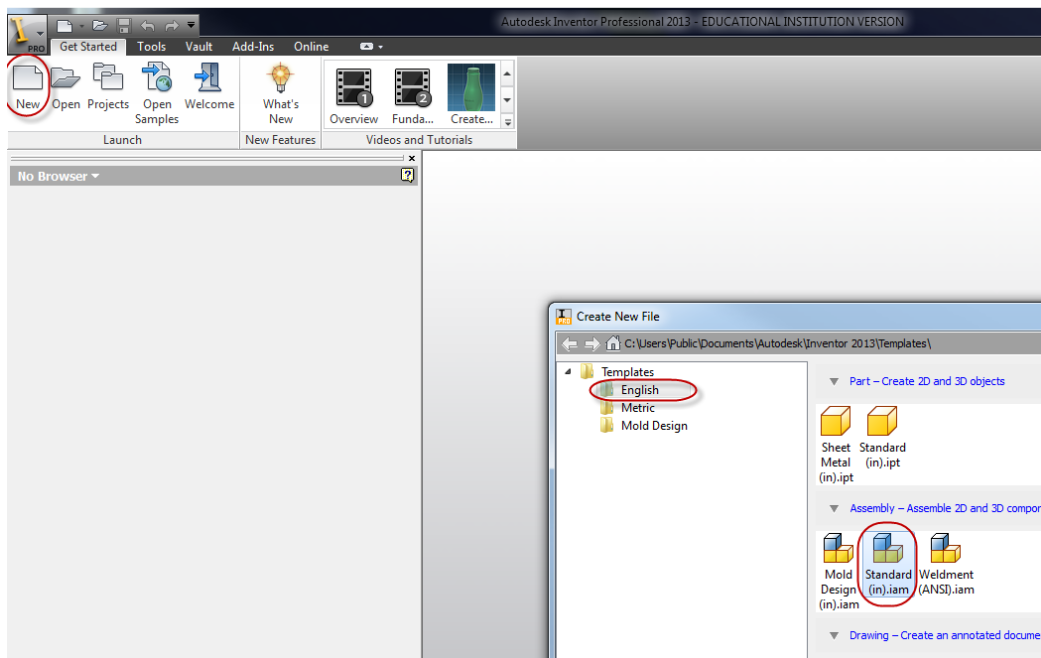


Drive Constraint: Rack / Spur Gear

The Rack / Spur assembly

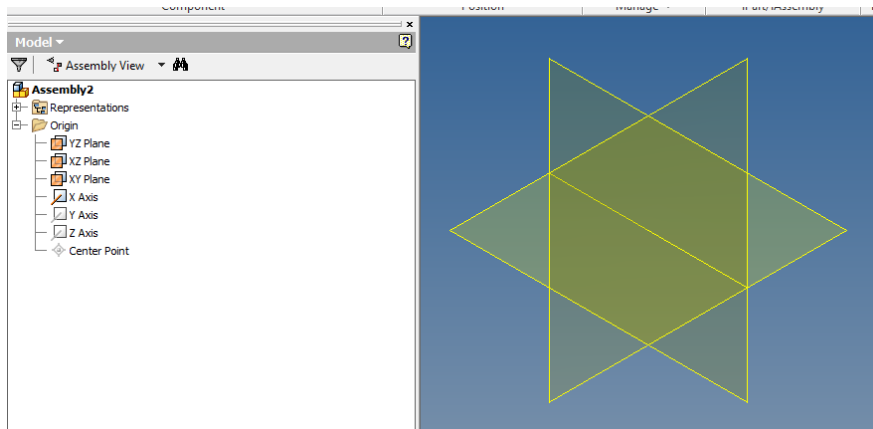
1. Create a new assembly: New | English | Standard (in).iam



