AutoCAD®
MECHANICAL
2007

The AutoCAD Mechanical Advantage

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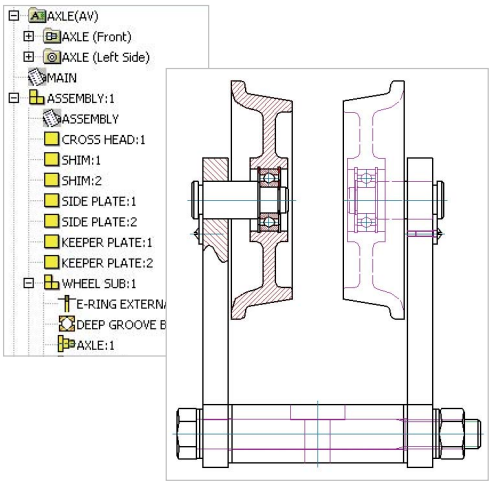
To compete and win in today's design market, mechanical engineers need to create and revise mechanical designs faster than ever before. AutoCAD® Mechanical software, a purpose-built design application, saves countless hours of design and rework by automating common tasks. As a result, you gain a competitive edge and can spend your time innovating rather than struggling with workflow issues caused by generic design applications. Sharing design information accurately and efficiently with team members, customers, and suppliers is also a key part of getting designs to the manufacturing floor. AutoCAD Mechanical is based on AutoCAD® software—the world's best-selling computer-aided design application—and uses the native DWG format, providing access to the largest design community worldwide. Discover why so many companies are using AutoCAD Mechanical to solve their daily design issues.

Reduce Complex or Repetitive Tasks

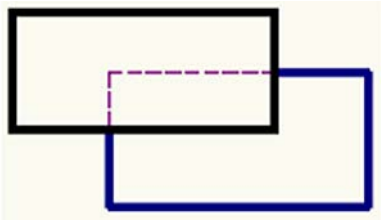
ENHANCED 2D Mechanical Structure

In AutoCAD Mechanical, 2D mechanical structure creates a more intuitive mechanical design environment in which individual lines, arcs, and circles combine to form parts and assemblies. Mechanical structure functionality gives you a comprehensive suite of tools for organizing, storing, and reusing designs. These innovative design tools reduce both detailing time and the amount of editing required because changes to one part ripple throughout the structure. And since this kind of associativity works throughout the design, the same applies to the bill of materials (BOM) and other reports. When a part moves, the associated screws, nuts, and bolts move with it. With mechanical structure, you work more intuitively and efficiently in a design environment that enables you to easily express and revise design intent.



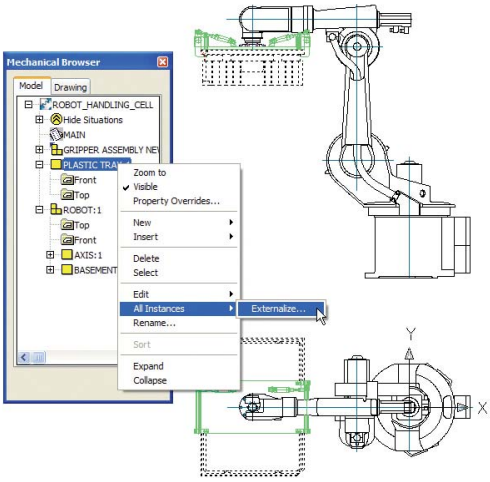
ENHANCED Associative 2D Hide

Ramp up your productivity by defining simple foreground and background selections that automatically redraw geometry to show hidden or dashed lines of parts that are obstructed by other parts in your design. These hidden lines also automatically update when changes occur, virtually eliminating the time required to manually redraw geometry due to iterative changes. It warns you of potential geometrical errors and provides a graphical workflow that can update entire assemblies. For the first time in 2D, identical parts can have different geometrical appearances when in hide situations—but if you need to change the design or get an accurate count for the parts list, AutoCAD Mechanical remembers they are still identical parts. This means you spend less time and effort updating your 2D structure-based designs.



ENHANCED Browser

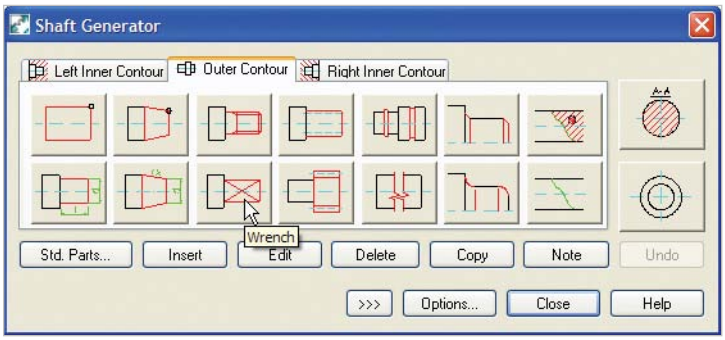
Linked to the BOM database and part of the software's 2D mechanical structure, the browser in AutoCAD Mechanical provides a graphical interface that enables you to visually organize design data into logical parts and assemblies. Contextual menus provide easy access to edit properties (color, visibility, BOM data), sort or rename components, and add, create, or reuse parts and assemblies. The browser's drag-and-drop functionality allows for easy restructuring of design data to better match design intent and reduce the risk of production errors and delays.



