Get started with intelligent 3D Adobe PDF documents

From the experts at Adobe

Adobe® Acrobat® 3D allows you to publish and share 3D design information from major CAD applications with virtually any computer user. As a superset of Acrobat 7.0 Professional, much of Acrobat 3D is instantly familiar to Acrobat users. This tutorial walks you through the additional features that put the "3D" in "Acrobat 3D."

Note: Download the acrobat_tutorials.zip file to your hard disk from http://download.adobe.com/pub/adobe/ tutorials/acrobat/acrobat_tutorials.zip to follow along with this tutorial. Alternatively, you can substitute your own CAD files of a similar type.

Convert 3D content to Adobe PDF files

Acrobat 3D lets you convert fully interactive 3D content from major Microsoft Windows® and UNIX CAD applications (such as SolidWorks®, CATIA®, and Pro/ENGINEER®) into compact PDF files, using any of three simple methods—drag the CAD file into the Acrobat 3D window, right-click the file and choose Convert To Adobe PDF, or press the Print Screen key while in your CAD application to activate the 3D Capture Utility.

Convert to PDF using drag and drop:

1   Drag the Landing_Gear_Assy.CATProduct file from the Tutorial Files folder into the Acrobat 3D window. The Acrobat 3D Conversion dialog box opens. The five tabs in the dialog box let you fine-tune the conversion from proprietary CAD format to the format used by Acrobat 3D.
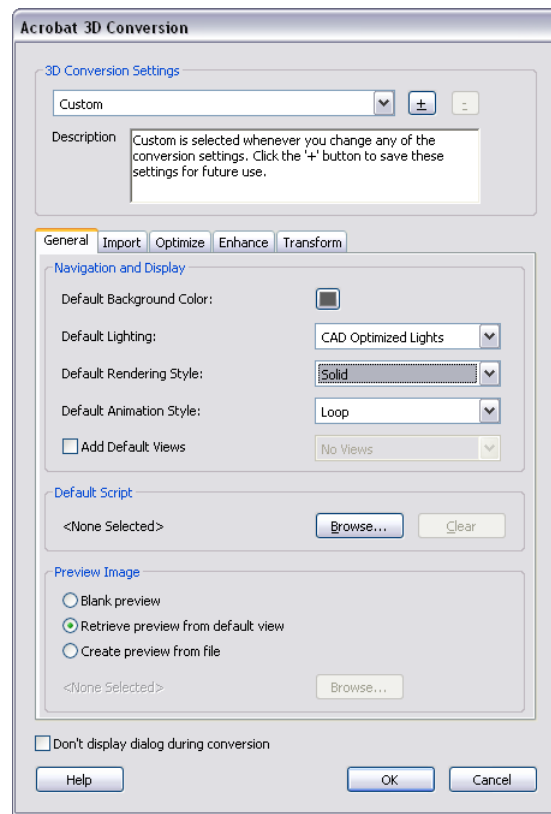
Use the Acrobat 3D Conversion dialog box tabs to control every aspect of the conversion from proprietary CAD document formats to PDF.

2   In the General tab, set the default lighting to CAD Optimized Lights, then click OK to complete the conversion to PDF.

3   Click the 3D model to activate it and reveal the toolbar controls.

4   Select the Rotate tool ⊕ and drag to rotate the model in three dimensions. Use the Pan tool ⊕ to move your view laterally, and use the Zoom tool 🔍 to increase (drag upwards) or decrease (drag downwards) the magnification.

The Acrobat 3D toolbar appears when you click a 3D model in a PDF file, providing tools for manipulating the model in three dimensions, switching and saving views, changing lighting and render modes, and more. Hover the cursor over any button to reveal its descriptive tool tip.

While dragging with the Rotate tool, hold down the Shift key to zoom in and out. Hold both mouse buttons down while dragging with the Rotate tool to pan the scene.

5   Select the Distance tool ⊢ and note the options in the 3D Measurement Tool dialog box. Measurement types including Angle, Distance, and Auto, which intelligently adapts to the area being measured.

6   Choose Distance from the 3D Measure Type menu. Click once at a starting point on the 3D model, and click again at an end point to create the measurement.