2. Save the file:

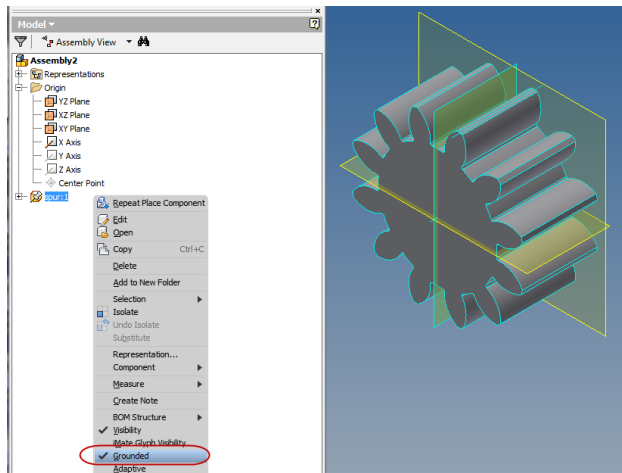


3. Inialize: Home View and Reference Visibility

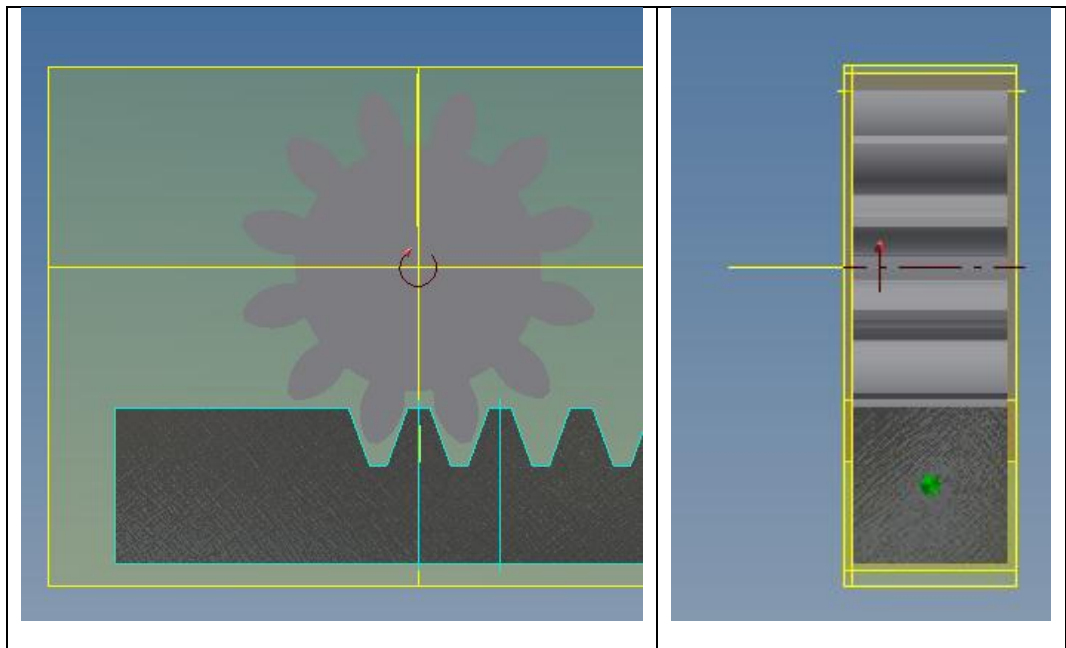


Drive Constraint: Rack / Spur Gear

- Place Component: Spur | Remove Grounded (uncheck)

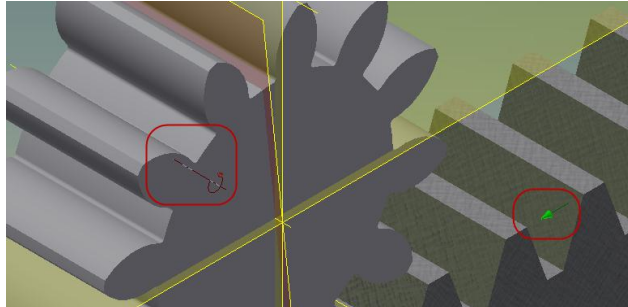


- Constrain the spur Gear: It has to be free to rotate.
 - Mate the Gear axis with x-axis
 - Mate a face of the gear with the YZ plane
- Place the component: Rack
- Constrain the rack component
 - Mate the face of the rack with the YZ plane
 - Offset the top of the rack from the .45 (Flush Constraint)
- Verify:
 - Position of components

