

CATIA V5R13

Course Catalog
March 2004 Edition

محل برگزاری دوره :

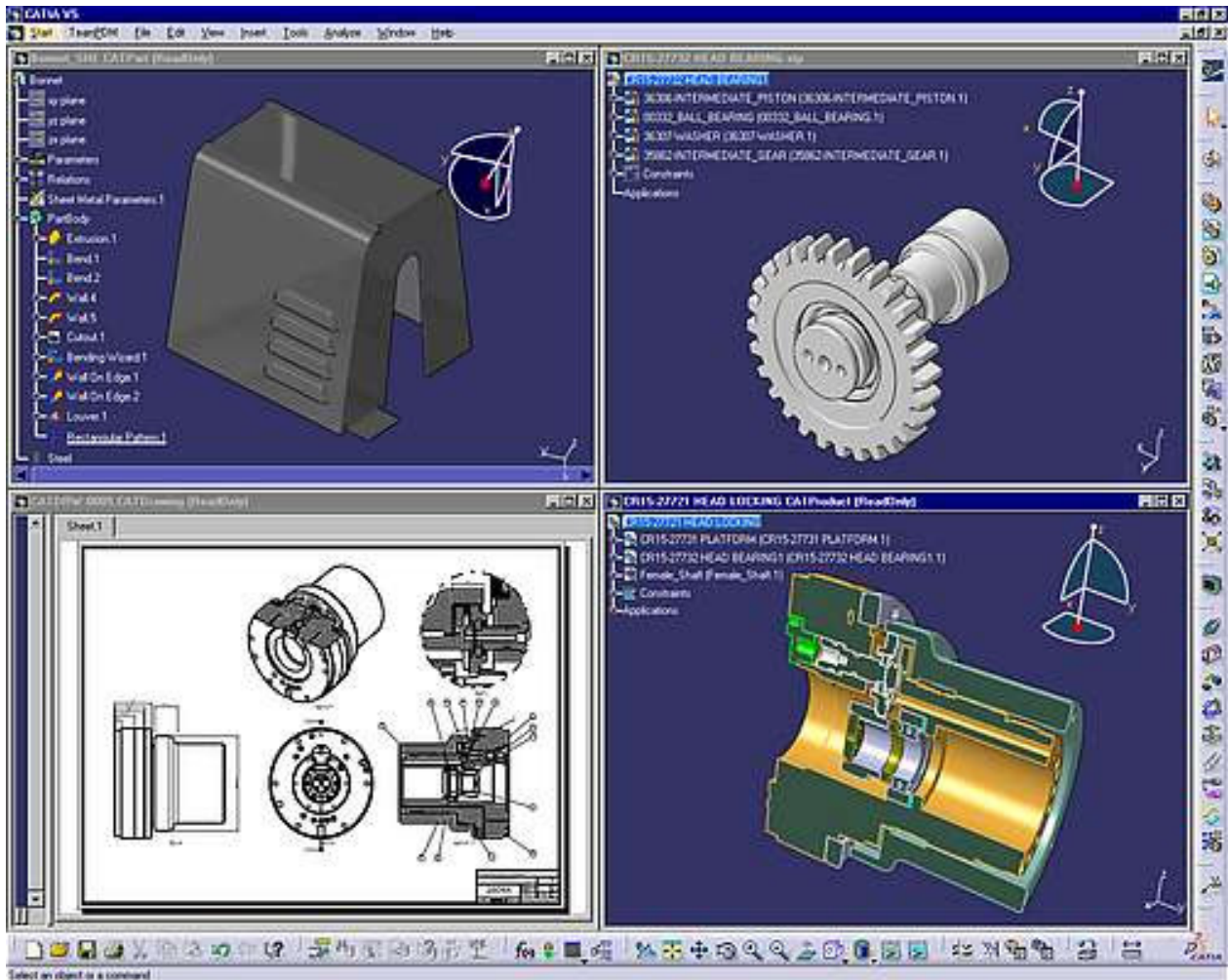
جهاد دانشگاهی دانشکده فنی دانشگاه تهران

تدوین و تدریس :

مهندس محمدرضا زارع پور

مدت دوره :

45 ساعت



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

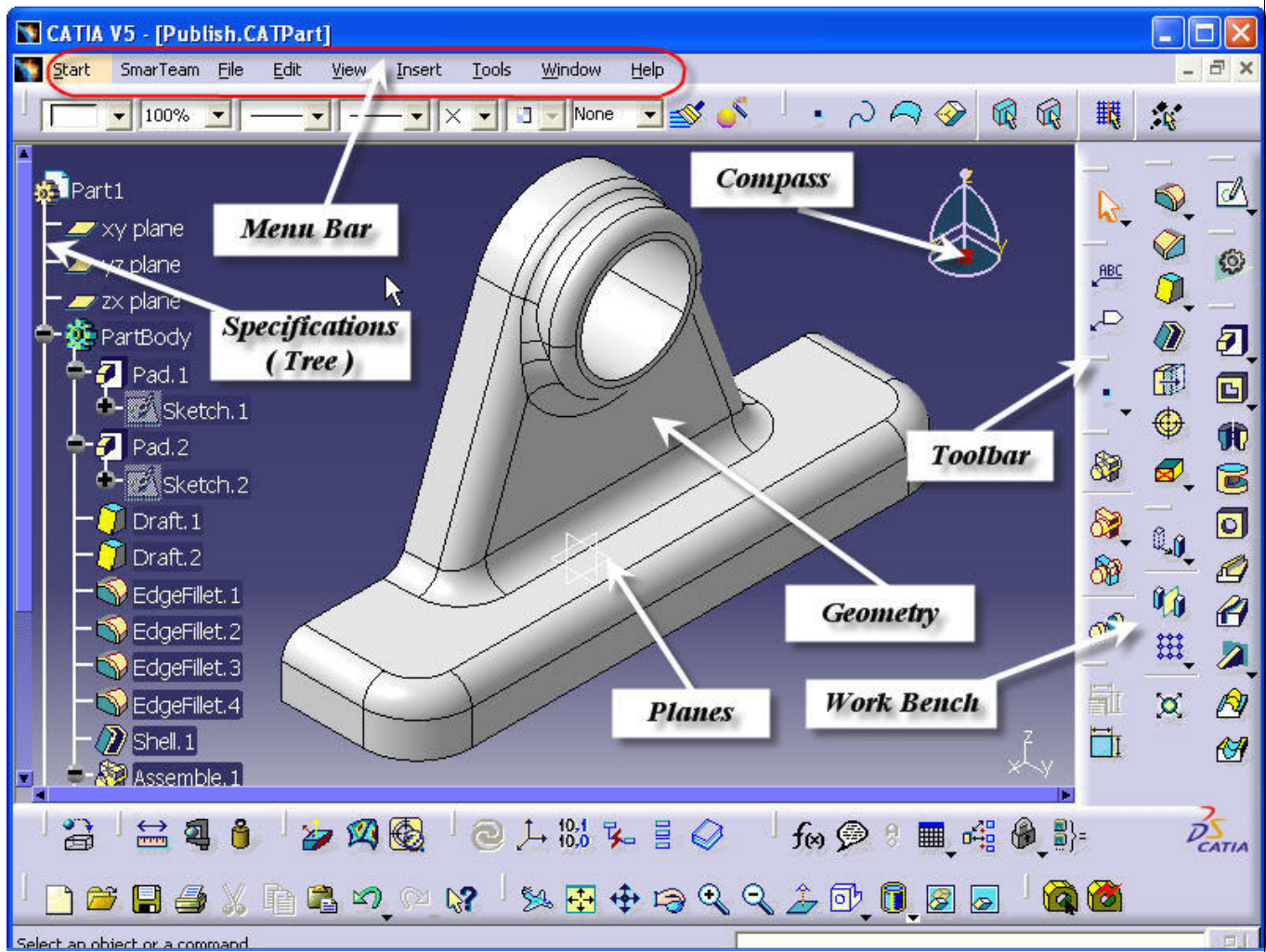
➤ **Infrastructure Solutions**

- Getting Started with CATIA V5 (F)

➤ **Mechanical Design Solutions**

- Sketcher
- Part Design
- Product Design
- Interactive & Generative Drafting
- Sheet Metal Design (F)

CATIA v5 معرفی پنجره نرم افزار



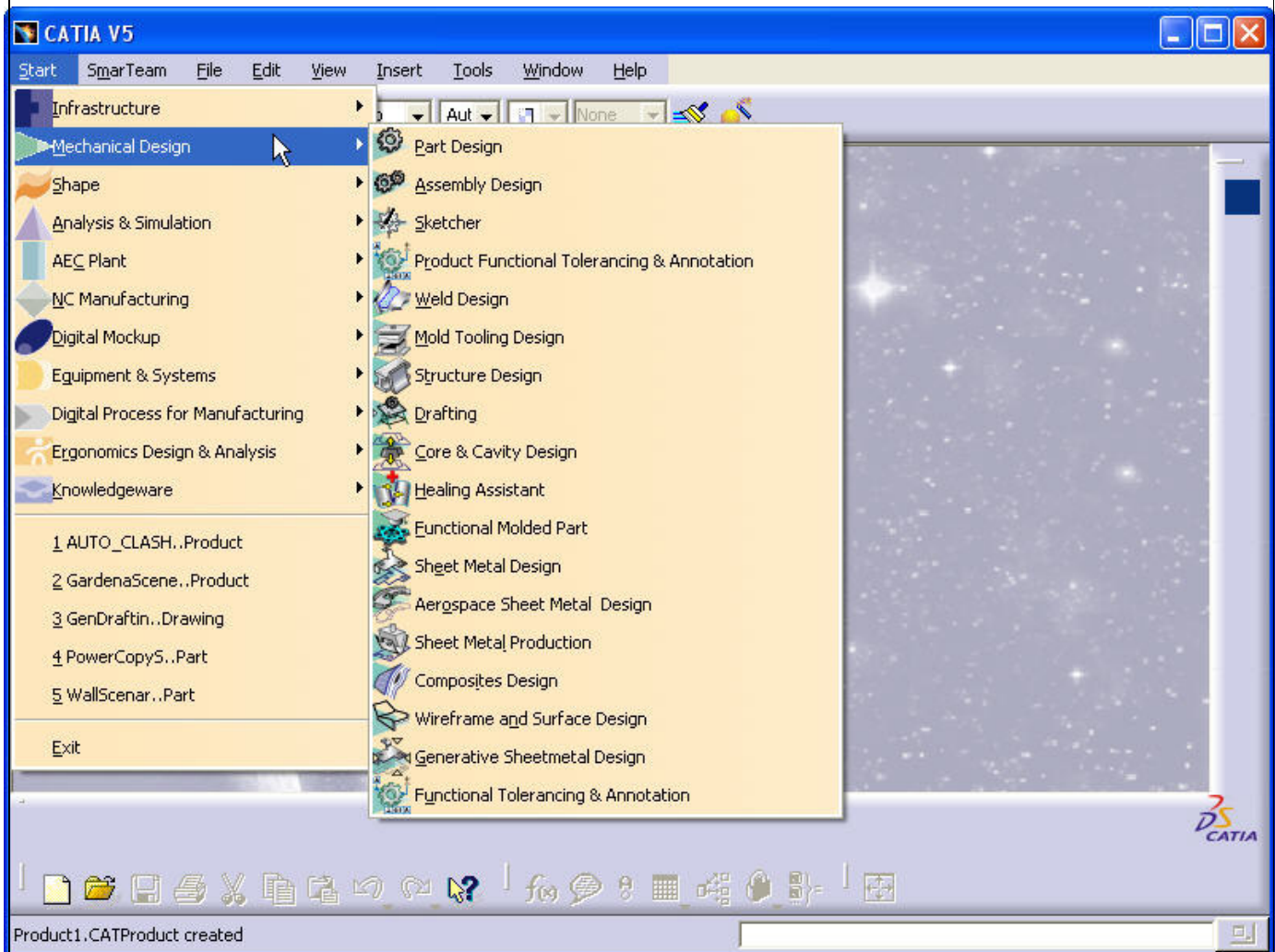
Workbench Description

Start
Menu Bar
Standard Toolbar
View Toolbar
Capture Toolbar
Graphic Properties Toolbar
Keyboard Shortcuts

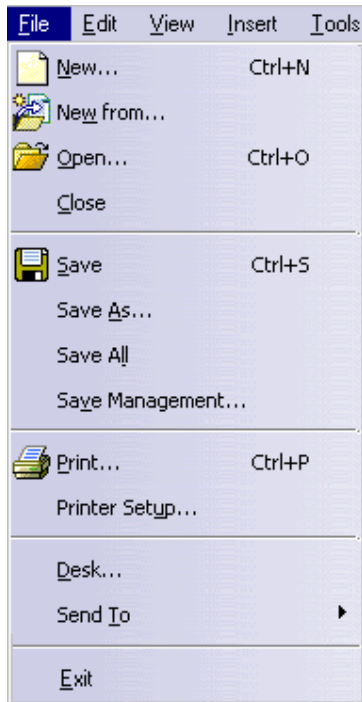
Infrastructure Menu Bar



Start



File



For...

