Animating assemblies

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SOLID EDGE
VELOCITY SERIES

...with Synchronous Technology

Contents

Lesson

1 *Introduction*

Welcome to self paced training for Solid Edge. This course is designed to educate you in the use of Solid Edge. The course is self-paced and contains instruction followed by activities.

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- **spse01515**—Constructing base features
- **spse01520**—Moving and rotating faces
- **spse01525**—Working with face relationships
- **spse01530**—Constructing treatment features
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Start with the tutorials

Self-paced training begins where tutorials end. Tutorials are the quickest way for you to become familiar with the basics of using Solid Edge. If you do not have any experience with Solid Edge, please start by working through the tutorials for basic part modeling and editing before starting this self-paced training.

Lesson

2 Course Overview

Course overview

The Explode-Render-Animate application within the Solid Edge assembly environment is a tool for creating different types of presentations of Solid Edge assemblies. Exploding an assembly allows you to control the movement, sequence and grouping of parts and subassemblies. Rendering a view allows you to define textures, lighting, shadows, backgrounds and other properties to create presentation style images. Motors apply movement to under constrained parts in an assembly which can be animated. Using animation, you can combine previously created exploding sequences and custom camera movement to create animation. Each frame of the animation can be rendered to create presentation quality animations.

Once you complete the activities in this course, you will be able to:

- Add a motor to a unconstrained part of an assembly to create movement for an animation.
- Manipulate animation events and explode events to create an animation of an assembly.

Lesson

3 *Defining motors*

There are two types of motors that can be defined in Solid Edge: rotational and linear.

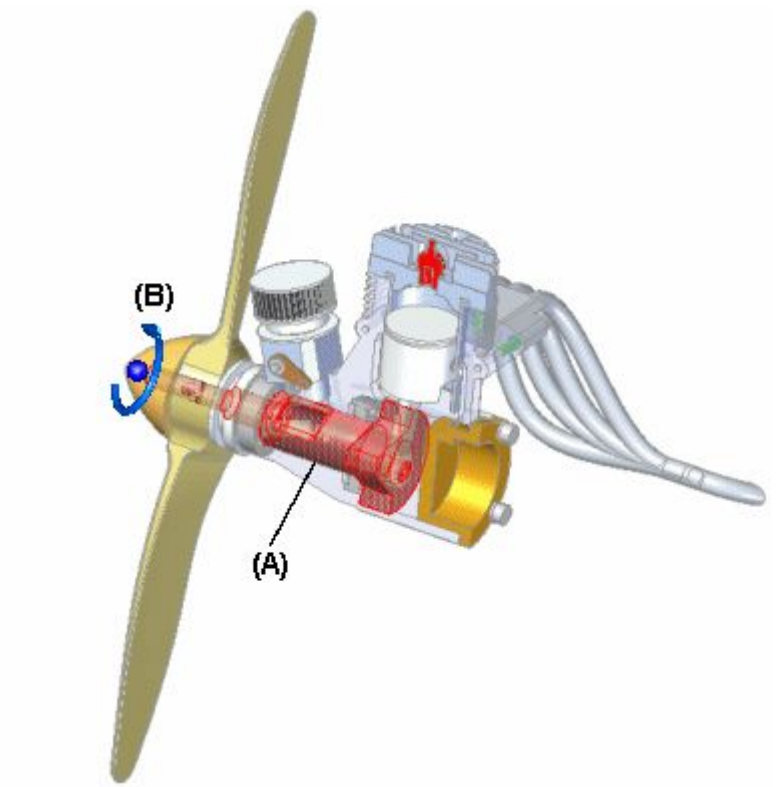
You use motor features to help you observe how a set of under-constrained parts will move relative to the part you define as a motor. This allows you to design and simulate complex mechanisms where the movement of a set of interrelated parts needs to be simulated.

 Motor command

Defines a rotational or linear motor using an element on a selected part. You can then use the Simulate Motor command to display a kinematic simulation of the motion in an assembly.

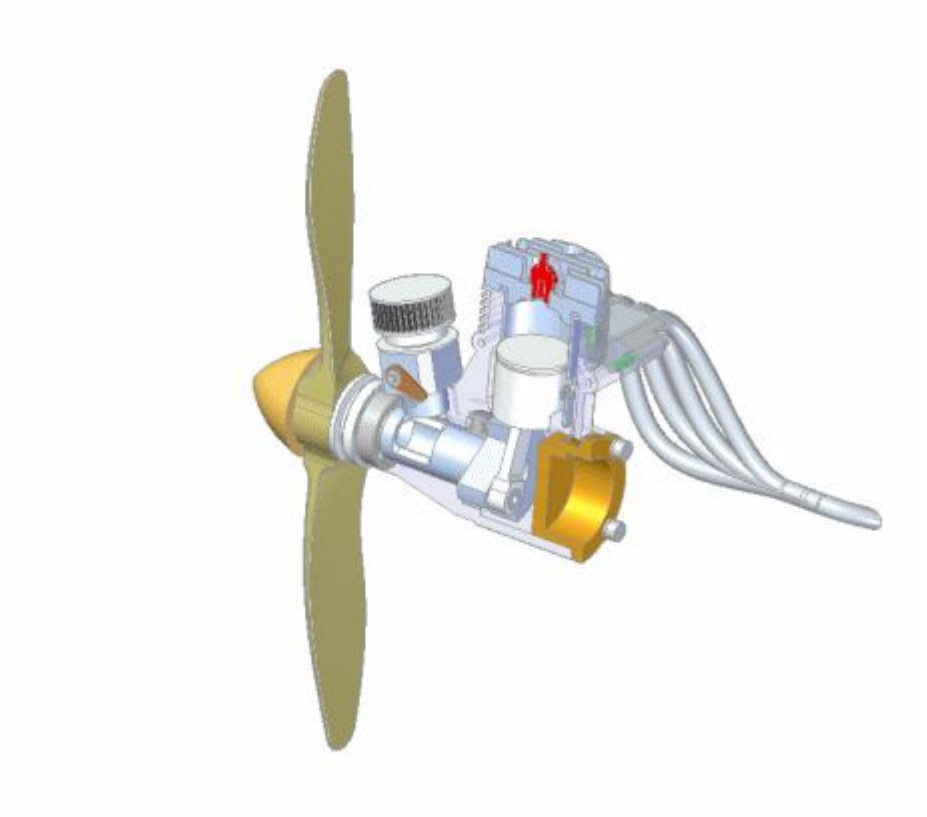
You use motor features to help you observe how a set of under-constrained parts will move relative to the part you define as a motor. This allows you to design and simulate complex mechanisms where the movement of a set of interrelated parts needs to be simulated.

This is useful when working with assemblies that contain moving parts such as gears, pulleys, crankshafts, parts that travel in grooves or slots, and hydraulic or pneumatic actuators. For example, you can specify that a crankshaft part (A) in a mechanism rotates around an axis you specify (B).



You can then use the Motor Simulation command to playback a kinematic simulation of how the under-constrained parts in the assembly move.

Press F5 to replay the animation.



You can define properties for the motor, such as the type of motor, the motor rate or speed, motor direction, and any limits you may want to place on the motor.

When you define a motor feature using the Motor command, an entry is added for the motor feature to PathFinder. You can select the motor entry in PathFinder to edit the motor feature later.

Types

You can define the following types of motors:

- Rotation
- Linear

Steps

The basic steps for defining a motor are:

- Specify the type of motor you want, Rotation or Linear.
- Select the part you want to act as a motor.
- Define the movement axis.
- Specify the motor rate and limits.

Specifying Motor Type

The Motor Type list on the command bar allows you to define the type of motor you want. You can specify whether you want the motor type to be Rotation or Linear.

Selecting the Part

You can only select a part that is under-constrained, or has relationships suppressed. The assembly should also be under-constrained such that the mechanism is free to move in the proper axes.

Defining the Movement Axis

Depending on the motor type you specify, you can select faces, edges, or cylindrical axes to define the motor axis. For example, to define a Rotary motor, you can select cylindrical faces, cylindrical edges, or cylindrical axes.

Specifying the Motor Rate and Limits

The Motor Value and Limits options on the command bar allow you to specify the speed or rate you want the motor operate at, and any limits on the travel you want to impose. For example, you may want to specify that a rotational motor rotates at 1750 revolutions per minute, and makes two complete revolutions (720 degrees).

You can set the working units you want to use for the angular and linear velocity of a motor using the Advanced Units button on the Units tab of the File Properties dialog box, on the File menu.

Motor Definition and Simulation Guidelines

You can define as many motors as you want in an assembly. When you define multiple motors in an assembly, use the Motor Group Properties dialog box, available with the Simulate Motor command and the Animation Editor tool to specify which motors you want to use, whether you want to detect collisions during the simulation, and so forth.

When working with more than one motor, use the Animation Editor tool to specify when the motors start time, duration time and stop time for each motor. This allows you to design and simulate complex mechanisms where the timing and positioning of the parts is critical to understanding the behavior of the mechanism.

Note

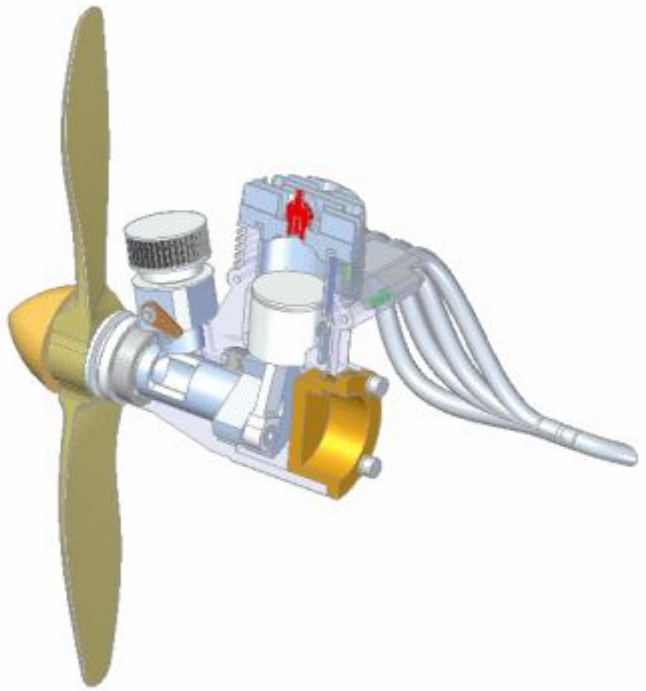
Only motors in the active assembly participate in a motor simulation. If you want subassembly parts to move in response to a motor simulation, you need to make the subassembly adjustable, using the Adjustable Assembly command on the PathFinder shortcut menu.

Motor command bar

 Simulate Motor command

Display a kinematic simulation of motion in an assembly. You use motor features to define how a set of interrelated parts will move. This is useful when working with assemblies that contain crankshafts, gears, pulleys, and hydraulic or pneumatic actuators.

Press F5 to replay the animation.



When you click the Simulate Motor button, the Motor Group Properties dialog box is displayed, so you can specify which motors you want to use, whether you want to detect collisions during the simulation, and so forth. When you click OK, the Animation Editor tool is displayed so you can run the simulation. To run the simulation, click the Play button.

