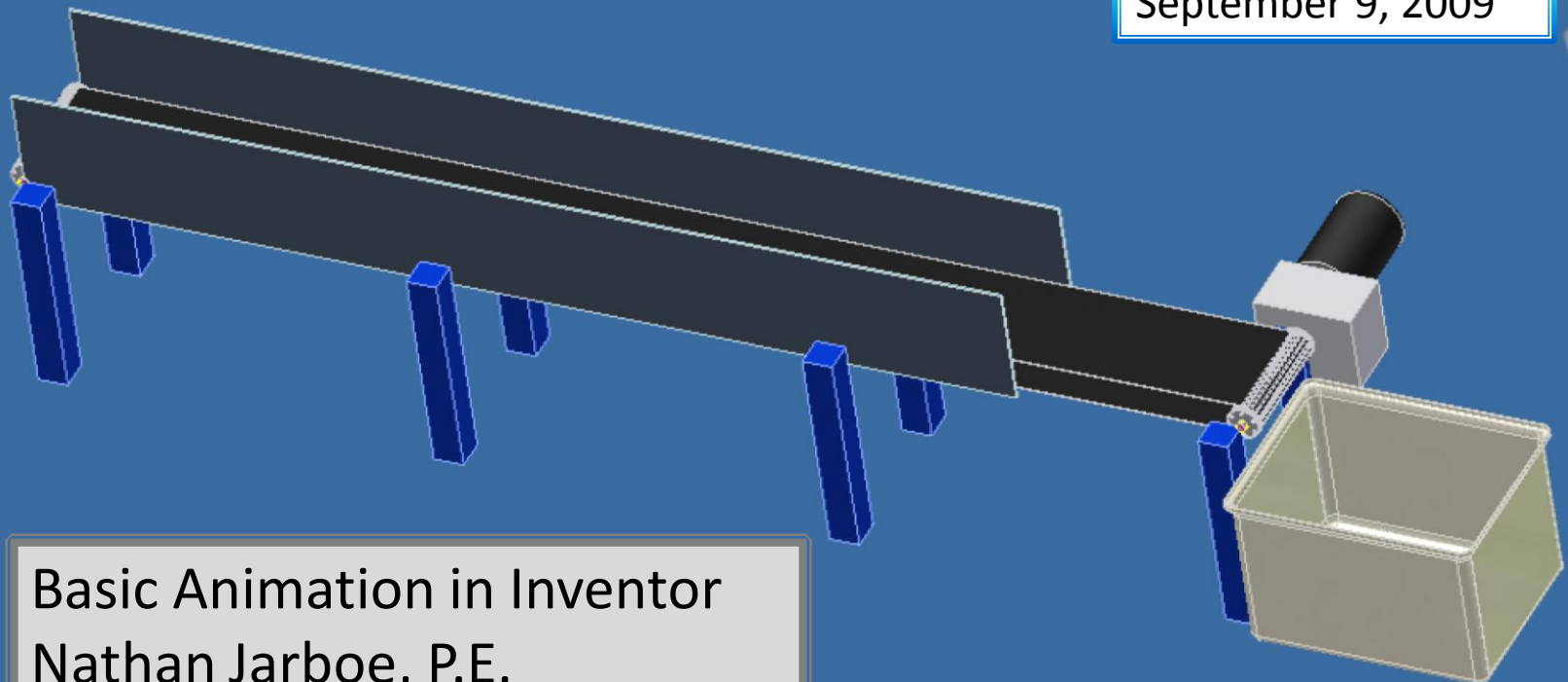




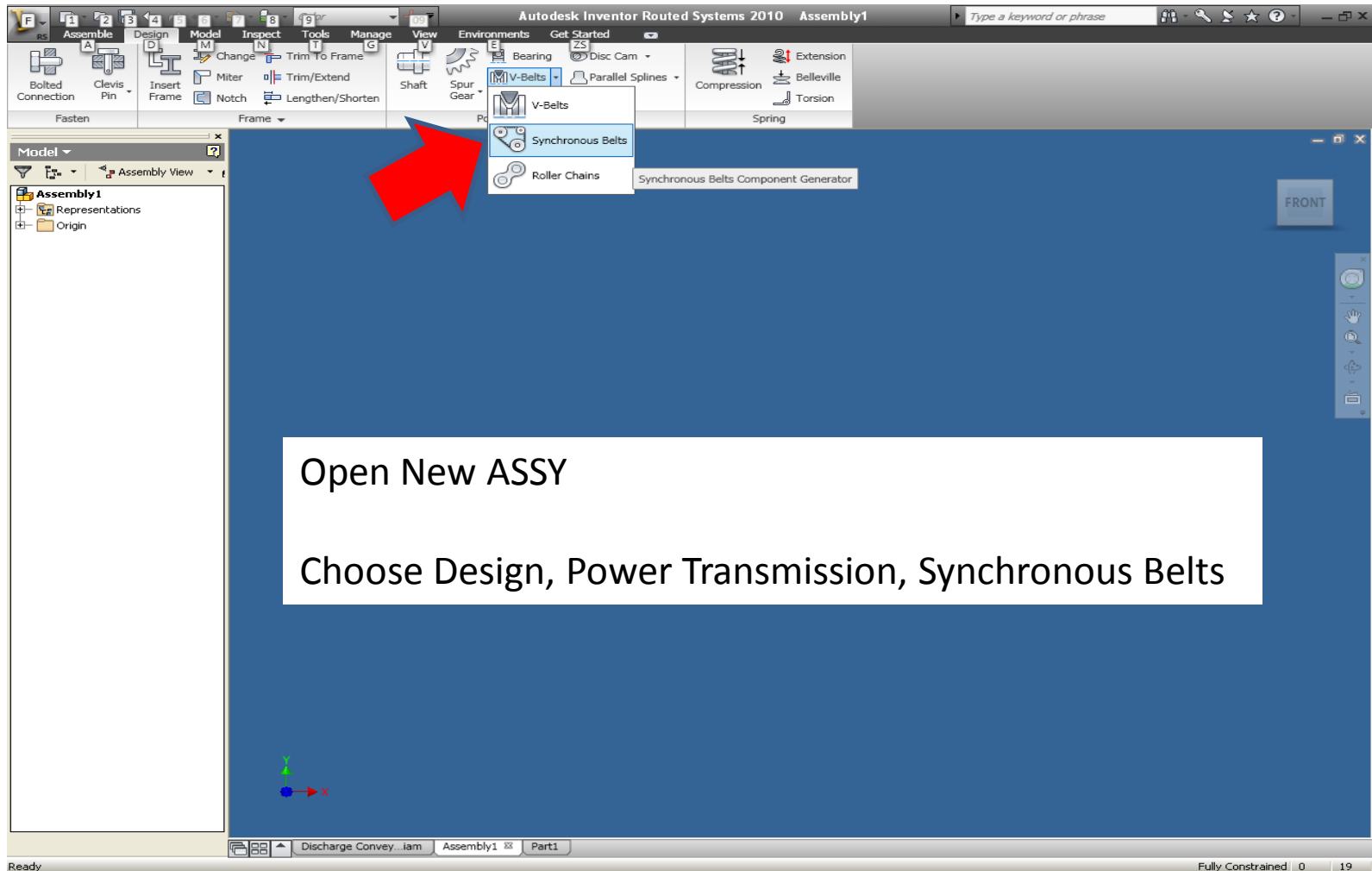
AUGI Autodesk User Group
International

Conveyor Animation in Inventor

September 9, 2009



Basic Animation in Inventor
Nathan Jarboe, P.E.