New...

New from...

Open...

Close

Save

Save As

Save All

Save

Management

Print...

**Printer
Setup...**

Desk...

Send To

See...

[Creating New Documents](#)

[Creating a New Document
from an Existing One](#)

[Opening Existing
Documents](#)

[Closing Documents](#)

[Saving Existing Documents](#)

[Saving Documents For the
First Time or Under
Another Name](#)

[Saving Documents In Other
Formats](#)

[Saving All Documents](#)

[Managing Document Save](#)

[Customizing Print Settings
Before Printing Your
Documents](#)

[Setting Up Your Printers on
UNIX and Windows](#)

[Using the FileDesk
Workbench](#)

[Transferring Version 5 Data](#)

Edit



For...

Undo

Redo/Repeat

Cut

Copy

Paste

Paste Special...

Delete

Search...

Selection Sets...

Selection Sets Edition...

Find Owing Selection Sets...

Sets...

Links...

Properties...

Other Selection...

See...

[Undoing Actions](#)

[Redoing and Repeating Actions](#)

[Cutting and Pasting Objects](#)

[Copying and Pasting Objects](#)

[Cutting and Pasting Objects](#)

[Copying and Pasting Objects](#)

[Using the Paste Special... command](#)

[Deleting Objects](#)

[Selecting Using the Search... Command](#)

[Storing Selections](#)

[Using Selection Sets](#)

[Editing Selection Sets](#)

[Storing Selections](#)

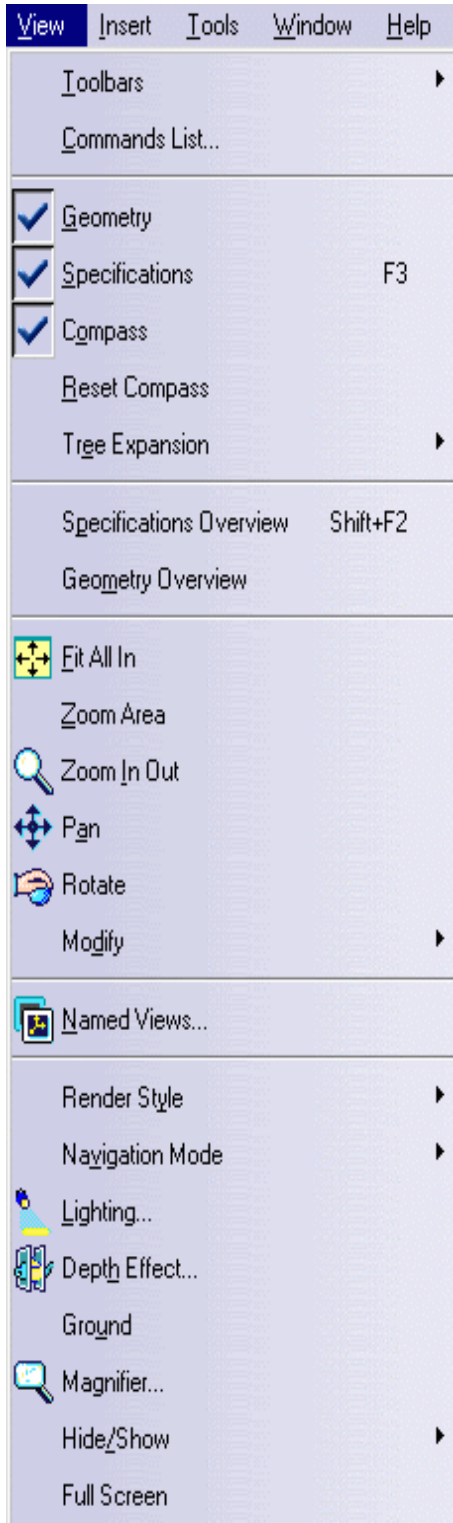
[Using Selection Sets](#)

[Editing Document Links](#)

[Displaying and Editing Graphic Properties](#)

[Selecting Using the Other Selections... Command](#)

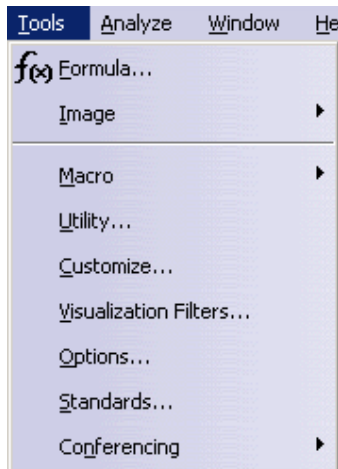
View



For...	See...
Toolbars	Viewing and Hiding Toolbars
Commands List...	Viewing the Commands List
Geometry	Setting Document Window Layout Preferences
Specifications	Setting Document Window Layout Preferences
Compass	About the 3D Compass
Reset Compass	Manipulating Objects
Tree Expansion	Using the Mouse and Compass
Specifications Overview	Expanding and Collapsing the Spec Tree
Geometry Overview	Using the Overview on the Specification Tree
Fit All In	Using the Geometry Overview
Zoom Area	Fitting All Geometry in the Geometry Area
Zoom In Out	Zooming In On An Area
Pan	Zooming In
Rotate	Zooming Out
Modify->Look At	Panning
Modify->Turn Head, Zoom In, Zoom Out, Normal View	Rotating
Named Views...	Looking At Objects
Render Style	Turning Your Head To View An Object
Navigation Mode	Zooming In
	Zooming Out
	Viewing Along a Normal to a Plane
	Using Standard and User-Defined Views
	Using Rendering Styles
	Navigating

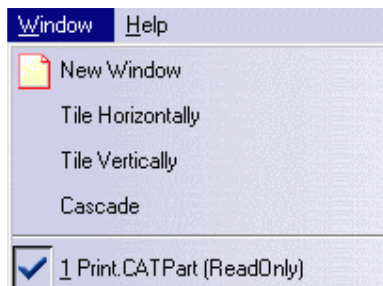
Lighting...	Setting Lighting Effects
Depth Effect...	Setting Depth Effects
Ground	Viewing Objects against the Ground
Magnifier...	Magnifying
Hide/Show	Hiding and Showing Objects
Full Screen	Using the Full Screen

Tools



For...	See...
Formula...	Using Knowledgeware Capabilities
Image	Capturing and Managing Images for the Album
Macro	Recording, Running and Editing Macros
Utility...	Using the Batch Monitor
Customize...	Customizing Toolbars
Visualization Filters...	Using Visualization Filters
Options...	Customizing Settings
Standards...	Customizing Standards
Conferencing	Conferencing













Window



For...	See...
New Window	Using Document Windows
Tile Horizontally	Using Document Windows
Tile Vertically	Using Document Windows
Cascade	Using Document Windows







Standard Toolbar


















-  [Creating New Documents](#)
-  [Opening Existing Documents](#)
-  [Saving Existing Documents](#)
-  [Printing a Document Quickly without Customizing Print Settings](#)
-  [Cutting and Pasting Objects](#)
-  [Copying and Pasting Objects](#)
-  [Cutting and Pasting Objects, and Copying and Pasting Objects](#)
-  [Undoing Actions](#)
-  [Undoing Actions](#)
-  [Redoing and Repeating Actions](#)
-  [Redoing and Repeating Actions](#)
-  [Using the What's This? Command](#)

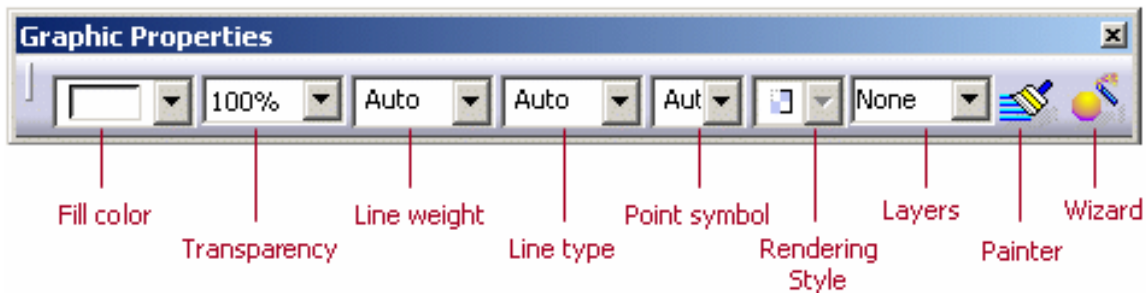
View Toolbar



-  [Navigating in Fly Mode](#)
-  [Navigating in Fly Mode](#)
-  [Navigating in Walk Mode](#)
-  [Navigating in Examine Mode](#)
-  [Fitting All Geometry in the Geometry Area](#)
-  [Turning Your Head To View An Object](#)

-  [Navigating in Fly Mode](#), [Navigating in Walk Mode](#)
-  [Navigating in Fly Mode](#), [Navigating in Walk Mode](#)
-  [Viewing Along a Normal to a Plane](#)
-  [Using Standard Views](#)
-  [Using Standard Views](#)
-  [Using Standard Views](#)
-  [Using Standard Views](#)
-  [Using Standard Views](#)
-  [Using Standard Views](#)
-  [Using Standard Views](#)
-  [Panning](#)
-  [Rotating](#)
-  [Zooming In](#)
-  [Zooming Out](#)
-  [Shading \(SHD\)](#)
-  [Shading with All Edges](#)
-  [Shading with Edges without Smooth Edges](#)
-  [Shading with Edges and Hidden Edges](#)
-  [Shading with Material](#)
-  [Customizing the View Mode](#)
-  [Hiding Objects](#)
-  [Displaying Hidden Objects](#)

Graphic Properties Toolbar



Capture Toolbar



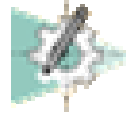
-  [Capturing Simple Images](#)
-  [Capturing Selected Areas of Images](#)
-  [Capturing Simple Images](#)
-  [Capturing Selected Areas of Images](#)
-  [Capturing Simple Images](#)
-  [Capturing Simple Images](#)

Keyboard Shortcuts

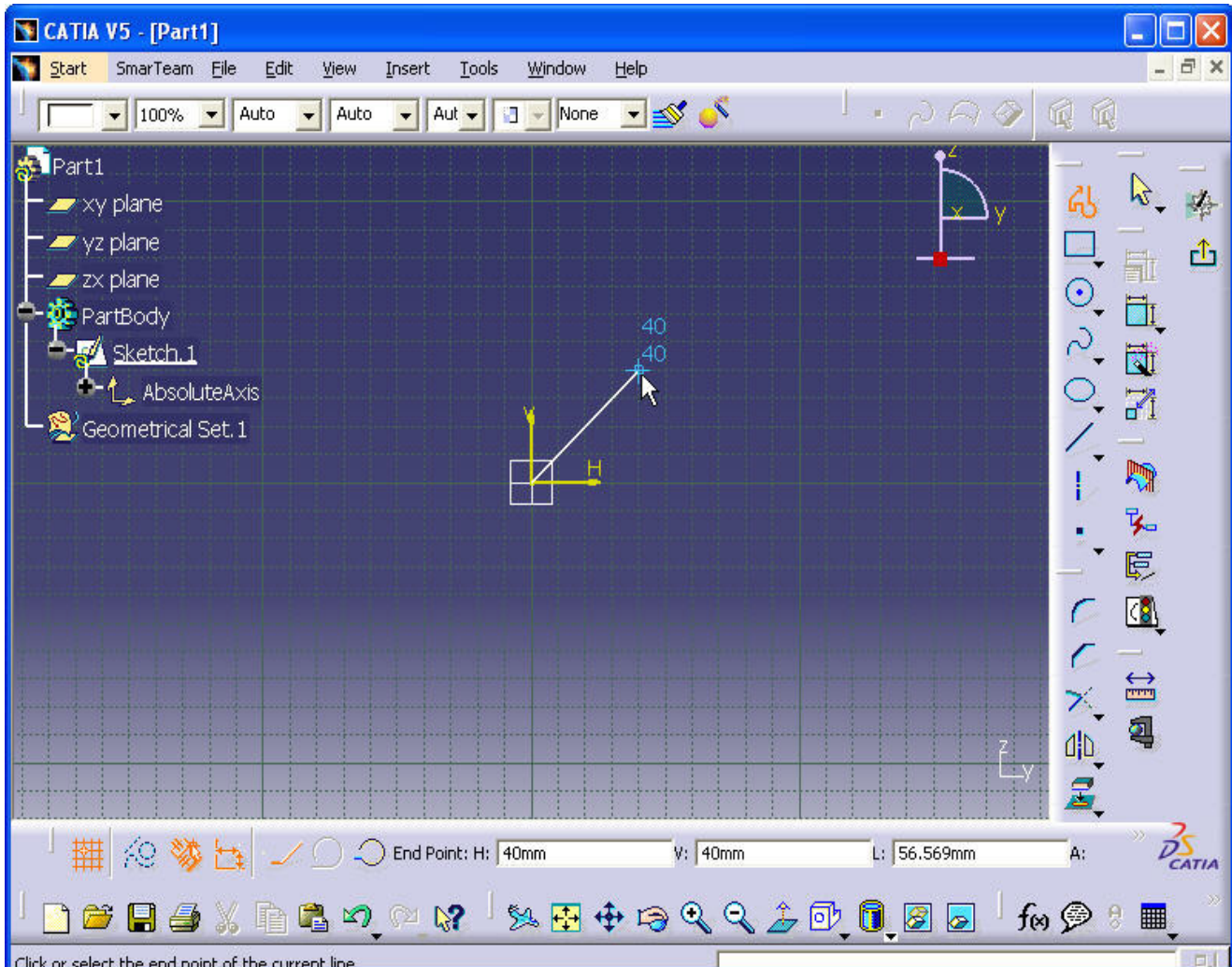
Use this keyboard key (or combination)...	To...
Escape	Exit the current dialog box (when there is one)
F1	Get contextual online help
Shift + F1	Get help on toolbar icons
Shift + F2	Toggle the specification tree overview on and off
F3	Toggle specification tree display on and off
Alt + F8	Run macros
Shift + F3	Activate the graph if the model is active and inversely
Home	Display the top of the graph
End	Display the bottom of the graph
Page Up	Relocate the graph one page up
Page Down	Relocate the graph one page down
Ctrl + Page Up	Zoom In the graph
Ctrl + Page Down	Zoom Out the graph
Up arrow	Relocate the graph 1/10th (one tenth) of a page to the top