Autodesk®

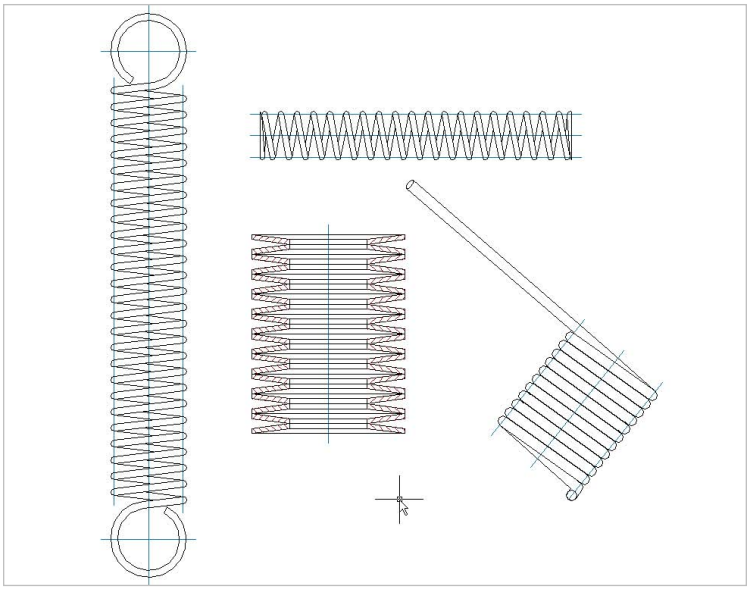
Shaft Generator

Another great time-saver, the shaft generator creates drawing views of solid and hollow shafts. This feature alone can save you countless hours of drawing, especially as you make small, iterative changes to improve your design. Features commonly found in shafts—including center holes, chamfers, grooves, profiles, wrench fittings, and standard parts (bearings, gears, retaining rings, and seals)—are quickly created as well. Generate automatic side views of the shaft from the front view, and changes that you make in any view are automatically reflected in the others.



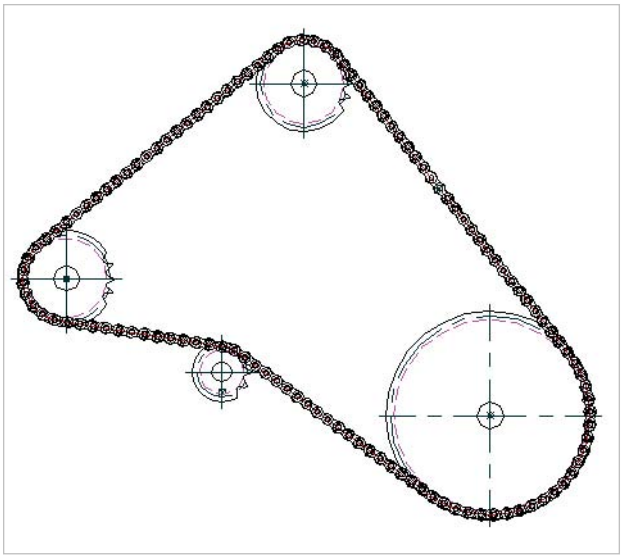
Spring Generator

The spring generator is a fast, easy, and valuable tool that enables you to select, calculate, and insert compression springs, extension springs, torsion springs, and Belleville spring washers in a design. You control the representation type of the spring, and you can create a specification form to incorporate in the drawing. The spring calculator even helps you select the right spring.



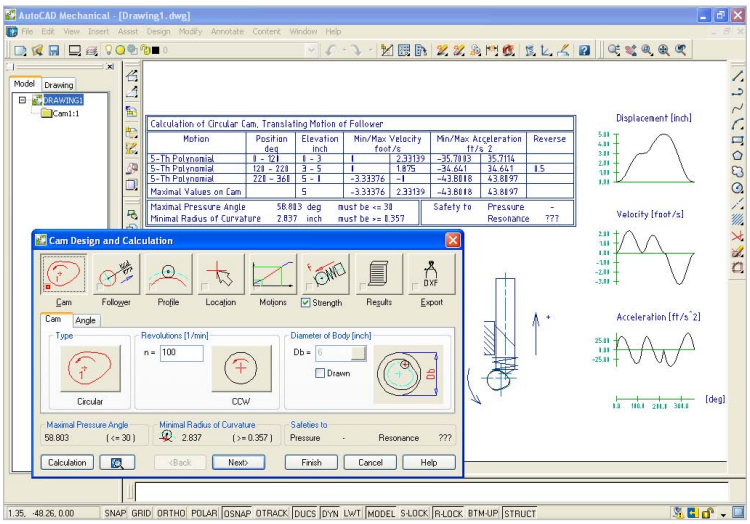
Belt and Chain Generator

Automating the generation of drive systems can save you hours, if not days, of work. The drive system generator makes it easy to create chain and sprocket as well as belt and pulley systems, calculate optimal lengths for chains and belts, and insert these assemblies into your design. Simply select your belts and chains from the standard libraries to get started.



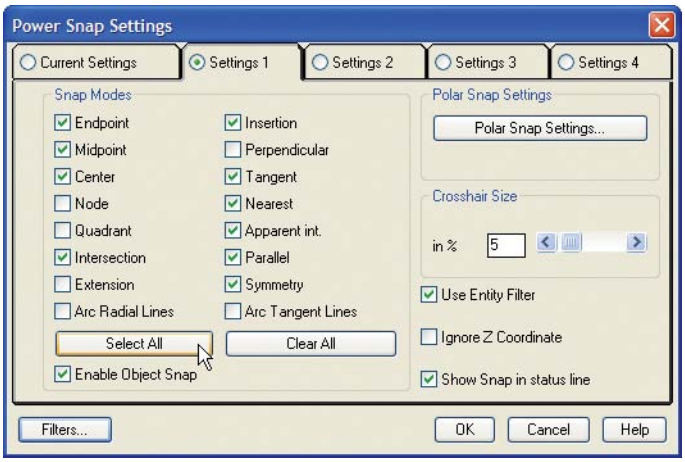
Cam Generator

The AutoCAD Mechanical cam generator makes the design of linear, circular, and cylindrical cams quick and easy. And with the time you save in design, you'll have more time to study crucial aspects of the cam's functionality. The cam generator creates cams based on the input border conditions that you set. Cam followers are generated and used in the design. Cam follower data representing the follower's position, size, and direction of movement is also included. Acceleration and jerk, as well as the cam curve path, can be calculated and displayed. You can couple driven elements to the cam and create CNC (computer numerical control) data via the curve on the path.



