# **Machinery Motor Tutorial**

The Adams/Machinery Motor module provides for the modeling of motor systems within the Adams/View environment.

Three modeling methods are available:

- Curve Based
- Analytical
- External

# **Curve Based**

The Adams/Machinery Motor module provides for the modeling of motor systems within the Adams/View environment. It supports multiple modeling methodology options. This example shows how to create motor using the curve-based method from the minimal set of input parameters.

This chapter includes the following sections:

- What You Will Create
- Curve Based Method Motor Model
- Simulation
- Adams/PostProcessor Results

#### What You Will Create

You will model a motor consisting of two parts (Stator and Rotor) with simple geometry. The stator and rotor will be attached to the ground and crank (Input) respectively. The crank is connected with a revolute joint and a spherical joint to the ground and connecting rod respectively. The connecting rod is connected to the rocker via a universal joint. The rocker is connected to ground via a revolute joint. The crank will be driven by the motor whose torque is defined by the user-input torque-speed curve.



Figure 1 Motor Model

#### **Curve Based Method Motor Model**

- 1. Start Adams 2013.2  $\rightarrow$  AView  $\rightarrow$  Adams View.
- 2. From the welcome screen click **Existing Model**.



 Open the model Motor\_Start.cmd from the installation directory. For example, Windows 64 examples files placed in the below location: C:\MSC.Software\Adams\_x64\2013.2\amachinery\example\motor\Motor\_Start.cmd.

**Tip:** Copy the example files folder and place it outside the working directory. Doing this, you can avoid having the working directory inside the Adams install folders.

84 Getting Started Using Adams/Machinery Curve Based





4. The imported model will look like the one shown below.

- a. It has:
  - Crank geometry connected with revolute and spherical joint with ground and connecting rod
  - Connecting rod is connected to rocker with universal joint
  - Rocker is connected to ground with revolute joint
- 5. Click the Machinery tab on the Adams/View ribbon.

6. From the Motor container, click the icon for Create Motor icon.



7. The motor creation wizard will launch. On the first page (Method) select Curve\_Based from the Method option menu and click Next.

Create Motor						
tep 1 of 6						
4	Method	•	Motor Type	•	Motor Connections	
Method	Curve Based	J				
1	Motor torque is	defined by a u	ser-provided torque vers	sus speed curv	ve.	
•   <b>L</b> al				< <u>F</u>	Back Next >	Close

Create Motor						
Step 2 of 6						
4	Method	•	Motor Type	•	Motor Connections	
	Torque Calculation	is based on C	urve Based Method.			
<b>•</b>				< }	2ack Next >	Close

8. On the next page click Next to proceed (the curve-based method is not type-specific).

9. On the next page (Motor Connection) enter values for as given below (circled in Red) and click Next.

Moto	or Type 🔹	Motor Connections	• Mol	tor Geometry
Motor Name	motor_1			
Motor	New	Direction	CCW	•
Location Axis Of Rotation	-35,0.0.0.0 Global Z	Rotor Attach Part Stator Attach Part	Grank ground	Fixed •
	0.0,0.0,0.0	Force Display	None	Flip Geometry

- a. Enter the values for the following fields and accept the defaults for others as shown below
  - Axis of Rotation as "Global Z".
  - Enter the values "-35.0,0.0,0.0" in mm for location.
  - Rotor attach part as "Crank" from right-mouse-button option Guesses.
  - Stator attach part as "ground" from right-mouse-button option Guesses.
- 10. In the **Motor Geometry**, enter the values (circled in red) as shown below and accept the default values for others and click **Next**.