Down arrow	Relocate the graph 1/10th (one tenth) of a page to the bottom
Left arrow	Relocate the graph 1/10th (one tenth) of a page to the left
Right arrow	Relocate the graph 1/10th (one tenth) of a page to the right
Ctrl + Tab	Swap active document windows
Alt + Enter	Run the Properties... command
Ctrl + C	Run the Copy command
Ctrl + F	Run the Search... command
Ctrl + G	Run the Selection Sets... command
Ctrl + N	Run the New... command
Ctrl + O	Run the Open... command
Ctrl + P	Run the Print... command
Ctrl + S	Run the Save... command
Ctrl + V	Run the Paste command
Ctrl + X	Run the Cut command
Ctrl + Y	Run the Redo command
Ctrl + Z	Run the Undo command

Sketcher



Start -> Mechanical Design -> Sketcher



Sketcher Toolbar

Sketch tools

Profiles

Constraints

Operations

Tools

Sketcher Toolbar



[Starting a Sketch](#)



[Starting a Sketch](#)



[Creating a Pad in the *Part Design User's Guide*](#)

Sketch Tools



[Snap to Point](#)



[Setting Constraints](#)



[Creating Corners](#)



[Creating Corners \(One Element Trimmed\)](#)


















[Creating Corners \(No Element Trimmed\)](#)



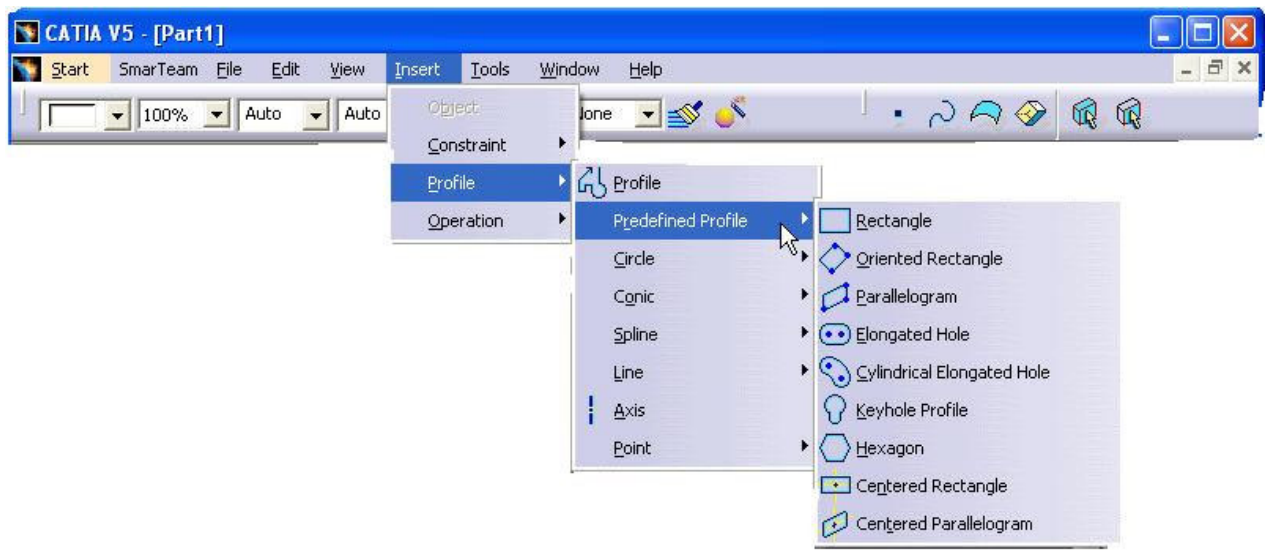
[Creating Corners \(Standard Lines Trim\)](#)



[Creating Corners \(Construction Lines Trim\)](#)

	Creating Corners (Construction Lines Not trimmed)
	Creating Chamfers with Both Elements Trimmed
	Creating chamfers with One Element Trimmed
	Creating Chamfers with No Element Trimmed
	Creating Chamfer with Standard Lines Trimmed
	Creating Chamfer with Construction Lines Trimmed
	Creating Chamfers (Construction Lines Not trimmed)
	Creating Standard or Construction Elements
	Setting Constraints
	Trimming Elements With Both Elements Trimmed
	Trimming Elements With One Element Trimmed
	Trimming Multiple Elements
	Closing Elements
	Breaking and Trimming Elements
	Creating Symmetrical Elements

Profiles Toolbar

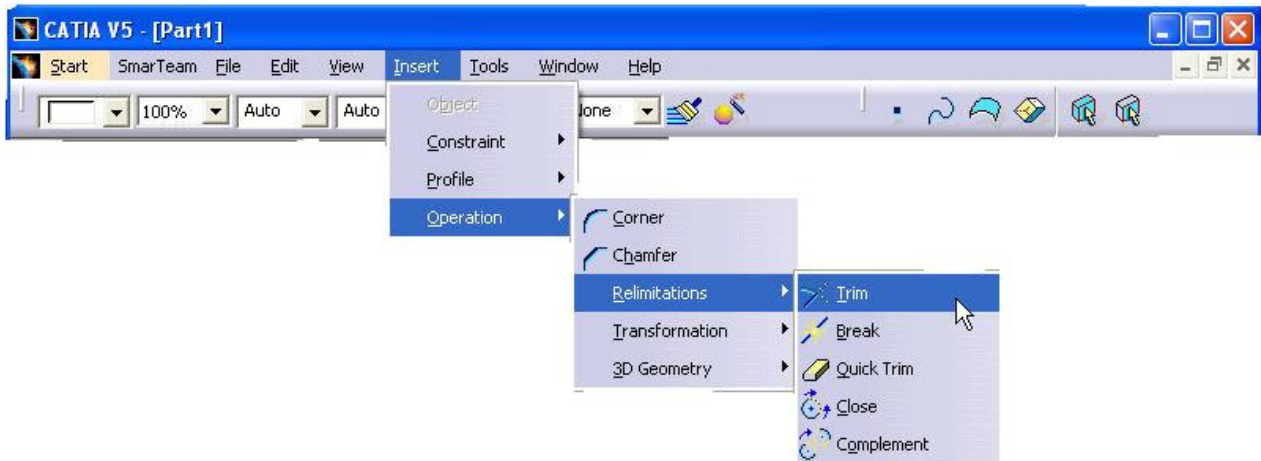










	Profiles
	Rectangles
	Oriented Rectangles
	Parallelograms
	Oblong Profiles
	Oblong Arcs
	Keyhole
	Hexagons
	Lines
	Infinite Line
	Line Normal to a Curve
	Axes
	Basic Circles
	Three Point Circles
	Circles Using Coordinates
	Tri-Tangent Circle
	Ellipses
	Parabola
	Hyperbola
	Conic
	Basic Arcs
	Arcs Three Point
	Arcs Three Point via Limits
	Splines
	Connecting Curves with a Spline and Connecting Curves with an Arc
	Bi-Tangent Line
	Bisecting Line
	Centered Rectangle
	Centered Parallelogram

	Points
	Points Using Coordinates
	Equidistant Points
	Intersection
	Projection Point

Operation Toolbar



	Creating Corners (Both Elements Trimmed)
	Creating Corners (One Element Trimmed)
	Creating Corners (No Elements Trimmed)
	Creating Chamfers with Both Elements Trimmed
	Creating Chamfers with One Element Trimmed
	Creating Chamfers with No Elements Trimmed



[Trimming Elements](#)



[Breaking Elements](#)



[Breaking and Trimming](#)



[Moving Element by Symmetry](#)



[Creating Mirrored Elements](#)



[Translating Elements](#)



[Rotating Elements](#)



[Scaling Elements](#)



[Offsetting Elements](#)



[Projecting 3D Elements onto the Sketch Plane](#)

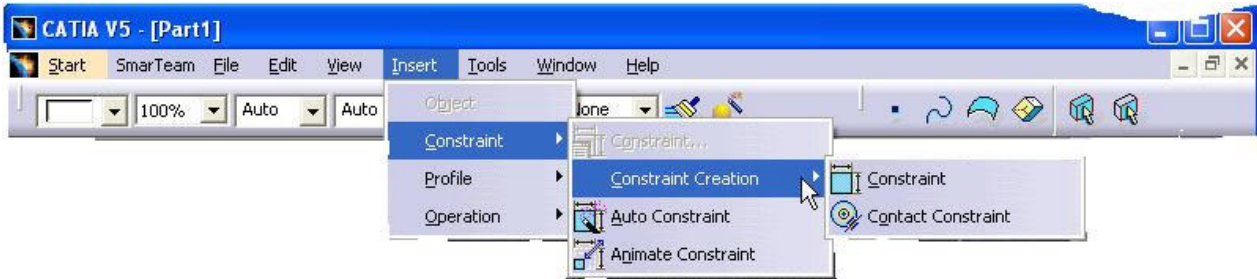


[Intersecting 3D Elements with the Sketch Plane](#)



[Projecting 3D Silhouette Edges](#)

Constraints Toolbar



[Creating Constraints via a Dialog Box](#)



[Quickly Creating Dimensional/Geometrical Constraints](#)



[Creating a Contact Constraint](#)



[Auto-constraining a group of Elements](#)



[Animating Constraint](#)

Tools Toolbar



[Cutting the Part by the Sketch Plane](#)



[Creating Datums](#)



[Creating Output Features](#)



[Performing a Light Sketch Analysis](#)

