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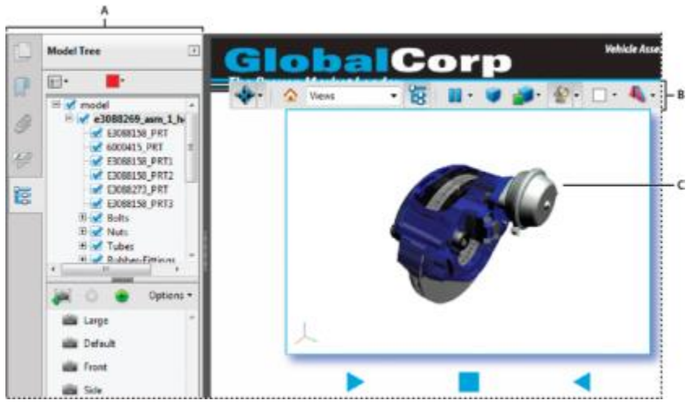
Viewing 3D Models

A 3D model initially appears as a two-dimensional preview image. Clicking the 3D model with the Hand or Select tool enables (or activates) the model, opens the 3D toolbar, and plays any animation.



Selected 3D object
***A.** Model Tree **B.** 3D toolbar **C.** 3D object*

3D toolbar overview

The 3D toolbar appears after you click the 3D model with the Hand tool. This action activates the 3D model and plays animations that are set to play when the file is enabled. The 3D toolbar always appears in the area above the upper-left corner of the 3D model and cannot be moved. A small arrow appears to the right of the Rotate tool, which you can click to either hide or expand the toolbar.
You can use the 3D toolbar to zoom in and out, rotate, and pan across the object. Use the Model Treeto hide or isolate parts, or make parts transparent.
You manipulate a 3D model by selecting and dragging various 3D navigation tools. When you navigate in 3D, it helps to think of it as viewing the stationary 3D model from a camera's perspective. You can rotate, pan (move up, down, or side-to-side), and zoom in or out.

3D navigation tools

Rotate

Turns 3D objects around relative to the screen. How the objects move depends on the starting view, where you start dragging, and the direction in which you drag.

Note:
You can also use the Hand tool to rotate an object. Ensure that Enable 3D Selection For The Hand Tool is selected in the 3D panel of the Preferences dialog box.

Spin

Turns a 3D model in parallel to two fixed axes in the 3D model, the x-axis and the z-axis.

Pan

Moves the model vertically and horizontally only. You can also pan with the Hand tool: Ctrl-drag.

Zoom

Moves you toward, or away from, objects in the scene when you drag vertically. You can also zoom with the Hand tool by holding down Shift as you drag.

Walk

Pivots horizontally around the scene when you drag horizontally. Moves forward or backward in the scene when you drag vertically; maintains a constant elevation level, regardless of how you drag. The Walk tool is especially useful for architectural 3D models. To change the walking speed, change the default display units in the Preferences (3D).

Note:
The Walk tool is available when you select the Preferences setting that consolidates tools or when you right-click the 3D model and choose Tools > Walk.

Fly

Navigates through a model while maintaining the surface orientation. Right-click and drag inside the 3D window. The Fly tool moves more slowly the closer you move toward an object. Drag the pointer right or left to turn.

To rotate the camera view, click the left mouse button inside the 3D window and drag to turn the camera view. To return to the starting camera direction, move the mouse back to the initial click point.

Use the mouse scroll wheel to move rapidly backward and forward along the camera view direction. This functionality is useful if you get lost within a model or fly into the surface.

Camera properties

Defines the camera angle, alignment, and other properties that define the lens through which a 3D model is viewed. Camera properties are components of views but are set independently.

3D Measurement Tool

Measures part sizes and distances in the 3D model.

3D toolbar view controls

Default View

Returns to a preset zoom, pan, rotation, and projection mode of the 3D model. Use the Options menu in the View pane of the Model Tree to set a different view as the default. Or use the Manage Views command on the 3D toolbar Views menu to set a different view as the default.

If an object ever moves out of your view, you have, in essence, turned your camera away from the object. Click the Default View icon on the 3D toolbar to move the object back into view.

Views menu

Lists any views defined for the current 3D model.

Toggle Model Tree

Opens and hides the Model Tree.

Play/Pause Animation

Plays or pauses any JavaScript-enabled animation. The Play/Pause Animation pop-up menu opens a slider that you can drag back and forth to move to different times in the animation sequence.

Use Orthographic/Perspective Projection

Toggles between displaying perspective and orthographic projection of the 3D object.