4	Mator	Connections		Motor Coomotor		Interior	•
•	MOLOF	Jonnections		motor Geometry		inputs	
•	Detailed G	eometry					
Roto	r Length	(1.0E-002m)		Stator Length	(1.0E-002m)		
Rotor [	Diameter	(1.5E-003m)	1	Stator Width	(1.0E-002m)		
otor Sta	tor						
fine Mass	By User	Input				•	
lass (1 kg	)						
lxx (1E-0	05(kg-m**2	2))		Г	Off-Diagonal Te	erms	
		lyy (1E-	005(kg-m**	2))			
				Izz (1E-005(kg-m	**2))		

4	Motor	Geometry		Inputs		Motor	Output	
	Motor	Geometry		mbus		Motor	output	
Enter	Spline File	-						
Select	Spline							
Enter	Spline File							
Create	e Data Points							
	11. se							
Spline F	File Name							
		Manage In case	the she lades	and and make I American	Mala and a hour		A contra and	
		Note: In csv	file, the indep	endent axis ( Angular	Velocity) shou	Id be in RPI	M units and	
		the e	diante avia (Tr	units must be	a north mod	al unite		
		the or	rdinate axis (10	orque) units must be a	as per the mod	el units.		
		_						
	D D	-						
Creat	e Data Points							
Creat	e Data Points							
Creat	e Data Points	<u> </u>						
Creat	e Data Points							
Creat	e Data Points			v		Type	v=f(x) (2D)	
Creat	e Data Points			Y		Туре	y=f(x) (2D)	•
Creat	e Data Points			<b>Y</b> 120		Type View as	y=f(x) (2D) Tabular Data	2
Creat/ X 1 0 2 10	e Data Points			<b>Y</b> 120 70		Type View as	y=f(x) (2D) Tabular Data extrapolation	•
Creat	e Data Points			<b>Y</b> 120 70		Type View as ┌──Linear	y=f(x) (2D) Tabular Data extrapolation	•
Creat	e Data Points 00 00 00			<b>Y</b> 120 70 50 30		Type View as ┌─ Linear	y=f(x) (2D) Tabular Data extrapolation	•
X 1 0 2 10 3 20 4 30 5 40	e Data Points 00 00 00 00			<b>Y</b> 120 70 50 30 20		Type View as ┌─ Linear	y=f(x) (2D) Tabular Data extrapolation	•
X 1 0 2 10 3 20 4 30 5 40 6 50	e Data Points 00 00 00 00 00 00			<b>Y</b> 120 70 50 30 20 10		Type View as I™ Linear	y=f(x) (2D) Tabular Data extrapolation	-
X 1 0 2 10 3 20 4 30 5 40 6 50 7 60	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			<b>Y</b> 120 70 50 30 20 10 5		Type View as IT Linear	y=f(x) (2D) Tabular Data extrapolation	
X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 0		Type View as	y=f(x) (2D) Tabular Data extrapolation	• •
X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00			<b>Y</b> 120 70 50 30 20 10 5 0		Type View as Linear	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d	iata jata
Creat X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	00 00 00 00 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 0		Type View as └ Linear	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d	iata jata
Creat X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	00 00 00 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 5		Type View as Linear Append Prepend Insert R	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d	iata jata
Create X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 0		Type View as Linear Append Prepend Insert R	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d	tata
Creat X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 0		Type View as Linear Append Prepend Insert R Remo	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d tow After we Row	iata
Creat X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 0		Type View as I Linear Append Prepend Insert R Remo	y=f(x) (2D) Tabular Data extrapolation row to X and Y of row to X and Y of tow After we Row	iata data
Creat X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			<b>Y</b> 120 70 50 30 20 10 5 0		Type View as I Linear Append Prepend Insert R Remo	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d tow After we Row	lata data
Creat X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			<b>Y</b> 120 70 50 30 20 10 5 0		Type View as IT Linear Append Prepend Insert R Remo	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d row After ve Row	iata data
Creat	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			<b>Y</b> 120 70 50 30 20 10 5 0		Type View as I Linear Prepend Insert R Remo	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d tow After we Row	iata data
Creat: X 1 0 2 10 3 20 4 30 5 40 6 50 7 60 8 70	e Data Points 00 00 00 00 00 00 00 00 00 00 00 00 00			Y 120 70 50 30 20 10 5 0		Type View as Linear Append Prepend Insert R Remo	y=f(x) (2D) Tabular Data extrapolation row to X and Y d row to X and Y d tow After	iata jata