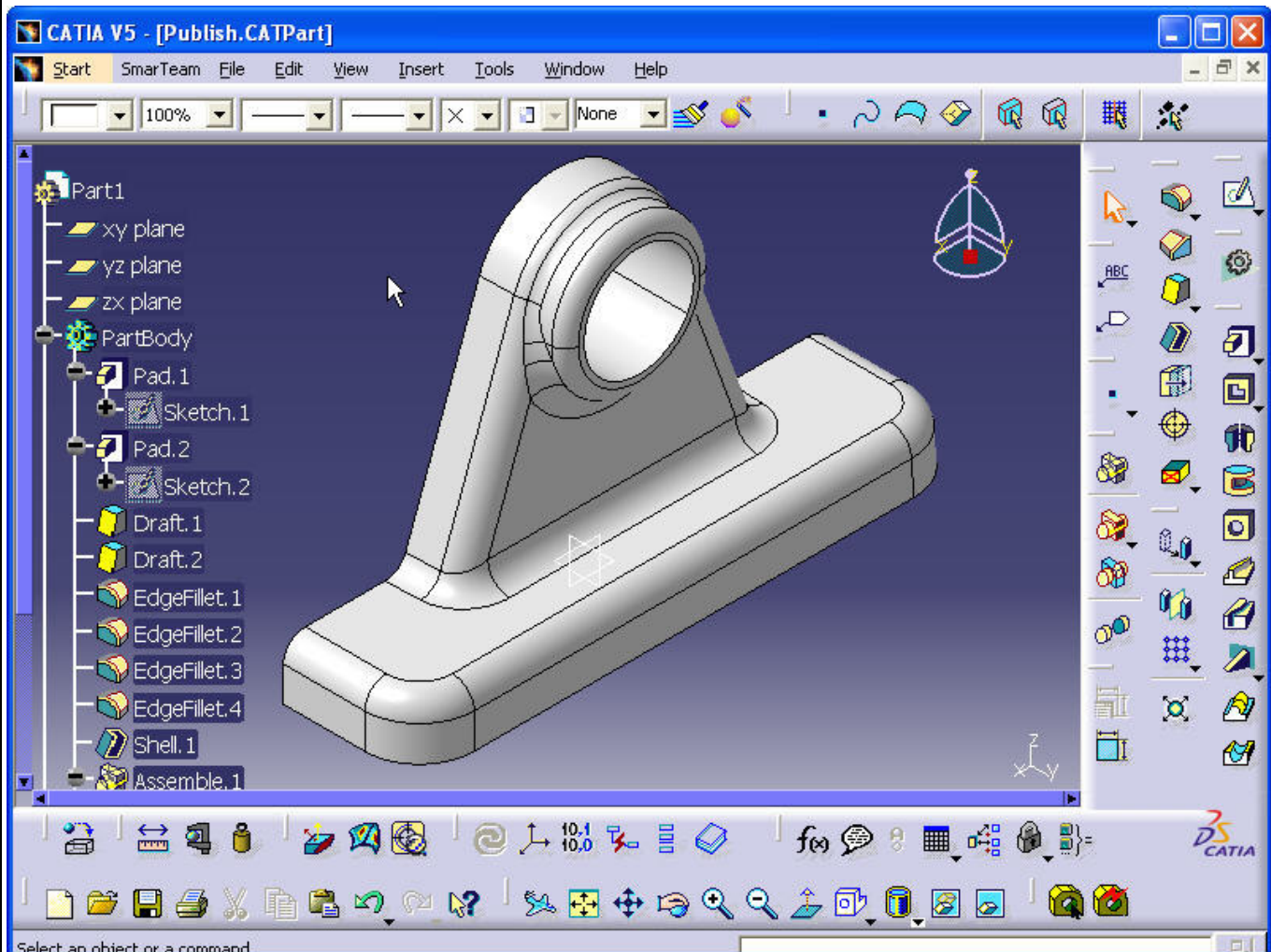


[Analyzing the Sketch](#)

Part Design



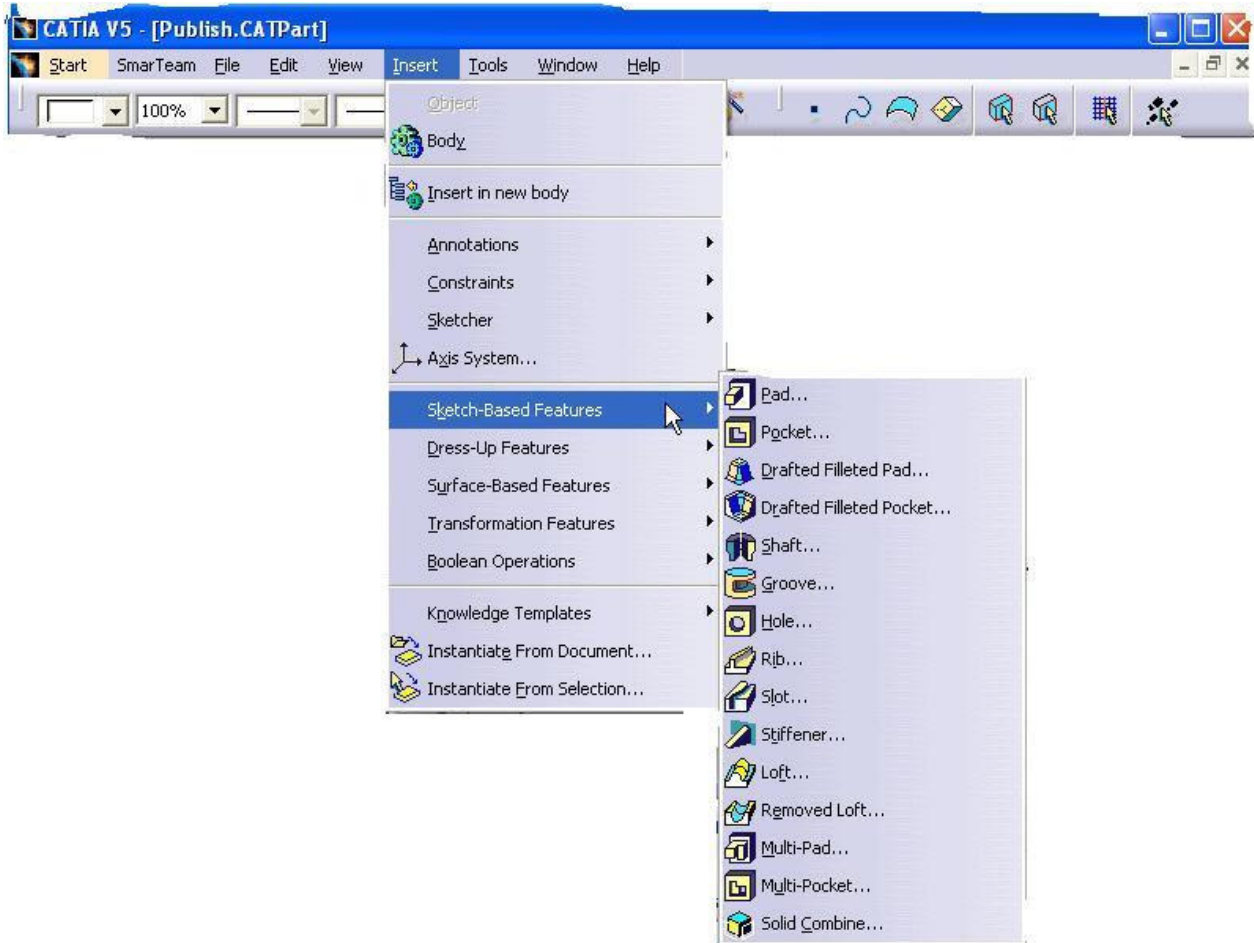
Start -> Mechanical Design -> Part Design



Workbench Description

- Sketch-Based Features Toolbar
- Dress-Up Features Toolbar
- Surface-Based Features Toolbar
- Transformation Features Toolbar
- Reference Elements Toolbar
- Boolean Operations Toolbar
- Sketcher Toolbar
- Constraints Toolbar
- Analysis Toolbar
- Annotations Toolbar
- Tools Toolbar
- Insert Toolbar

Sketch-Based Features Toolbar



[Pad](#)



[Drafted Filleted Pad](#)



[Pocket](#)



[Drafted Filleted Pocket](#)



[Shaft](#)



[Multi-Pad](#)



[Multi-Pocket](#)



[Groove](#)



[Hole](#)



[Rib](#)



[Slot](#)



[Solid Combine](#)



[Stiffener](#)

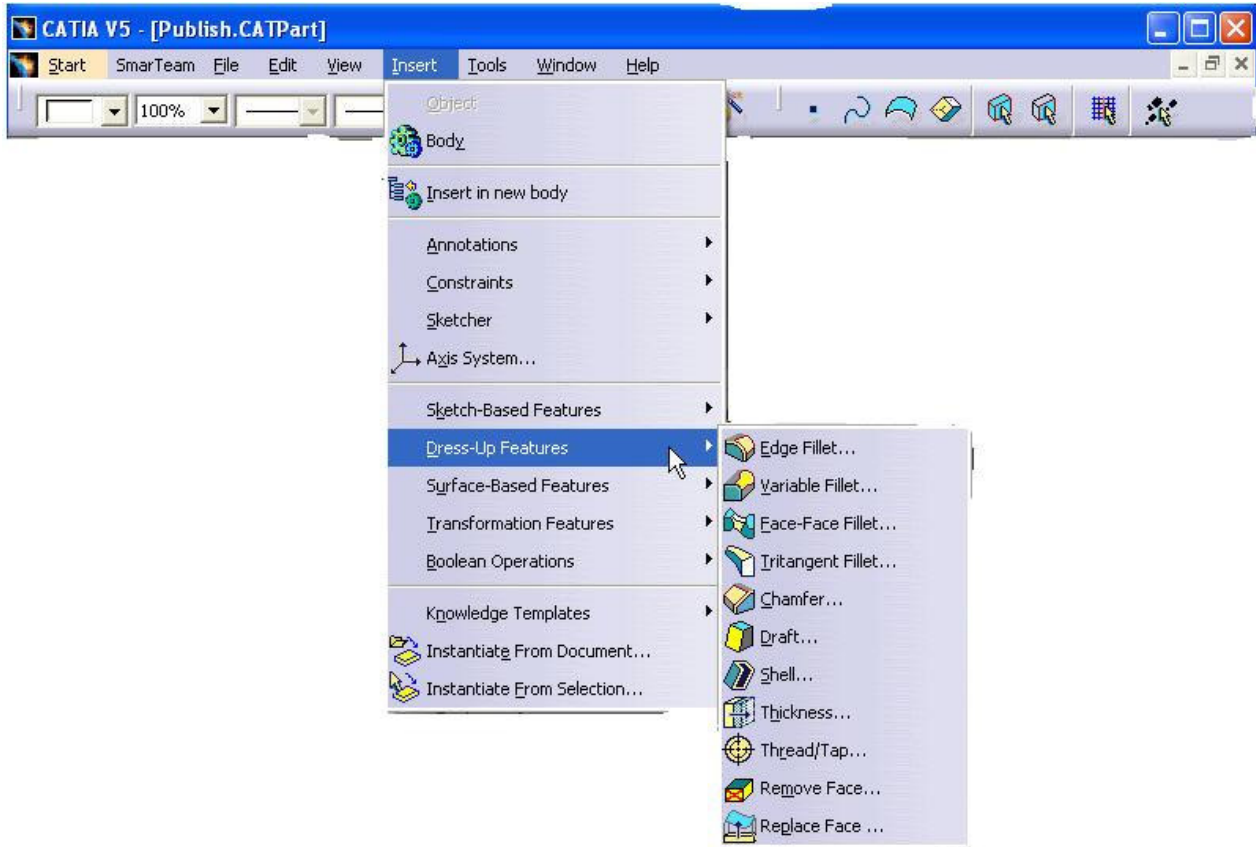


[Multi-sections Solid](#)



[Removed Multi-sections Solid](#)

Dress-Up Features Toolbar



 [Edge Fillet](#)

 [Variable Radius Fillet](#)

 [Face-Face Fillet](#)



[Tritangent Fillet](#)



[Chamfer](#)



[Basic Draft](#)



[Draft from Reflect Lines](#)



[Variable Angle Draft](#)



[Advanced Draft](#)



[Shell](#)



[Thickness](#)



[Thread](#)

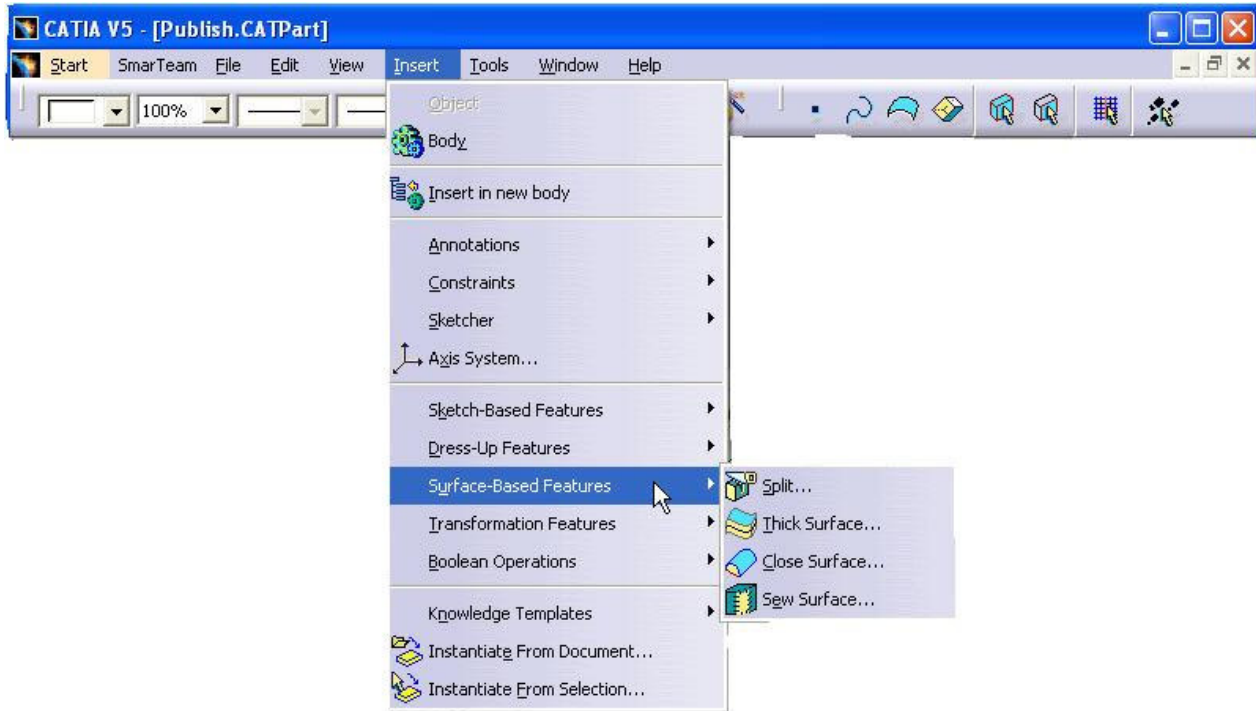


[Replace Faces](#)