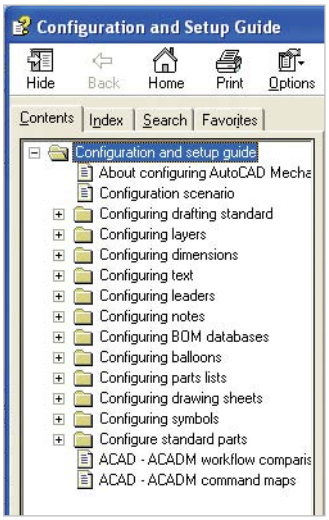
Power Snaps

AutoCAD Mechanical includes five task-based sets for object snaps, as well as many more options for selecting specific geometry than standard AutoCAD software offers. Quickly choose the snap setting that works best for the task at hand, reducing the tedium of model space selection.



NEW Configuration and Setup Guide

Use this guide to make informed decisions about available options when configuring and setting up AutoCAD Mechanical for the first time. To simplify the transition from AutoCAD to AutoCAD Mechanical, the guide includes information about basic design workflows and a detailed feature comparison chart.



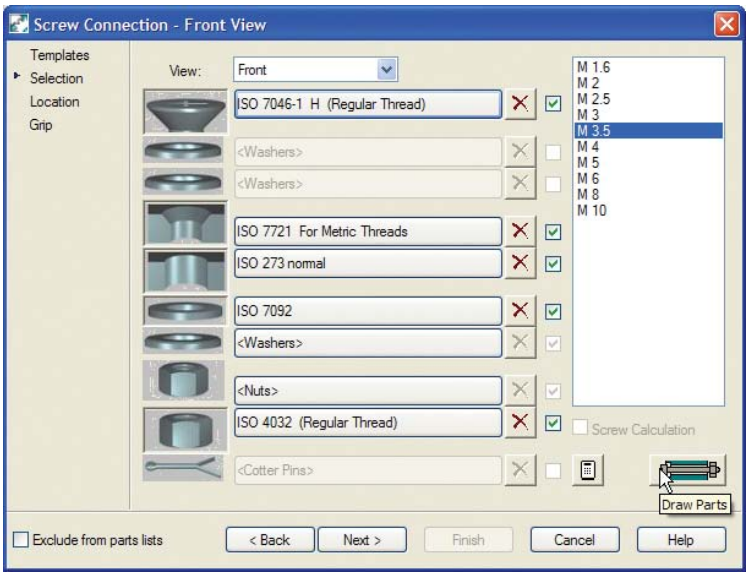
ENHANCED Software Development Toolkit

These tools provide the capability to customize and combine features in AutoCAD Mechanical, and achieve higher levels of productivity. The application programming interface (API) provides information to customize and automate individual features or combinations of features, and includes all new API documentation and sample scripts. A full suite of mechanically focused APIs extends the core AutoCAD capability and includes comprehensive coverage of the most advanced features available with 2D mechanical structure. Both the C++ API interface and Microsoft® Visual Basic®/COM are offered.

Reduce Errors

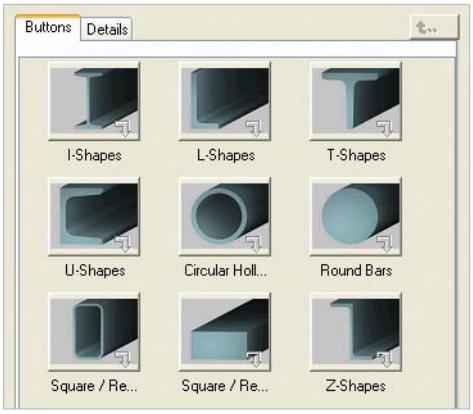
Screw Connections

Another major time-saver in AutoCAD Mechanical is the ability to design whole fastener assemblies at once. Pick the type of screw, and the software presents the right sizes for nuts, washers, and holes. Indicate where the fastener is to go, and there you have it—the entire fastener assembly inside the appropriate hole. When you input loads for each connection, the intuitive user interface helps you determine whether your selection is a feasible design.



2D Structural Steel Shapes

By using pre-drawn geometry, you minimize time-consuming catalog searches and create your designs more quickly and accurately. AutoCAD Mechanical contains more than 11,000 pre-drawn standard structural steel shapes that you can quickly drag into any design; these include common structural shapes such as U-shape, I-shape, T-shape, L-shape, Z-shape, rectangular tube, round tube, rectangular full beam, and rectangular round beam.

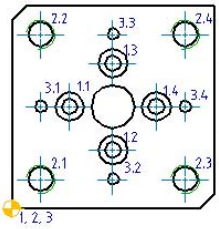


ENHANCED 2D Standard Parts, Features, and Holes

When you're dealing with machinery that contains hundreds or thousands of parts, you could take days, even weeks, to draw them from scratch. AutoCAD Mechanical changes that by providing more than 700,000 pre-drawn, standards-based parts that you can select for your designs. The list includes screws, nuts, washers, pins, rivets, bushings, and many other commonly used components. There are 100,000 pre-drawn standard features like undercuts, keyways, and thread ends. When you incorporate these into a design, the feature cleans up the area in which it was inserted, so you don't have to edit it manually. AutoCAD Mechanical also contains more than 8,000 pre-drawn holes, including through, blind, and oblong holes. And the holes clean up the area where they are placed just as the standard features do.