7   Choose Angle from the 3D Measure Type menu. Click three times to set the vertices for the measurement.

8   Experiment with the other options; tips in the Measurement area of the dialog box guide you through the process. You can display measurements in model units, or to exact scale, by entering the scale of the model in the dialog box. The dimensions you create remain active if the Measurement Markup option is selected, but they will not be saved with the PDF file, so you can create new ones at any time.
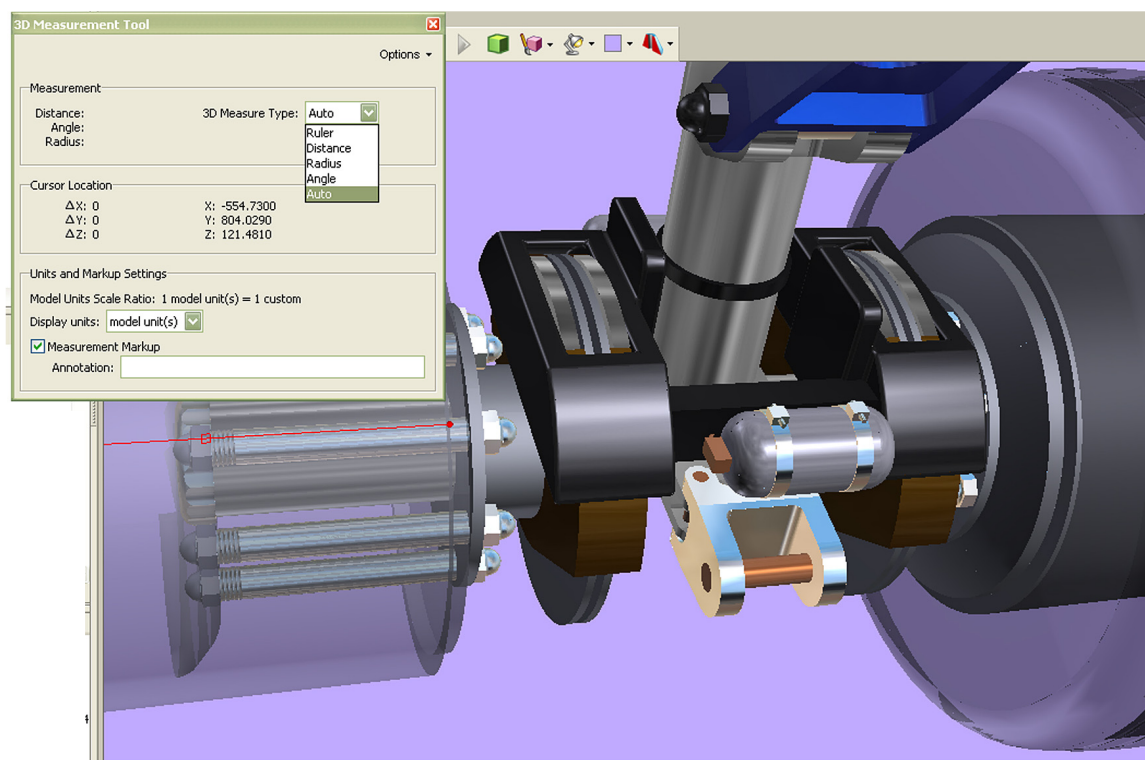
The Distance tool, visible as the red line in this image, allows you to take precise measurements in any model. Adjust units and track precise cursor location in the 3D Measurement Tool dialog box, and set the 3D measurement type to assist in measuring radius, angle, distance, and more, simply by dragging across the 3D model.

9   Click the Model Render Mode button 🔴 and experiment with the menu options, which provide a variety of different render modes suitable for different workflows.

10 Click the Enable Extra Lighting button 🔵 and experiment with the menu options. Depending on the 3D model, different lighting will enhance your view of individual parts or the entire model. Close the file without saving it.

Convert to PDF using the contextual menu:

When Acrobat 3D isn't open, you can start the conversion process by right-clicking the file you want to convert, and choosing Convert To Adobe PDF from the menu.

Convert to PDF using the 3D Capture utility:

With both Acrobat 3D and your CAD application open, choose Create PDF > From 3D Capture in Acrobat 3D. Switch to your CAD application, open any file, and press the Print Screen key to capture the currently displayed CAD file. This method of conversion allows you to convert files directly from CAD applications running on UNIX, as well as on Windows. When you use this method, however, the Model Tree is flat and there is no parent/child hierarchy.

Note: A one-time setup is necessary to prepare your CAD application for use with Acrobat 3D. See Acrobat 3D Help for more information.

Combine 3D files with other documents

Acrobat 3D enables you to convert virtually any document to PDF, including e-mail, spreadsheets, and charts. You can insert 3D CAD designs into Microsoft Word, Excel, and PowerPoint files, then let Acrobat 3D convert them to PDF. Three-dimensional CAD content can then be combined with other PDF files into one comprehensive project document. Using a compound PDF document enables team members to quickly and easily convey the contextual details and scope of a complex project to anyone with the free Adobe Reader®*—saving time and improving accuracy.

Using a simple procedure, you can combine any number of document types into one PDF file:

1   After installing Acrobat 3D, start Microsoft Word and open a new document. You'll notice a fourth button in the PDF Maker toolbar, and a new submenu under the Insert menu named 3D Model. The button

and submenu are inserted in Word, PowerPoint, and Excel by Acrobat 3D, so that you have more options available for combining 3D designs into your documents and presentations.

2   Click the Insert Acrobat 3D Model button ⬚, select the Gear_Brake.u3d file from the Tutorials Files folder, and click Open. Acrobat 3D inserts the model at the cursor position in the open Word document.

3   Click the Convert To Adobe PDF button ⬚ on the PDF Maker toolbar to convert the document to PDF, complete with your 3D model. Save the file.

4   In Acrobat 3D, choose File > Create PDF > From Multiple Files, select all of the files in the Combine folder, then click Add to add them to the list.