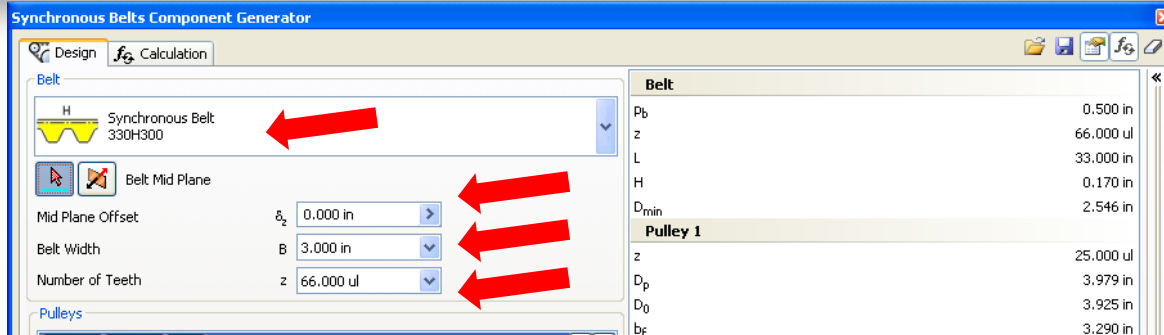
Open New ASSY

Choose Design, Power Transmission, Synchronous Belts



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Software Prompts an Assembly Save.
Name and Save the Assembly.

Select Planar Face or Work Plane – XY Plane is O.K.

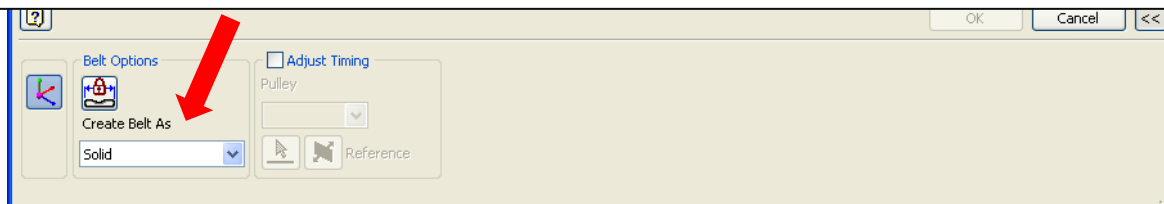
H-type Belt

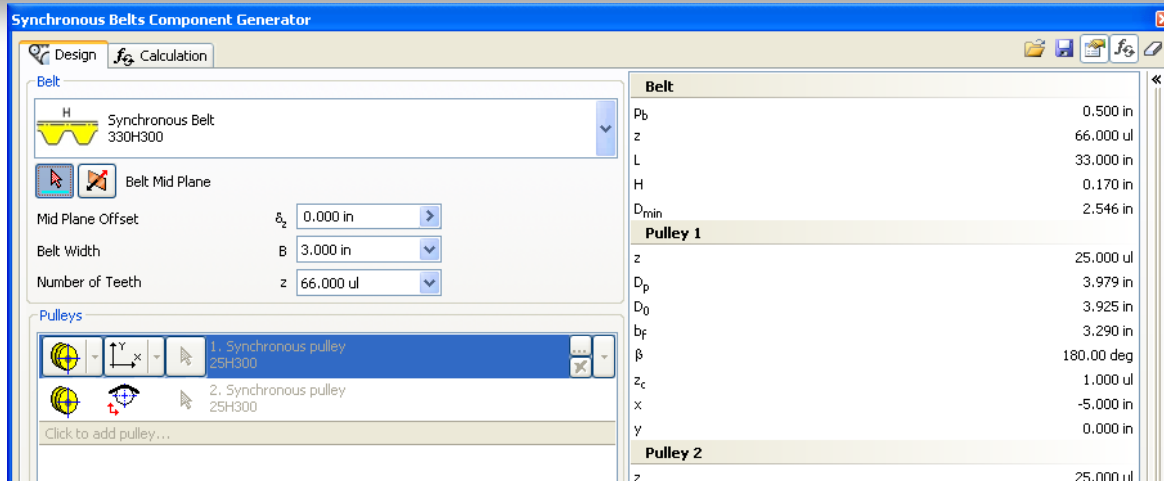
Mid Plane Offset = 0

Belt Width = 3 (adjust later)

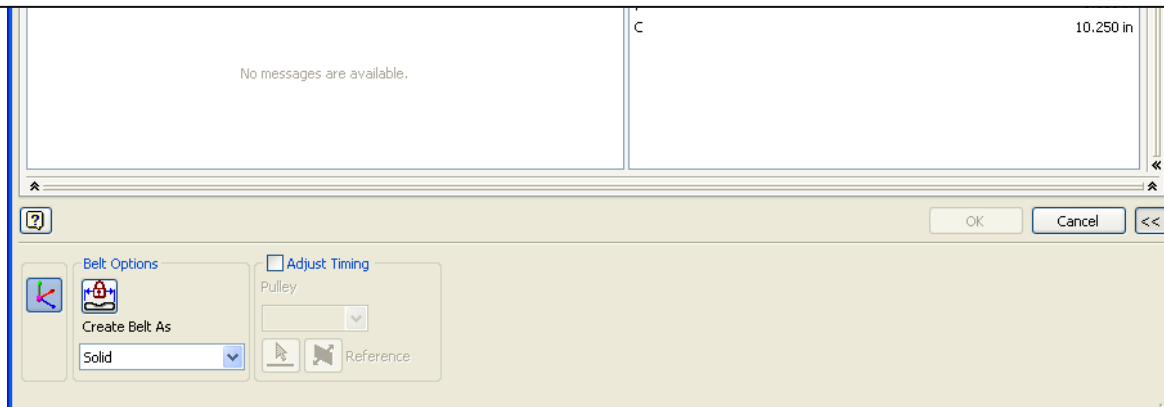
Number of Teeth = 66 (more about this later)