Model Render Mode menu

Determines how the 3D shape appears. For an illustrated guide, see Examples of model rendering modes.

Enable Extra Lighting menu

Lists the different lighting effects that are available to enhance the illumination of the 3D object. Experiment to get the visual effects you want.

Background Color

Opens the color picker, which you can use to select a different color for the space surrounding the 3D object.

Toggle Cross Section

Shows and hides cross sections of the object. Click the pop-up menu to open the Cross Section Properties dialog box.

Add Multimedia/3D Comment

Enables you to add a sticky note to any part of the 3D model. The note stays with the view.

Change rendering mode, lighting, projection, and background

The model rendering mode determines the surface appearance of the 3D model. The default rendering mode is solid, but you can also choose another rendering mode. You can also change the lighting of the 3D model as well as the background.

Changing the appearance of the 3D model

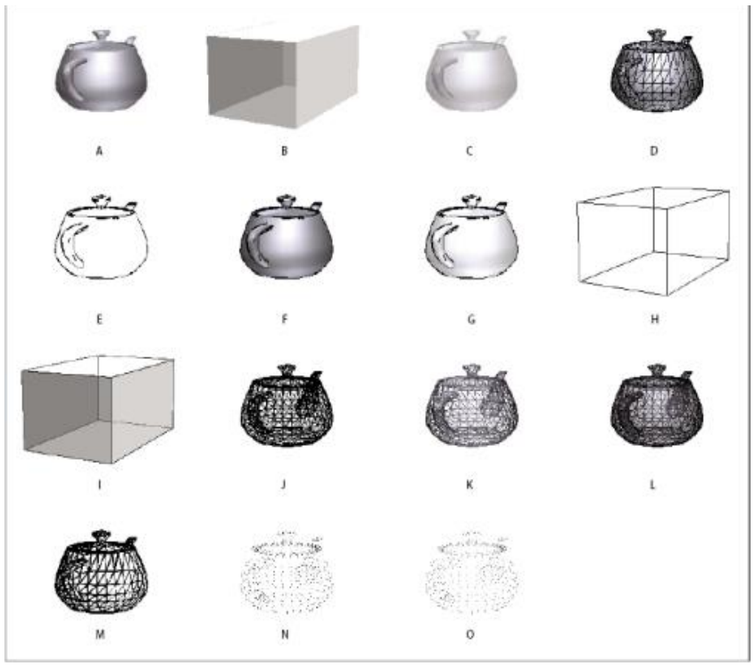
***A.** Default appearance **B.** Wireframe rendering mode **C.** Colored lighting **D.** Different background color*

- Use items on the 3D toolbar to make any of these changes:
- To change the rendering mode, choose an option from the Model Render Mode pop-up menu .
- To view an orthographic projection, click the Use Orthographic Projection button . An*orthographic projection* effectively removes a dimension, preserving the size ratio between objects but giving the 3D model a less realistic appearance. Click the button again to use perspective projection.
- To turn lighting on or off or to change lighting, choose an option from the Enable Extra Lighting pop-up menu .
- To change the background color, click the arrow next to the Background color swatch and choose a color.

Note:
Model rendering modes, lighting schemes, and background color options are also available by right-clicking the 3D model, and then clicking Viewing Options. Model rendering modes also appear under the Options menu on the Model Tree.

Examples of model rendering modes

The model rendering modes include combinations of factors that affect the appearance of the 3D object. The illustration below shows a simple object rendered in each of the available modes.

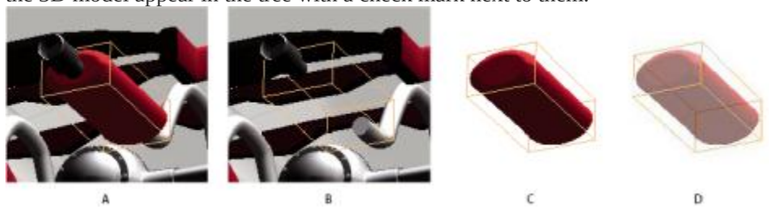


Model rendering modes

***A.** Solid **B.** Transparent Bounding Box **C.** Transparent **D.** Solid Wireframe **E.** Illustration **F.** Solid Outline **G.** Shaded Illustration **H.** Bounding Box **I.** Transparent Bounding Box Outline **J.** Wireframe **K.** Shaded Wireframe **L.** Transparent Wireframe **M.** Hidden Wireframe **N.** Vertices **O.** Shaded Vertices*

Hide, isolate, and change the appearance of parts

Some 3D models are composed of individual parts. You can use the Model Tree to hide or isolate parts, zoom in to parts, or make parts transparent. Parts that show in the 3D model appear in the tree with a check mark next to them.