5   In the Files To Combine area of the Create PDF From Multiple Documents dialog box, drag files up or down to change their order in the resulting PDF file, or just click OK to complete the process. You can reorder a completed PDF file just as easily—just drag pages in the Pages palette in Acrobat 3D.
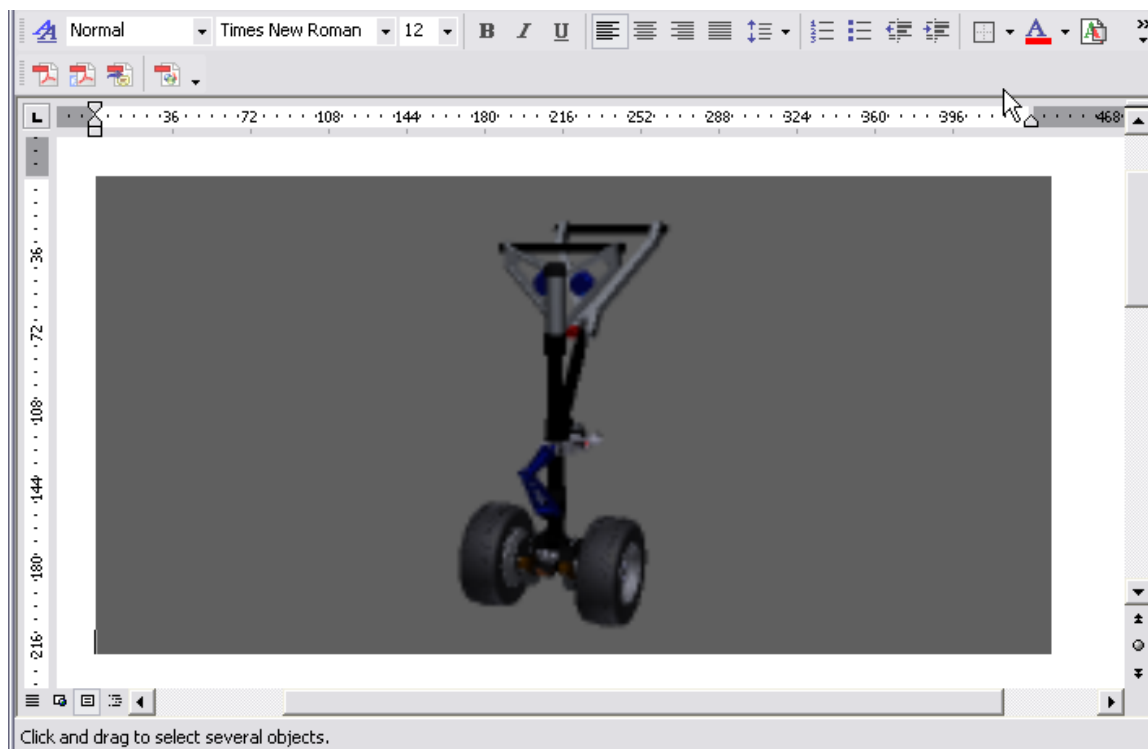
Acrobat 3D enables you to insert 3D CAD designs into Word (above), Excel, and PowerPoint documents, by using commands in the Insert menu in each application, or the new Insert 3D Model button in the PDF Maker toolbar.

Add comments using familiar Acrobat tools

Acrobat 7.0 Professional users are familiar with marking up 2D documents using the extensive built-in review and commenting tools. Along with these functions, Acrobat 3D allows you to apply view-specific comments directly to 3D content. Plus, users of Adobe Reader* can add their comments on 3D objects and 2D content in the PDF files, after the PDF file is enabled for Reader commenting in Acrobat 3D. Extended team members can define multiple cross-sections of a 3D object to view internal structures and assembly relationships, as well as measure dimensions in a 3D design to provide more accurate comments.

To create, save, and manage views in a 3D PDF file:

1   From the Tutorial Files folder, open Turboliner_Comments.pdf, and click on the model to activate it and reveal the toolbar. Using the Views menu, toggle through the saved views, which include two containing comments, and a cross-section view.

2   Click the Default View button ⬛ to return to the original view.

3   Use the Rotate and Zoom tools to focus on a small area of the model, then click the Views menu and choose Manage Views. Click New View, select the NewView1 label, enter a descriptive name, and then click OK to save the view in the PDF file. You can also click the Toggle Model Tree button ⬛ to open the Model Tree panel, and then click the New View button ⬛ in the Views section to create a new view.

4   Click the Toggle Cross Section button ⬛ to reveal the current cross-section, then click the arrow on the right of the button and choose Cross Section Properties. Notice the wide array of precise controls to adjust the positioning, alignment, and axis of the cross-section.