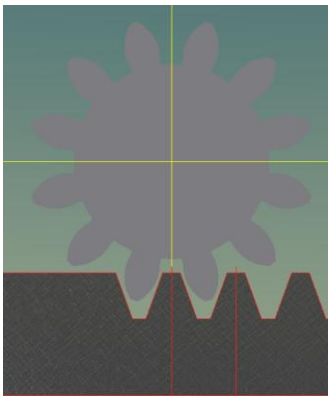


Drive Constraint: Rack / Spur Gear

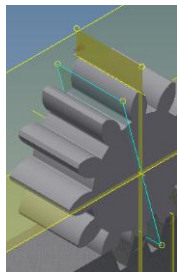
- b. Verify Degrees of freedom (Ribbon: View | Degrees of Freedom)
 - i. Gear should be able to rotate
 - ii. Rack should be free to translate



- 9. Set the starting position : Mate appropriate work planes - Verify
 - a. Alignment (See Below)
 - b. Degrees of freedom (none displayed)



- 10. Angle Constraint
 - a. Suppress previous constraint (alignment)
 - b. Rotate the gear slightly
 - c. Create an angle constraint
 - i. Spur Gear: Select the visible reference plane
 - ii. Assembly: Select the XY plane

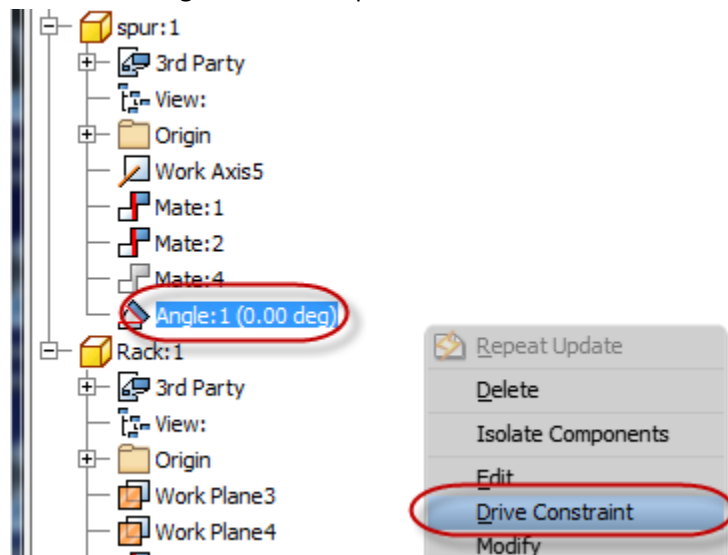


- d. Set the starting angle to 0 degrees

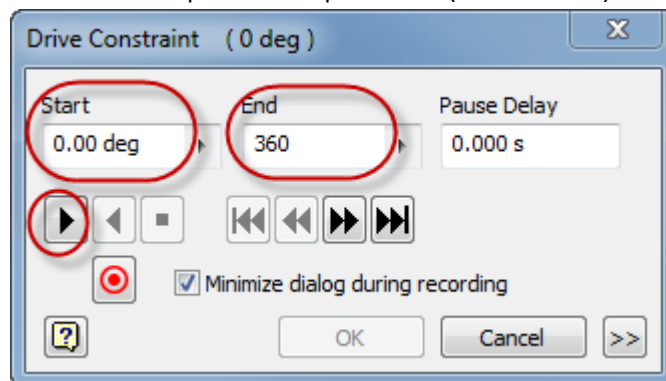
Drive Constraint: Rack / Spur Gear

11. Drive Constraint

- a. Select: The Angle Constraint | Drive Constraint



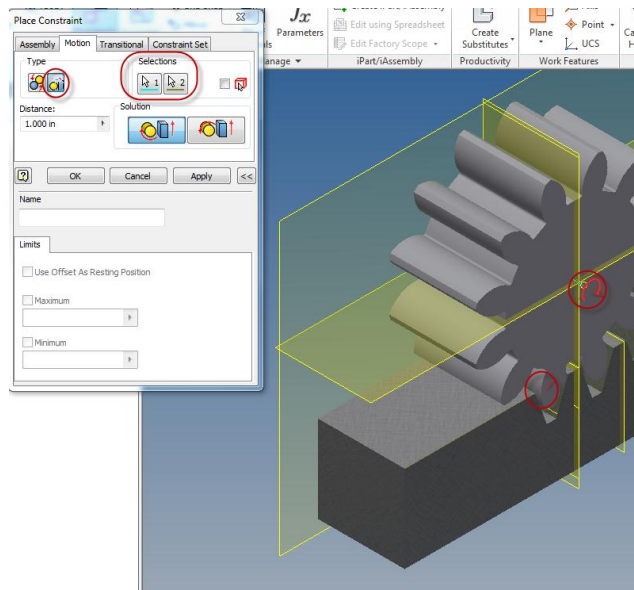
- b. Select: Start=0 | End =360 | Forward (and Reverse)