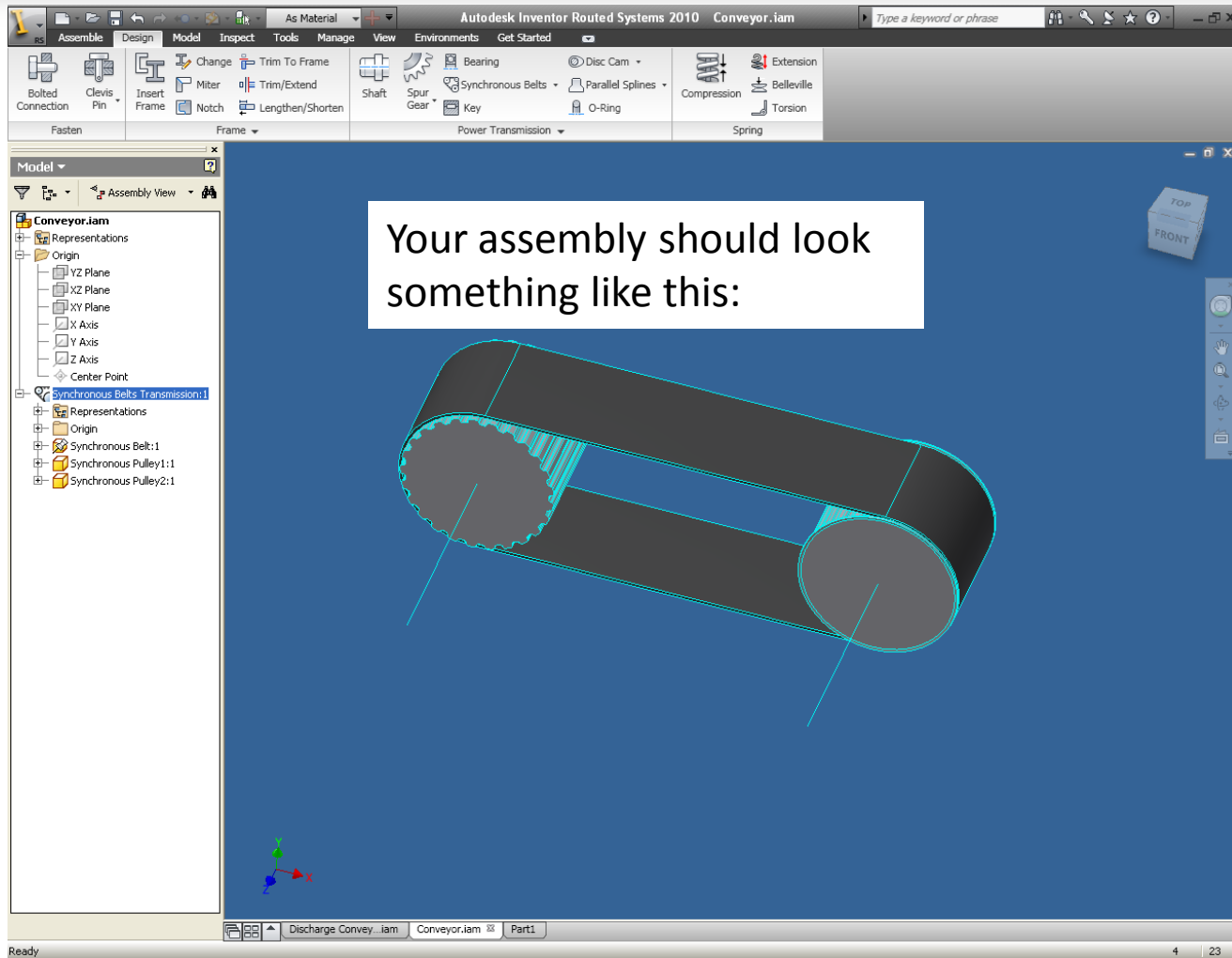
Create Belt as Solid under “Belt Options”



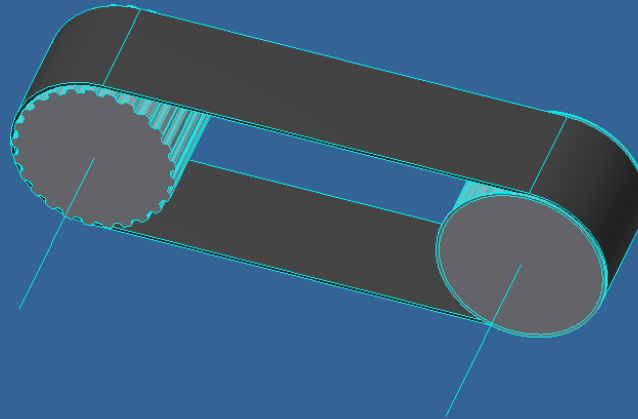


Move to Pulley Selection
Leave Pulleys as Default
Hit O.K.





Your assembly should look something like this:



TOP
FRONT



The screenshot shows the Autodesk Inventor interface with a conveyor assembly. A white text box with a black border is overlaid on the 3D model, containing the text: "Choose 'Synchronous Belt' part. Choose 'open'". A red arrow points from the text box to the "Synchronous Belt:1" entry in the Model browser on the left. The Model browser shows a hierarchy starting with "Conveyor.iam", followed by "Synchronous Belts Transmission:1", and then "Synchronous Belt:1". The 3D model shows a black conveyor belt with a grey pulley at the end. The software title bar reads "Autodesk Inventor Routed Systems 2010 Conveyor.iam". The status bar at the bottom shows "Ready" and "Discharge Convey...iam Conveyor.iam Part1".



The screenshot shows the Autodesk Inventor interface with a 3D model of a conveyor belt. The 'Model' browser on the left shows the hierarchy: Synchronous Belt > Mates > Solid Bodies(1) > Origin > Sketch Path > Cross Section Plane > Work Axis1 > Work Axis2 > Work Plane2 > Work Plane3 > Belt > Sketch Path > Cross Section. A context menu is open over the 'Cross Section' feature, with 'Edit Sketch' highlighted by a red arrow. The main 3D view shows the belt with a dimension of 30.000 inches. A text box in the center of the screen provides instructions: 'Under "belt", choose "edit sketch". Change belt width to 12 inches. Save Part.'

Under "belt", choose "edit sketch".
Change belt width to 12 inches.
Save Part.

Autodesk Inventor Routed Systems 2010 Synchronous Belt.ipt

Model

Synchronous Belt

- Mates
- Solid Bodies(1)
- Origin
- Sketch Path
- Cross Section Plane
- Work Axis1
- Work Axis2
- Work Plane2
- Work Plane3
- Belt
- Sketch Path
- Cross Section

Repeat 2D Sketch

- Copy Ctrl+C
- Edit Sketch**
- Properties...
- Redefine
- Share Sketch
- Edit Coordinate System
- Measure
- Create Note
- Export Sketch As...
- Visibility
- Dimension Visibility
- Find in Window End
- How To...