5   In the Position and Orientation area, slowly adjust the Offset slider and notice the changes in the cross-section.

6   Use the Rotate and Pan tools to adjust your view of the 3D model, even with the Cross-Section Controls dialog box open.
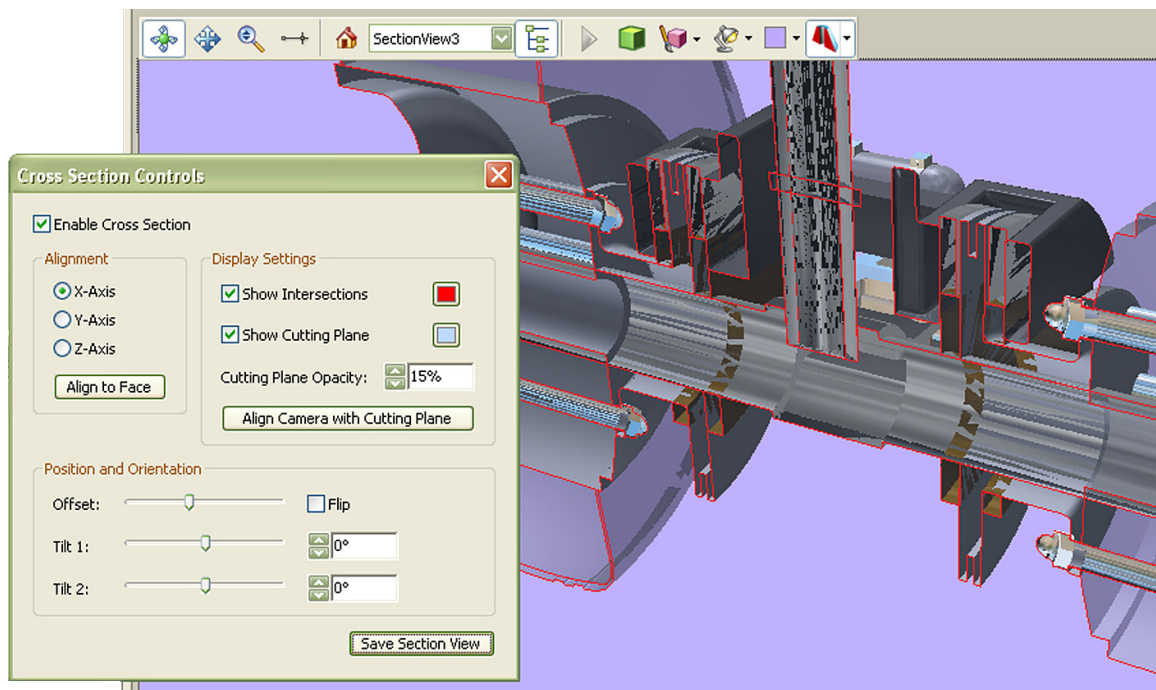
Create detailed cross-section views in Acrobat 3D to interrogate 3D models as deeply and in as much detail as you need, complete with fine controls for the cutting plane, alignment, and orientation. Save as many section views as you choose, with one click each of the Save Section View button.

7   Click the Align Camera With Cutting Plane button for the fullest view of the internal area of the model.

8   Click Save Section View to save a new view with the current display. You can save as many different slices of the model as you require.

9   Click the Model Tree tab at the left to reveal its panel. The center pane shows all of the current model views, and allows you to add new views and toggle between them.

10 Select the Note Tool in the Commenting toolbar and click the model. Add a comment, then examine the change in the Views pane of the Model Tree panel. The new comment appears in the active view.

11 Click a different view in the Model Tree. The previously entered comment is no longer displayed in the main window. View-specific comments allow you to quickly focus attention on the smallest part in the most intricate model.
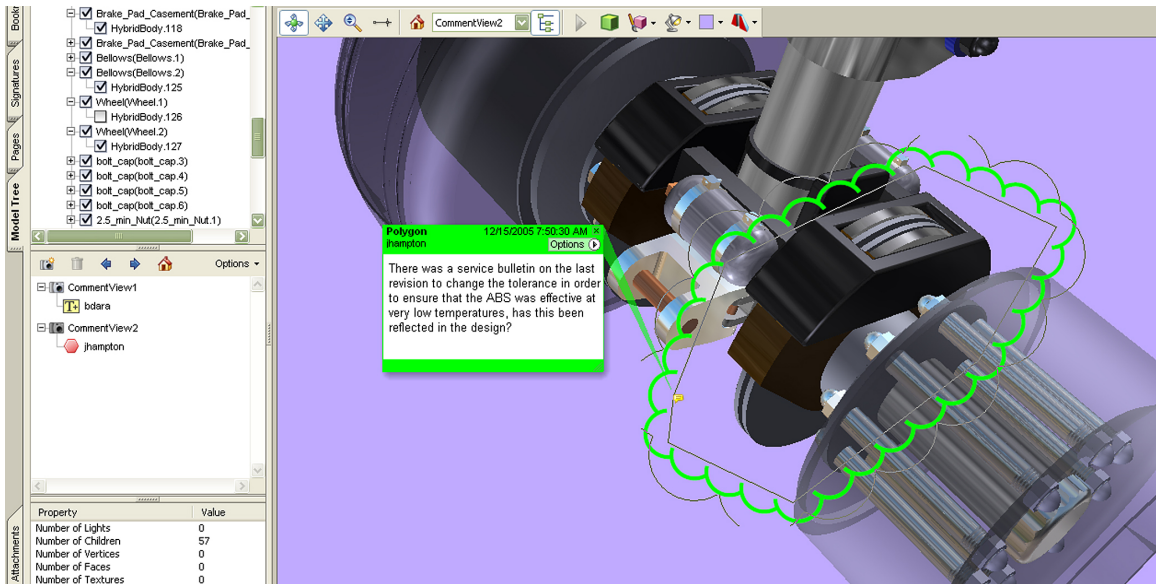

With comments in a 3D PDF file saved as individual views, it's simple to find, review, and deal with comments at any time. You can view comments by using the Views pane, by clicking on them in the 3D views, or by clicking the Comments tab at the lower left.