Manipulating parts

***A.** Selected part **B.** Hidden part **C.** Isolated part **D.** Transparent part*

1. In the 3D model, use the Hand tool to click the part you want to manipulate. If a preference setting prevents you from using the Hand tool, select the part in the Model Tree list.
2. From the Options menu in the top pane of the Model Tree, choose any of the following:

Note:
The items that appear on the Options menu depend on whether the 3D model is composed of just one part or multiple parts. Many of these options are also available by right-clicking a part in the 3D model.

Model Render Mode
Changes the surface appearance of the entire 3D model according to the item you choose from the submenu: Transparent Bounding Box, Solid, Transparent, Solid Wireframe, and so on.

Show All Parts
Displays the entire 3D model.

Fit Visible
Displays all visible parts and centers them in the view.

Show Physical Properties
Displays the surface area and volume (if available) in the Object Data pane of the Model Tree.

Display Bounding Box
Displays the box that encloses the 3D object or selected parts of the model.

Set Bounding Box Color
Changes the color of the bounding box. Choose this option, select a color, and then click OK.

Hide
Displays the model without showing the selected parts. You can also select and deselect check boxes in the top pane of the Model Tree to hide and show different parts.

Isolate
Displays only the selected part, hiding all others.

Isolate Part
Displays the geometry, the Product Manufacturing Information (PMI), and all views (including PMI views) for the isolated part only. Views and information for all other parts are hidden or deselected. Changes occur in the Model Tree as well. In the Structure pane (top), only the isolated part is selected. The structure of the other parts is available but deselected. The View pane (middle) lists only the views that have been defined for the isolated part, including PMI views. If you click a view, you see only the PMI for that view in the document pane. (To view the PMI for the isolated part, make sure 3D PMI is selected in the Structure pane.) The View pane hides views related to the assembly or other parts, including custom views created in Acrobat. You can add parts to the view by selecting them in the Model Tree. You can also use the Hide/Show commands in the options menu of the Model Tree. To cancel the isolated part, do any of the following:

- Select another part with the Isolate Part command.
- Select the top assembly in the Model Tree.
- Select the Home View button.

Zoom To Part
Changes the center focus from the entire 3D model to the selected parts. This setting is especially useful for rotating a part, allowing the rotation to occur around the center focus of the part rather than around the entire model.

Part Render Mode
Displays all of the rendering modes that are available for the part. The rendering mode changes the appearance of the 3D model according to the rendering mode you choose.

Transparent
Displays a see-through version of the selected part.

Export As XML
Creates a separate XML file of either Whole Tree or Current Node of the 3D model.

Export As CSV
Creates a separate file in CSV format that contains all of the model data. You can export the data from the whole Model Tree or a selected node. The file can be opened in any program that supports CSV formatting, such as Microsoft Excel.

Note:
If the 3D model includes Product Manufacturing Information (PMI), options for showing and hiding the PMI are available on this menu.

Model Tree overview

The Model Tree appears in the navigation pane on the left side of the work area. You can also open the Model Tree by clicking the Toggle Model Tree button on the 3D toolbar. Or, right-click the 3D model and choose Show Model Tree.

Note:
Using the Model Tree requires version 7.0.7 or later of either Acrobat or Adobe Reader. Users with earlier versions can interact with 3D models but not with the Model Tree.

The Model Tree has three panes, each of which displays a specific type of information or controls.

Structure pane
The topmost pane shows the tree structure of the 3D object. For example, a 3D object depicting a car has separate groups of objects (called *nodes*) for the chassis, engine, and wheels. In this pane, you can move through the hierarchy and select, isolate, or hide various parts.

Product Manufacturing Information (PMI) appears as a group of items on the same hierarchical level as its related object or assembly.

View pane
The middle pane lists the views that have been defined for the 3D object. When you change a view, click one of the listed views to return the 3D model to a saved state. You can also add to and edit views in the View pane. For example, after you isolate and rotate a part, you can save that particular view, including the camera angle, background, lighting, and other attributes. This feature is not available for Adobe Reader.

Object Data pane
The lower pane displays other information, including properties and metadata, if any, about the object or part. You cannot edit this information for 3D objects in Acrobat.

Model Tree

***A.** 3D object hierarchy **B.** Saved& views **C.** Part or object information*

Note:
To change the default behavior for the Model Tree, open the Preferences dialog box and under Categories, select 3D and Multimedia. Then choose an option from the Open Model Tree On 3D Activation menu.

The author of the PDF can set up a 3D model in the conversion settings so that clicking it automatically displays the Model Tree.