Discharge Convey...iam Conveyor.iam Part1 Synchronous Belt1.ipt

Opens a sketch for editing

start

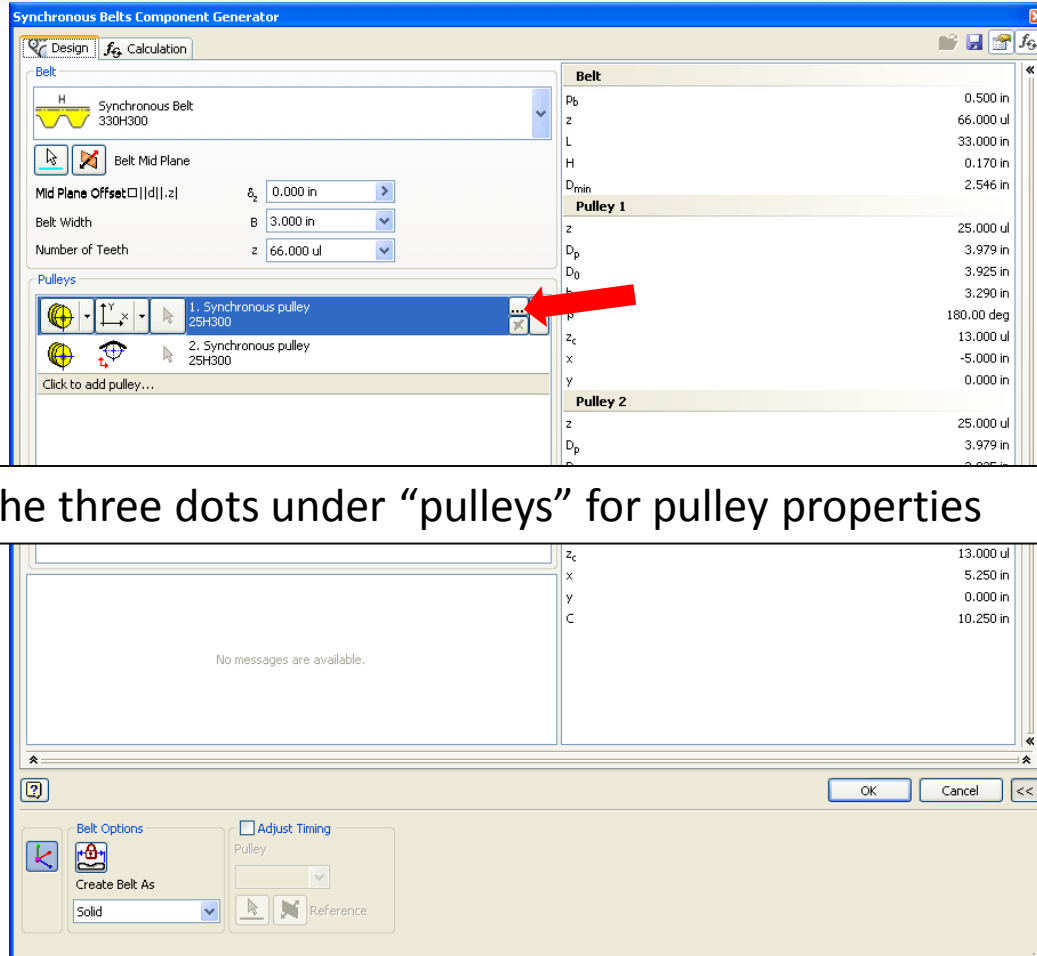
Inbox - Microsoft Out... C:\BIDNESSSCHWA... Autodesk Inventor R... Microsoft PowerPoint ... 2:30 PM



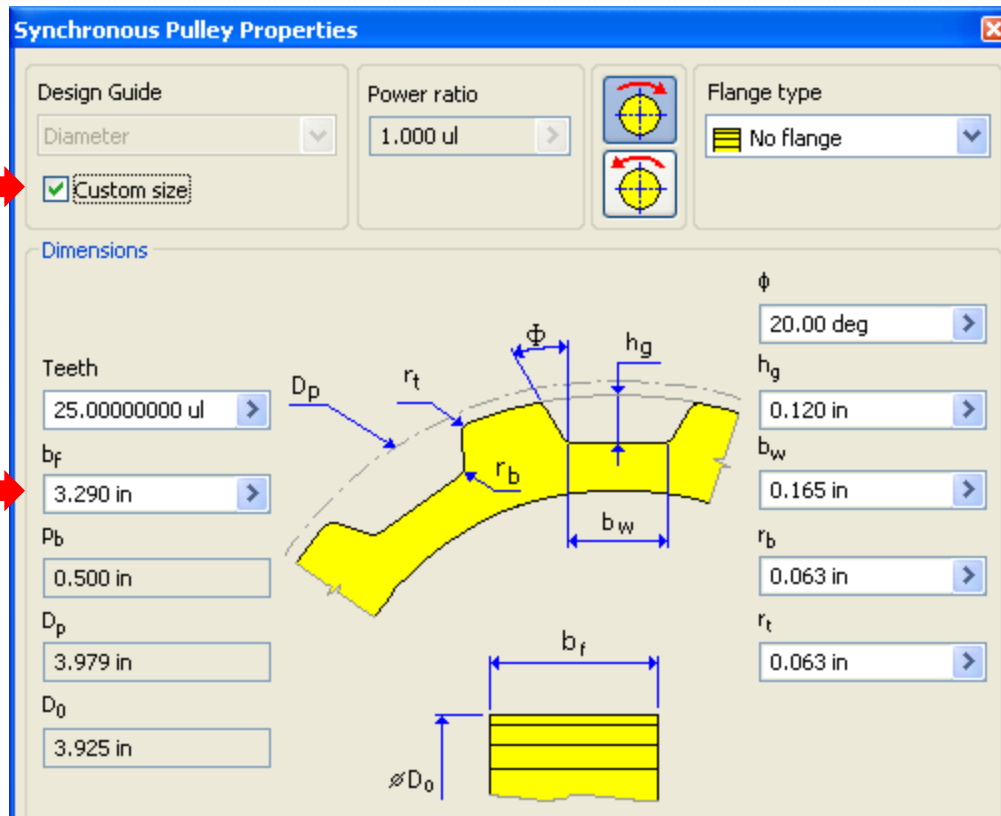
The screenshot shows the Autodesk Inventor 2010 interface. The title bar reads "Autodesk Inventor Routed Systems 2010 Conveyor.iam". The ribbon includes tabs for Assemble, Design, Model, Inspect, Tools, Manage, and View. The Model tab is active, showing various tools like Place, Create, Copy, Make Layout, Mirror, Shrinkwrap, Constrain, Move, Rotate, Grip Snap, Position, Manage, Parameters, Create Substitutes, Cable and Harness, Tube and Pipe, Convert to Weldment, Edit Factory Scope, and iPart/Assembly Author. The left-hand Model browser shows a tree structure with "Conveyor.iam" at the top, followed by "Representations", "Origin", and "Synchronous Belts Transmission". A context menu is open over "Synchronous Belts Transmission", with "Edit using Design Accelerator" highlighted by a red arrow. The main 3D view shows a black conveyor roller with red wireframe lines. A white text box in the upper right of the 3D view says "Pulley width can be adjusted via design accelerator." Another white text box at the bottom of the 3D view says "Click on 'Synchronous Belts Transmission'. Choose 'Edit using Design Accelerator'". The Windows taskbar at the bottom shows the Start button, taskbar icons, and the system tray with the time 2:42 PM.