Note

The Simulate Motor command contains a subset of the Animation Editor functionality. To access the full functionality of the Animation Editor tool, you must use the Animation Editor command in the Explode-Render-Animate application. To access the Explode-Render-Animate application, on the Tools tab, click Explode-Render-Animate.

Motor Group Properties dialog box

No Analysis

Allows you to move under-constrained parts and observe the results.

Detect Collisions

Allows you to detect collisions during motor animation.

Physical Motion

Allows you to simulate physical motion between parts. This option detects contact between unconstrained surfaces and applies temporary constraints

between the contacting surfaces. This makes it possible to analyze motion in mechanisms that contain gears and other forms of sliding contact.

Motor Duration

Specifies how the motor duration is defined.

Use Motor Limits as Duration if Defined

Specifies that the motor limits define the duration.

Default Motor Duration

Specifies the motor duration in seconds. You can type a value.

Available Motors

Lists the available motors. You can use the Add and Remove buttons to add motors to and remove motors from the Motors in Animation list.

Add

Adds a motor to the Motors in Animation list.

Remove

Removes a motor from the Motors in Animation list.

Motors in Animation

Lists the motors that will be used in the animation.

Activity: Motor

Activity objectives

In this activity, you assign a motor to a part in an assembly. The motor type is rotational, and it is applied to a gear in a clock. The speed of the motor is defined so that the second hand of the clock moves at the operating speed of 1 rpm. The gear relationships are predefined, and by assigning the motor to the appropriate gear, you can show motion through motor simulation. This motor simulation is used in a later activity to create an animation of the clock.

Turn to appendix A for the activity: Creating a motor.

Lesson review

Answer the following questions:

1. Name two types of motors.
2. How do you change the rotational units from degrees per second to revolutions per minute?
3. Can a motor that exists in a subassembly be used to apply motion to unconstrained parts in a higher level assembly? If so, explain how.
4. Once a motor is defined, how do you get it to drive unconstrained parts and see the movement?

5. Can the movement created by a motor be seen during an animation, along with explosion events?

Answers

1. Name two types of motors.

   The two types of motors are linear and rotational.

2. How do you change the rotational units from degrees per second to revolutions per minute?

   To change the rotational units from degrees per second to revolutions per minute, click the advanced units button in file properties>units.

3. Can a motor that exists in a subassembly be used to apply motion to unconstrained parts in a higher level assembly? If so, explain how.

   A motor that exists in a subassembly can be used to apply motion to unconstrained parts in a higher level assembly if the subassembly is defined as an adjustable assembly.

4. Once a motor is defined, how do you get it to drive unconstrained parts and see the movement?

   The simulate motor command will show the movement created by a motor.

5. Can the movement created by a motor be seen during an animation, along with explosion events?

   The movement created by a motor can be seen during an animation, along with explosion events.

Lesson summary

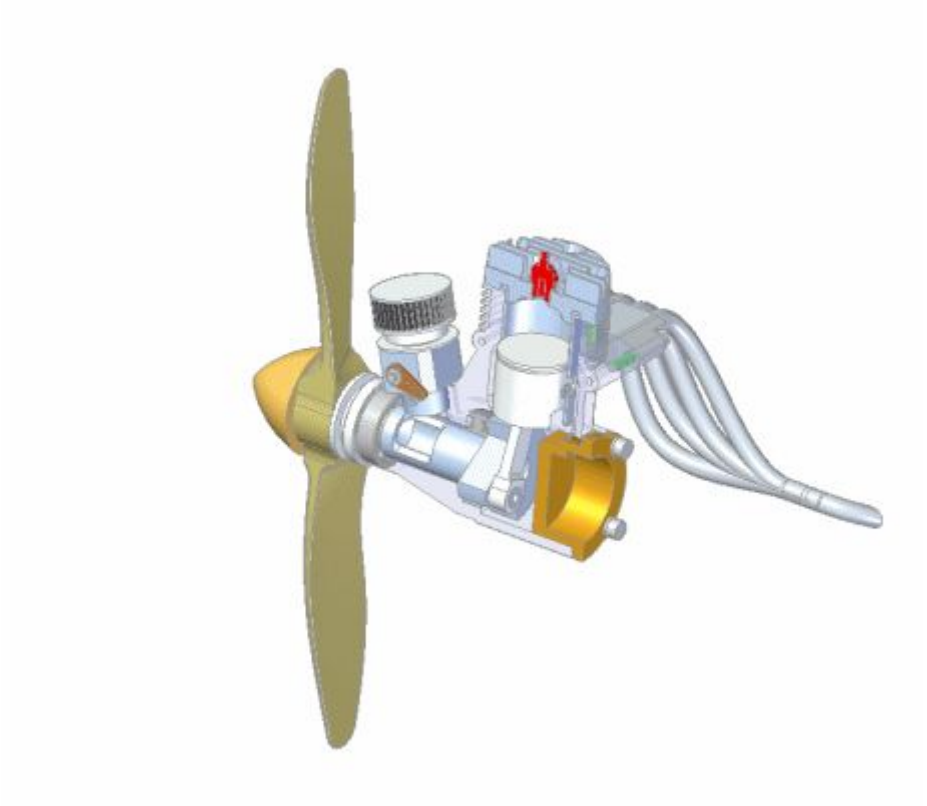
In this lesson, you learned how to create and simulate a motor. The motor animation created will be used later during the explode sequence. In the activity, the following topics were covered:

- The speed and direction of a rotational motor was defined.
- Parameters used to define the motor were changed by an editing process.
- The motor simulation was created and run.
- Animation controls and time line were introduced.
- A motor time line was created to be used in exploding and an animation.

Lesson

4 Animating an assembly

Solid Edge enables you to easily create animated presentations of your assemblies. Assembly animations can be useful for motion studies of mechanisms, visualizing how parts are assembled into a completed assembly, and for vendor or customer presentations.



Animation Editor command

Displays the Animation Editor Tool so you can create, display, and edit animations of an assembly.

You can define the following types of animation events:

- Camera
- Motor
- Explosion
- Appearance
- Motion Path

You can use the controls on the Animation Editor tool to play, stop, pause, and rewind the animation in the graphic window.

You can also save an assembly animation in AVI format with the Save As Movie button on the Animation Editor tool.

> **Note**
>
> When you are working in Solid Edge Embedded Client, AVI files are saved to unmanaged locations.

For more detailed information on creating assembly animations, see the Creating Assembly Animations Help topic.

Animation Editor Tool

Animation List

Lists the existing animations. You can select an animation entry from the list for playback and editing purposes.

New Animation

Displays the Animation Properties dialog box so you can define the properties for a new animation.

Save Animation

Saves the current animation.

Delete Animation

Deletes the current animation.

Animation Properties

Displays the Animation Properties dialog box so you can edit the properties for an existing animation.

Save as Movie

Displays the Save as Movie dialog box so you can save the current animation as an AVI file.

Camera Path

Displays the Camera Path Wizard so you define the camera path you want.

Display Camera Path

Displays the camera path as a curve in the graphic window. This can be useful in visualizing the path the camera will take during the animation.

Animation Events List (Left Pane)

Lists the event types available in the current animation. Depending on the current animation, you can define events or select existing events for the camera, motor, explosion, appearance, and path you want to use for the current animation. You can expand, collapse, and select items in the list. Shortcut menu commands are available that allow you to define the event you want to use for the animation, delete the current event, and so forth.

Speed

Specifies the speed you want to use for playback purposes. The speed setting does not affect the speed of an AVI recording, or the relative speed of the animation entries.

Go to Start

Moves the current frame indicator to the start of the animation.

Previous Frame

Moves the indicator to the previous frame.

Play/Pause

Plays or pauses the current animation.

Stop

Stops the playback of the animation.

Next Frame

Moves the indicator to the next frame.

Go To End

Moves the current frame indicator to the end of the animation.

Time

Displays the current time in the animation.

Frame

Displays the current frame in the animation.

 Toggle Scale

Toggles the timeline scale between frames and seconds.

 Zoom Out

Reduces the scale of the animation timeline.

 Zoom In

Increases the scale of the animation timeline.

 Minimize

Minimizes the Animation Editor.

 Motion Path

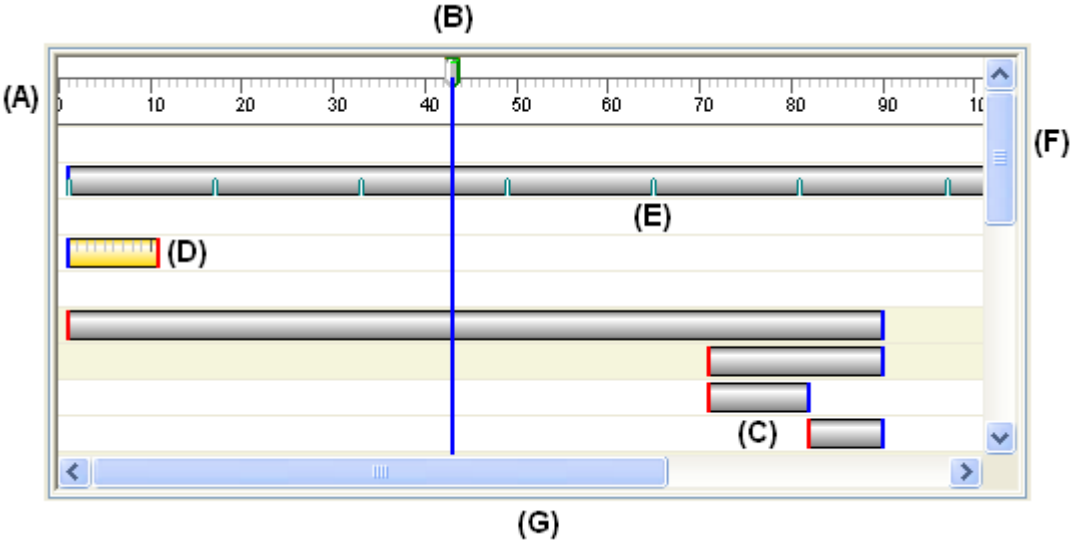
Displays the Motion Path command bar so you can select components and draw a curve path to guide component movement.

 Appearance

Displays the Appearance command bar so you can create an appearance event. For example, you may want a part to fade in or fade out in your animation.

Event Timeline and Duration List (Right Pane)

Displays event duration bars, which represent the start and stop times, and elapsed time for each event in the current animation timeline. You can edit event duration bars by dragging with the cursor or using shortcut menu commands. This allows you to customize the animation.



Basic user-interface elements in the right pane include:

(A) Frame Scale. You can use the Toggle Scale button to change the scale display between Frames and Seconds.

(B) Current Frame Indicator. The current frame is the frame which is displayed in the graphic window. You can use the cursor to drag the Current Frame Indicator to another location to view individual frames in the animation.

(C) Event Duration Bars. Notice that a different color is used at the start and end locations.

(D) Selected Event Duration Bar. Notice that a scale is displayed when a duration bar is selected. This can make it easier to precisely relocate a duration bar with respect to Frame Scale.