ENHANCED Hole Charts

The hole chart feature makes detailing and documenting the design of large machines and complex machine parts easier, faster, and far more accurate than doing them by hand. Simply place holes in the design, and the software automatically generates hole charts that display detailed design information, including machining instructions. Dynamic highlighting enables you to ensure that all holes needed for the chart are accurately represented. After the chart is placed, it remains dynamically linked to the design—any change to the model is automatically reflected in the charts. Filtering capabilities enable you to separate different hole sizes into different hole charts for streamlined manufacturing processes.



List of Coordinates for Counterbored Holes

Hole	X	Y	ø	Description	Standard
1.1	20	35	ø5.5	Counterbore	DIN 974 T1-R1 – 5
1.2	35	20	ø5.5	Counterbore	DIN 974 T1-R1 – 5
1.3	35	50	ø5.5	Counterbore	DIN 974 T1-R1 – 5
1.4	50	35	ø5.5	Counterbore	DIN 974 T1-R1 – 5

List of Coordinates for Tapped M10 Holes

Hole	X	Y	ø	Description	Standard
2.1	10	10	ø8.38	Metric ISO-Thread	ISO 261 – M10
2.2	10	60	ø8.38	Metric ISO-Thread	ISO 261 – M10
2.3	60	10	ø8.38	Metric ISO-Thread	ISO 261 – M10
2.4	60	60	ø8.38	Metric ISO-Thread	ISO 261 – M10

List of Coordinates for Blind Holes

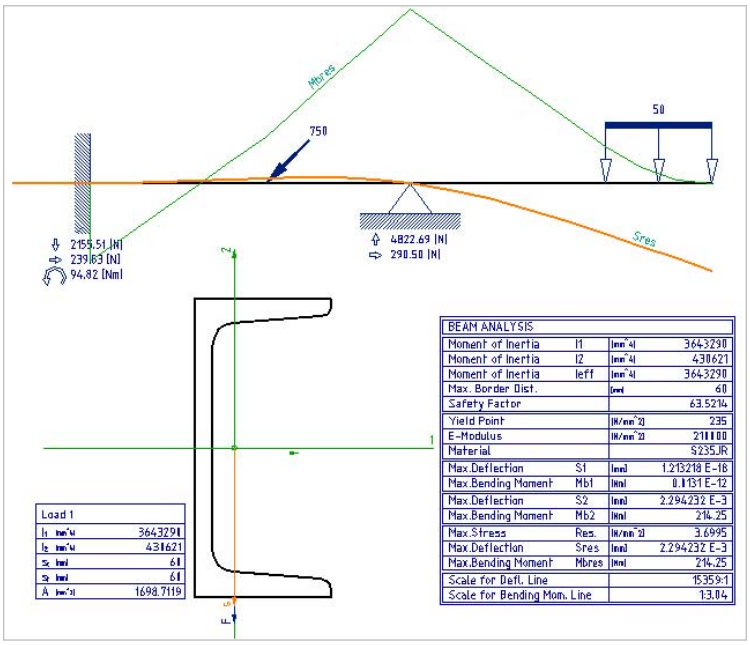
Hole	X	Y	ø	Description	Standard
3.1	10	35	ø4	Blind Hole	Acc. to ISO 273 – 4 x 20
3.2	34.99	10	ø4	Blind Hole	Acc. to ISO 273 – 4 x 20
3.3	35	60	ø4	Blind Hole	Acc. to ISO 273 – 4 x 20
3.4	60	35	ø4	Blind Hole	Acc. to ISO 273 – 4 x 20

IGES Translator

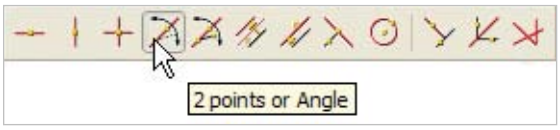
Use the built-in IGES Translator to improve the accuracy of data shared with team members on different CAD systems. With AutoCAD Mechanical you can import and export drawings into the industry-standard IGES (Initial Graphics Exchange Specification) format so that all team members have access to project data regardless of the CAD system they're using.

Moment of Inertia, Deflection, and Load Calculations

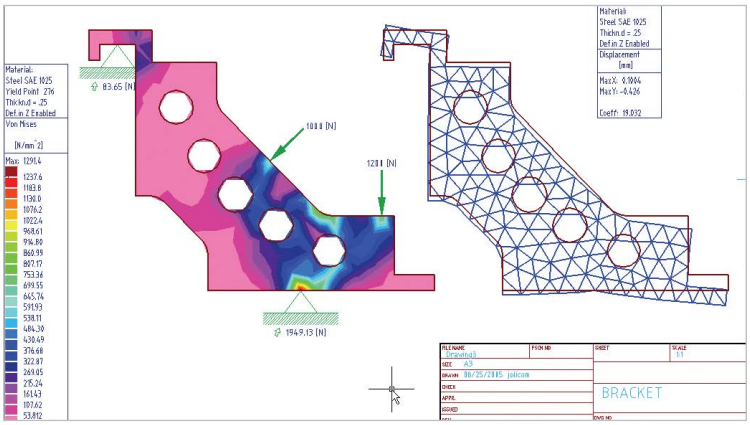
Built-in engineering calculators reduce both design time and the tedium of manual calculations. Instantly generate many different sets of calculated graphs and tables for screws, bearings, cams, and shafts with minimal additional input. Quickly perform engineering calculations such as a moment of inertia of a cross section or deflection of a profile with given forces and supports.