Pulley width can be adjusted via design accelerator.

Click on "Synchronous Belts Transmission".
Choose "Edit using Design Accelerator".



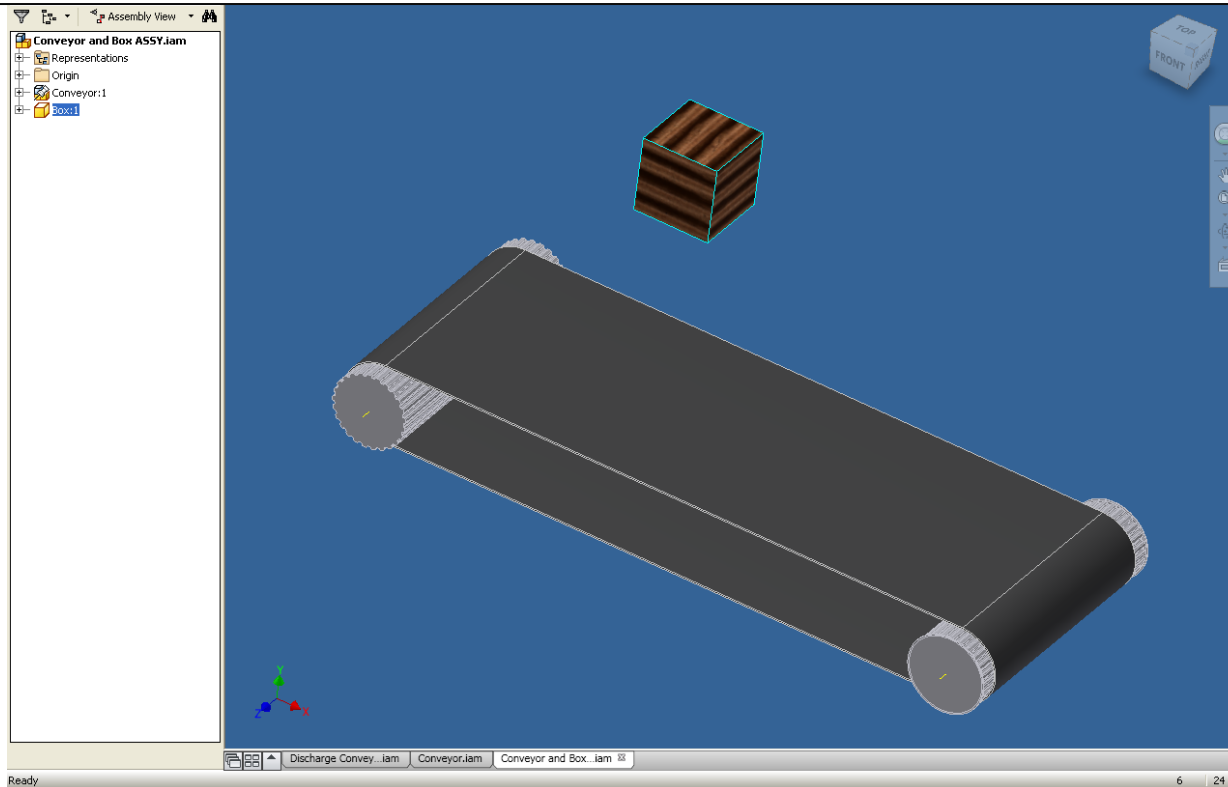
Click on the three dots under “pulleys” for pulley properties



Choose “custom size” at the top left.
Change width of pulleys to 14 inches. Do this for both pulleys.

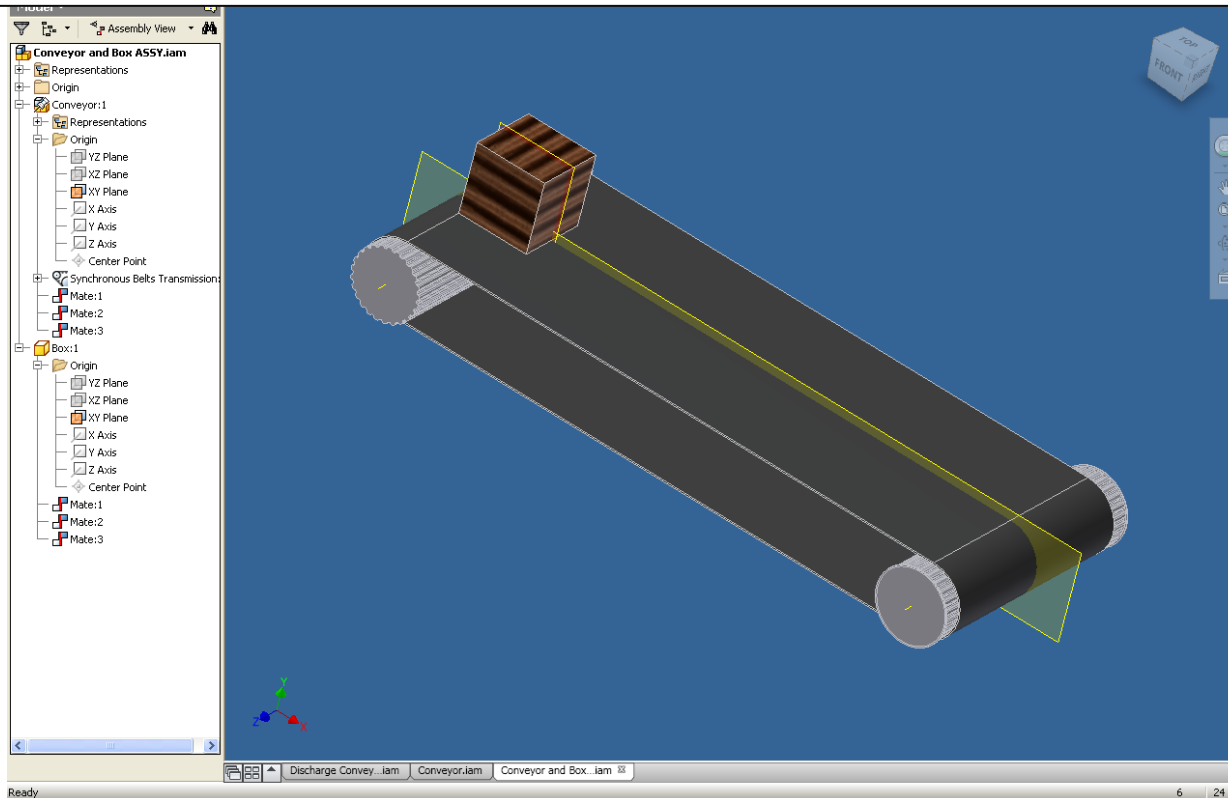


Create another assembly file for conveyor and box.
Create another part file, a box to be used on the “conveyor”.
Lengthen pulley by editing the assembly in Component Generator.
Increase belt “number of teeth”, as shown on slide 3, to 150.