(E) Event Duration Bar Key Frame Indicator.

(F) Vertical Scroll Bar. Allows you to scroll the timeline up and down.

(G) Horizontal Scroll Bar. Allows you to scroll the timeline left and right.

Shortcut Menu Commands

The following shortcut menu commands are available. The shortcut menu commands are context-sensitive. In other words, the commands which are available change based on what is selected.

Left Pane Shortcut Menu Commands

Delete

Deletes the selected event.

Rename

Renames the selected event.

Edit Definition

Allows you to define a new event or edit an existing event. The action you can perform depends on the event type and whether you are defining a new event or editing an existing event.

Camera

The Edit Definition command displays the Camera Path Wizard when you click the Camera category entry, and displays the Path command bar when you select an existing camera event.

Motor

The Edit Definition command displays the Motor Group Properties dialog box when you select the Motor category entry.

Explosion

The Edit Definition command displays the Explosion Properties dialog box when you select the Explosion category entry.

Appearance

The Edit Definition command displays the Appearance command bar when you select an existing Appearance event.

Paths

The Edit Definition command displays the Path command bar when you select an existing Path event.

Expand All

Expands all the event collections.

Right Pane Shortcut Menu Commands

Cut

Cuts the selected event from the animation and places it on the Clipboard.

Copy

Copies the selected event from the animation and places it on the Clipboard.

Paste

Pastes an event onto the animation timeline.

Delete Duration

Deletes the selected event duration.

Insert Key Frame

Inserts a keyframe at the current cursor position. This option is available when the cursor is over a camera or motion path event duration bar.

Delete Key Frame

Deletes a keyframe at the current cursor position. This option is available when the cursor is over a camera or motion path event duration bar.

Insert Camera Location

Inserts a camera location at the current cursor position. This option is available when the cursor is over a camera event duration bar.

Add Frames

Displays the Add Frames dialog box so you can add frames or time to an animation event.

Remove Frames

Displays the Remove Frames dialog box so you can remove frames or time to an animation event.

Properties

Displays the Duration Properties dialog box so you can redefine the start time, end time, or elapsed time for an animation event.

event duration bar

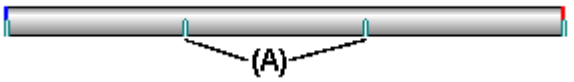
A user-interface element on the timeline (right) pane of the Animation Editor tool.

Event duration bars allow you to visualize and control the timing of events in an assembly animation.

Event duration bars represent the start time, elapsed time, and end time for an animation event. There are two basic types of event duration bars:

- Duration bars for explode, appearance, and motor events.

- Duration bars for camera and motion path events. Duration bars for these event types also support key frames (A).



You can move and modify duration bars using the cursor and shortcut menu commands.

Camera Path Wizard command

Runs the Camera Path Wizard, which guides you through the process of creating a camera path for an assembly animation. The Camera Path Wizard allows you define the camera path name, camera direction, and so forth. You can use camera paths as part of an assembly animation.

Animation Properties dialog box

Animation Name

Displays the name of the animation.

Frames Per Second

Specifies how many frames per second are used to build your animation. You can specify a standard frame rate, such as NTSC or PAL, or a custom frame rate.

NTSC

Specifies that the NTSC standard frame rate is used to build the animation.

PAL

Specifies that the PAL standard frame rate is used to build the animation.

Custom

Allows you to define a custom frame rate. Type the number of frames per second you want.

Animation Length

Specifies the duration of the animation in seconds.

Duration Properties dialog box

Start Frame

Lists the current start frame. You can type a new value to change the starting time for the event duration.

End Frame

Lists the current end frame. You can type a new value to change the ending time for the event duration.

Entry Duration

Lists the current duration of the event entry. When you change this value, the End Frame value also updates.

Path command bar (Animation Editor Tool)

This command bar is displayed when you are creating or editing Motion Path or Camera Path events.

Select Parts Step

Specifies the parts you want to follow the motion path. Select the parts you want in the graphic window. This step is only available when creating or editing a motion path.

Draw Path Step

Draws a path to guide component or camera motion. You can draw a curve that defines the path in the graphic window.

Finish/Cancel

This button changes function as you move through the motion path definition process. The Finish button applies the motion path properties you defined. The Cancel button discards any input and exits the command.

Select Parts Step Options

Deselect (x)

Clears the selection.

Accept (check mark)

Accepts the selection.

Draw Path Step Options

Activate Part

Activates the selected part.

Keypoints

Sets the type of keypoint you can select to define the motion path curve. The available keypoint options may be different than displayed below.


Allows you to select any keypoint.


Allows you to select an end point.


Allows you to select a midpoint.


Allows you to select the center point of a circle or arc.


Allows you to select a tangency point on an analytic curved face such as a cylinder, sphere, torus, or cone.


Allows you to select a silhouette point.


Allows you to select an edit point on a curve.

Open Path

Sets the path curve type to open.

Closed

Sets the path curve type to closed. The start and end points of a closed path curve are coincident. If the start and end points you selected are not coincident, and you set the Closed option, a keypoint that is coincident with the start point is automatically added to the curve.

When you set this option, the Start and End options are automatically set to Periodic. Periodic curves are closed, connected, and tangent at the first and last points on the curve.

Frame Count

Specifies the total frame count for the path.

Straight Path

Creates the path with straight segments.

Blend Path

Creates the path with curved or blended segments.

Hold
Holds the component position until the next key frame.

Deselect (x)
Clears the selection.

Accept (check mark)
Accepts the selection.

Activity: Animating an assembly

Activity objectives

In this activity, you will use the animation portion of the Explode-Render-Animate application to produce a presentation quality animation. The animation will be created and then different effects will be used to edit the animation and give the desired results. The animation time line you create will consist of a motor driving under-constrained parts, explosion events, camera events, and appearance events. The end result will be an *.avi* movie.

Turn to appendix B for the activity: Animating an assembly.

Lesson review

Answer the following questions:

1. How is a camera path represented in an animation?
2. How is an appearance event used in an animation?
3. The frame scale can be displayed in what two types of units?
4. Can explosion or appearance event duration bars be copied and mirrored?
5. What are the different types of event duration bars that appear in the animation editor time line?
6. What command creates an *.avi* movie file?

Answers

1. How is a camera path represented in an animation?

   A camera path is represented as a curve. Key points along the curve can be edited to change camera viewing angle and view previews of the camera display for that point in the time line.

2. How is an appearance event used in an animation?

   Use appearance events to change part colors and visibility during an animation. For example, you can create fade in and fade out effects for parts in the animation.

3. The frame scale can be displayed in what two types of units?

The frame scale can be represented in frames or seconds.

4. Can explosion or appearance event duration bars be copied and mirrored?

   Explosion and appearance event duration bars can be copied and mirrored.

5. What are the different types of event duration bars that appear in the animation editor time line?

   Types of duration bars are:

   - Explode events
   - Paths
   - Appearance
   - Motors
   - Camera
   - What command creates an *.avi* movie file?

     The save as movie command creates an *.avi* movie file.

Lesson summary

In this lesson, you learned how to create and edit an animation. The animation consisted of events defined by exploded views, camera movement, appearance events, and rendering. Using editing commands, the time line for each event was able to be edited to produce the desired effect. You created an *.avi* movie showing the animation.

A Activity: Creating a motor

Step 1

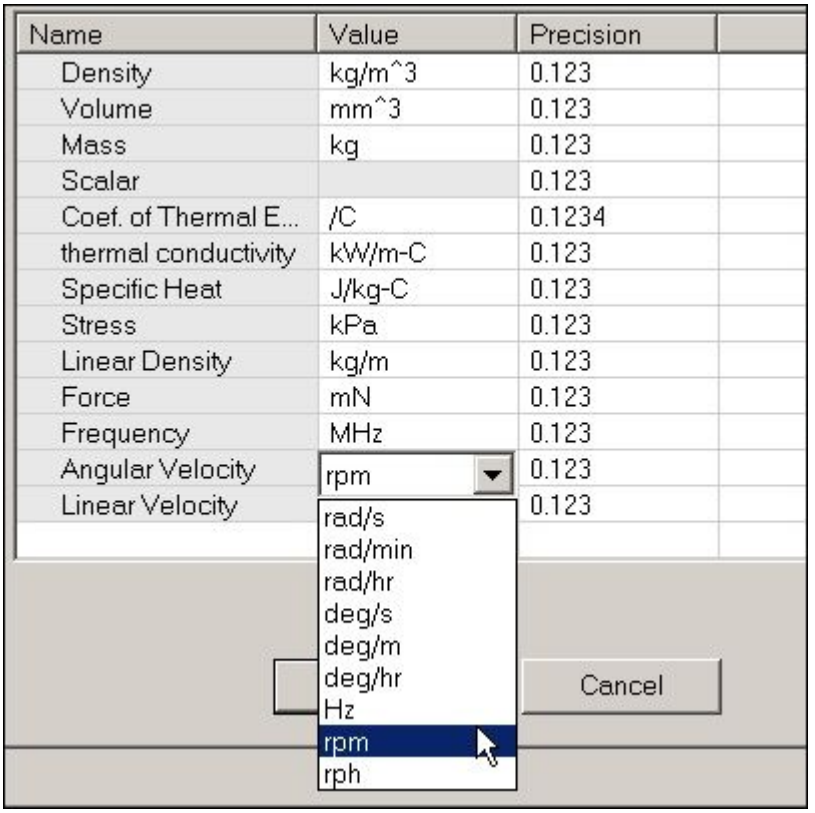
You will open an assembly, then inspect and change the rotation units for the assembly and assign a motor to a part in the assembly. Once the motor is defined, a motor simulation will be generated to be used later in an animation.

> **Note**
>
> A motor can only be assigned to a part that is under constrained in an assembly. If the under constrained part used to define the motor exists in a subassembly, then the subassembly will have to be made into an adjustable assembly rather than a rigid assembly. By making a subassembly adjustable, the relationships used to position the parts in the subassembly are promoted into the higher level assembly and solved at that level.

You will set the Angular Velocity units to revolutions per minute.

- Open the assembly *motor.asm* with all the parts active.
- Click the Application button  , and then choose Properties® File Properties.

- Click the Units tab, and on the Units tab, click Advanced Units. Set the Angular Velocity to rpm, and then click OK to dismiss the Advanced Units dialog box. Click OK to return to the assembly.



Step 2

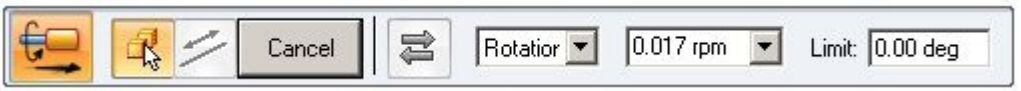
Create the motor and define the motor parameters.

- In PathFinder, right-click the part *G05_62.par* and then click Show Only. Click Fit to see the gear.