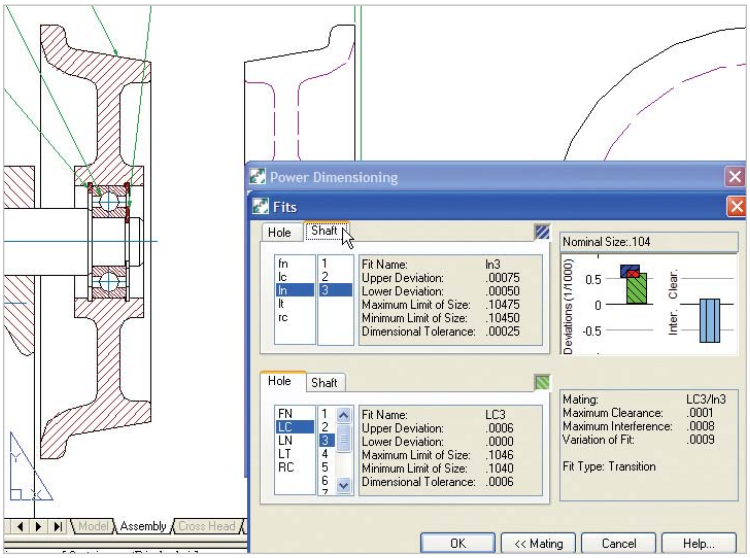
Construction Lines
The expanded set of construction lines available in AutoCAD Mechanical greatly reduces time spent creating geometry and aligning drawings. Construction lines are automatically placed in their own color and layer group, clearly distinguishing them from design geometry.



2D Finite Element Analysis (FEA)
Use the 2D finite element analysis feature to quickly identify potential areas of failure on designs and analyze their integrity under various loads, thereby avoiding costly field maintenance later. Don't be fooled by how easy it is to use; the 2D FEA feature is a powerful tool for determining the resistance capability of an object put under a static load. You can then add movable and fixed supports to the part to be analyzed, as well as stress points, lines, and areas.

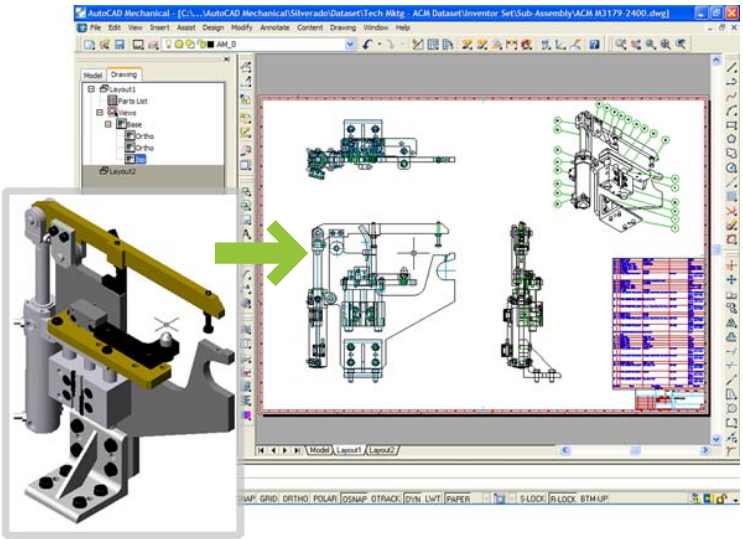


Fit Lists
Fit lists linked to your design data help reduce errors and keep your team productive. As you add special fit information to your design, the fit list table stays in sync and updates automatically so that your fit lists are always accurate.