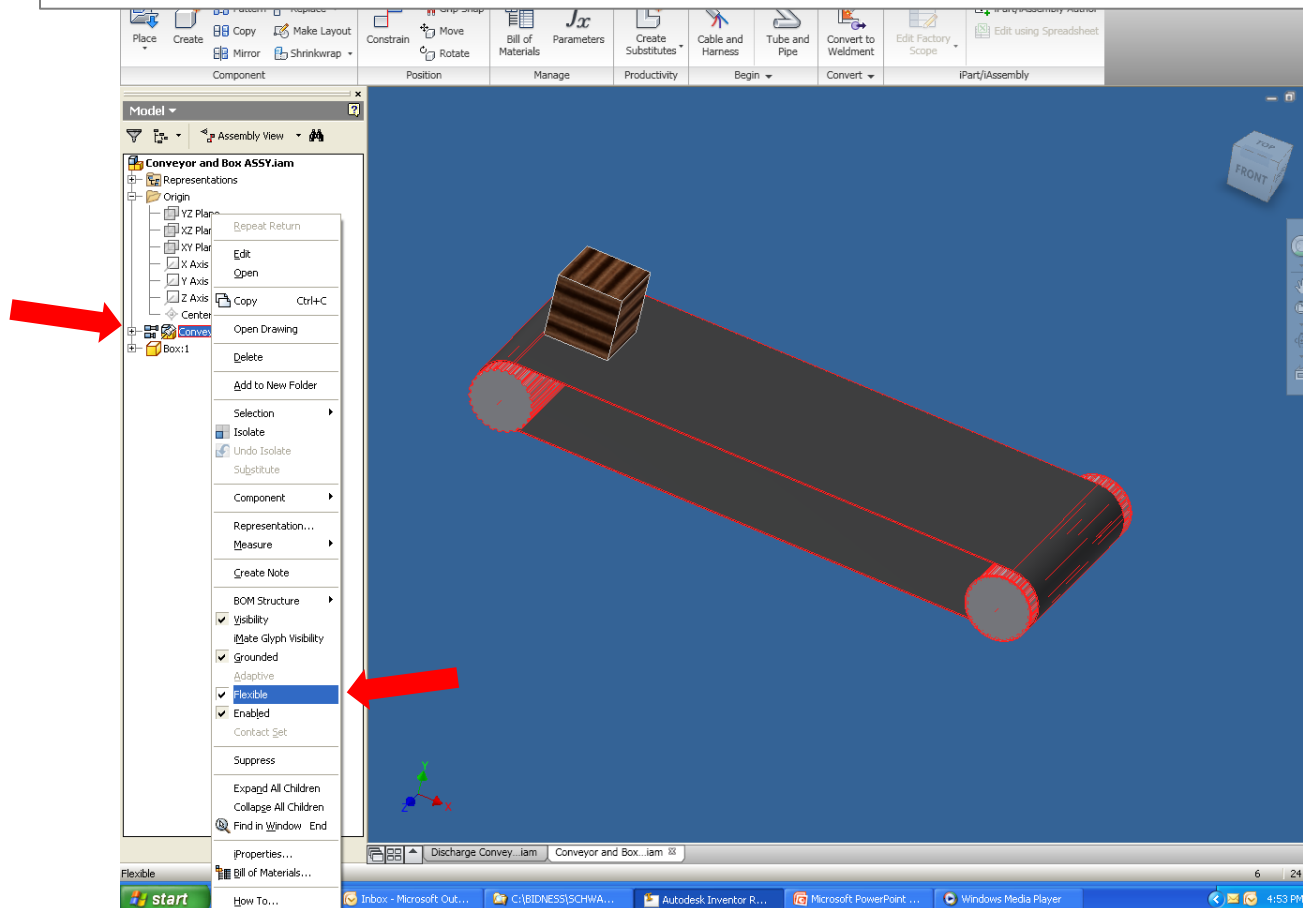


Constrain box center plane (xy) to conveyor center plane (xy).
Constrain box bottom to conveyor top.
Constrain box toward one end of conveyor.





Choose Pulley and Belt Assembly in model viewer, right click, and choose “flexible” to allow pulleys to rotate during animation.

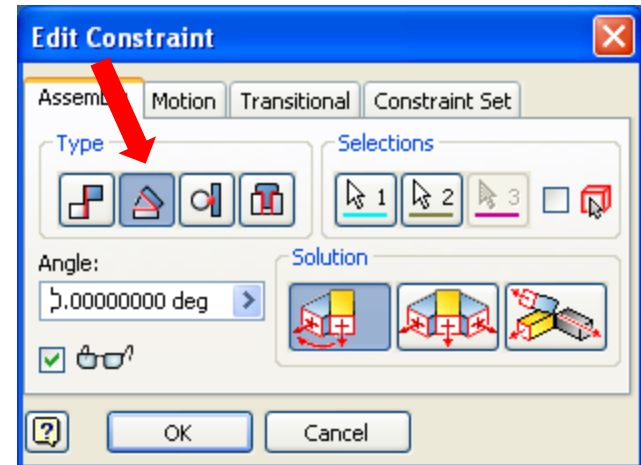
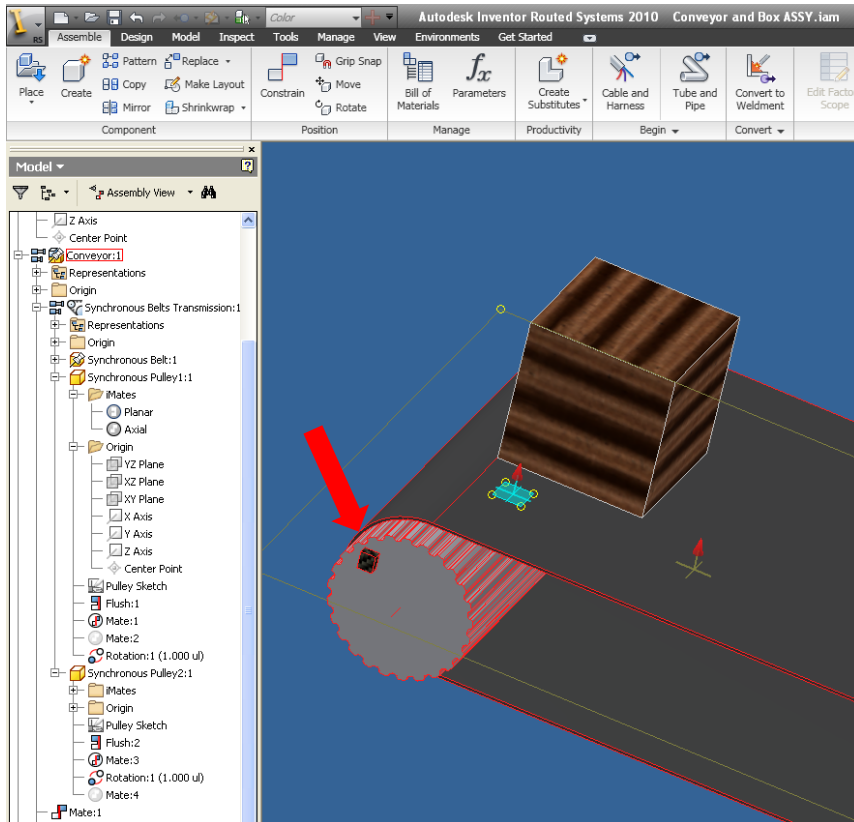




