

Segments Motor Incline Plane

A. Open File.

Step 1. If necessary, open your **Incline Plane** file.

B. Change Ramp Angle Back to 25°.

Step 1. **Rewind** Motion Study to **T = 0**.

Step 2. **Expand TRACK 6** and **expand Mates in INCLINE PLANE** in Motion Manager design tree, **Fig. 1**.

Step 3. **Double click Angle1 Mate**, **Fig. 1**.

Step 4. Change **Angle to 25°** in the Modify dialog box, click **Rebuild**  and **OK** , **Fig. 2**.

Step 5. Click **Calculate**  and **Play from Start**  on the Motion Manager toolbar.

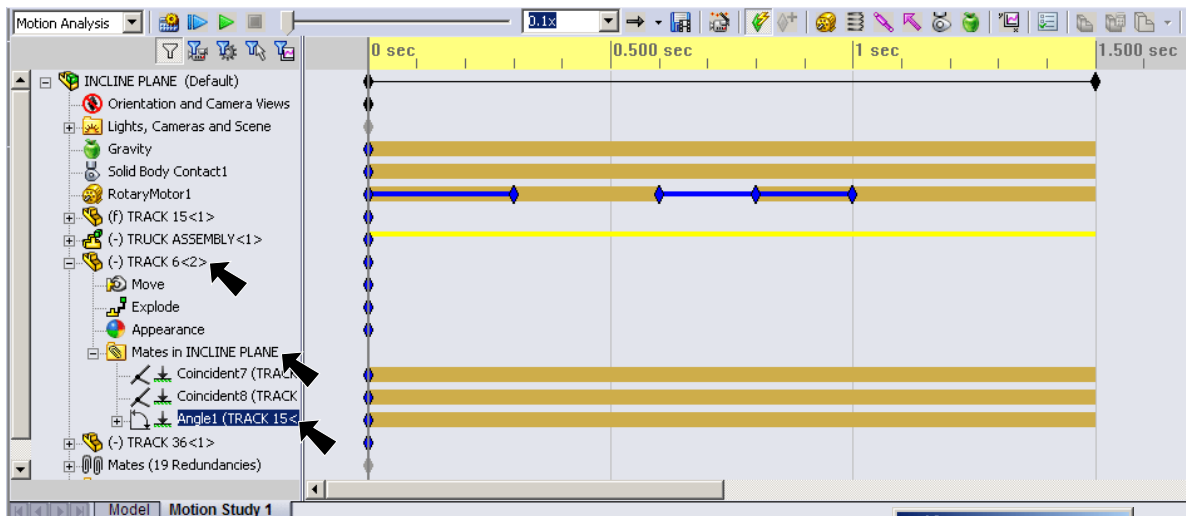


Fig. 1

C. Duplicate Motion Study.

Step 1. **Right click Motion Study 1 tab** **Motion Study 1** at the lower left of the drawing area and click **Duplicate**, **Fig. 3**.

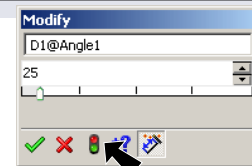


Fig. 2

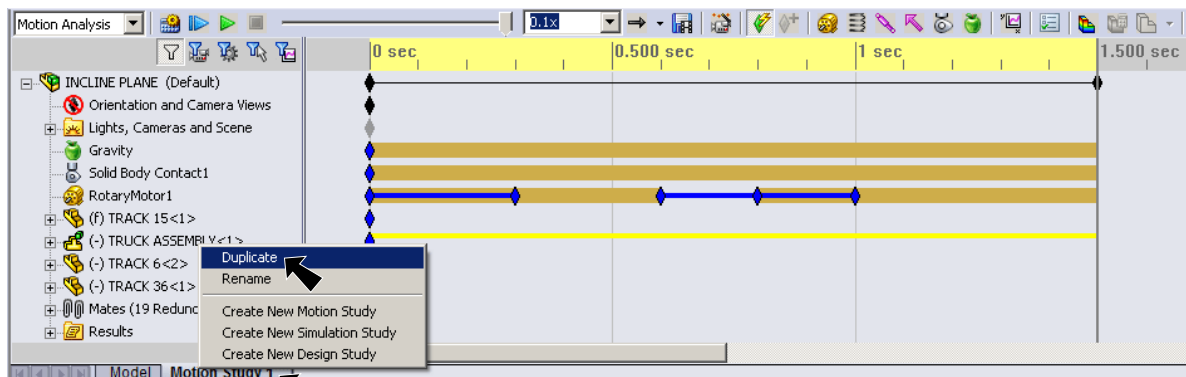




Fig. 3

Step 2. Click **Zoom in**  in lower right corner of the Motion Manager to increase the Time Bar with finer time increments, **Fig. 4**.