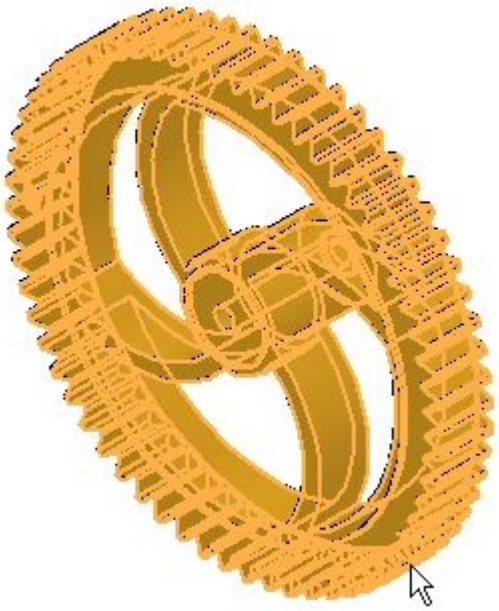
Note

As an option, to better understand how the predefined gear relationships in this assembly, you can review the spreadsheet named *clock_gears.xls*, which is located in the same folder as the assembly. This spreadsheet shows the relationships and gear ratios used to create the clock mechanism.

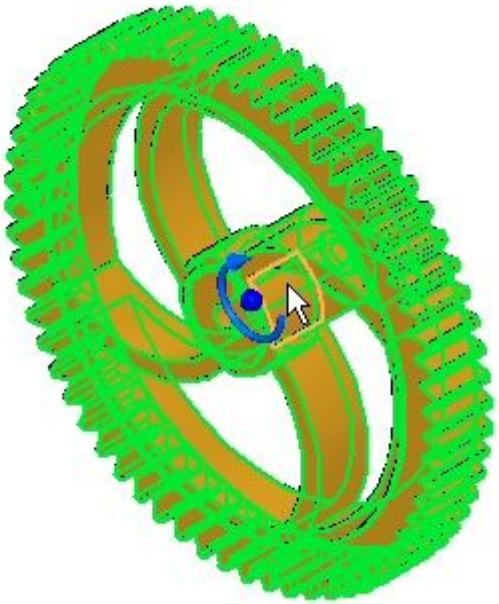
- Choose Home tab® Assemble group® Motor  .
- Set the motor type to Rotation.
- Set the rotation rate in rpm by entering 1/60.



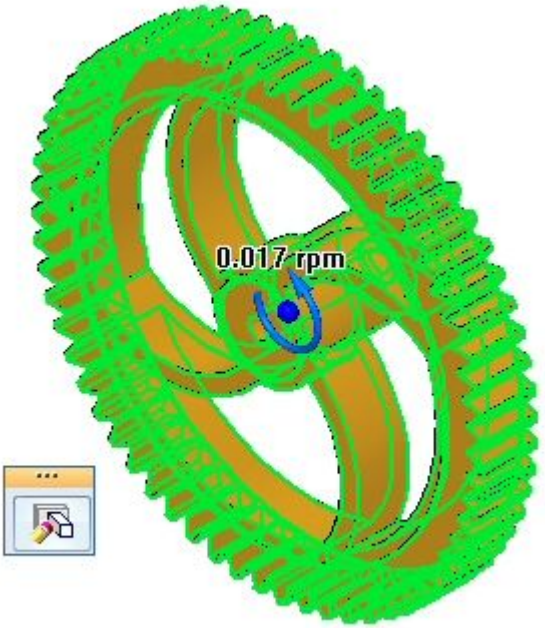
- Select the gear as the under-constrained part.



- Select the interior cylindrical face to define the rotation axis.



- The rotation is defined as counterclockwise as shown. You can change the direction by clicking the Flip direction button.



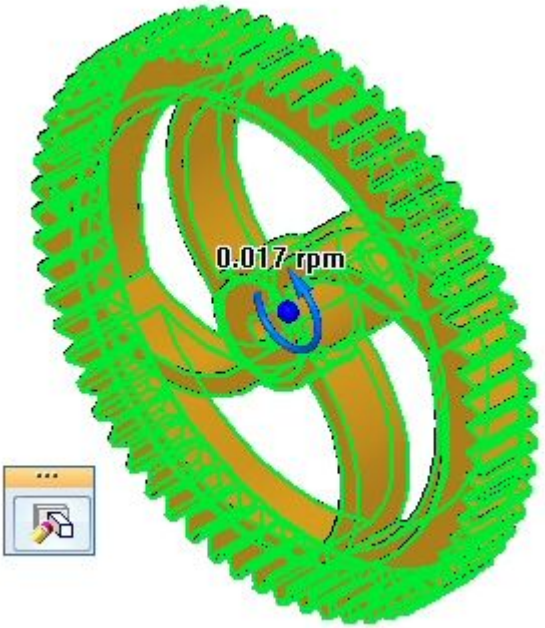
- Click Finish to complete the motor definition.

Step 3

Once you have defined a motor, you can change a parameter by editing the motor. Even though the motor is defined correctly, this step shows how you can edit it. You will ensure that the direction of rotation for this motor is counter clockwise. If not, you can reverse the rotation.

- On the ribbon, click the Select command and select Motor 1 in PathFinder.

- The rotation is displayed. If the rotation is counter clockwise as shown, skip the next step.

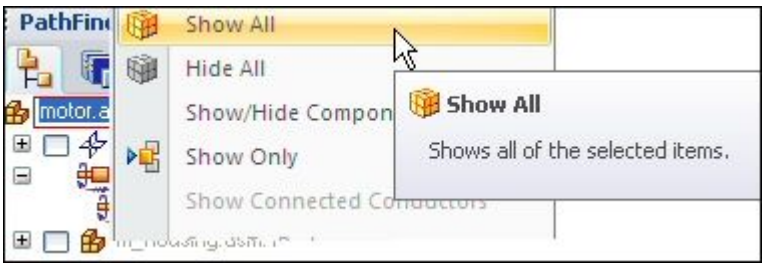


- To change the direction of rotation, click Edit Definition. Click the Flip Direction button, then click Finish.

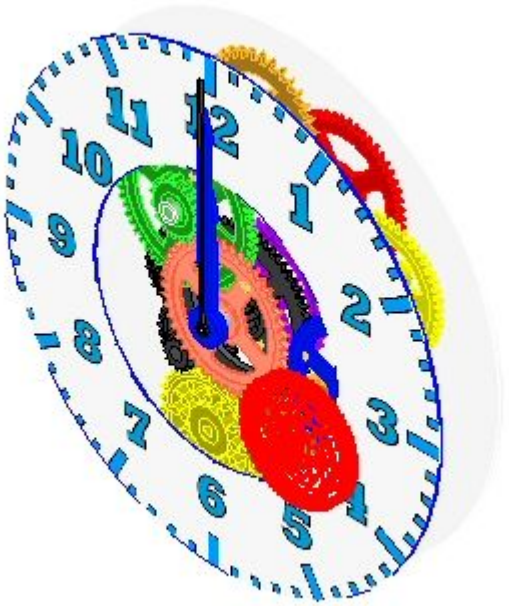
Step 4

Display the motor. For best visibility, all the parts of the assembly will be shown, and then some will be hidden.

- Click the Select command and right-click *motor.asm* in PathFinder. Click Show All.



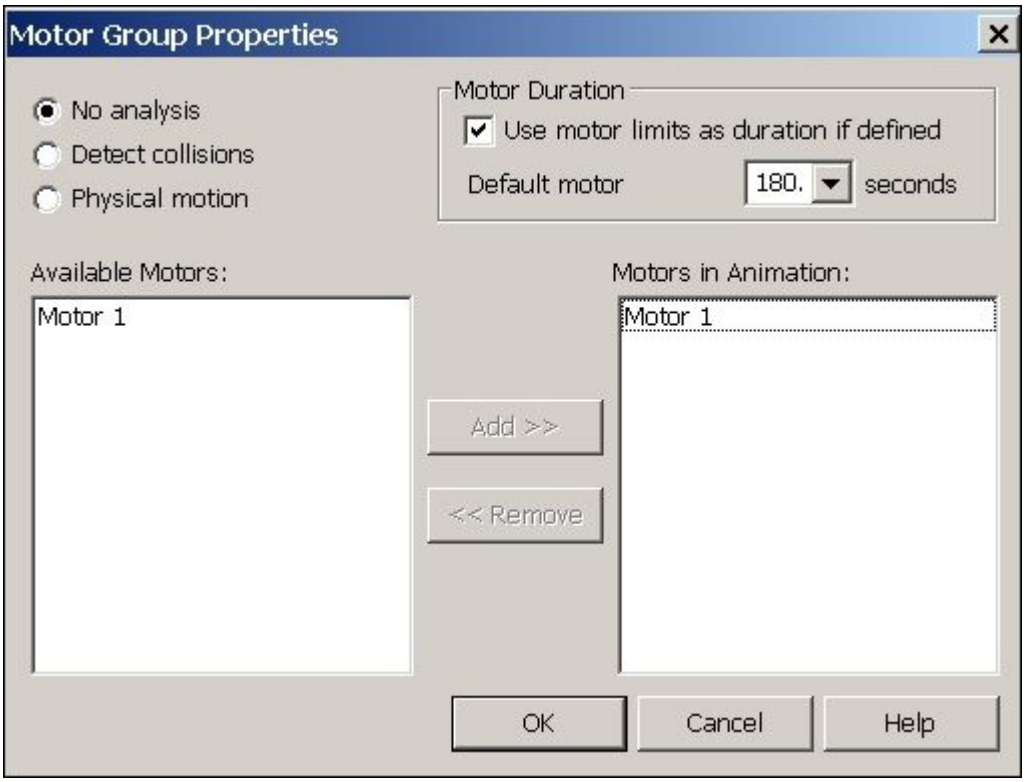
- Using the same procedure as in the previous step, hide *m_housing.asm*, and then fit the assembly.



Step 5

Create a motor simulation.

- Choose Home tab® Assemble group® Simulate Motor  .
- In the Motor Group Properties dialog box, set the Motor Duration to 180 seconds (3 minutes) and the other values as shown, and then click OK.



Note

If you need to change any of these values at a later time, right-click Motors in the time line and then click Edit Definition. You can define multiple motors in a simulation but for this activity, you define a single motor.

- The controls for playing the animation are shown below.

- Click Play to start the animation.

- As the animation is playing, increase the Speed to 4x.

Note

Changing the speed to 4x is for animation display purposes only. The motor is still spinning at the assigned rpm.

- Click the Stop button to halt the motor simulation.

- Click Go to Start, to reset the animation to the initial point.

- Set the Speed back to 1x.
- Click the Application button.

- Click Save. When prompted to save changes to the animation editor, click yes.
- In PathFinder, right-click *motor.asm* and click Show All.
- Save and close this assembly. This completes this activity.

Activity summary

In this activity, you learned how to create and simulate a motor. The motor animation created will be used later during the explode sequence. In the activity, the following topics were covered:

- The speed and direction of a rotational motor was defined.
- Parameters used to define the motor were changed by an editing process.
- The motor simulation was created and run.
- Animation controls and time line were introduced.
- A motor time line was created to be used in exploding and an animation.