11. In the Inputs page select Create\_Data\_Points options and accept the default values. Click Next.

12. Accept the default values in the next page (Motor Output) and click Finish.

Create Motor						
Step 6 of 6						
•	Motor Geometry	٠	Inputs	٠	Motor Output	•
Multiply	Scale Factor	•				
Scale Factor	1.0	-				
🗕 🖬				< <u>B</u> ac	ck <u>E</u> inish	Close

# Simulation

Simulate your model for 25 seconds at 2500 steps by clicking the **Interactive Simulation** icon from the **Simulate** container on the **Simulation** tab, entering the values shown below and clicking the **Start Simulation** button.



#### Adams/PostProcessor Results

1. Switch to PostProcessor by clicking plotting icon from the Simulation Control.



mulation	Filter R	equest	Component	□ Surf
Last_Sun	(2013 displaceme -	motor_1 (Resset Container	) Notor_rpm	Add Curves
	accelerati	motor_req	Power	Add Curves To Curren
	force		Rotor_Angle	Clear Plot
	user defir		Angular_Acceleration	Independent Axis:
	11			C Time C Data
	2			
urce Requests				
tor It				
uer	4 14		•	
iter			<b>)</b>	_ /
Independent A	is Browser	1]		
Independent Av	is Browser Filter	Request	Come	ponent
Independent Av	is Browser Filter	Request	Comp	ponent
Independent Av Simulation + Last_Run	is Browser Filter	Request - motor_1 (Resset Con	Lainer ) Koto Moto	onent z_torque
Independent Av Simulation + Last_Run	Filter (2) displacement velocity acceleration	Request - motor_1 (Resset Con motor_req	Lainer ) Moto Powe	ponent z_torque z
Independent Au Simulation + Tast_Pun	Filter Carlos Browser Filter Carlos Browser Carlos Browser	Request - motor_1 (Resset Con motor_req	Lainer ) Moto Roto Roto	ponent r_tpn r_torque r r_Angle
Independent Av Simulation	Filter Filter Carl displacement velocity acceleration force user defined	Request - motor_1 (Resset Con motor_req	tainer ) Koto Roto Angu	r_torque r_torque r_tagle lar_Acceleration
Independent Av Simulation + Case Run	Filter Filter Construction force user defined	Request - motor_1 (Resset Con motor_req	Lainer ) Koto Roto Roto Angu	r_torque r_torque r_t_Angle lar_Acceleration
Independent Av Simulation + Last_Run	Sis Browser Filter Gisplacement velocity acceleration force user defined	Request - motor_1 (Resset Con motor_req	Lainer ) Koto Roto Angu	r torque r_torque r_Angle llar_Acceleration

2. In the Post Processor, Select the **Motor\_rpm** as data for independent axis as shown below.

3. Select the items highlighted in blue below and then by clicking **Add Curves** button to plot the motor rpm vs torque.



# Analytical

The Adams/Machinery Motor module provides for the modeling of motor systems within the Adams/View environment. It supports multiple modeling methodology options including an analytical modeling method which supports multiple motor types: DC, AC Synchronous, DC Brushless and Stepper. This example shows how to create a motor of type DC of method analytical from the minimal set of input parameters.

This chapter includes the following sections:

- What You Will Create
- Analytical Method Motor Model
- Simulation
- Adams/PostProcessor Results

#### What You Will Create

You will model a motor consisting of two parts (Stator and Rotor) with simple geometry. The stator and rotor will be attached to the ground and crank (Input) respectively. The crank is connected with a revolute joint and a spherical joint to the ground and connecting rod respectively. The connecting rod is connected to the rocker via a universal joint. The rocker is connected to ground via a revolute joint. The crank will be driven by the motor whose torque is defined by an analytical, equation-based calculation.