Step 3. Delete all the Key Points  in the RotaryMotor2 Timeline. To delete Key Points, **Ctrl click** all the Key Points  in the RotaryMotor2 Timeline and press **Delete** key on keyboard, **Fig. 4**.

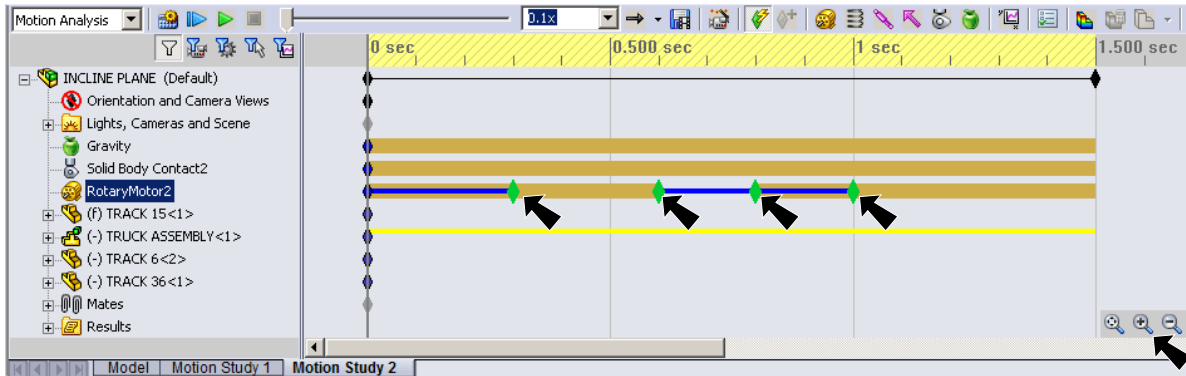


Fig. 4

D. Segments Motor.

Step 1. **Double click** RotaryMotor2 Key Point  at T = 0, **Fig. 5**.

Step 2. In the Motor Property Manager set:
under **Motion**, **Fig. 6**
select **Segments**

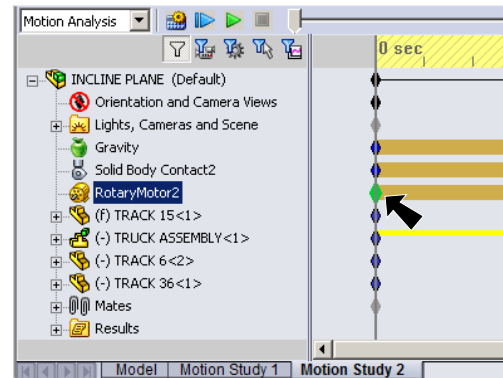


Fig. 5

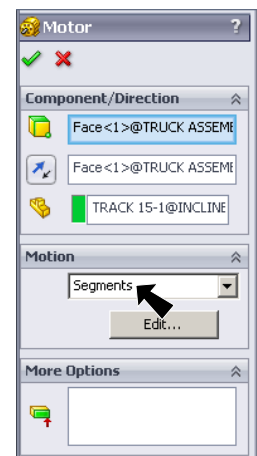


Fig. 6

Step 3. In the Function Builder dialog box set, **Fig. 7**:
 Value (y): **Velocity (deg/s)**

$1 \text{ RMP} = 6 \text{ deg/s}$

Step 4. In the Segments chart, **Fig. 7**
 under **Value**
 key-in **3000** (3000 deg/s = 500 RPM)