B Activity: Animating an assembly

Step 1

In this activity you will open an assembly that contains a motor and an exploded configuration. You will use the Animation Editor to manipulate the events that occur during the animation. You will create an animation that consists of camera movement, changes in part appearance, part motion paths, exploded views and motion from motors.

You will define a camera path for a predefined animation.

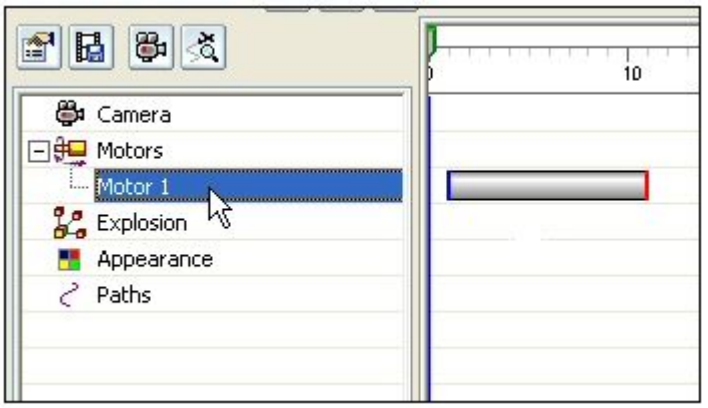
> **Note**
>
> The description of the animation controls is also covered in the activity exploding an assembly.

- Open the assembly *animate.asm* with all the parts active.
- Choose Tools tab® Environs group® ERA  .
- Choose Home tab® Animation group® Animation Editor  .

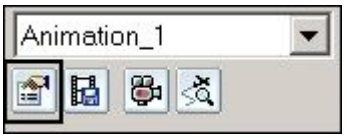
- Examine the Animation Editor.

  The right pane is the time line for each of the animation events. A motor was defined previously in this assembly. Controls for playing the animation are displayed.

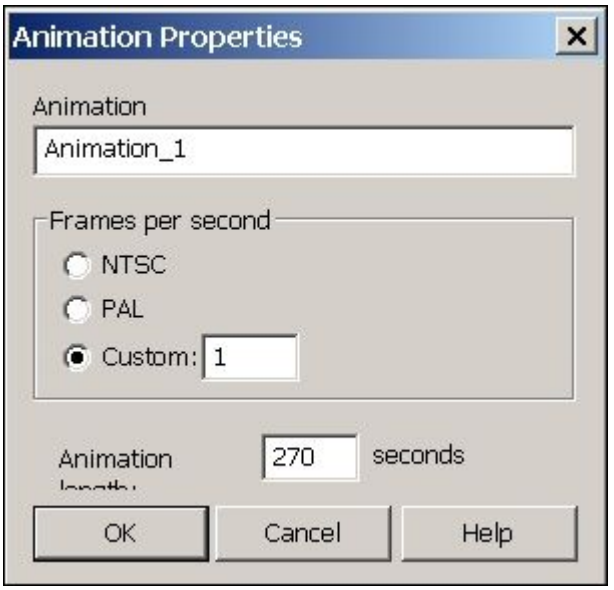
  The left pane displays the animation events, and the right pane displays the event duration bars. These can be used to define and sequence the events of the animation.



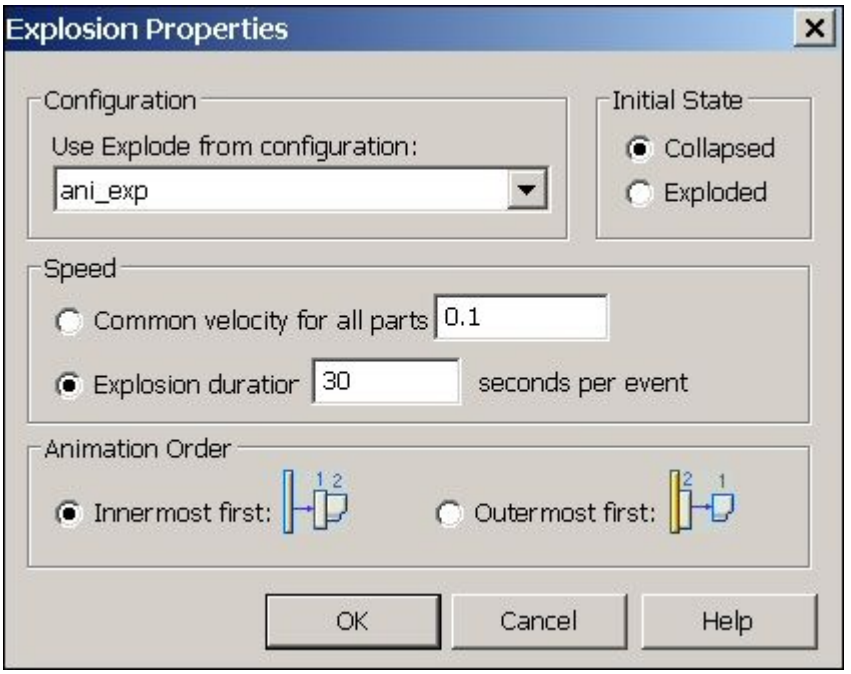
- Click Animation Properties.



- Set the values as shown, and then click OK.

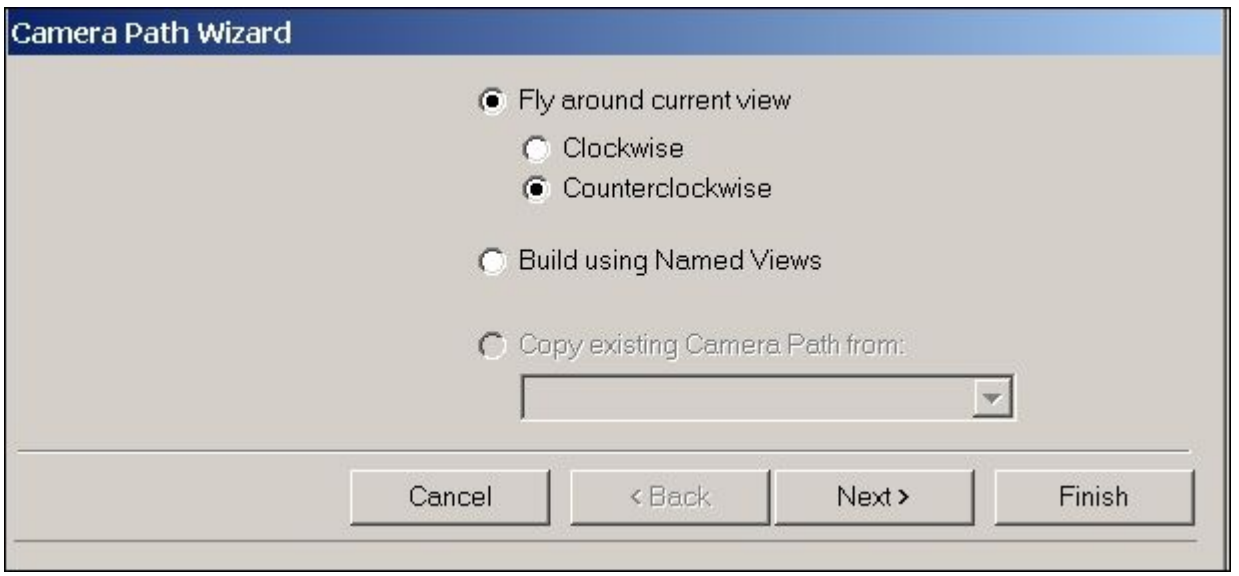


- Right-click the Explosion event and then click Edit Definition. Examine the parameters previously defined for this explosion. Click OK when finished.

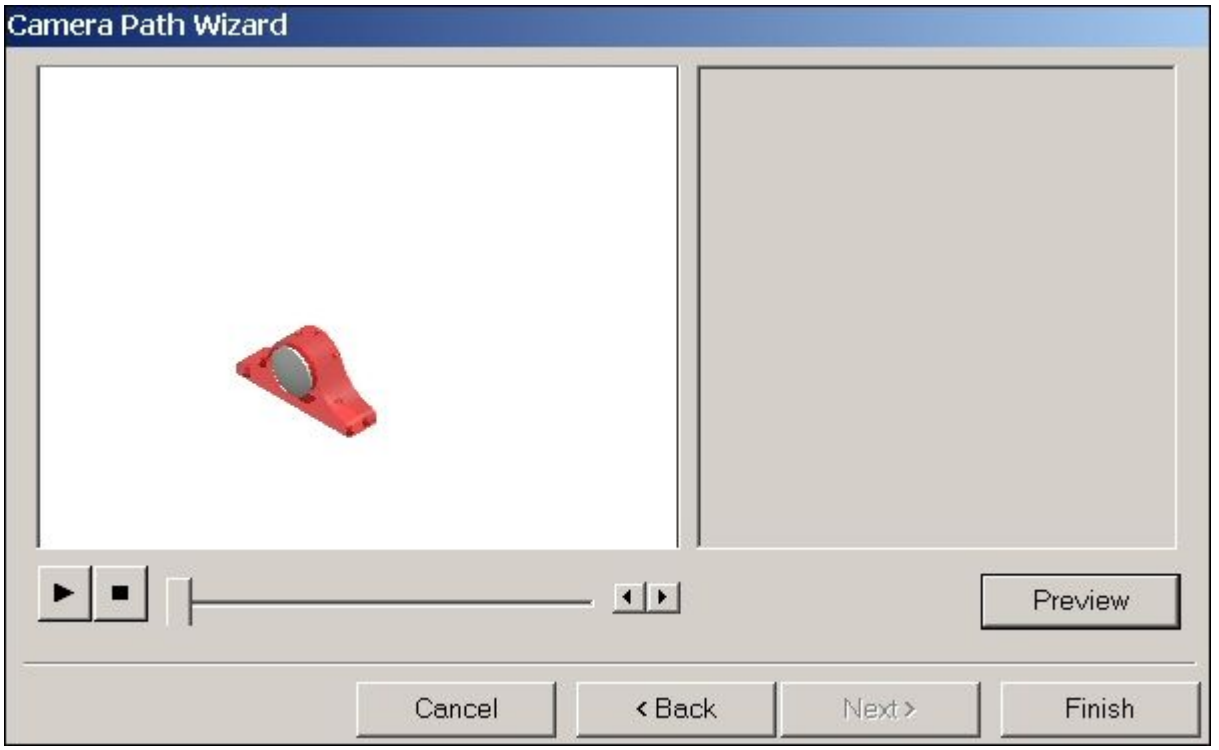


- Click the Camera Path command to open the Camera Path Wizard.

- Set the values as shown, and then click Next.