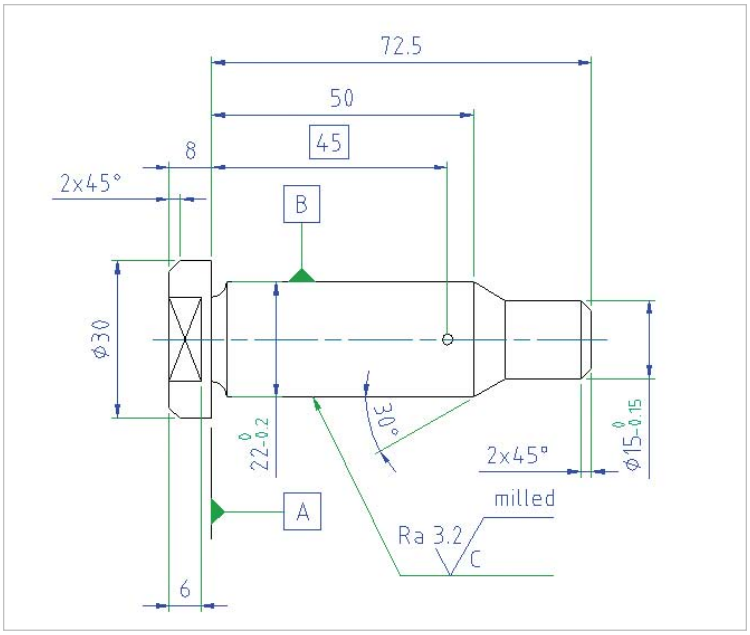
Increase Drafting Productivity

ENHANCED **Autodesk Inventor Associativity for Parts and Assemblies**
Use AutoCAD Mechanical to detail and document native Autodesk Inventor® software parts and assemblies. By documenting Autodesk Inventor models (IAM, IPT) in the AutoCAD Mechanical environment, you drastically reduce time-consuming translation workflows and shave time off your production schedule. Just open AutoCAD Mechanical and browse through Autodesk Inventor files, choose a file, and AutoCAD Mechanical creates a new drawing linked to the Autodesk Inventor file. Incorporate design revisions quickly and easily through the associative link—the software automatically notifies you of changes to the Autodesk Inventor file and regenerates the 2D drawing, including any changes. Visualize design intent by shading and rotating solid models, and review other attributes associated with the Autodesk Inventor design. And now AutoCAD Mechanical users can control the visibility of certain parts in an Autodesk Inventor assembly, providing more flexibility and helping to ensure a design is correctly documented for production. Information stored in Autodesk Inventor models is automatically available to the BOM database in AutoCAD Mechanical, so it's fast and easy to add balloons and annotations.



ENHANCED Power Dimensions

With the powerful dimensioning tools in AutoCAD Mechanical, you can create dimensions using abbreviated dialog boxes to control only the relevant dimension variables. This advanced dimensioning method adheres to standards, which makes adding, deleting, and editing dimensions of parts and assembly drawings quick and easy. With automatic dimensioning, you can create multiple dimensions with minimal input, resulting in instant groups of ordinate, parallel, or symmetric items that are appropriately spaced. Smart dimensioning tools force overlapping dimensions to automatically space themselves appropriately while integrating tolerance and fit list information into the design.

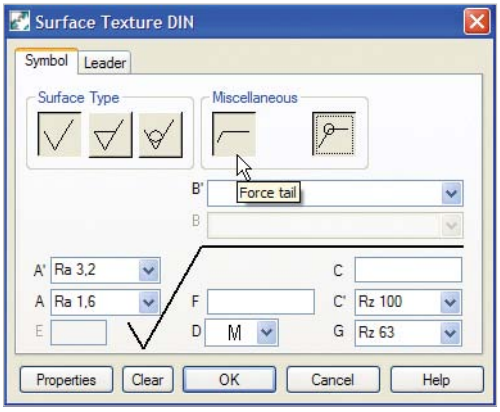


ENHANCED Dimension Stretch

Now it's easy to update designs to specific sizes and shapes. Simply change the dimension values, and the geometry of a design resizes accordingly. For complex designs, use multiple selection windows to choose exactly which geometry should be changed by the dimension value.

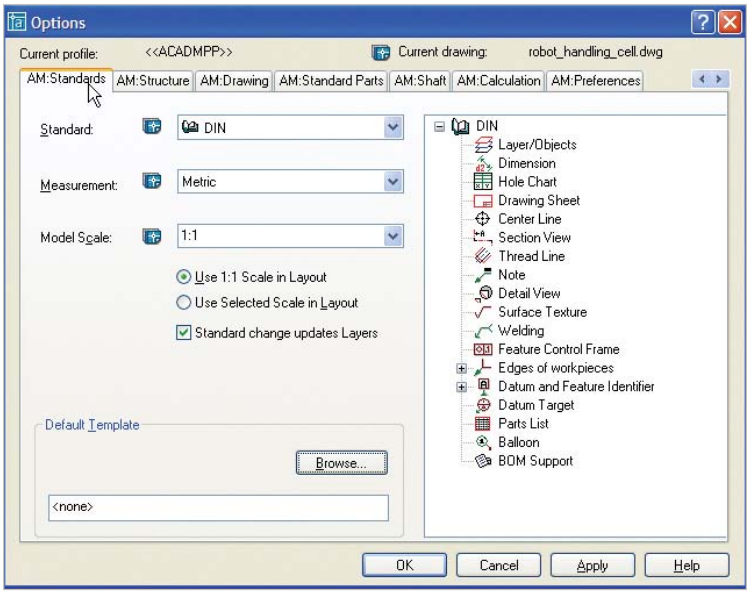
ENHANCED Annotations

Forget about drawing symbols from scratch or referencing old static block libraries of symbols. AutoCAD Mechanical includes drafting tools to create standards-based surface texture symbols, geometric dimensioning and tolerances, datum identifiers and targets, notes, taper and slope symbols, and weld symbols. Use the settings to automatically scale the symbols to your design. Even better, when you are annotating standard parts and features, the software automatically creates note fields and updates them as the design changes.



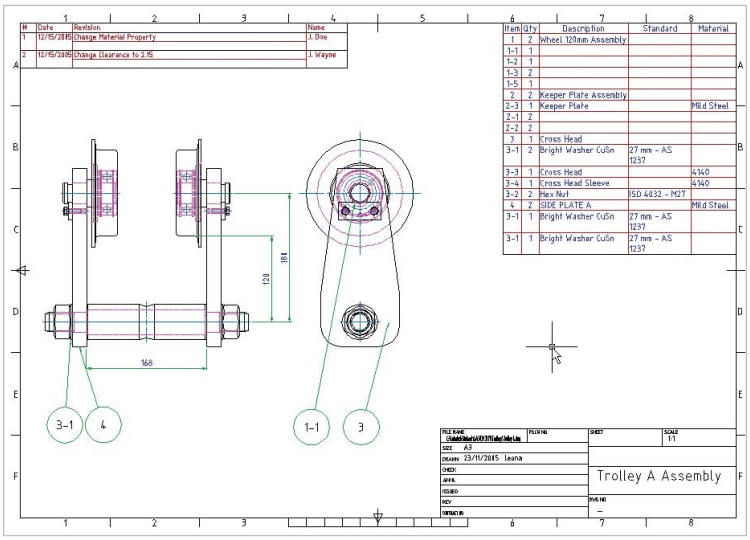
ENHANCED Standards-Based Design

Multiply your productivity with tools that help you and your team deliver consistent, standards-based design documentation. AutoCAD Mechanical supports ANSI, BSI, CSN, DIN, GB, ISO, and JIS drafting environments. Adhering to a standard environment helps your team maintain a common form of communication for consistent production results.