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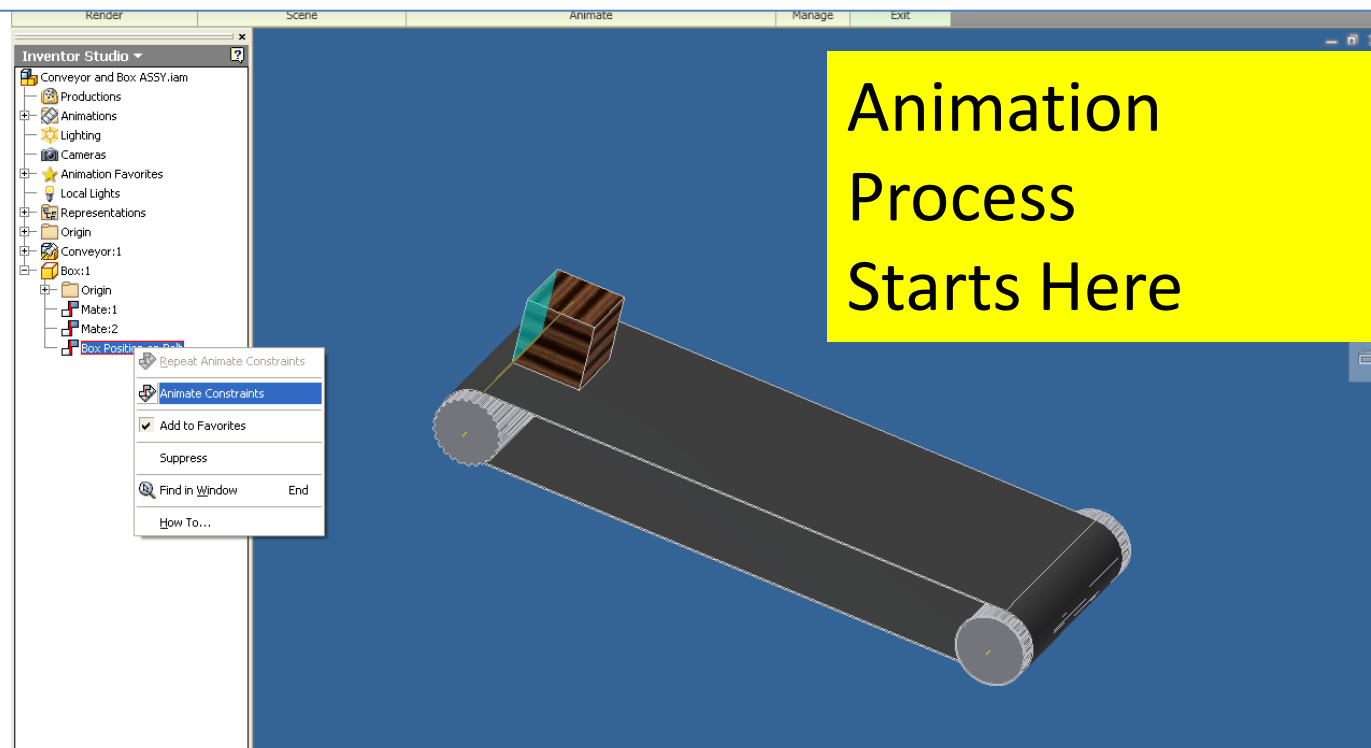
Conveyor Animation in Inventor

Create constraint on pulley to manipulate during later animation.
Constrain XZ plane of pulley to XZ plane of overall assembly, angle = 0 Deg.
Create contrast feature on pulley to more easily visualize rotation.





Animate Parts and make a video:
Go to Environments, Inventor Studio.