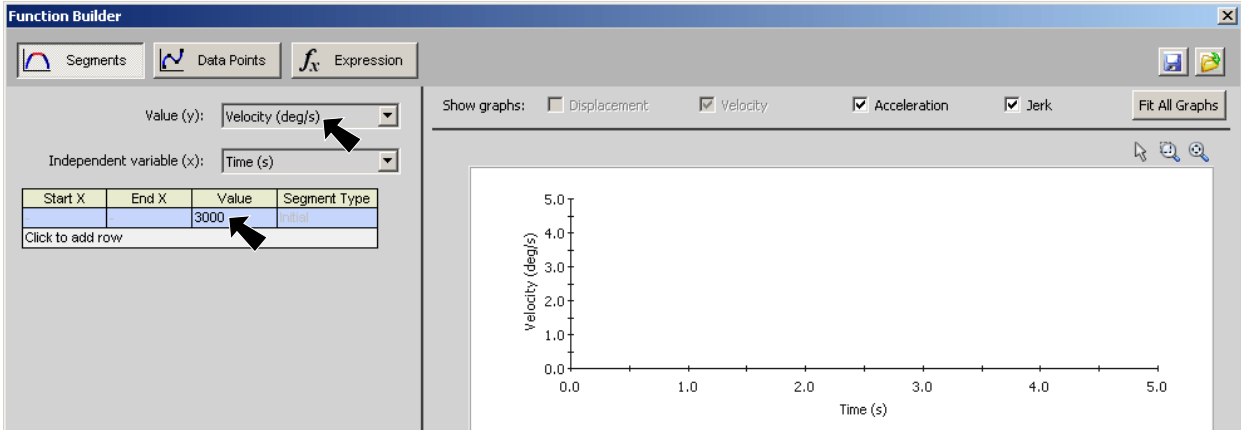


Fig. 7

Step 5. In the Segments chart, **Fig. 8**
 click **Click to add row**
 under **End X** in new row
 key-in **.3**
 under **Value**
 key-in **42000** (42000 deg/s = 7000 RPM)

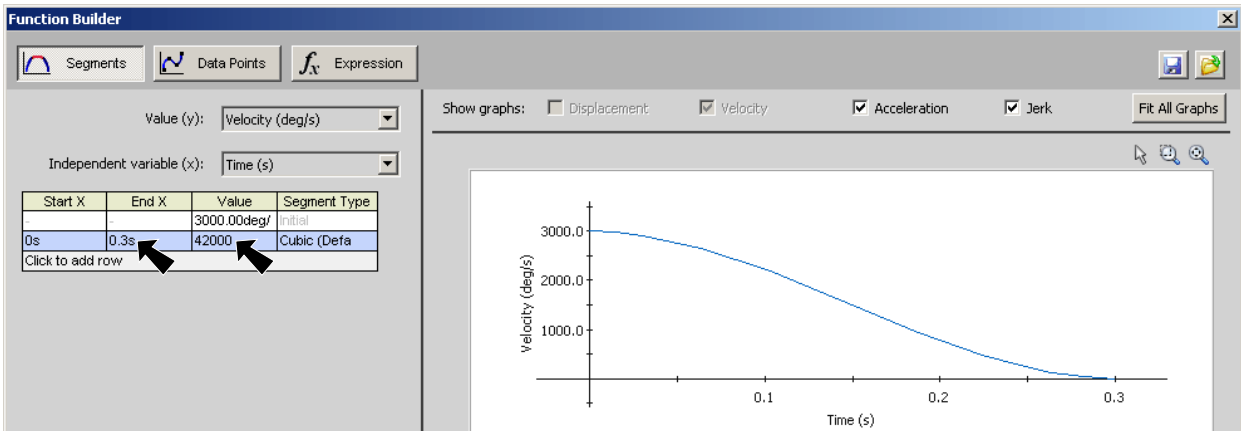


Fig. 8

Step 6. In the Segments chart, **Fig. 9**
 click **Click to add row**
 under **End X** in new row
 key-in **.6**
 under **Value**
 key-in **42000**