Easily track and gather feedback

Acrobat 3D lets you efficiently manage comments from multiple reviewers, instead of having to manually reconcile confusing or conflicting rewrites. Initiating e-mail-based reviews is simple, and comments from multiple reviewers can appear together in one PDF file for easy viewing.

To initiate an e-mail-based review:

1   Open the Turboliner_NG_Brake.pdf file in the Tutorial Files folder. Click the Send For Review button in the Commenting toolbar, and choose Send By Email For Review.

2   The open document should already be selected in the Specify A PDF File menu. Click Next.

3   In the Invite Reviewers step, you can select recipients by clicking the Address Book button, or by typing addresses directly into the box.

4   Click Customize Review Options, and enter the e-mail address for the person who will coordinate the review. By default, the current Acrobat 3D user's e-mail address is entered. Select Display Drawing Markup Tools For This Review if you want to make all of the commenting tools available to reviewers, and select Also Allow Users Of Free Adobe Reader 7.0 To Participate In This Review. This final selection makes all of the commenting tools available to reviewers who don't own Acrobat 3D.
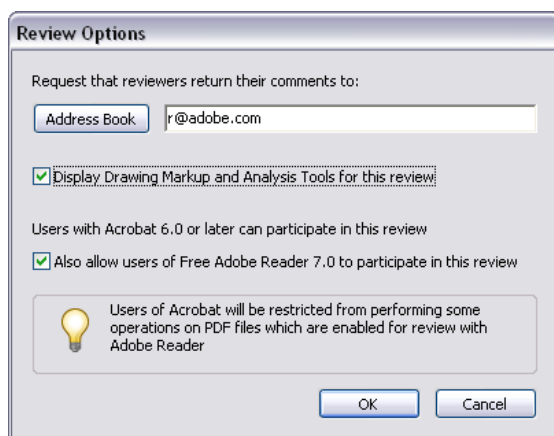
Acrobat 3D allows you to include Adobe Reader* users in online reviews of your 3D-enabled documents.

5   Click OK to close the Customize Review Options dialog box, then click Next. In the Preview Invitation step, you can customize the subject line for the invitation message, as well as the body of the message itself. Acrobat 3D inserts a default message that explains the simple steps for participating in the review and submitting comments.

6   When you're satisfied with the message, click Send Invitation to create the e-mail and send it to the recipients list, with the PDF file attached.

To incorporate reviewer comments:

1   Choose Comments > Import Comments, and select the Turboliner__Comments.fdf file in the Tutorial Files folder. When reviewers send in their comments by e-mail, you'll receive similar comments files. You can import all the .fdf files from a review into the same original PDF document, making it easier to view all of the input on the design at once.

2   Leaf through the different views using the Views menu or the center pane of the Model Tree panel. Choose Comments > Export and note the options in Acrobat 3D to export back to Word or AutoCAD. If the document originated in one of these applications, this option allows you to incorporate reviewer comments directly into the source file in its original application.

Protect sensitive information

Acrobat 3D provides advanced security controls to better protect sensitive PDF documents. Password protection restricts access, printing, editing, and other actions on the PDF file. Specific security settings can be created for and applied to designated users or user groups. Digital signatures help ensure authenticity. And when integrated with Adobe LiveCycle™ Policy Server software, Acrobat 3D users can create a server-managed security policy and apply it in one step to PDF documents.

To apply security controls to a PDF file:

1   Open the Turboliner_NG_Brake.pdf file in the Tutorial Files folder. Choose File > Properties, select the Security tab, and then choose Password Security from the Security Method menu.

2   In the Password Security Settings dialog box, set Compatibility to Acrobat 7 And Later to make sure recipients use a compatible version of Acrobat or Adobe Reader.

3   Select Require A Password To Open, and enter a password to prevent unauthorized recipients from viewing the PDF file.

4   Select Restrict Editing And Printing, enter a different password, and set the permissions level for printing and editing. Acrobat 3D allows you to precisely set how much access you want to allow.

Note: For even greater security, there is Adobe LiveCycle Policy Server, which gives you more advanced control over who can open the file and even when it can be opened. For more information, visit the Adobe website at www.adobe.com/products/server/policy/main.html.