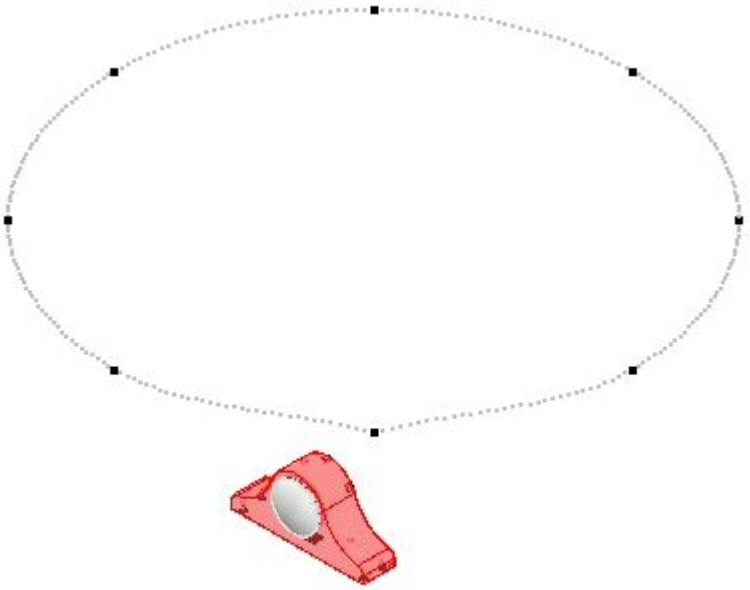
- Click Preview. Observe the animation preview, and then click Finish. The camera path is created.



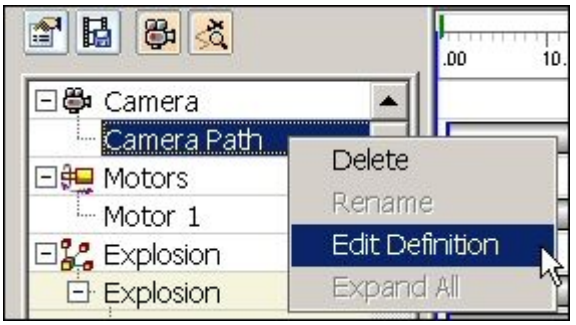
Step 2

You will view the camera path and then edit the path.

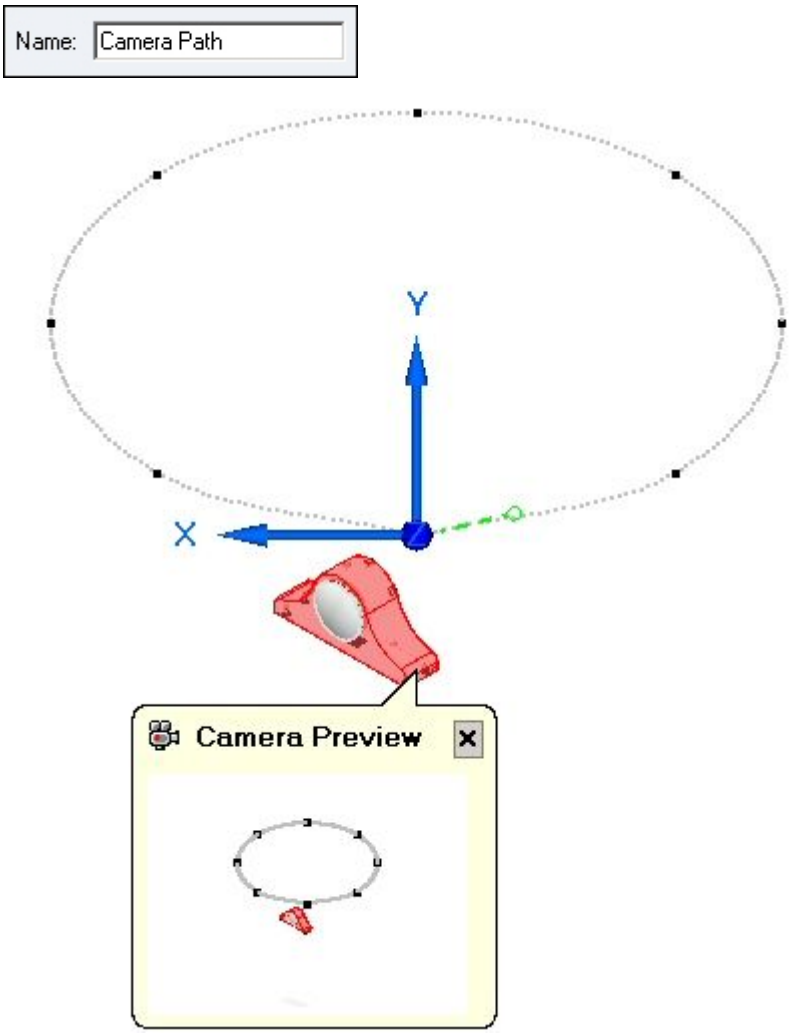
- Click the Show Camera Path command. The path is displayed.



- Right-click the Camera Path in the event time line, and then click Edit Definition.



- On the command bar, click the Draw Path Step group button and observe the controls.

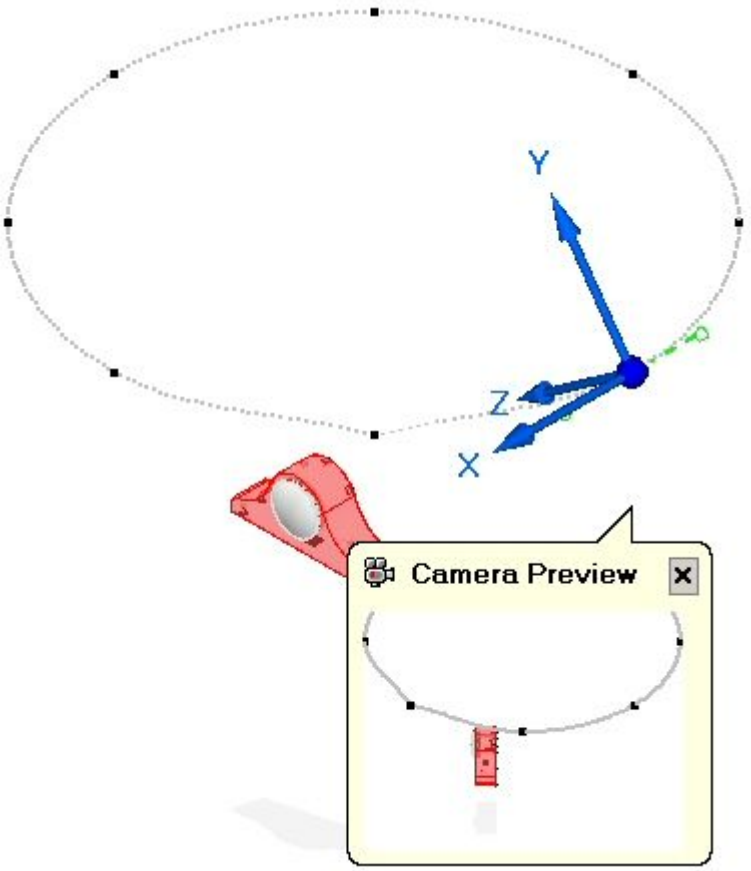


- The camera path can be either open or closed. For this path click Closed.

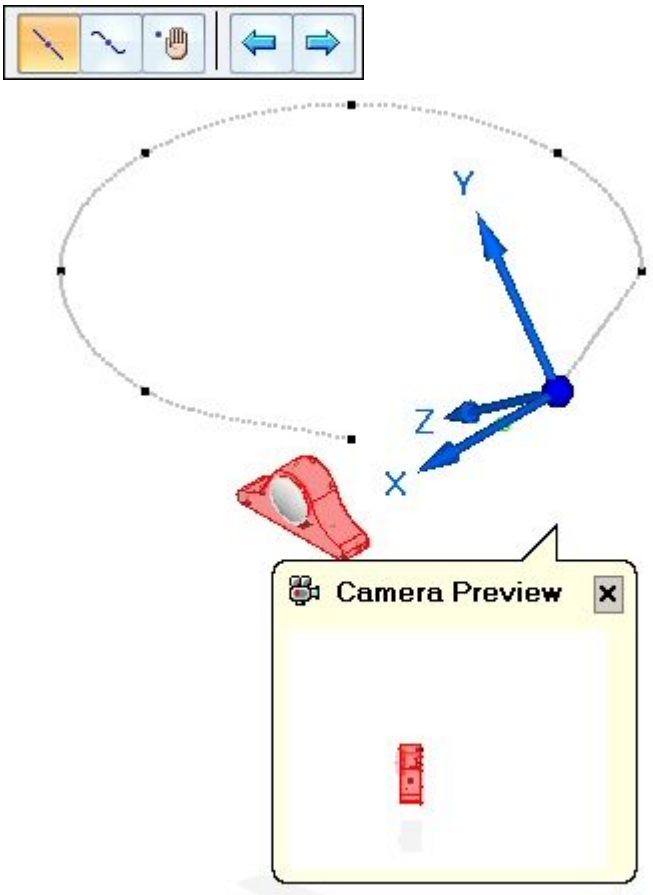
- The key points of the camera path are graphically displayed as points on the curve. The X-Y-Z axis displays at the location of the key point which is currently being edited and a preview of what the camera sees at that frame is shown. The frame count showing the duration of the camera movement is displayed.

- Camera movement and direction can be edited at each key point. The blue navigation arrows move to the next or previous point for making changes to those points. Click the Next Point button, which is the right blue arrow.

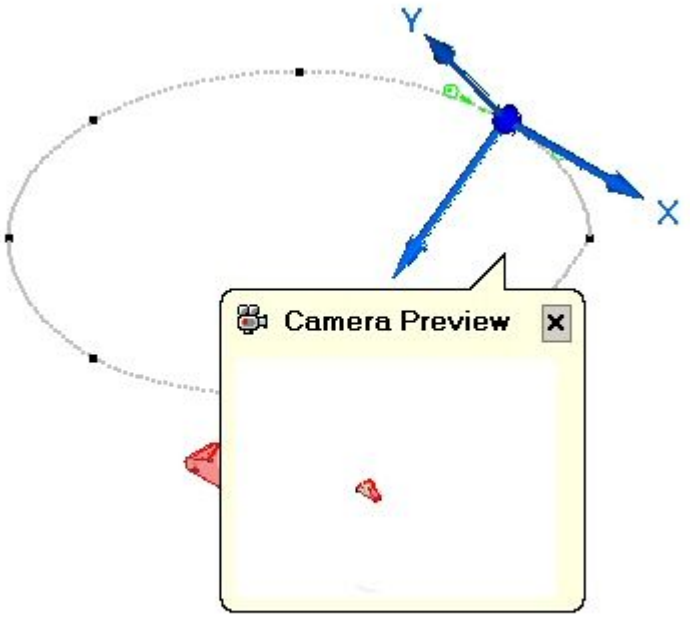
Notice the camera preview and X-Y-Z axis move to the next point.



- Click the Straight Path button. This changes the curvature of the previous point from a curve to a straight path.