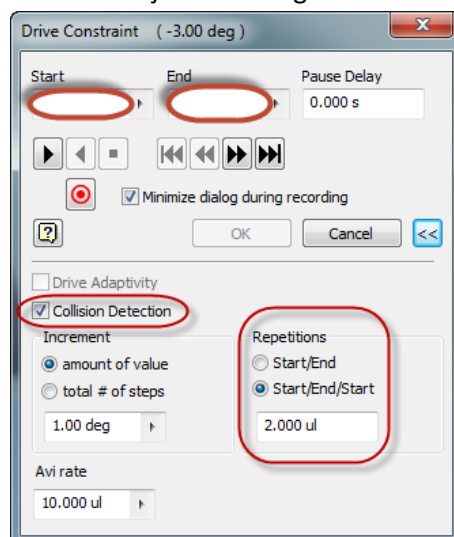
Drive Constraint: Rack / Spur Gear

12. Motion Constraint | Rotation-Translation

- a. Selection 1: Spur Gear axis
- b. Selection 2: Rack edge

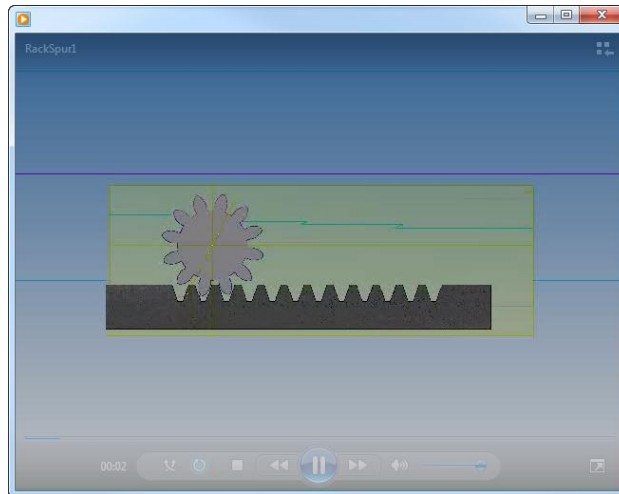


13. Drive Constraint: Play again, notice the rack moves but timing is off
14. Edit the Motion Constraint: Change Distance to 3.1416 (Corresponds to the gear dia = 1in.)
15. Drive Constraint: Play again, notice the timing.
16. Drive Constraint: Select Collision Detection
 - a. Play (Gear stops at the end of the rack) – Enter the current angle for the End Angle
 - b. Reverse: Adjust start angle determine minimum start angle



Drive Constraint: Rack / Spur Gear

17. Record the final animation.
 - a. Repetitions: Start/End/Start= 2
 - b. Select Record
 - c. Select: WMV Files (.wmv) | BroadBand | 640x 4809
 - d. Select Forward
18. Play the animation



Alternative Problem (Recommend Practice)