[Remove Faces](#)

Surface-Based Features Toolbar



[Split](#)



[Thick Surface](#)

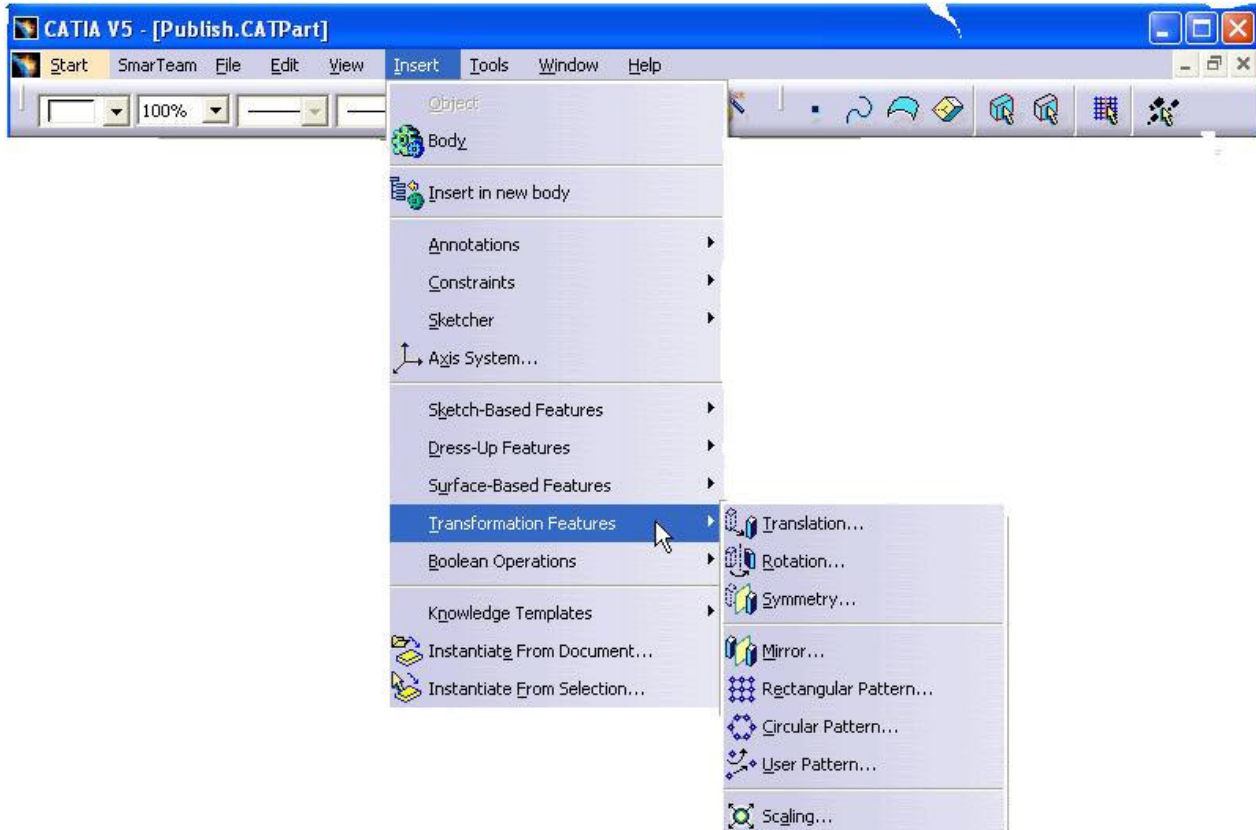










[Close Surface](#)



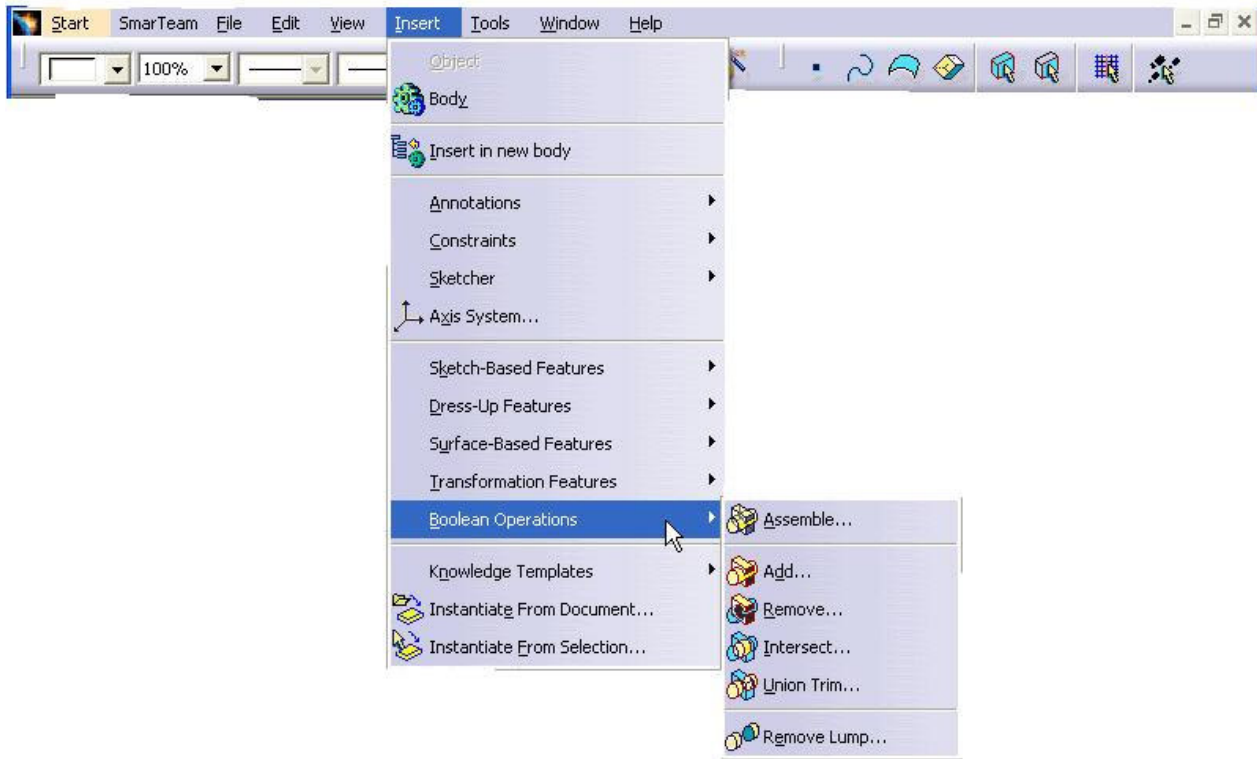
[Sew Surface](#)

Transformation Features Toolbar



	Translation
	Rotation
	Symmetry
	Mirror
	Rectangular Pattern
	Circular Pattern
	User Pattern
	Scaling

Boolean Operations Toolbar



 [Assembling Bodies](#)

 [Adding Bodies](#)

 [Removing Bodies](#)

 [Intersecting Bodies](#)

 [Trimming Bodies](#)

 [Keeping and Removing Faces](#)

Reference Elements Toolbar



**View -> Tool bars -> Reference Elements
(extended/compact).**

 [Points](#)

 [Lines](#)

 [Planes](#)

Sketcher Toolbar



 [Sketcher User's Guide.](#)

 [Change the Sketch Support.](#)

Constraints Toolbar



 [Setting Constraints](#)

 [Setting Constraints Defined in Dialog Box](#)

Analysis Toolbar



[Performing a Draft Analysis](#)



[Performing a Surfacic Curvature Analysis](#)



[Tap-Thread Analysis](#)

Annotations Toolbar



[Creating Texts With Leaders](#)



[Creating Flag Notes](#)

Tools Toolbar



[Updating Parts](#)



[Axis System](#)



[Mean Dimensions](#)



[Creating Datums](#)



[Customizing the Tree and Geometry View](#) and [Associating Bodies](#)



Infrastructure User's guide Version 5 (Browsing a Catalog)

Insert Toolbar

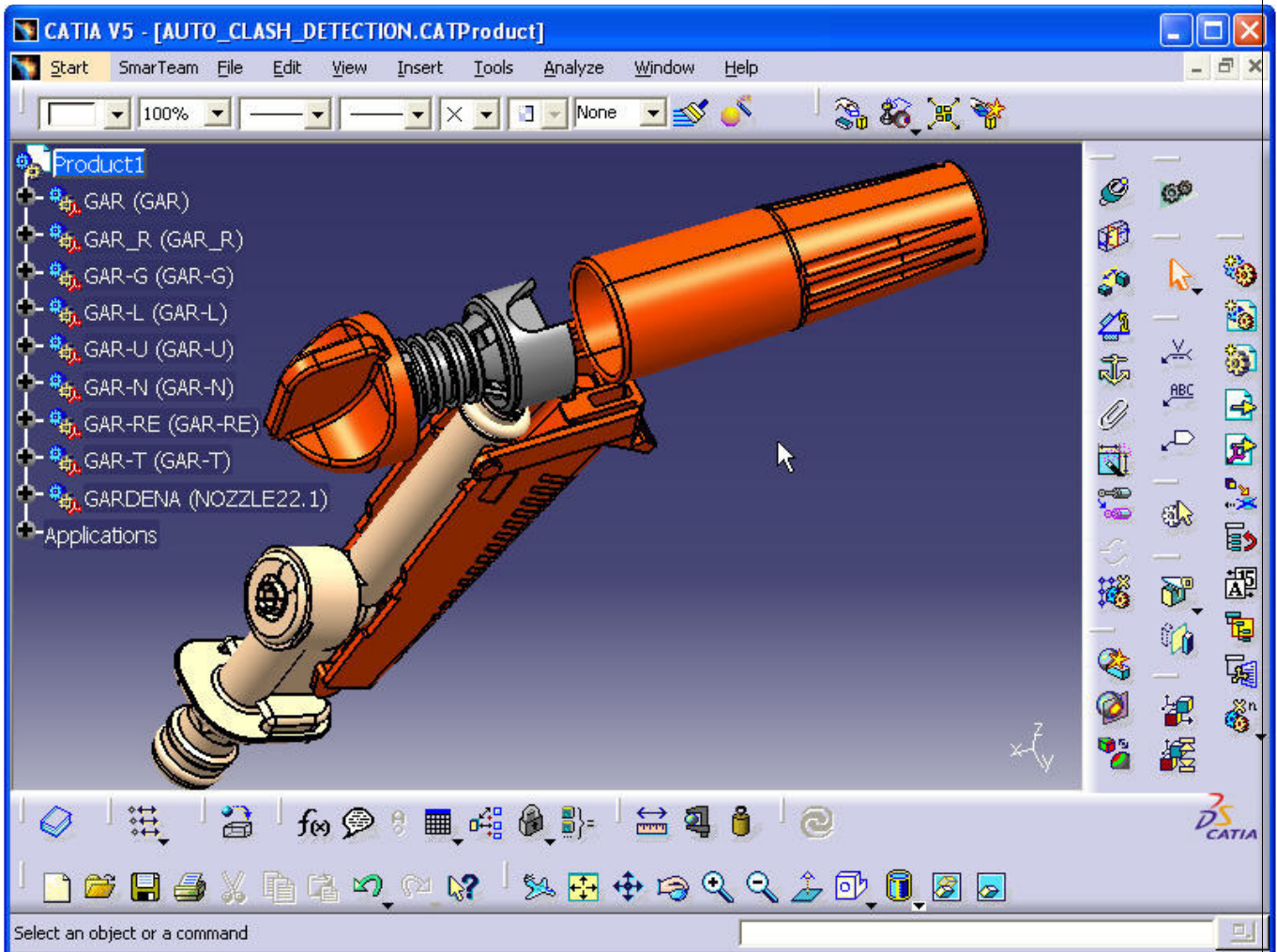


[Inserting a New Body](#)



[Inserting Features into a New Body](#)

Start -> Mechanical Design -> Assembly Design



Workbench Description

- Product Structure Tools Toolbar
- Update Toolbar
- Move Toolbar
- Constraints Toolbar
- Assembly Features Toolbar
- Annotations Toolbar
- Space Analysis Toolbar
- Scenes Toolbar

Assembly Design Menu Bar

Start

File

Edit

View

Insert

Tools

Analyze

Windows

Help

Edit



For...