Finally, note that the most basic security feature of Acrobat 3D is PDF itself. By distributing a PDF document, you prevent dissemination of your original CAD data.
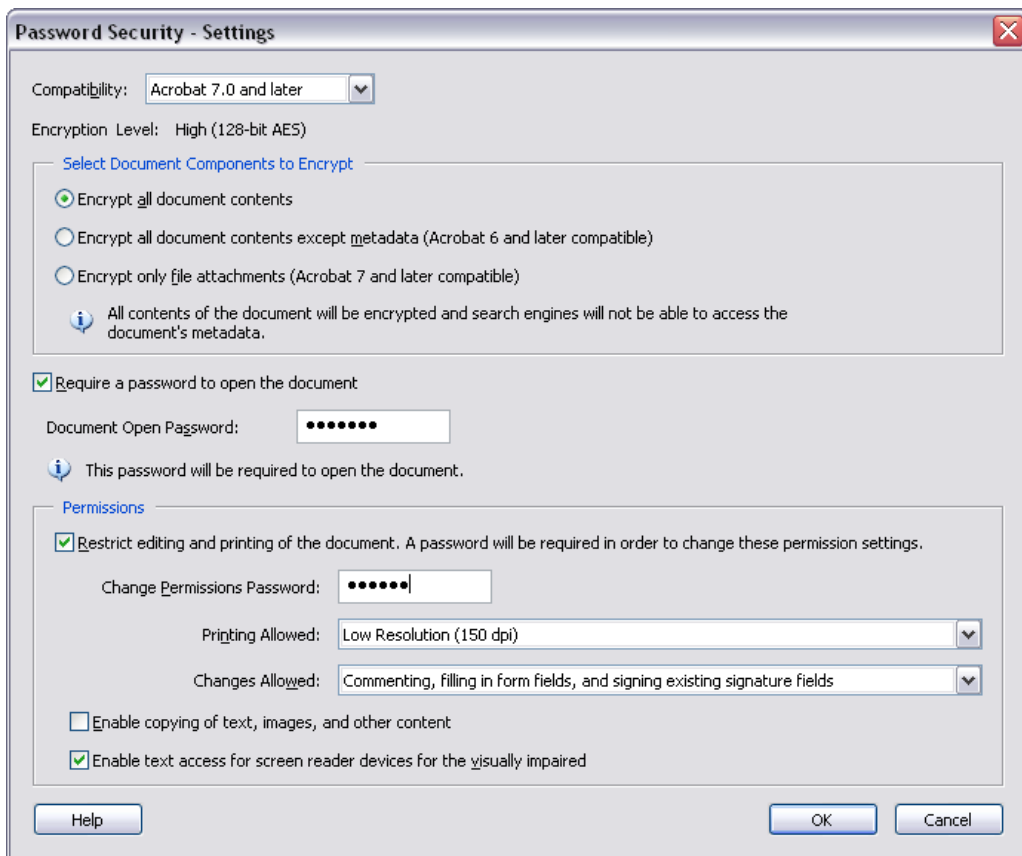
Acrobat 3D security settings let you tailor the security of your PDF documents, with separate options for access, printing, and editing.

Publish richer interactive documents containing 3D content

3D line art is routinely used to illustrate printed technical documentation. However, line art made from 3D objects can be time-consuming to produce, as the line art must often be redrawn using a program such as Adobe Illustrator®. Also, the information conveyed in a published illustration can become outdated and may not aid understanding as well as an interactive 3D object, which can be rotated for multiple viewing angles.

Acrobat 3D enables you to publish technical documents as PDF files with fully interactive 3D illustrations. These documents cost far less to produce; are easily updated; provide much more information and context than a flat, printed illustration; and can be viewed and interacted with using nothing more than Adobe Reader 7*.

To interact with a 3D-enabled PDF technical document:

1   Open the Turbine.pdf file and click the 3D model to activate it, and then open the Model Tree. Click through the saved views in the Views pane.

2   Right-click Lid-01 in the Model Tree and choose Isolate. Right-click Lid-01 again and choose Zoom To Part. Drag the model to change your view of the part.

3   Click the Default View button 🏠. Right-click any entry in the Model Tree and choose Show All Parts. Then right-click Axis5 and choose Hide. Notice how more of the interior parts are revealed by hiding the part that partially surrounds them.