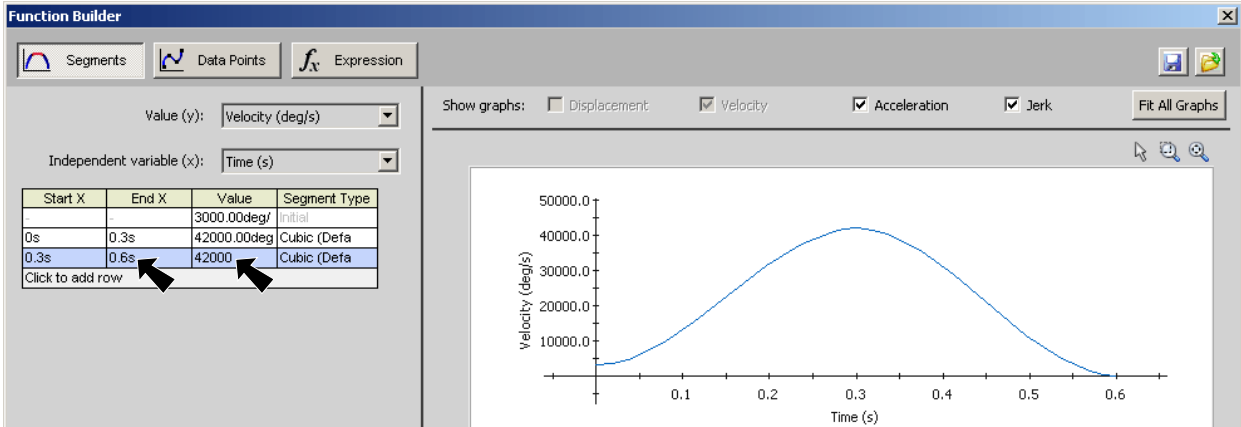


Fig. 9

Step 7. In the Segments chart add 3 more Rows as shown in **Fig. 10**
 End X Value
 .8 3000
 1 0
 1.5 0 click OK.

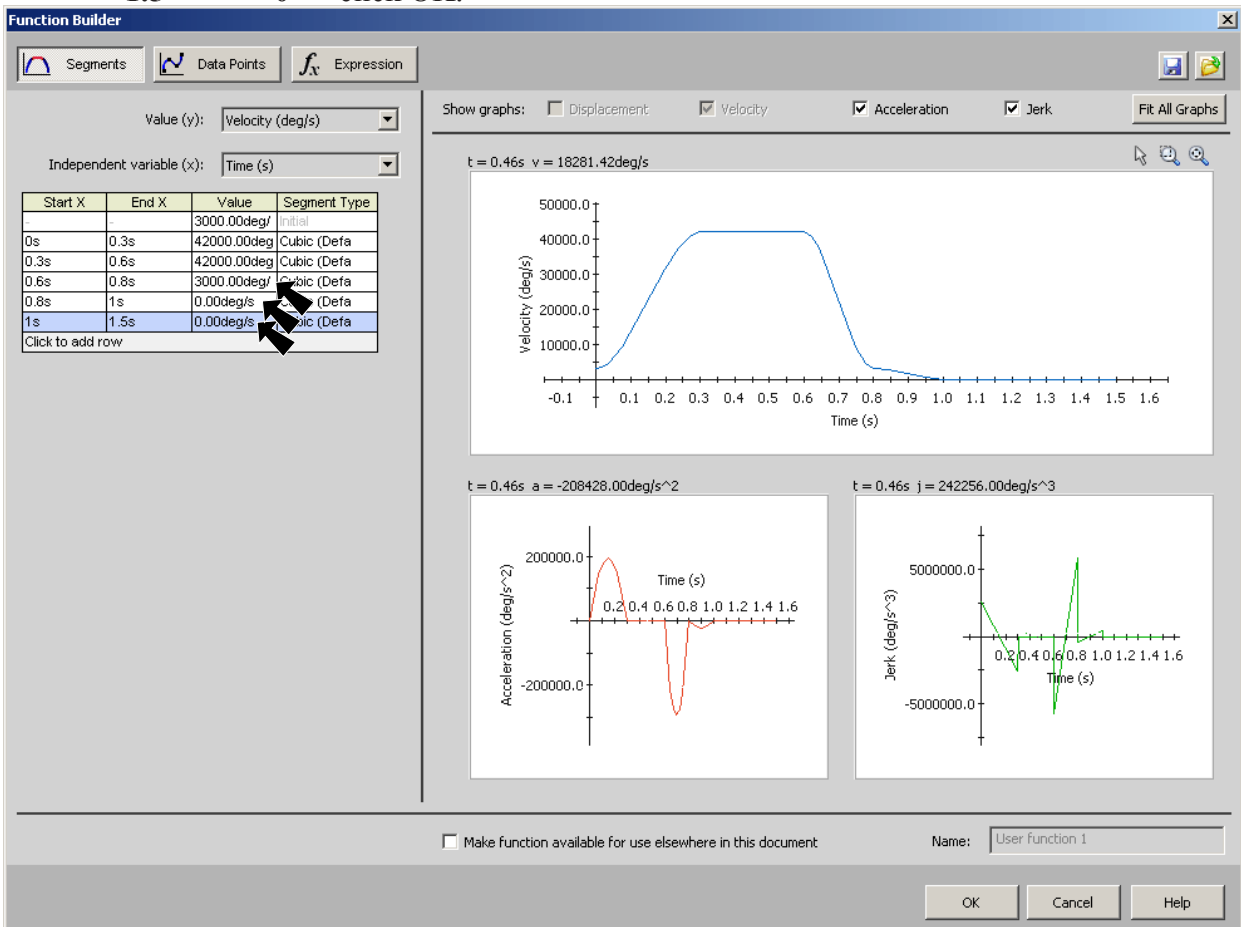



Fig. 10

Step 8. Click OK  in the Motor Property Manager.