...

Update

[Updating an Assembly](#)

Move

[Moving Components](#)

Component
Constraints

[Selecting Constraints
of Given Components](#)

Properties

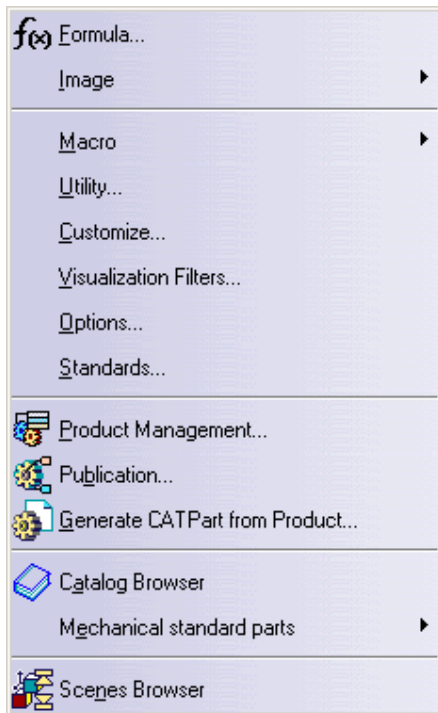
[Modifying the Properties
of a Constraint](#)

Insert



For...	...
Coincidence...	Creating a Coincidence Constraint
Contact...	Creating a Contact Constraint
Offset...	Creating an Offset Constraint
Angle...	Creating an Angle Constraint
Fix Together...	Fixing Components Together
Fix	Fixing a Component
Quick Constraint	Using the Quick Constraint Command
Reuse Pattern...	Using a Part Design Pattern
Document Template Creation...	Working with Interactive Templates
Create Scene	Creating an Enhanced Scene
Fast Multi-Instantiation	Fast Multi-Instantiation
Define Multi-Instantiation	Defining a Multi-Instantiation
Views	Creating a Projection View, Creating a Section View, Creating a Section Cut
Annotations	Creating Annotations
Assembly Features	Assembly Features

Tools



For...

Options...

Product Management...

Publication...

Generate CATPart from Product...

Mechanical Standard Parts

Scenes Browser

...

[Customizing](#)

[Managing Products in an Assembly](#)

[Using a Standard Part Contained in a Parametric Standard Part Catalog](#)

[Generating CATPart from Product](#)

[Using a Standard Part Contained in a Parametric Standard Part Catalog](#)

[Browsing Enhanced Scenes using the Scenes Browser](#)

Analyze



For...

Update...

Constraints...

Degrees of freedom...

Dependencies...

Mechanical Structure...

Compute Clash...

Measure Item...

Measure Between...

Measure Inertia...

...

[Analyzing Updates](#)

[Analyzing Constraints](#)

[Analyzing Degrees of Freedom](#)

[Analyzing Dependences](#)

[Flexible Sub-Assemblies](#)

[Computing Clash between Components](#)

[Measure Minimum Distances and Angles](#)

[Measure Elements](#)

[Measure Inertia](#)

Clash...

[Detecting Interferences](#)

Sectioning...

[Sectioning](#)

Distance

[Measuring Minimum Distances](#)

Product Structure Toolbar



[Inserting a New Component](#)



[Inserting a New Product](#)



[Inserting a New Part](#)



[Inserting an Existing Component](#)



[Replacing a Component](#)



[Reordering the Tree](#)



[Generating Numbers](#)



[Loading Components](#)



[Unloading Components](#)

Representation Toolbar



[Managing Representations](#)



[Design Mode](#)



[Visualization Mode](#)








[Activate Node](#)



[Deactivate Node](#)

Move Toolbar



-  [Translating Components](#) or [Rotating Components](#)(P1 configuration)
-  [Manipulating Components](#)
-  Jump to [Supports Sub-Toolbar](#)
-  [Exploding a Constrained Assembly](#)
-  [Stop Manipulation on Clash](#)


Supports Sub-Toolbar



-  [Snapping Components](#)
-  [Smart Move](#) or [Smart Move with Viewer](#)

Tools Toolbar



-  [Updating an Assembly](#)

Constraints Toolbar




 [Creating a Coincidence Constraint](#)

 [Creating a Contact Constraint](#)

 [Creating an Offset Constraint](#)

 [Creating an Angle Constraint](#)

 [Fixing a Component](#)

 [Fixing Components Together](#)

 [Using the Quick Constraint Command](#)

 [Flexible Sub-Assemblies](#)

 [Changing Constraints](#)

 [Using a Part Design Pattern](#)

Assembly Features Toolbar




 Jump to [Assembly Features Sub-Toolbar](#)

 [Performing a Symmetry on a Component](#)

Assembly Features Sub-Toolbar



 [Assembly Split](#)

 [Assembly Hole](#) and [Using Hole Series](#)

 [Assembly Pocket](#)

 [Assembly Add](#)

 [Assembly Remove](#)

Annotations Toolbar



[Creating Weld Features](#)



[Creating a Text With Leader](#)



[Creating a Flag Note With Leader](#)

Space Analysis Toolbar



[Detecting Interferences](#)



[Sectioning](#)



[Measuring Minimum Distances](#)

Scenes Toolbar



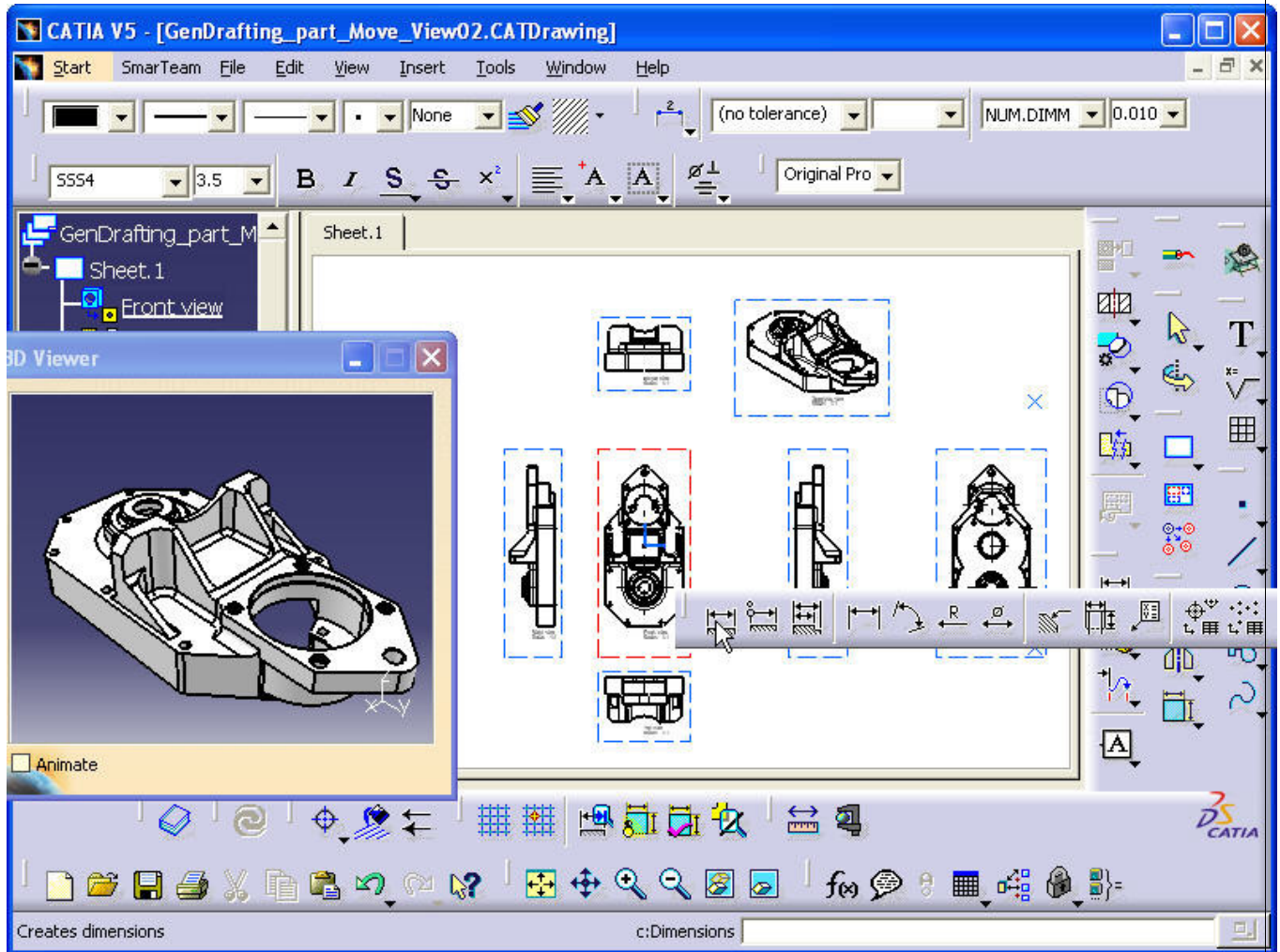
[Creating an Enhanced Scene.](#)



[Browsing Enhanced Scenes using the Scenes Browser.](#)

Generative & Interactive Drafting

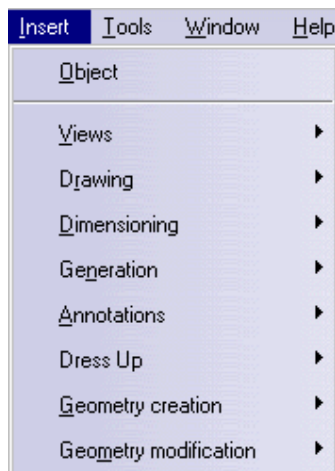
Start -> Mechanical Design -> Drafting



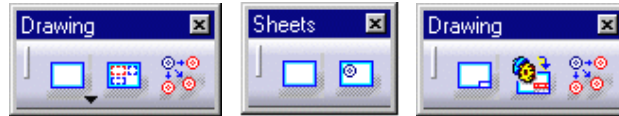
Generative Drafting Toolbars






Generative Drafting Toolbar	Purpose
Drawing	Create sheets, views, 2D components and frame title blocks
Views	Create different kinds of views
Generative View Style	Specify the generative view style that should be used when creating views
Dimension Generation	Generate dimensions and balloons

Interactive Drafting Toolbar	Purpose
Dimensioning	Create all types of dimensions needed for your drawing
Annotations	Add annotations to existing views by creating them
Dress-Up	Add dress-up elements on the drawing
Tools	Activate display and positioning tools
Tools Palette	Use specific options or value fields available for a given command
Properties	
Text Properties	Modify the text properties
Graphic Properties	Modify the graphic properties of all kind of features
Dimension Properties	Modify the dimensions properties
Style	Set the style that will be used to create a new object

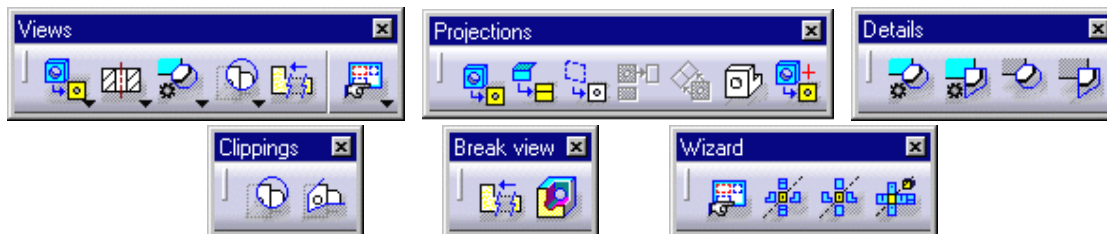









Drawing



-  [Manipulating the Drafting Sheet](#)
-  [Creating a 2D Component](#)
-  [Re-using a 2D component](#)
-  [Creating a 2D Component](#)
-  [Add a generative Bill of Material](#)