Figure 2 Motor Model

#### **Analytical Method Motor Model**

- 1. Start Adams 2013.2  $\rightarrow$  AView  $\rightarrow$  Adams View.
- 2. From the welcome screen click **Existing Model**.



 Open the model Motor\_Start.cmd from the installation directory. For example, Windows 64 examples files placed in the below location: C:\MSC.Software\Adams\_x64\2013.2\amachinery\example\motor\Motor\_Start.cmd.

**Tip:** Copy the example files folder and place it outside the working directory. Doing this, you can avoid having the working directory inside the Adams install folders.

	Open an Existing Model	
File Name	s\Motor_Start.cmd	
	Use File Directory as Working Directory	
Working Directory	C:\	
Echo Command	ls	
☐ Update Screen		
Display Model	Jpon Completion	
On Error:		
C Continue Com	nand · Ignore Command · Abort File	
		-



4. The imported model will look like the one shown below.

- a. It has:
  - · Crank geometry connected with revolute and spherical joint with ground and connecting rod
  - Connecting rod is connected to rocker with universal joint
  - Rocker is connected to ground with revolute joint
- 5. Click the Machinery tab on the Adams/View ribbon.

6. From the Motor container, click the icon for Create Motor icon.



7. The motor creation wizard will launch. On the first page (Method) select Analytical from the Method option menu and click Next.

ep 1 of 6						
4	Method	•	Motor Type	•	Motor Connections	
Method	Analytical	•				
	Motor torque is selected on the	defined by equ next page.	ation sets specific to th	ne type of moto	r	

8. The motor creation wizard will launch. On the next page (**Type**) select **DC** from the **Type** option menu and click **Next**.

ep 2 of 6						
4	Method	٠	Motor Type	٠	Motor Connections	
Motor Type	DC	•				
0	The DC motor i source, current type DC motors	s a mechanica t in the rotor is can be repres	Illy commutated motor switched by the comm sented with this option.	Powered by a utator.Both se	DC electric eries and shunt	
i ul				< [	Back Next >	Close

9. On the next page (Motor Connection) enter values for as given below (circled in Red) and click Next.

Moto	or Type 🔹	Motor Connections	• M	otor Geometry
Motor Name	motor_1			
Motor	New	Direction	CCW	-
Location	-35,0,0.0,0.0	Rotor Attach Part	Crank	Fixed •
Axis Of Rotation	Global Z	Stator Attach Part	ground	Fixed •
	0.0,0.0,0.0	Force Display	None	Flip Geometry

- a. Enter the values for the following fields and accept the defaults for others as shown below
  - Axis of Rotation as "Global Z".
  - Enter the values "-35.0,0.0,0.0" in mm for location.
  - Rotor attach part as "Crank" from right-mouse-button option Guesses.
  - Stator attach part as "ground" from right-mouse-button option Guesses.

10. In the **Motor Geometry**, enter the values (circled in red) as shown below and accept the default values for others and click **Next**.

Motor Co	nnections •	Motor Geometry	•	Inputs	
Detailed Geo	ometry				
Rotor Length	(1.0E-002m)	Stator Length	(1.0E-002m)		
Rotor Diameter	(1.5E-003m)	Stator Width	(1.0E-002m)		
otor Stator					
fine Mass By User In	iput			•	
ass (1 kg )					
Ixx (1E-005(kg-m**2))			Off-Diagonal T	erms	
	lyy (1E-005(kg-m*	*2))			
		Izz (1E-005(kg-m*	**2))		

11. In the **Inputs** page modify the source voltage to **110**, the number of conductors to **200** and accept the default values for others. Click **Next**.