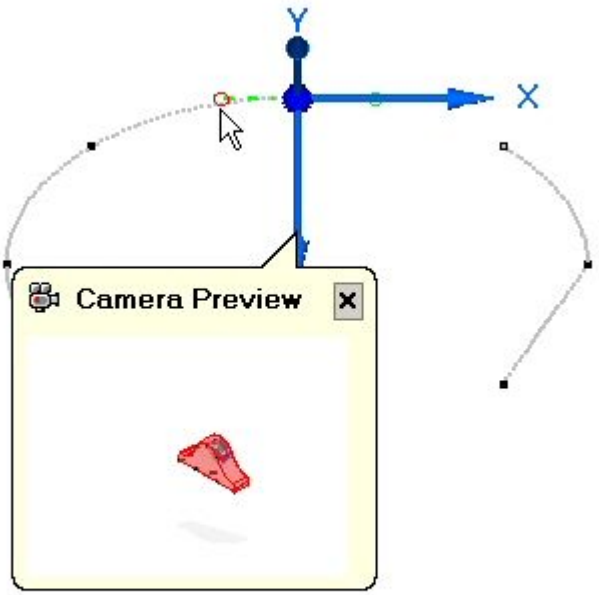


- Click the Next Point button twice to move the camera.

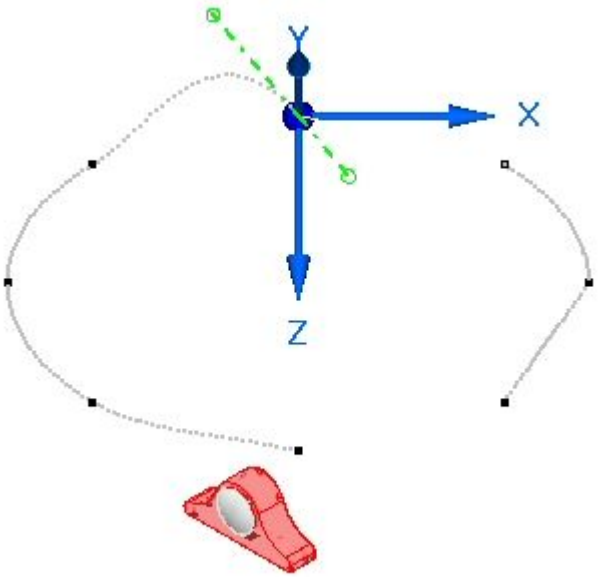


- Click Hold. This freezes the animation until the next key frame is reached in the time line.

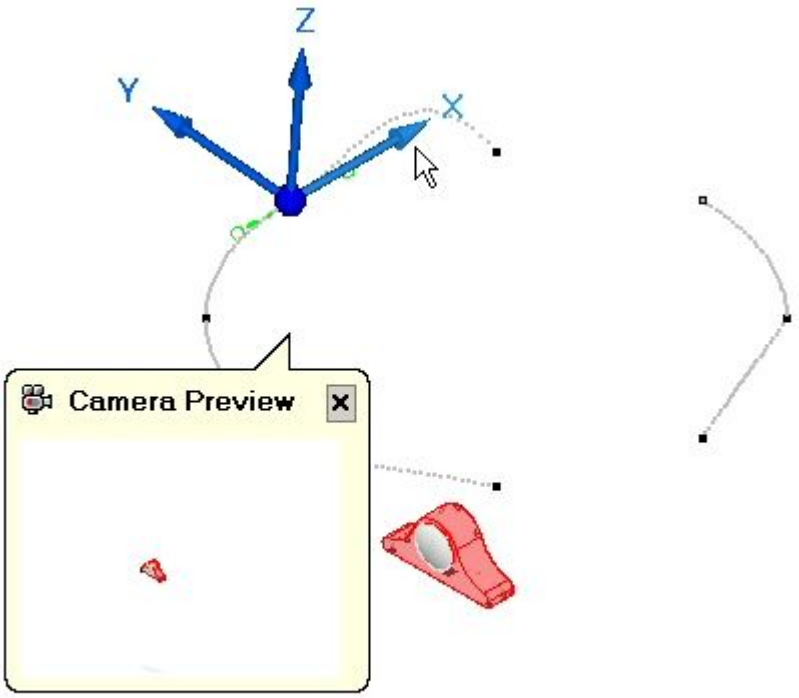
- Click the Next Point button once. Drag the tangency control handle of the key point.



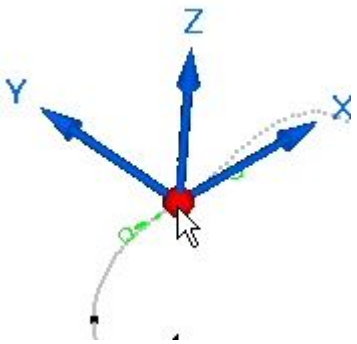
- Drag the handle so that the curve is approximately positioned as shown.



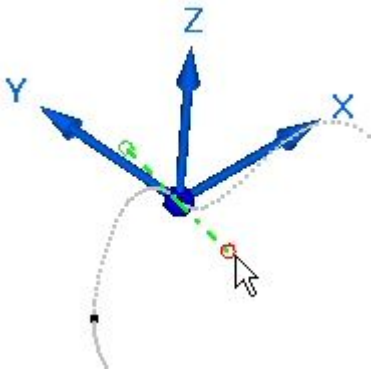
- Click Next Point. Select the X axis of the triad and enter a rotation angle of 5º.



- Select the origin of the triad. The curvature tangency handles are available at the key point.

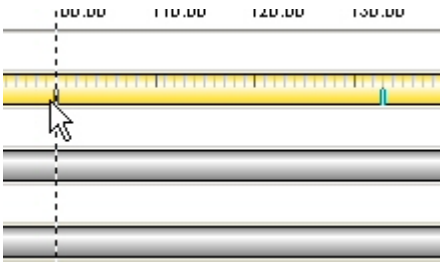


- Drag one of the handles so that the curve is approximately modified as shown.



- Click Finish. Play the animation and observe how the edits to the camera path affected the animation. After the animation plays, reset the animation by stopping the animation and then clicking the Go to Start button.

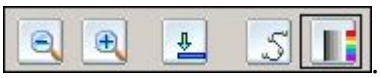
- On the camera path event bar, notice the key points are displayed as green graduation marks. Click and drag any of the key points to a different position. This changes the time at which a key point occurs, and increases the speed of the transition from that key point to the key point in the direction you moved the point. Likewise, the duration of the transition of the camera path is increased from the key point moved and the point you moved away from.



- Play the animation and observe how the edits to the camera path affected the animation. After the animation plays, reset the animation by stopping the animation and then clicking the Go to Start command.

Step 3

Add an appearance event to the time line.

- Click the Appearance command  .

- Select *a_case.par* and *a_backplate.par* as the parts for the appearance change, and then click Accept.
- Set the Start style to Use Part Style and the Finish style to Chrome. Set the Frames duration to 50, and then click Accept. Click Finish.

- Find the appearance and play the animation from the beginning through the first 50 frames. Observe the change to chrome for the parts selected.
- Play the animation and observe how the selected parts transition to chrome. After the animation plays, reset the animation by stopping the animation and then clicking the Go to Start command.

Step 4

Edit the event bars along the time line.

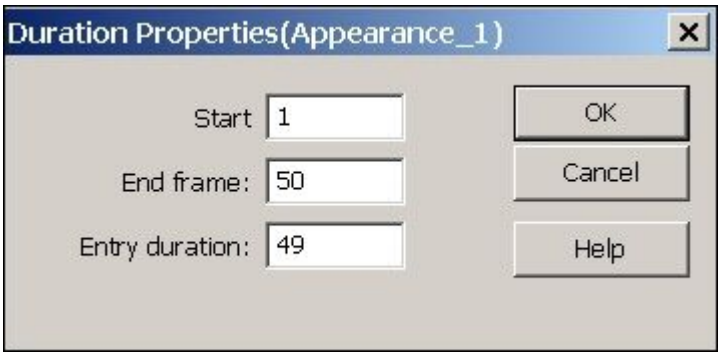
Note

An event group consists of events occurring either simultaneously or sequentially. The duration of an event group is defined by the extent of all the events within that group. Actions such as mirroring and copying of events must incorporate all the events making up a group.

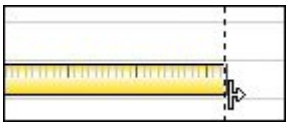
- Right-click the Appearance_1 event bar, and then click Properties. Examine the values, and then click OK.

Note

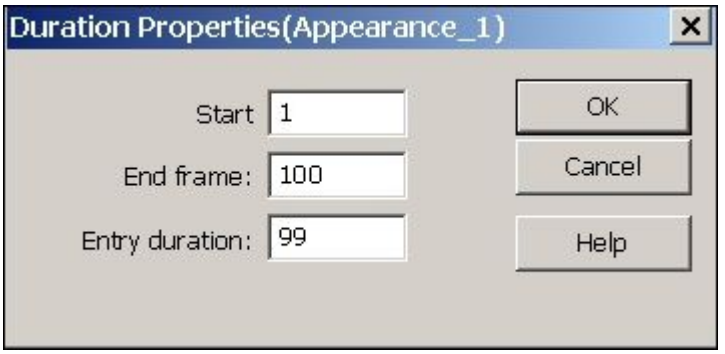
The values can be edited in the Duration Properties dialog box if desired.



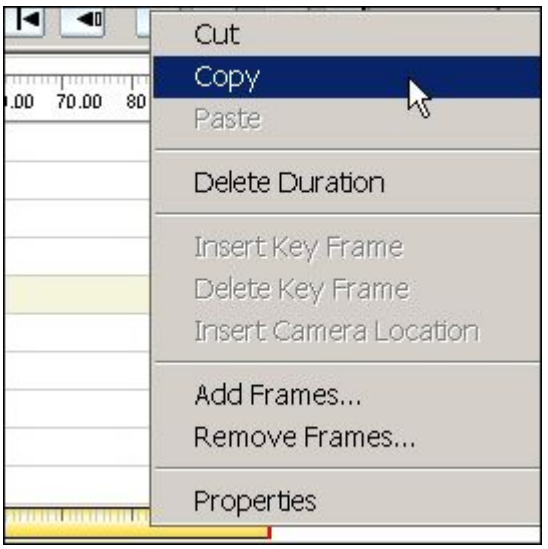
- Click and drag the right side of the Appearance_1 event bar to frame 100.



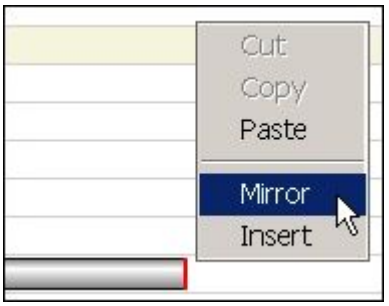
- Right-click the Appearance_1 event bar, and then click Properties as you did previously. Notice the changed values.



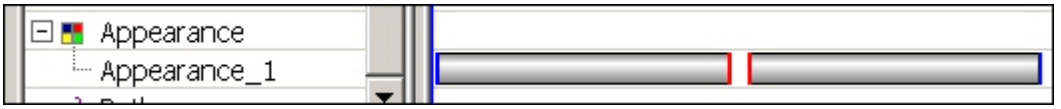
- Right-click the Appearance_1 event bar and choose Copy.



- Right-click on the time line after the Appearance_1 event and choose Mirror.



- Observe the new event bar on the Appearance_1 event.