Step 9. Click **Calculate**  and **Play from Start**  on the Motion Manager toolbar.

Step 10. Save. Use **Ctrl-S**.

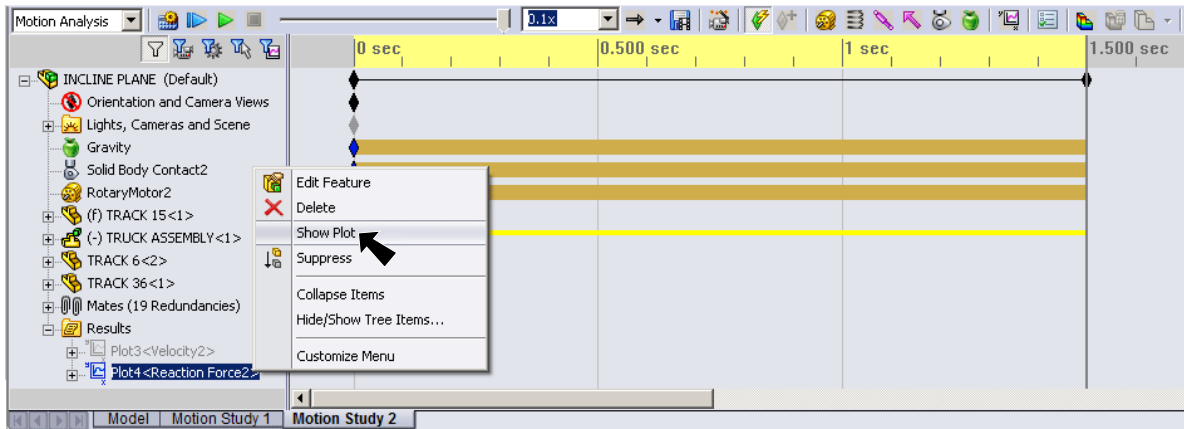



Fig. 11

Step 11. What's the Force? **Expand Results** at bottom Motion Manager design tree, **right click Plot4 Reaction Force2** and click **Show Plot** from menu, **Fig. 11**.

E. Solver.

Step 1. Up to this point we have been using the GTIFF solver. The GTIFF solver is limited to around 7200 RPMs. If you are looking for more power in your motors try the WSTIFF solver. To change solvers, click

Motion Study Properties  on the Motion Manager toolbar. In the Property Manager click Advanced Options. In Advanced Motion Analysis Options set Integrator Type to WSTIFF.

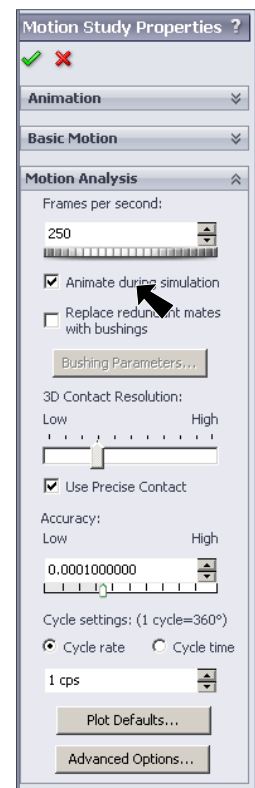


Fig. 12

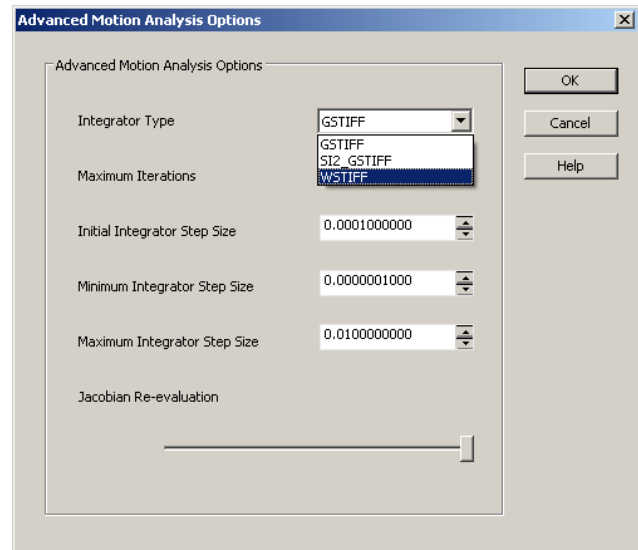


Fig. 13