4	Motor Geometry	•	Inputs •	Motor Output	
No. of Conduc	ctors 200		Armature Resistance (Ohms)	0.35	
Iux Per Pole	(Wb) 0.025		No. of Poles	4	
Source Voltag	ge (V) 110			Shunt	
No. of Paths	2	_			

12. Accept the default values in the next page (Motor Output) and click Finish.

	Motor Geometry	•	Inputs	•	Motor Output	
Aultiply	Scale Factor	•				
Scale Factor	1.0	_				

## Simulation

Simulate your model for 1 second at 1000 steps by clicking the **Interactive Simulation** icon from the **Simulate** container on the **Simulation** tab, entering the values shown below and clicking the **Start Simulation** button.



#### Adams/PostProcessor Results

1. Switch to PostProcessor by clicking plotting icon from the Simulation Control.



2. In the Post Processor, Select the **Motor\_rpm** as data for independent axis as shown below.

<pre>* Last_Run [2013] displaceme - motor_1 (Reset Container) velocity scolerati force wser dofif inter *</pre>	imulation	Filter	Request	Component	☐ Surf
velocity accelerati force user defind     motor_req_DC     Motor_torque Power Rotor_Angle Angular_Acceleration     Add Curves To Current Clear Plot Independent Axis:	Last_Run (2	012 displaceme	- motor_1 (Resset Container	) Notor_spm	Add Curves
Independent Axis: Time © Data Page 1 of Page 1 of P		velocity accelerati force user defin	motor_req_DC	Motor_torque Power Rotor_Angle Angular_Acceleration	Add Curves To Current Clear Plot
Independent Axis Browser       Simulation       Filter       Request       Component       * Lest_Bun       (2)       displacement       velocity       acceleration       force       user defined         * Motor_treq_DC         Page 1 of	ource Requests		4 1		C Time C Data
imulation     Filter     Request     Component       Last_Run     displacement velocity acceleration force user defined     - motor_1 (Resset Container )     Motor_rpm Motor_treq					Page 1 of
<pre>+ Last_Run (2) displacement velocity acceleration force user defined </pre> - motor_1 (Resset Container ) Motor_rpm Motor_treq Motor_treq Power Rotor_Angle Angular_Acceleration	Independent Axis B	rowser		1-1-1-1	
	Independent Axis B	rowser Filter	Request	Compo	nent



3. Select the items highlighted in blue below and then by clicking **Add Curves** button to plot the motor rpm vs torque.

# **External**

The Adams/Machinery Motor module provides for the modeling of motor systems within the Adams/View environment. It supports multiple modeling methodology options including an external modeling method. This example shows how to create a motor using the external method from the minimal set of input parameters.

This chapter includes the following sections:

- What You Will Create
- External Method Motor Model
- Simulation
- Adams/PostProcessor Results

# What You Will Create

You will model a motor consisting of two parts (Stator and Rotor) with simple geometry. The stator and rotor will be attached to the ground and crank (Input) respectively. The crank is connected with a revolute joint and a spherical joint to the ground and connecting rod respectively. The connecting rod is connected to the rocker via a universal joint. The rocker is connected to ground via a revolute joint. The crank will be driven by a prescribed torque provided via ESL (External System Library, which is a binary representation of model generated by MATLAB®) and the simulation will be carried out entirely inside Adams. The torque created in the motor will be based on this external model.



Figure 3 Motor Model

#### **External Method Motor Model**

- 1. Start Adams 2013.2  $\rightarrow$  AView  $\rightarrow$  Adams View.
- 2. From the welcome screen click **Existing Model**.



 Open the model Motor\_Start.cmd from the installation directory. For example, Windows 64 examples files placed in the below location: C:\MSC.Software\Adams\_x64\2013.2\amachinery\example\motor\Motor\_Start.cmd.

**Tip:** Copy the example files folder and place it outside the working directory. Doing this, you can avoid having the working directory inside the Adams install folders.

110 Getting Started Using Adams/Machinery External





4. The imported model will look like the one shown below.

- a. It has:
  - Crank geometry connected with revolute and spherical joint with ground and connecting rod
  - Connecting rod is connected to rocker with universal joint
  - Rocker is connected to ground with revolute joint
- 5. Click the **Machinery** tab on the Adams/View ribbon.