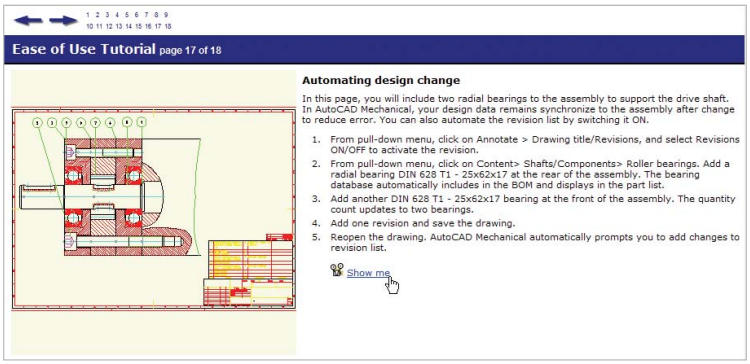
Title Blocks and Revision Blocks

Get your company drawings started quickly with uniform title and revision blocks. AutoCAD Mechanical includes a full set of configurable title and revision blocks in both English and metric units. Customize these blocks with company-specific information, and then make them available throughout your organization for consistency in drawing deliverables.



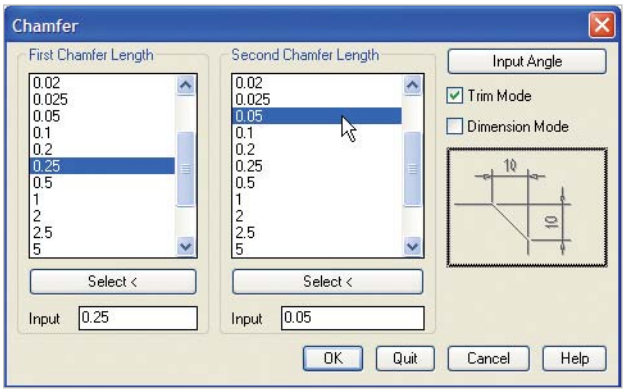
ENHANCED Help System Tutorials, Show Me Animations, Explanations, and Examples

Jump-start your understanding of the most popular features in AutoCAD Mechanical with animations and tutorials that make it easy to learn the software. The AutoCAD Mechanical help system offers a variety of learning mediums, including workflow-based tutorials, feature animations, and in-depth examples.



Associative Detailing Tools

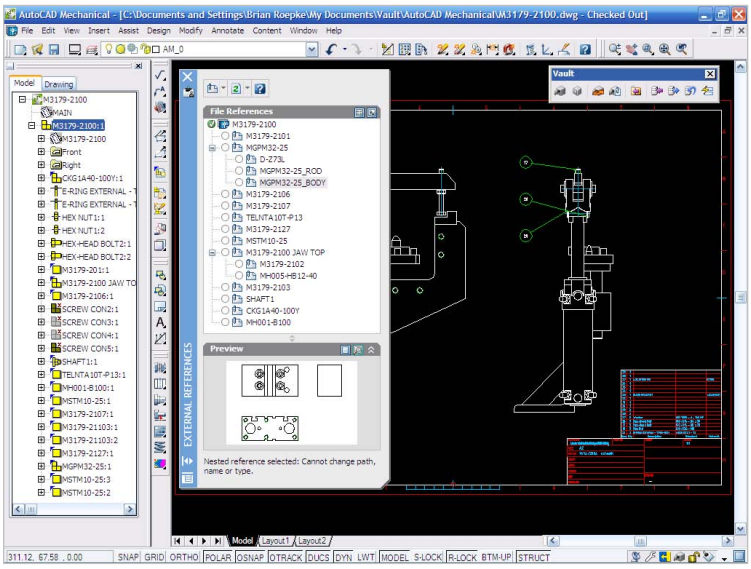
Because a design or plan is just a starting point for further refinements, fast editing and updating are crucial to your productivity. After the initial creation of a feature, the AutoCAD Mechanical drafting tools retain the original operation so you don't have to edit from scratch. For example, to edit the size of a chamfer, simply select the geometry and change the parameters. The ability to edit previous operations makes drawing updates fast and easy.



Communicate and Manage Design Data

ENHANCED Autodesk Vault Integration

Integrated with AutoCAD Mechanical, Autodesk® Vault software is a centralized data-management application for workgroups that securely stores and manages work-in-progress design data and related documents. Use it to maximize return on your company's investment in design data by driving design reuse.