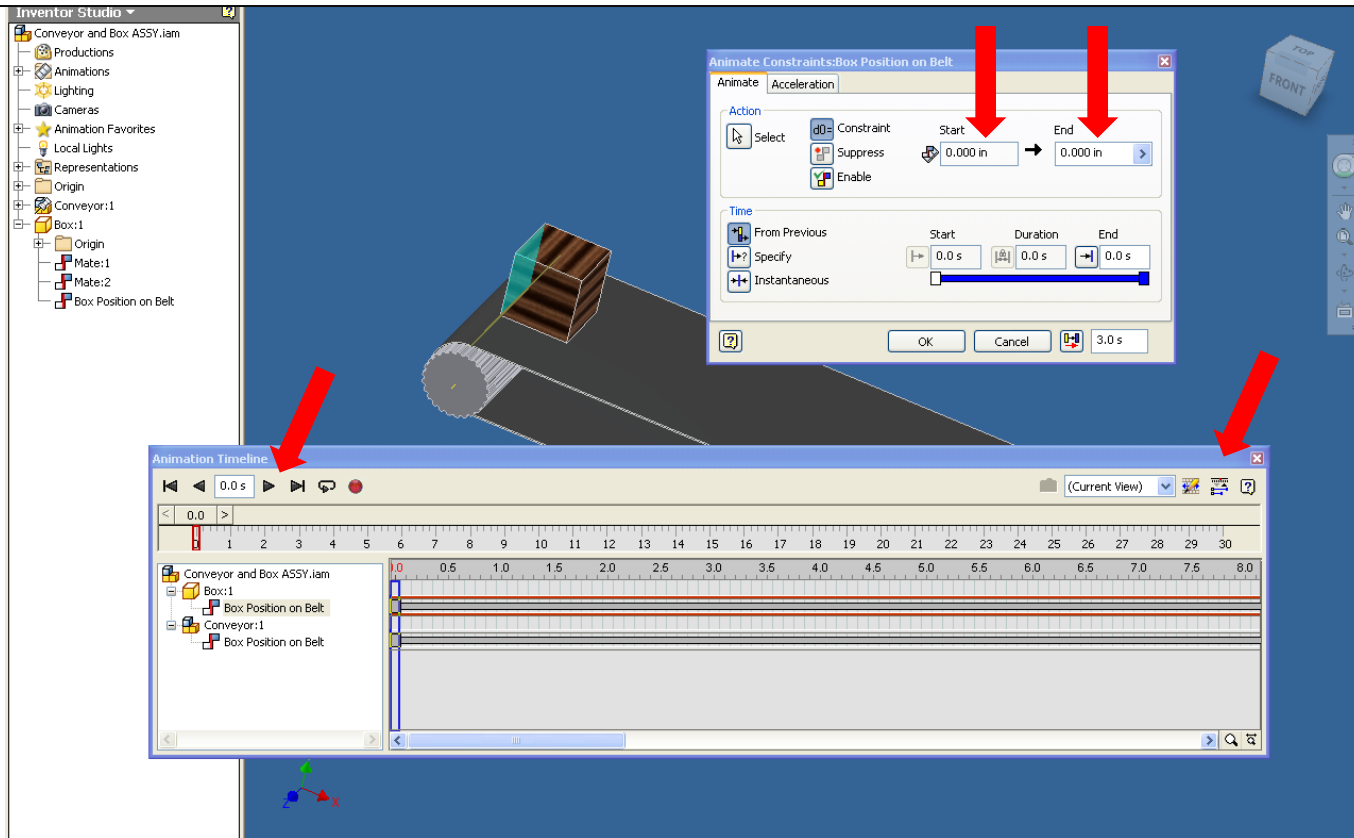


Right click the constraint holding the box toward one end of the conveyor.
Choose “Animate Constraints”.

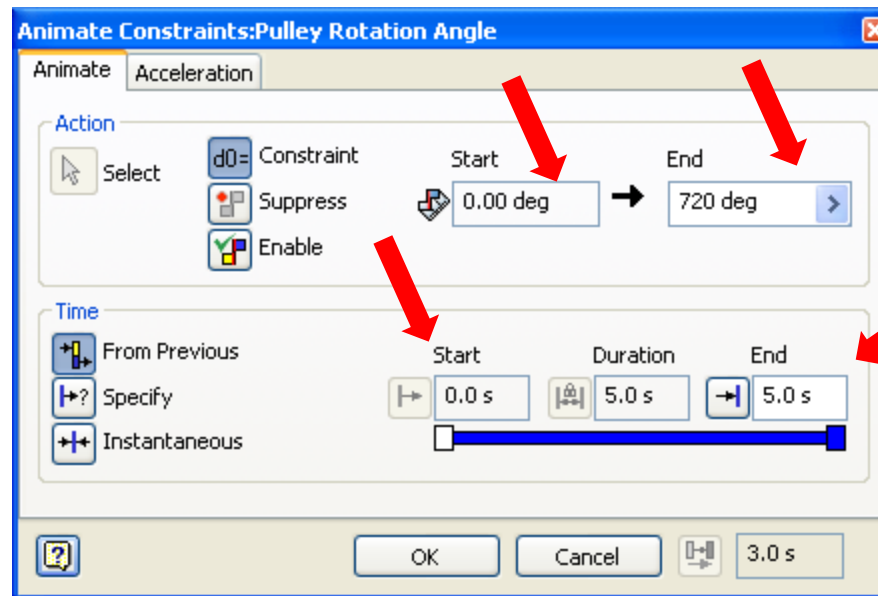


Conveyor Animation in Inventor

Choose a start and end distance for box travel: 18 inches.
Choose a start and end time for box travel: 0 to 5 seconds.
Use play button to preview animation. Expand Action Editor.
Record button can be used to render animation as a video.



Drive Pulley Rotation Constraint in Inventor Studio:
Set local-XZ-to-global-XZ-angle to range from 0 to 720 Degrees in 5 seconds.
This makes pulleys rotate during animation while box moves down the line.



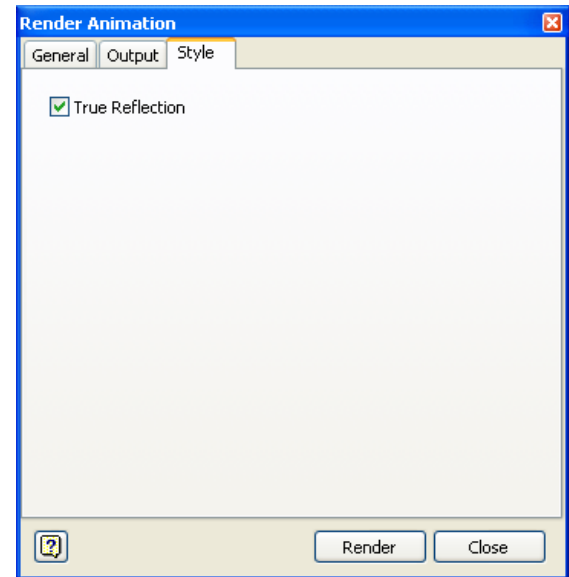
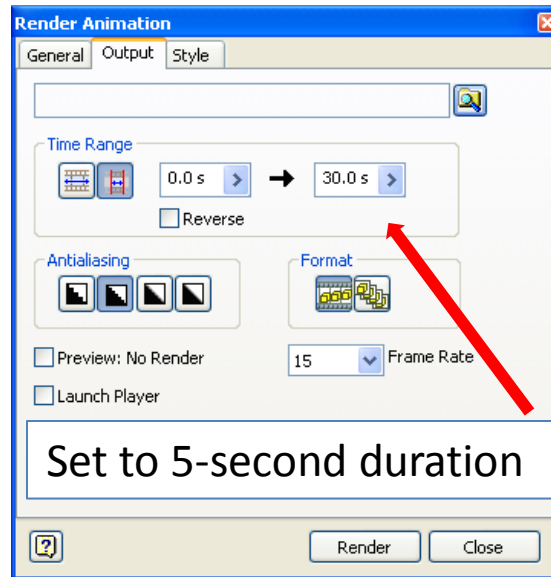
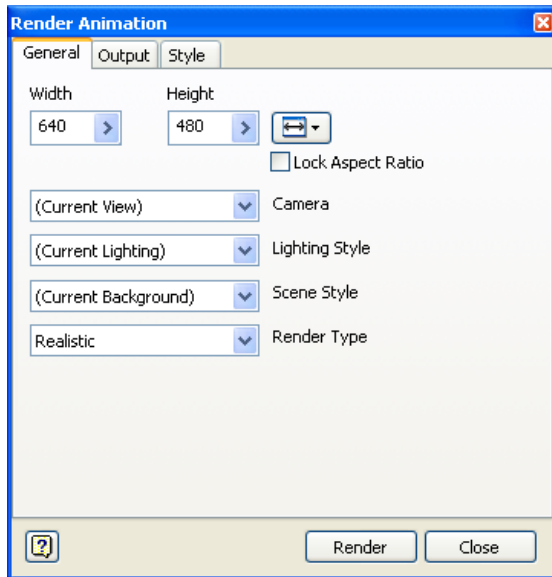


Choose the red button to render an animation, or choose “render animation”.

General: Video Size, Lighting, Scene, etc. Play with these variables for effect.

Output: Choose time range, file name, location to save file, quality of video, etc.

Style: Frankly, I don’t know what true reflection means but I use it!





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Enjoy!