Note

Copying and mirroring an event reverses the effect caused by that event. By copying and mirroring the appearance event, as the animation plays, the selected parts transition into chrome and return to their original part styles. Mirroring is also valid for explosion events. Mirrored event bars can be moved, or shortened to make the transition happen faster, or lengthened to make the event happen slower.

- Play the animation to observe the changes you made. After stopping the animation, click Go to Start to reset the animation.

- Click Save Animation to save your edits.

Step 5

In the following steps, you will use what you learned in the previous steps to continue editing the animation. You will not be directed to edit specific events, however you will edit events you choose based on the general directions given.

- Lengthen an explode event by dragging the end of the event bar for that event.

- Copy and mirror the explosion event.

- Reposition an explosion event that has a sequence of cascading events. Shorten some of the events and lengthen others.

- Generate a new camera path based on saved views.

Step 6

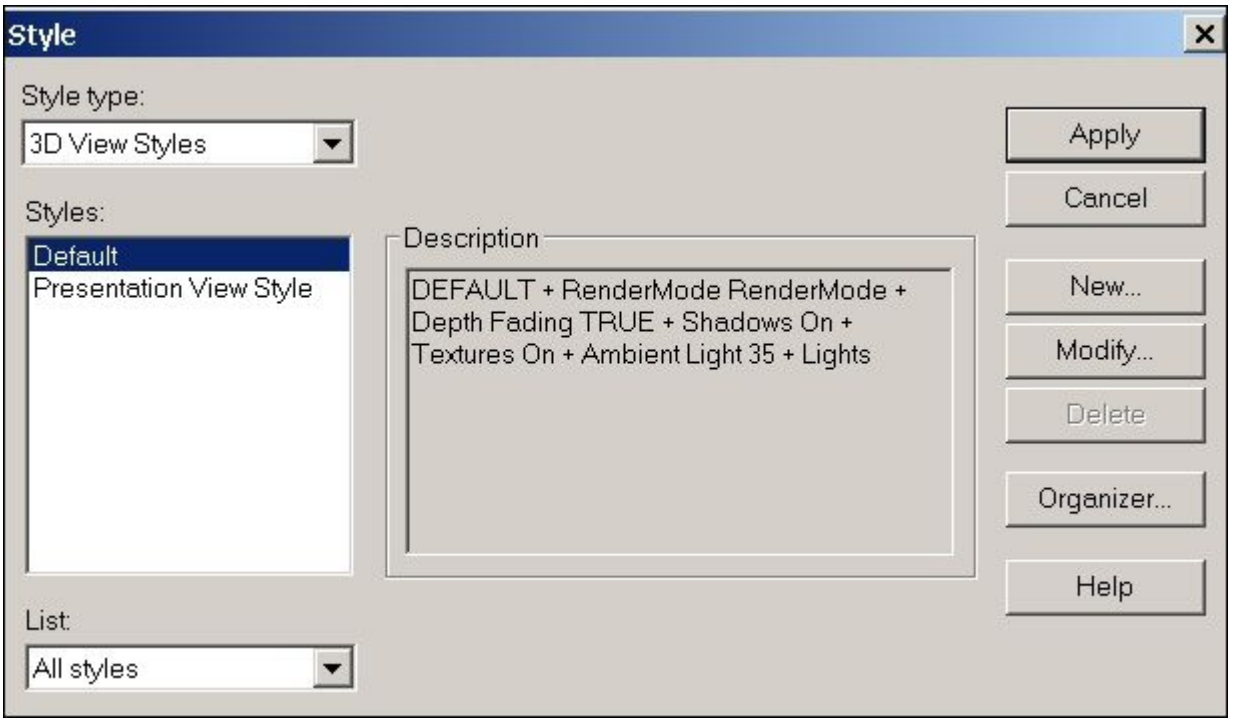
Save an animation.

Note

Animations are saved as *.avi* formatted movies. There are many different players available from many different sources. A video codec is a device or software that enables video compression and or decompression for digital video. The list of codecs that are available to be used for creating an animation may differ from one computer to the next. To choose the codec which best works for the animations you are trying to create needs to be determined by experimentation.

- Animation views can be generated from previously generated 3D view styles. To see the current 3D view styles available, choose View tab® Style group® Styles  .

- Set the Style type to 3D View Styles.



Note

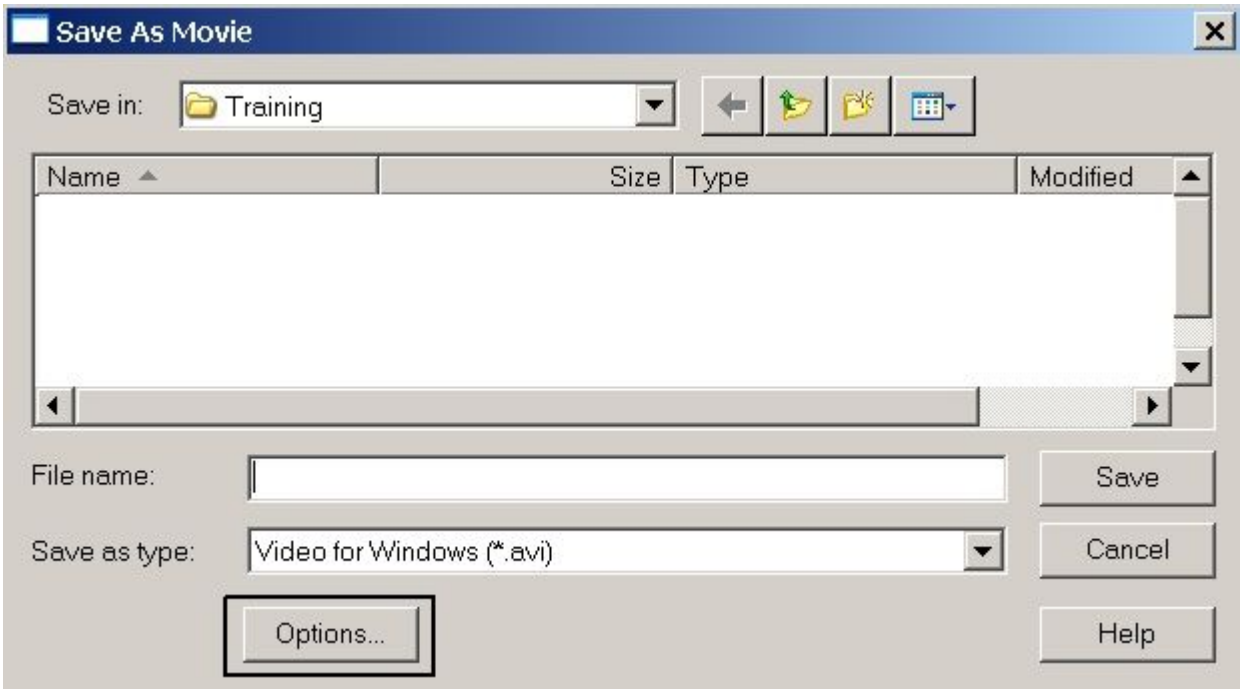
Existing 3D view styles can be modified or new 3D view styles can be created to suit your needs.

- Click Apply to close the Style dialog box.

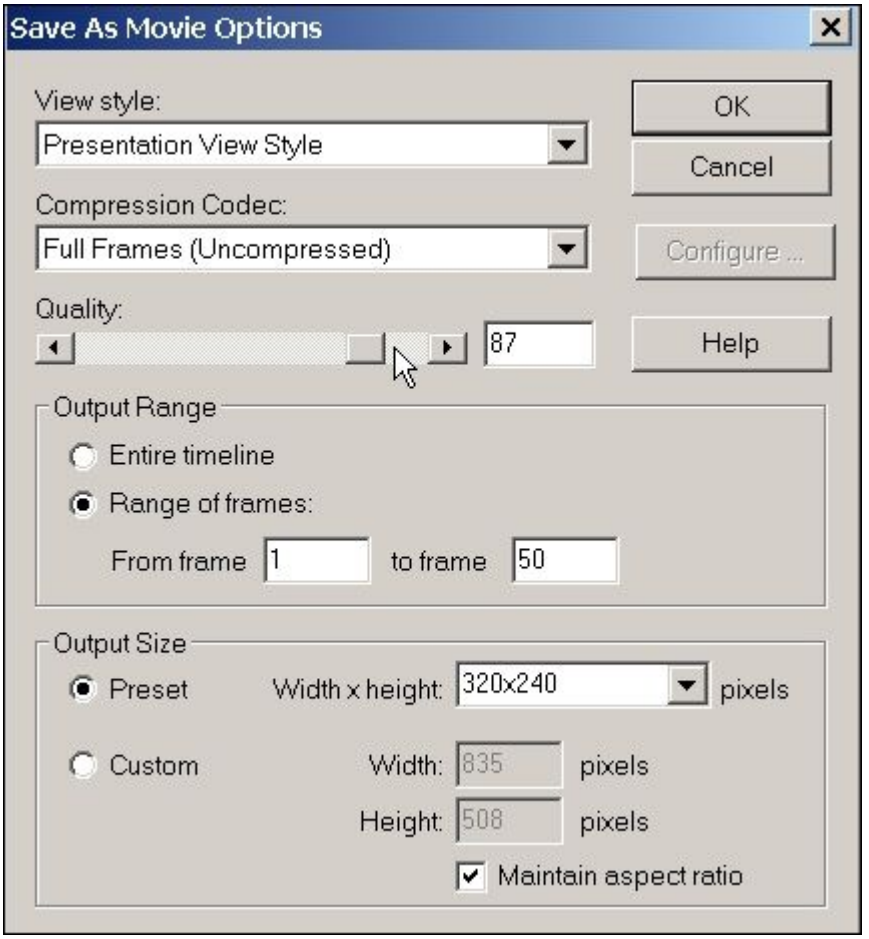
- Reopen the Animation Editor in Explode-Render-Animate.

- Reset the animation to the beginning. Click the Save as Movie command  .

- In the Save As Movie dialog box, click Options.



- Examine the options for creating an animation.



Note

Creating an animation can take considerable system resources depending on the options chosen. It is good practice to run a small number of frames rather than the complete animation to preview the results. Once the settings are satisfactory, then you can run the complete animation.

Notice the view style selection set is the same as the 3D view styles shown in the previous steps.

Set the quality to 100, and click OK.

- Save an animation to a folder of your choice and give it a name of your choice.

Note

To create a rendered animation, render the view just prior to saving the animation and the animation will use the rendering settings. Rendered animations typically take more processing time to create.

- To exit the Animation Editor, click the Animation Editor command  .
- This completes the activity. Click Close ERA to exit the Explode-Render-Animate application. Save the assembly.

Note

To create a rendered animation, render the view just prior to saving the animation and the animation will use the rendering settings. Rendered animations typically take more processing time to create.

This completes this activity. Save and exit the assembly.

Activity summary

In this activity, you learned how to create and edit an animation. The animation consisted of events defined by exploded views, camera movement, appearance events, and rendering. Using editing commands, the time line for each event was able to be edited to produce the desired effect. You created an *.avi* movie showing the animation.