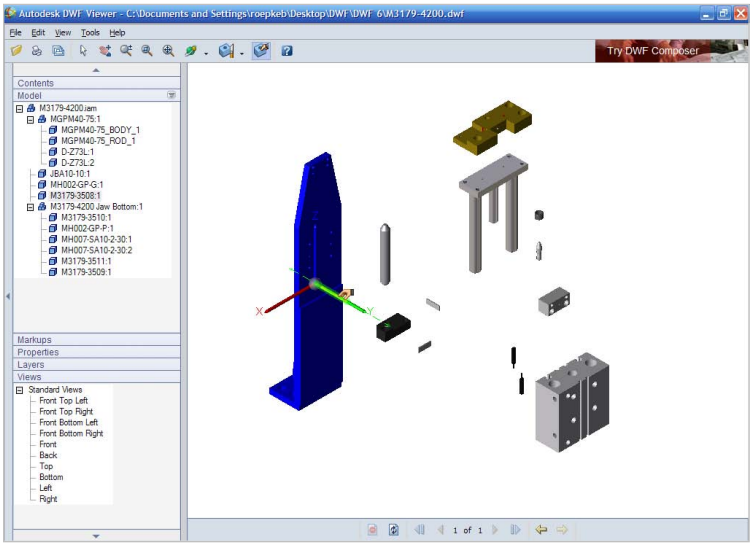


ENHANCED 2D Mechanical Structure Sample Migration Tool

Don't waste time re-creating existing data; reuse that data instead by migrating it to 2D mechanical structure. This sample migration tool supports conversion of blocks to mechanical structure and now includes conversion samples and examples. Written in Microsoft Visual Basic for Applications (VBA) programming language, this tool can be easily customized for the needs of individual users.

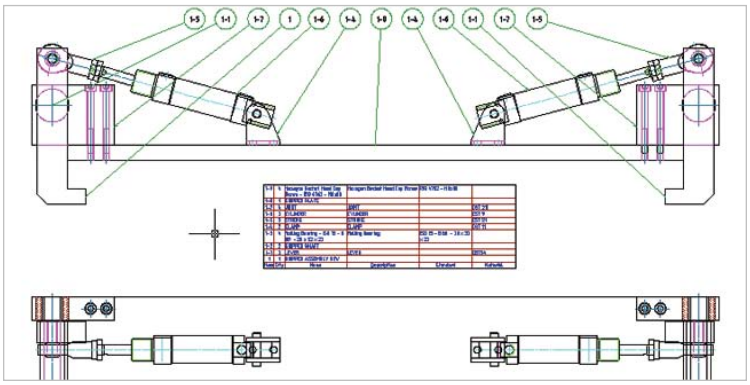
ENHANCED Autodesk DWF

Autodesk® DWF™ technology enables all team members to easily and securely view 2D and 3D designs published directly from Autodesk manufacturing design applications. Use Autodesk® Design Review to easily review, mark up, and print designs. And all extended team members can use the free* Autodesk® DWF™ Viewer application to review and print designs.



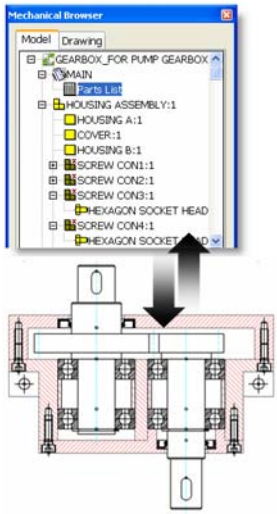
ENHANCED Balloons and Bills of Materials

Create automated and associative part lists and BOMs in AutoCAD Mechanical. Specifically developed for mechanical engineering applications, the software contains commands to automatically create standards-based balloons and part lists that can mirror the mechanical browser content. It supports multiple part lists per drawing and collapsible assemblies, as well as automatic recognition of standard parts inserted from the standards-based library. A central database keeps track of all design data, so you can quickly add attributes to any part of the drawing knowing that all related parts will be updated automatically. You can export or link BOM data to manufacturing resource planning (MRP) or enterprise resource planning (ERP) systems. Even better, this data can be managed by Autodesk® Productstream™ software for release management, change control, BOM management, and other more complex workgroup tasks.



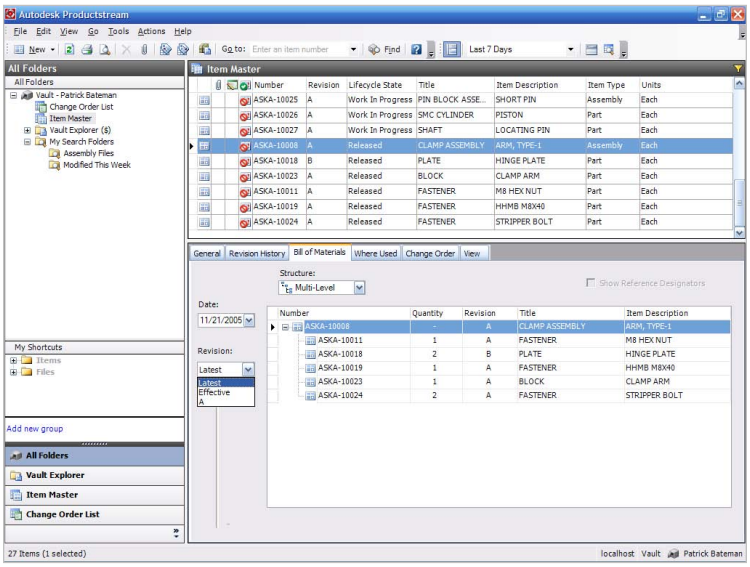
ENHANCED Structure Catalog

The structure catalog is the primary tool for reusing mechanical structure between drawings. Highly flexible file searching capabilities help you locate single parts or entire drawings, which can then be inserted into a design as external references or local copies. Quickly preview the entire design, from the top assemblies to the smallest part, in a format that shows top, front, and side views simultaneously. Completed drawings become instant libraries available for linked or copied reuse. Additional integration with Autodesk Vault software makes it easier to track file dependencies and keep your extended team up-to-date.



ENHANCED Autodesk Productstream

Help ensure your company's designs are complete, accurate, approved, and released to manufacturing in a timely and effective manner. Autodesk Productstream software automates the release management process by managing engineering changes and bills of materials while the engineering department maintains control of the design data.



The Autodesk Solution for Manufacturing

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