4   Add a comment, which creates a new view as a bookmark.
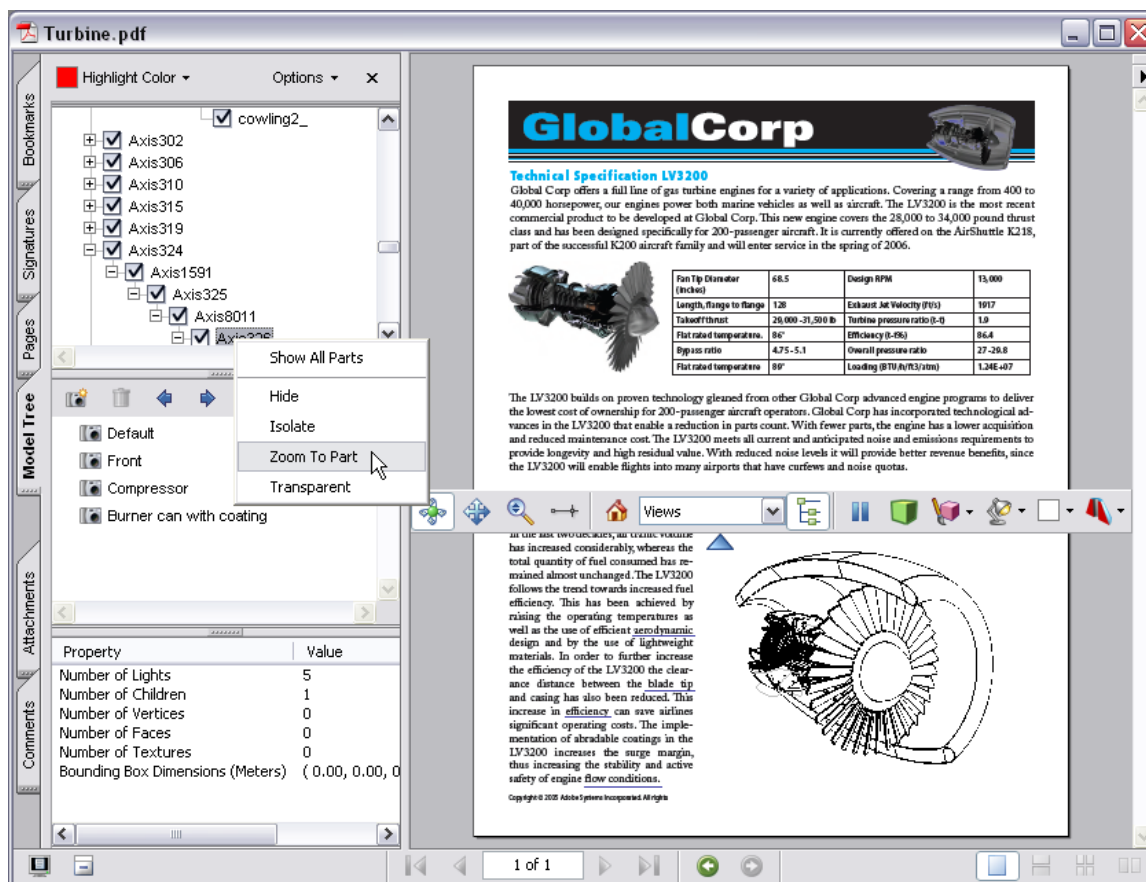
Insert 3D models directly into brochures, technical manuals, and other product documentation so your readers can interact directly with the content, such as rotating a model, changing the display render mode, and zooming in to an individual part.

Further enhance interactivity

Included with Acrobat 3D is Acrobat 3D Toolkit. The 3D Toolkit lets you create animations (such as exploded views), edit lighting, change the textures and materials of an object, and save your changes as either a 3D object or 2D raster or vector image. You can also add JavaScript™ to any 3D PDF file to enhance interactivity and understanding.

To create an exploding animation:

1   Drag the Gear_Brake.U3D file from the Tutorial Files folder into the Acrobat 3D window.

2   Click the 3D model to activate it, and then right-click and choose Edit In 3D Toolkit from the contextual menu.

3   Click the triangle at the right side of the Explode Objects button ▦, and choose Settings.

4   Click the Defaults button, select Create Animation, and click OK to close the dialog box.

5   Click the Explode Objects button. Acrobat 3D Toolkit creates the animation, and the animation controls toolbar appears at the bottom of the window.

6   Click the Play Forward button ▸ to play the animation, and then choose File > Save As.

7   Choose 3D Interchange from the Save As Type menu, and click Settings.

8   Click the Animation tab, select Export Animation, and then click OK.

9   Save the file.
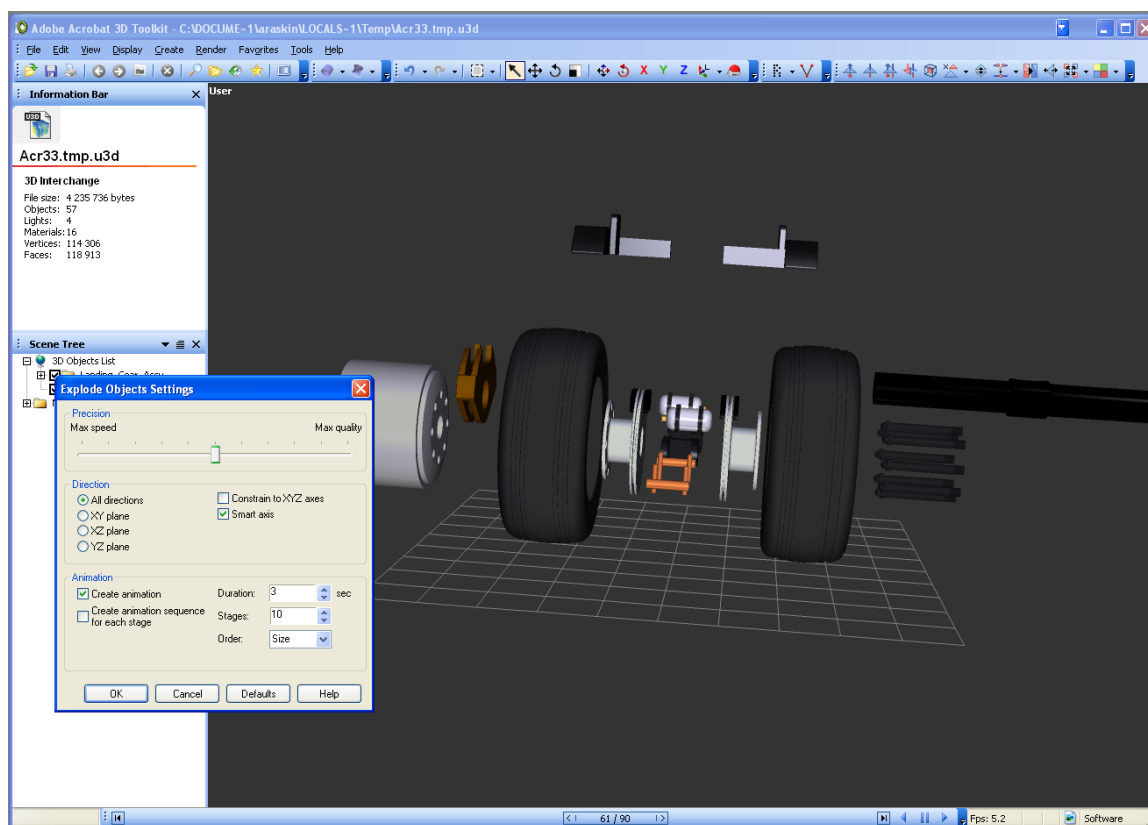
Use the Explode Objects Settings dialog box to tailor factors such as speed, direction, duration, and number of stages in a typical exploding-parts animation.