6. From the Motor container, click the icon for Create Motor icon.



7. The motor creation wizard will launch. On the first page (Method) select External from the Method option menu and click Next.

Create Motor					CONTRACTOR OF	×
Step 1 of 6						
4	Method	•	Motor Type	•	Motor Connections	
Method	External	•				
	The motor is m It is incorporate import mode or	odeled externa d into the Ada co-simulation	lly in any software supp ms analysis via either e mode.	ported by Ada external syste	a <mark>ms/Controls.</mark> em library (ESL)	
<u></u>				<	Back Next >	Close

Create Motor					100	*
Step 2 of 6						
4	Method	•	Motor Type	•	Motor Connections	
	Torque Calculation	is based on E	xternal Method.			

8. On the next page (Motor Type) click Next to proceed.

9. On the next page (Connection) enter values for as given below (circled in Red) and click Next.

Moto	r Type 🔹	Motor Connections	• M	otor Geometry
Motor Name	motor_1	-		
Motor	New	Direction	ccw	•
Location	-35,0,0.0,0.0	Rotor Attach Part	Crank	Fixed •
Axis Of Rotation	Global Z	Stator Attach Part	ground	Fixed -
	0.0,0.0,0.0	Force Display	None	Flip Geometry

- a. Enter the values for the following fields and accept the defaults for others as shown below
  - Axis of Rotation as "Global Z".
  - Enter the values "-35.0,0.0,0.0" in mm for location.
  - Rotor attach part as "Crank" from right-mouse-button option Guesses.
  - Stator attach part as "ground" from right-mouse-button option Guesses.

10. In the **Motor Geometry**, enter the values (circled in red) as shown below and accept the default values for others and click **Next**.

			2	111111	
Motor Co	nnections •	Motor Geometry	•	Inputs	
Detailed Geo	ometry				
Rotor Length	(1.0E-002m)	Stator Length	(1.0E-002m)		
Rotor Diameter	(1.5E-003m)	Stator Width	(1.0E-002m)		
otor Stator					
fine Mass By User In	put			•	
ass (1 kg )					
Ixx (1E-005(kg-m**2))		Г	Off-Diagonal Te	rms	
	lyy (1E-005(kg-m**2	2))			
		Izz (1E-005(kg-m*	**2))		

11. In the **Inputs** page select **External System Library Import** option and select the **Motor\_External\_Demo.dll** created by MATLAB® via the right-mouse-button option from GUI as shown below. Click **Next**.

**Important:** Please select the *.dll* based on your platform. The *.dll* is different for all three platforms.

reate Motor						
p 5 of 6						
4	Motor Geometry	•	Inputs	٠	Motor Output	
External Me	ethod	<ul> <li>External Systematics</li> </ul>	em Library Import	Co-Simulation	ī)	
Plant Input/	Output	Standard	•			
General Sta	te Equation Name	motor_1_gse				
External Sy	stem Library	oftware\Adams_x	64_Beta\2013_2\ama	chinery\example	es\motor\Motor_Externa	al_Demo.dll
		Generate Exte	ernal Model Specificat	ions	MATLAB 🔹	

116 Getting Started Using Adams/Machinery External

Create Motor						
tep 6 of 6						
4	Motor Geometry	•	Inputs	٠	Motor Output	
Multiply	Scale Factor	•				
Scale Factor	1.0	_				
I UI				< Bac	k Finish	Close

# Simulation

Simulate your model for 1 second at 1000 steps by clicking the **Interactive Simulation** icon from the **Simulate** container on the **Simulation** tab, entering the values shown below and clicking the **Start Simulation** button.



- a. Before running the simulation, do the following steps in the order mentioned below:
- Check the Start at equilibrium
- Click the Find Static Equilibrium
- Now run the simulation by clicking **Start Simulation Button**

#### Adams/PostProcessor Results

1. Switch to PostProcessor by clicking plotting icon from the Simulation Control.







120 Getting Started Using Adams/Machinery External