Crank Shaft Pist.stp - 3D FastView Pro (Ver. 4.11.0 / 64-bit)
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# 1. 3D FastView Version Information

▣ Use the following comparison of 3D FastView versions to find the version that matches your needs.

The major difference between Standard and Pro version is the support of opening 2D formats, analysis, pro and animation tools .

| | | 3D FastView Standard | 3D FastView Pro |
|---|---|---|---|
| Open 3D File Formats | STL (*.stl) | ● | ● |
| | CATIA V4 (*.model;*.exp;*.session) versions 4.1.9 to 4.2.4 | ● | ● |
| | CATIA V5 (*.CATPart;*.CATProduct;*.CGR) versions V5R8 to 5-6R2018 | ● | ● |
| | CATIA V5 2D (*.CATDrawing) | | ● |
| | UG NX (*.prt) versions 11-NX 12.0.0 | ● | ● |
| | JT (*.jt) versions JT8.x, 9.x, 10, 10.2 | ● | ● |
| | Pro/Engineer (*.prt;*.prt.*;*.asm;*.asm.*) | ● | ● |
| | ProE/Creo Parametric 2D (*.drw;*.drw.*) versions 16 - Creo 5.0 | | ● |
| | STEP (*.stp;*.step) versions AP203, AP214, AP242 | ● | ● |
| | IGES (*.igs;*.iges) versions Up to 5.3 | ● | ● |
| | Parasolid (*.x_t;*.xmt_txt;*.x_b;*.xmt_bin) versions 9.0 - 31.0.154 | ● | ● |
| | Solidworks (*.sldprt;*.sldasm) versions 98 – 2019 | ● | ● |
| | Solidworks 2D (*.slddrw) | | ● |
| | Autodesk Inventor (*.ipt,*.iam) versions v11 – 2019 | ● | ● |
| | Solid Edge (*.par;*.asm;*.psm) versions V18 - ST11 | ● | ● |
| | 3D XML (*.3dxml) versions 4.0 to 4.3 | ● | ● |
| | XML (*.xml) | ● | ● |
| | Autodesk (*.dwg;*.dxf) versions 2.5 to 2019 | ● | ● |
| | HPGL (*.hpgl;*.hpgl2;*.hgl;*.hpg;*.hp2,*.gl2;*.plt) | ● | ● |
| | Image (*.jpg;*.gif;*.bmp;*.png;*.tif;*.tiff) | ● | ● |
| | PDF (*.pdf) | ● | ● |

# 1. 3D FastView Version Information

| | | 3D FastView Standard | 3D FastView Pro |
|---|---|---|---|
| Visualize | ISO Display (CATIAV5,NX, Default) | ● | ● |
| | Pan, Rotate, Orbit, Move Pivot, Persp./Ortho, Zoom | ● | ● |
| | Show/Hide Components, Annotations, Measurements | ● | ● |
| | Panels (Layer, 2D Layer, Review, Userview, Section, Model Tree, Explore, Properties) | ● | ● |
| | Snap Modes, Osnap | ● | ● |
| | Quick Search Components | ● | ● |
| | Add Model | ● | ● |
| | PMI (Product Manufacturing Information) Display | ● | ● |
| | Save Image | ● | ● |
| | Visual Styles | ● | ● |
| | Solid/ Surface Color and Transparency | ● | ● |
| | Manipulator | ● | ● |
| | Axis Management | ● | ● |
| | Section Plane, Box, Inner | ● | ● |
| | Create Custom View (Snapshot) | ● | ● |
| | Create 2D Projection of Section | ● | ● |
| | Create 2D Projection of Model | ● | ● |
| | Create Animation (Snapshot) | ● | ● |
| | New, Open, Save Animation (.AVI) | | ● |
| | 3D Exploded View | | ● |
| | View 2D Drawings (DWG, DXF) | ● | ● |
| | 2D View (Monochrome, Mini, Snapshots) | ● | ● |

# 1. 3D FastView Version Information

| | | 3D FastView Standard | 3D FastView Pro |
|---|---|---|---|
| Annotate & Measurement | Surface Notes | ● | ● |
| | 2D/3D Notes | ● | ● |
| | 3D Markup (Text, Line, Arrow, Circle, Rectangle, Free Curve, Cloud) | ● | ● |
| | 2D Markup (Visual Note, Line, Rectangle, Circle) | ● | ● |
| | Basic Measurement (Coordinates, Length, Angle) | ● | ● |
| | Hole Measurement (Radius, Diameter, Coordinate, Slot Hole, Hole Depth, Hole Step) | ● | ● |
| | Comprehensive Distance Measurement Tools | ● | ● |
| | Comprehensive Angle Measurement Tools | ● | ● |
| | Calculate (Bound Boxing, Area, Surface Area) | ● | ● |
| | Calculate (Volume/Weight, Center of Gravity, Surface Volume, Planes) | ● | ● |
| | Save Coordinates | ● | ● |
| | Record Annotations and Measurements | ● | ● |
| Analyze | Calculate Projected Area | | ● |
| | Undercut Analysis | | ● |
| | Draft Angle Analysis | | ● |
| | Interference Check Analysis | | ● |
| | 2D CAD Drawing Compare and 3D Model Compare | | ● |
| Import & Export | Import & Export Review | ● | ● |
| | 2D (Create Part List, Copy Text, Copy Image) | ● | ● |
| | Export Interference Check (CSV, Excel, HTML, Userview) | ● | ● |
| | Translate Single (STP, IGS, CATIAV5, ACIS, PDF, 3DXML, CGR, Parasolid) | STP, IGS | ● |
| | Translate Multiple (STP, IGS, CATIAV5, ACIS, PDF, 3DXML, CGR, Parasolid) | STP, IGS | ● |