Learn more on your own

Explore the advanced capabilities of the Acrobat 3D Toolkit to control every aspect of your 3D-enabled PDF documents.

Collapse Hierarchy Select the topmost assembly name in the Scene Tree, right-click, and choose Tools > Collapse Hierarchy to combine all elements.

Delete Geometry Select any subassembly or part in the Scene Tree, right-click, and choose Delete Objects to remove the part or parts from the model.

Create Illustrations Choose View > Controls And Toolbars > Illustration to reveal the Illustration toolbar, and then click either the Raster or Vector buttons to output 2D images from your 3D models.

Create Custom Animation Using the Animation Controls, Animation Timeline, and 3D Editor toolbars, precisely adjust your model parts and set keyframes to create customized assembly/disassembly and other animations.

Change Materials and Textures Select objects in the Scene Tree or Viewport, and then drag files from the Materials or Textures tabs to modify their appearance.

Optimize Geometry Right-click a model in the Viewport, and choose an option such as Remove Internal Parts, Remove Duplicate Faces, or Remove Duplicate Materials from the Tools submenu.

*Adobe Reader 7.0.7 or later required.
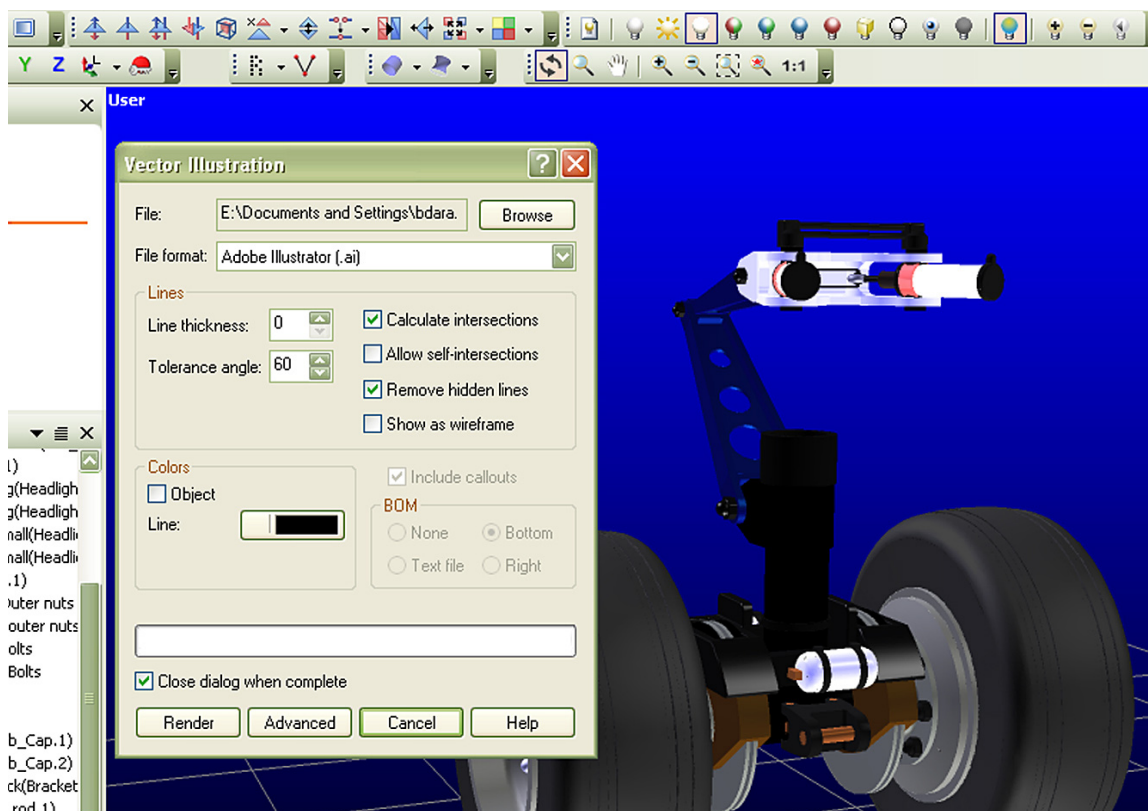
Click the Vector Illustration button on the Illustration toolbar to output vector graphics in Adobe Illustrator or other file formats suitable for professional printing applications.