Views



-  [Creating a Front View](#)
-  [Creating an Advanced Front View](#)
-  [Creating an Unfolded View](#)
-  [Creating Projection Views](#)
-  [Creating an Auxiliary View](#)
-  [Creating an Offset Section View/Offset Section Cut](#)
-  [Creating an Offset Section View/Offset Section Cut](#)



[Creating an Aligned Section View/Aligned Section Cut](#)



[Creating an Aligned Section View/Aligned Section Cut](#)



[Creating a Quick Detail View/Quick Detail View Profile](#)



[Creating a Detail View/Detail View Profile](#)



[Creating a Detail View/Detail View Profile](#)



[Creating a Clipping View](#)



[Creating a Clipping View](#)



[Creating an Isometric View](#)



[Creating a Broken View](#)



[Creating a Breakout View](#)

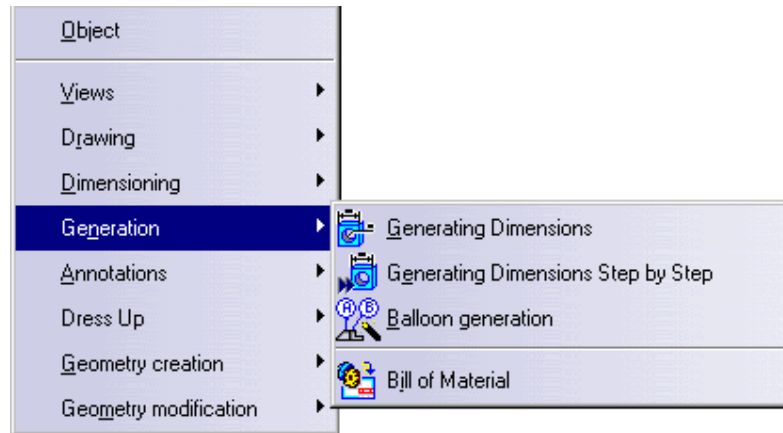


[Creating Views via the Wizard](#)



[Creating Views via the Wizard](#)

Dimension Generation

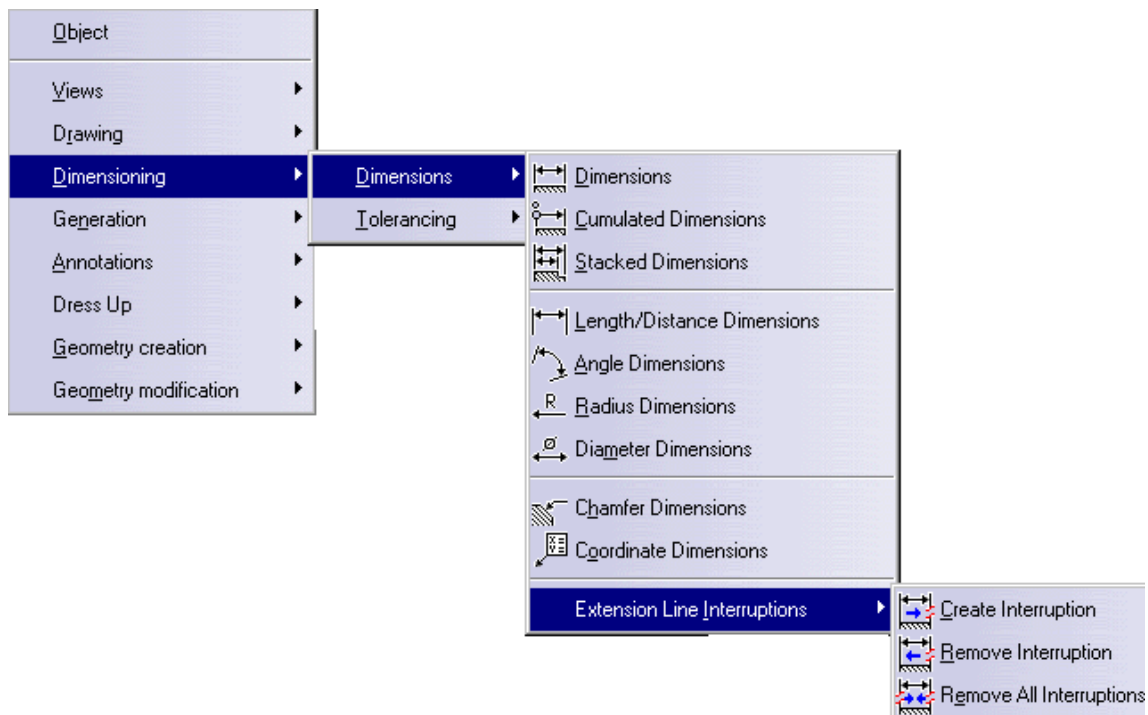


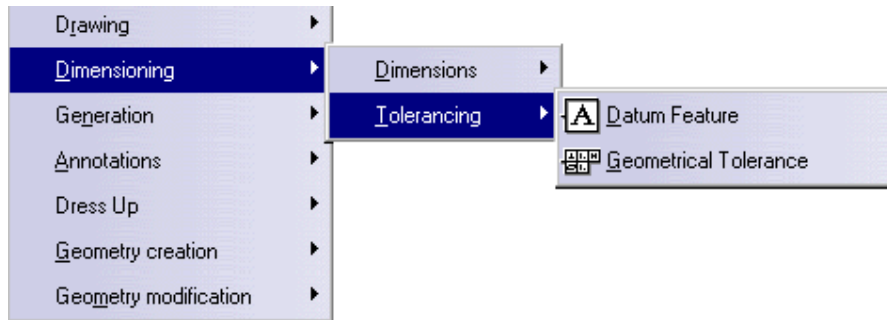
 [Dimensions Generation in One Shot](#)

 [Semi-automatic Dimension Generation](#)

 [Generating Balloons](#)

Dimensioning





[Creating a Dimension](#)



[Creating a Cumulated Dimension](#)



[Creating a Stacked Dimension](#)



[Creating Explicit Dimensions](#)



[Creating Explicit Dimensions](#)



[Creating Explicit Dimensions](#)



[Creating Explicit Dimensions](#)



[Creating a Chamfer Dimension](#)



[Creating Associative Thread Dimensions](#)



[Creating a Coordinate Dimension](#)



[Creating a Hole Dimension Table](#)



[Creating a Points Coordinates Table](#)



[Technological Feature Dimensions: Before you Begin](#)



[Creating Intra-Technological Feature Dimensions](#)



[Creating Inter-Technological Feature Dimensions](#)



[Technological Feature Dimensions: Before you Begin](#)



[Technological Feature Dimensions: Before you Begin](#)



[Technological Feature Dimensions: Before you Begin](#)



[Technological Feature Dimensions: Before you Begin](#)



[Re-routing Dimensions](#)



[Interrupting Extension Lines](#)



[Interrupting Extension Lines](#)

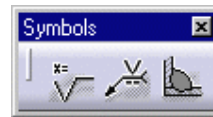
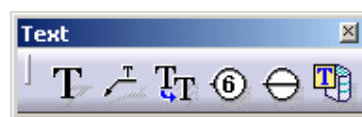
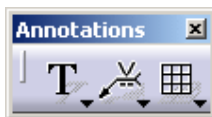
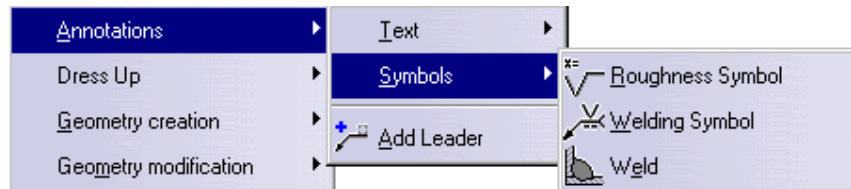
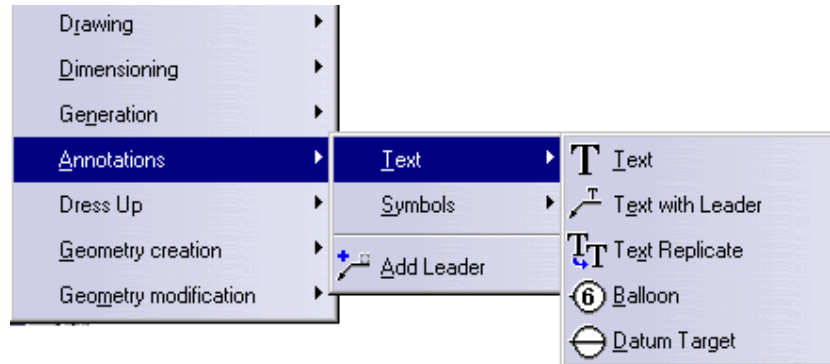


[Creating a Geometrical Tolerance](#)



[Creating a Datum Feature](#)

Annotations



[Creating Text](#)



[Creating Text with Leader](#)



[Replicating a Text](#)



[Creating a Balloon](#)



[Creating a Datum Target](#)



[Annotate Drawings using Text Templates](#)



[Creating a Roughness Symbol](#)



[Creating a Welding Symbol](#)

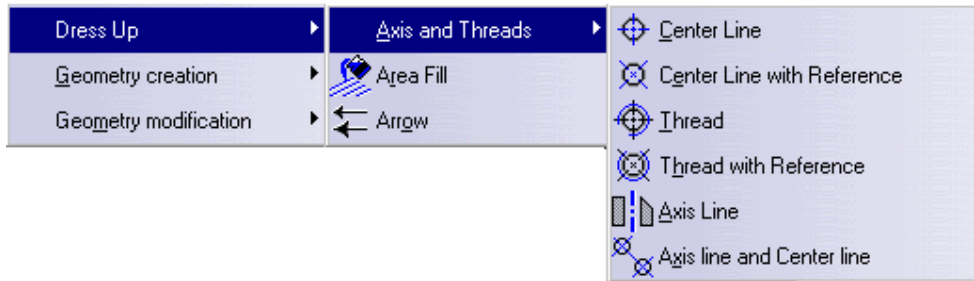









[Creating a Geometry Weld](#)



[Creating/Modifying a Table](#)







Dress-Up



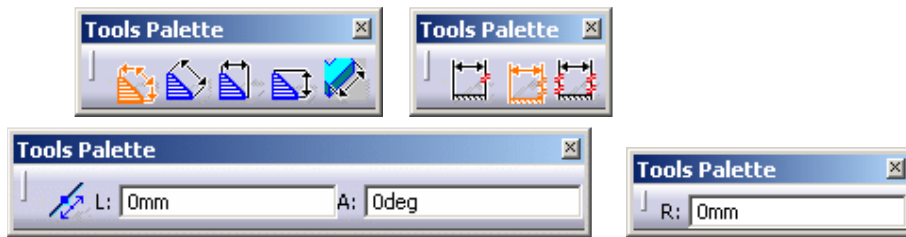
-  [Creating a Center Line](#) and [Modifying a Center line](#)
-  [Creating a Center Line](#) and [Modifying a Center line](#)
-  [Creating a Thread](#)
-  [Creating a Thread](#)
-  [Creating an Axis Line](#)
-  [Creating an Area-Fill](#)
-  [Creating an Arrow](#)

Tools



-  [Using Tools](#)
-  [Using Tools](#)
-  [Using Tools](#)
-  [Constraints](#)
-  [Constraints](#)
-  [Using Tools](#)

Tools Palette

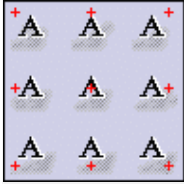


Text Properties



Option	Name	Description
	<i>Font Name</i>	Changes the style of the text.
	<i>Font Size</i>	Changes the size of the text. Note that this size cannot be inferior to 0.2 mm.
	<i>Bold</i>	Changes the weight of the text. Toggles between normal and heavy (bold).
	<i>Italic</i>	Changes the angle of the text. Toggles between normal and slanted (italic)
	<i>Underline</i>	Adds a line under the text.
	<i>Strike Thru</i>	Adds a line through the center of the text.
	<i>Overline</i>	Adds a line above the text.
	<i>Superscript</i>	Raises the text above the normal text line.
	<i>Subscript</i>	Lowers the text below the normal text line.
	<i>Left Justify</i>	Aligns multiple lines of text to the left edge of the text frame.
	<i>Center Justify</i>	Centers multiple lines of text within the text frame.
	<i>Right Justify</i>	Aligns multiple lines of text to the right edge of the text frame.
	<i>Anchor point</i>	Changes the position of the point that connects the text to the drawing or to an

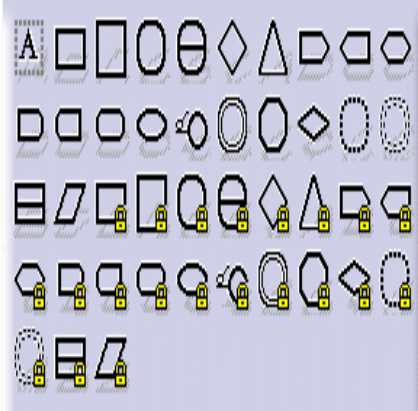
point



connects the text to the drawing or to an element. Choices are as follows:

- Along the top of the text: left, center or right
- Along the vertical center of text: left, center or right
- Along the bottom of the text: left, center or right


Frame




Draws a single-line frame around the text.

A variety of different shapes is available.

You can choose to create each frame with either a variable or a fixed size. For a rectangular frame, for example, the

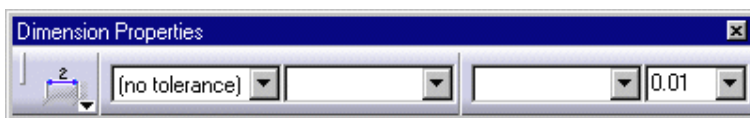
icon  represents the variable-size

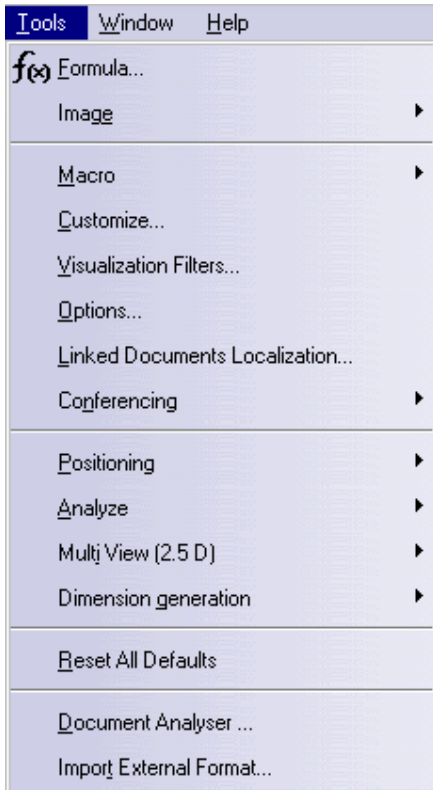
frame, and the icon  (with the padlock) represents the fixed-size frame.

Graphic Properties



Dimension Properties































Interactive Drafting Toolbars

Geometry Creation



- [Points](#)
-  [Points using Coordinates](#)
-  [Equidistant Points](#)
-  [Intersection Points](#)
-  [Projection Points](#)
-  [Lines](#)
-  [Infinite Lines](#)
-  [Bi-Tangent Lines](#)
-  [Bisecting Lines](#)
-  [Lines Normal to Curves](#)
-  [Circles](#)
-  [Three Point Circle](#)
-  [Circles Using Coordinates](#)
-  [Tri-Tangent Circle](#)
-  [Arcs](#)
-  [Three Point Arc](#)
-  [Three Point Arc with Limits](#)
-  [Ellipses](#)
-  [Profiles](#)
-  [Rectangles](#)
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-  [Parallelograms](#)
-  [Hexagons](#)
-  [Elongated Holes](#)
-  [Cylindrical Elongated Holes](#)
-  [Keyhole Profiles](#)
-  [Splines](#)



[Connect](#)



[Parabola by Focus](#)

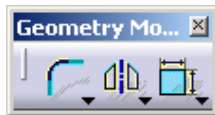


[Hyperbola by Focus](#)



[Conic](#)

Geometry Modification



[Modifying a Corner](#)



[Modifying a Chamfer](#)



[Trimming Elements](#)



[Breaking Elements](#)



[Breaking and Trimming Elements](#)



[Closing Elements](#)



[Complementing an Arc \(Circle or Ellipse\)](#)



[Creating Symmetrical Elements](#)



[Translating Elements](#)



[Rotating Elements](#)



[Scaling Elements](#)



[Offsetting Elements](#)



[Creating Quick Dimensional/Geometrical Constraints](#)






[Creating Constraints using a Dialog Box](#)



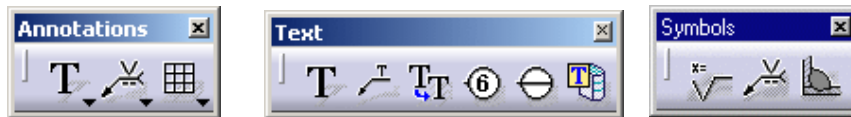
[Creating Contact Constraints](#)









Views

Interactive Drafting elements necessarily need to be positioned in a view. In other words, you will first create a view on a [sheet](#) and then add [2D geometry](#), [dimensions](#), [annotations](#) and/or dress-up elements in this view.

-  [Create views](#): Create a front view and then projection views.
-  [Define the view plane](#): Define the plane of a view (a front view, an isometric view or an auxiliary view).
- [Create views using folding lines](#): Add geometry in views using folding lines as an assistant.
-  [Create a multiple view projection](#): Generate geometry in a view by projecting geometry from previously defined views.
- [Reframe a view](#): Reframe a view so as to display only part of it.

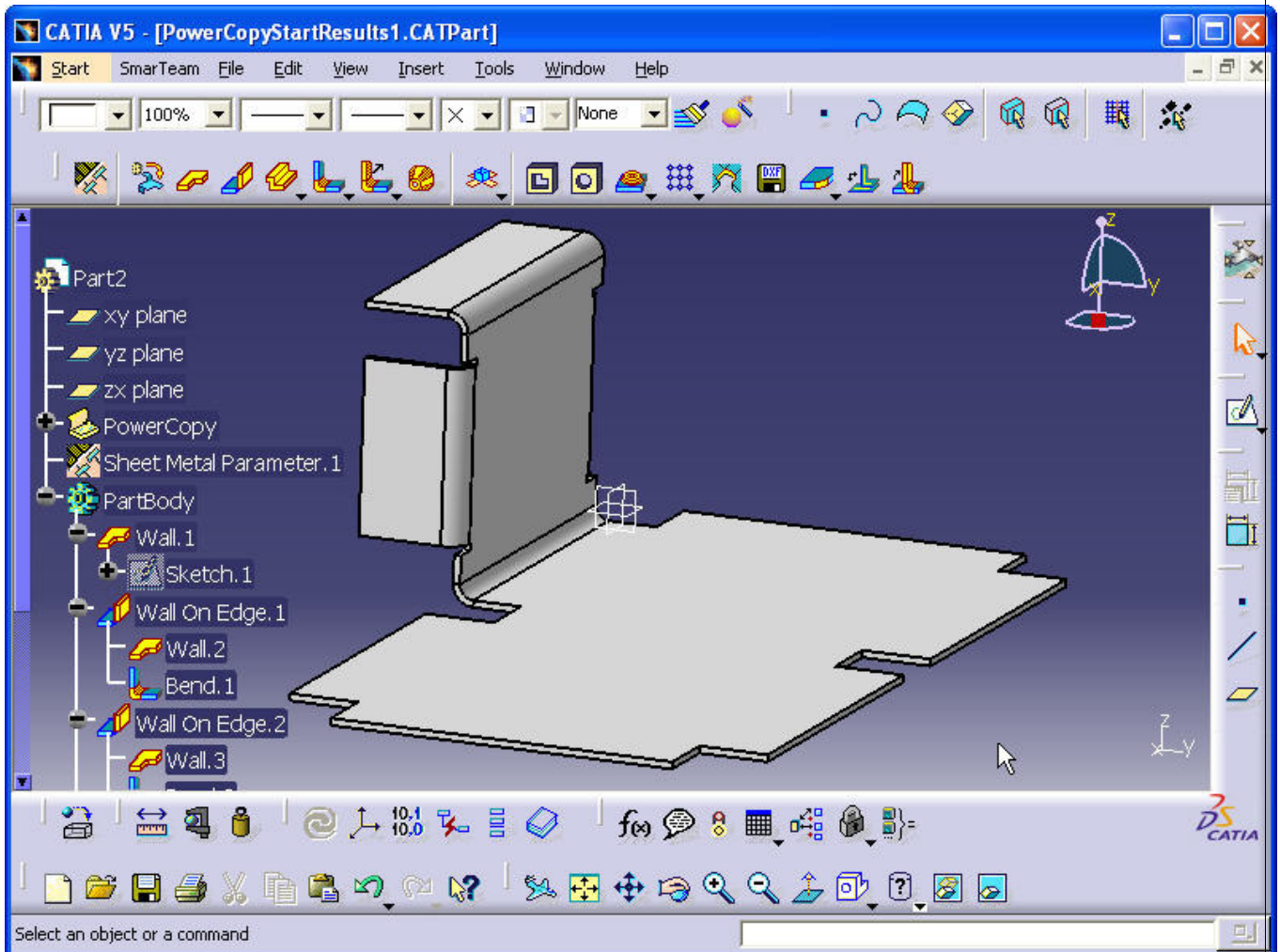
Annotations



-  [Creating Text](#)
-  [Creating Text with Leader](#)
-  [Replicating a Text](#)
-  [Creating a Balloon](#)
-  [Creating a Datum Target](#)
-  [Annotate Drawings using Text Templates](#)
-  [Creating a Roughness Symbol](#)
-  [Creating a Welding Symbol](#)
-  [Creating a Geometry Weld](#)
-  [Creating/Modifying a Table](#)

Generative SheetMetal Design

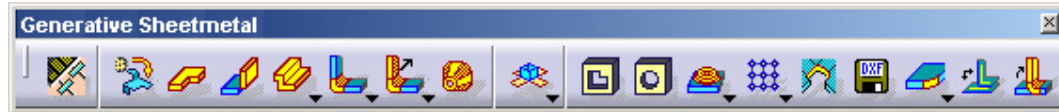
Start -> Mechanical Design -> Generative SheetMetal Design



Workbench Description

Generative Sheetmetal Toolbar
Constraints Toolbar
Reference Elements Toolbar

Generative Sheetmetal Toolbar



 [Managing the Default Parameters](#)

 [Recognizing Walls From an Existing Part](#)

 [Creating Walls from a Sketch](#)

 [Creating Walls From An Edge](#)

 [Extruding](#)



 [Creating Rolled Walls](#)

 [Creating Bends From a Line](#)



 [Creating Conical Bends](#)

 [Creating Swept Walls](#)



 [Creating Hoppers](#)

 [Unfolding](#)

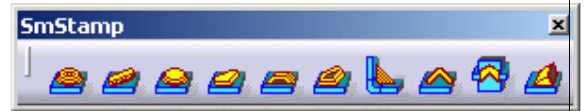


 [Creating a Cutout](#)

 [Creating a Hole](#)












Stamping



Creating Standard Stamping Features


This section explains and illustrates how to create and use various kinds of stamps.


The table below lists the information you will find.


-  [Create a flanged hole](#): select a point on a face, and set the stamping parameters.
-  [Create a bead](#): select a profile, and set the stamping parameters.
-  [Create a circular stamp](#): select a point on a face, and set the stamping parameters.
-  [Create a surface stamp](#): select a sketch, and set the stamping parameters.
-  [Create a bridge](#): select a point on a face, set the stamping parameters, and select an edge to give the bridge orientation.
-  [Create a flanged cutout](#): select a profile, and set the stamping parameters.
-  [Create a stiffening rib](#): select the external surface of a bend, and set the stamping parameters.
-  [Create a curve stamp](#): select a sketch, and set the stamping parameters.
-  [Create a louver](#): select a sketch, an opening line and set the stamping parameters.

Creating User-Defined Stamping Features

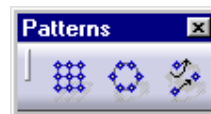
Two user-defined stamping features are available:

 [Create a punch and a die](#): define the punch and die features, select a wall, choose the punch and die as stamping elements, select an edge on the wall and give an angle for orientation purposes.

 [Open faces](#): define the punch, select a wall, define the opening faces of the punch, select an edge on the wall and give an angle for orientation purposes.

 [Edit a user-defined stamp](#): double-click the existing stamp and change its type, or select, or remove cutting and opening faces

[Patterning](#)



[Creating a Local Corner Relief](#)



[Saving As DXF](#)



[Creating Corners](#)



[Creating Chamfers](#)



[Mapping Elements](#)



[Creating Bends from a Line](#)




Constraints Toolbar



[Setting Constraints](#) from the *Part Design User's Guide*

Reference Elements Toolbar



-  [Creating Points](#)
-  [Creating Lines](#)
-  [Creating Planes](#)