# 2. Development Environment & System Specifications and Requirements

## ▣ Development Environment

| | |
|---|---|
| **Development Tools** | • Microsoft Visual Studio 2017<br>• configuration management s/w : SVN (Tortoise SVN) |
| **Development Language** | • Rendering/Data Core **: C/C++** (MFC(Microsoft Foundation Class) v10.0.40219<br>• application program **: C#** (Microsoft **.NET** Framework v4.5.50938 SP1) |

## ▣ System Specification

We recommend using an Intel processor, a minimum of 4GB of RAM, and a PC with a screen resolution of 1280 x 1024 pixels or more. For very complex CAD models, it is recommended to use a graphics card with at least 3GB VRAM.

| **3D FastView** | **Standard & PRO Versions** |
|---|---|
| **Operating System** | Microsoft Windows<br>• Product : Over **Win 7 SP2**<br>• Platform : x86 / x64 |
| **Hardware Specifications** | • Minimum : CPU 2GHz above / Mem. 8GB / HDD 250GB / VRAM 1024MB<br>• **Recommend : CPU 2GHz / Memory 16GB / SDD 500GB / VRAM 3GB** |

## ▣ System Requirements

3D FastView supports 32/64 bit OS.

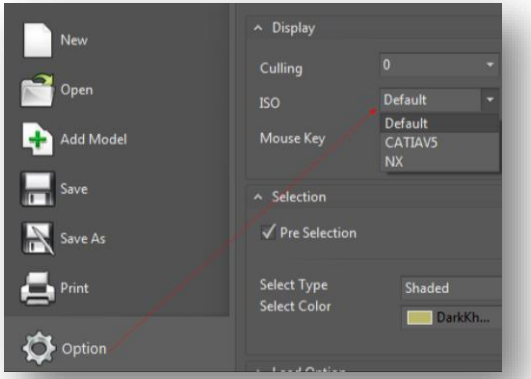
| **3D FastView Standard / Pro** |
|---|
| Windows 7<br>Windows 8.1<br>Windows 10 |

When using the 3D FastView interface, the opening and conversion speeds of CAD files are proportional to the available RAM and processor speeds. If large and complex CAD models require more computing power and main memory, the latest processors and 8GB or more of RAM are recommended.

# 3. Mouse Actions

□ 3D FastView supports three types of mouse handling options:

- The **Default** type is its own mouse handling function.
- The **CATIAV5** type is the same as the Catia mouse handling method.
- The **NX** type is the same as the NX mouse handling method.



| | L (1) | Middle (2) | Wheel (2) | | R (3) | |
|---|---|---|---|---|---|---|
| Default | Select Rotate | Pan | UP | out | Pop-up | |
| | | | DN | in | | |
| | L (1) | Middle (2) | Wheel (2) | | R (3) | (2) + (1) |
| CATIAV5 | Select | Pan | UP | in | Pop-up | Rotate |
| | | | DN | out | | |
| | L (1) | Middle (2) | Wheel (2) | | R (3) | (2) + (3) |
| NX | Select | Rotate | UP | out | Pop-up | Pan |
| | | | DN | in | | |

## 3D Mode of Default

**1. Rotate**
- Press the left mouse button, and move the mouse.

**2. Pan**
- Press the middle(wheel) mouse button, and move the mouse.

**3. Zoom in and out of the model**
- Scroll the mouse wheel.

**4. Find a part or component of the model in the Model Tree**
- Click a part or component of the model by the left mouse button.
- Press [Shift] and click a part of the model by the left mouse button.

**5. Select multiple parts or components on the model**
- Click the first part, press [Ctrl], and click more parts.

Tip: To highlight the selected parts and assemblies in red, activate Pre selection in 3D-Mode in the option of Run tool.

**6. Measure/Note mode**
- Move a dimension & note by pressing the left mouse button.
- Right-click on a dimension(or note) to change its properties.

**7. Fit assemblies and components to the display**
- Double click blank space to avoid model features on screen.

**8. Context menu (Access frequently needed functions)**
- Right-click a part of the model.
- Right-click parts, assemblies, and models in the Model Tree.

## 2D Mode Default

**1. Pan**
- Press the middle or right mouse button, and move the mouse.

**2. Zoom in and out on the drawing**
- Scroll the mouse wheel.

**3. Measure/Note mode**
- Move a dimension(or note) by pressing the left mouse button.

**4. Find a dimension(or note) of the model in the Review Tree**
- Right-click on a dimension(or note) to change its properties.

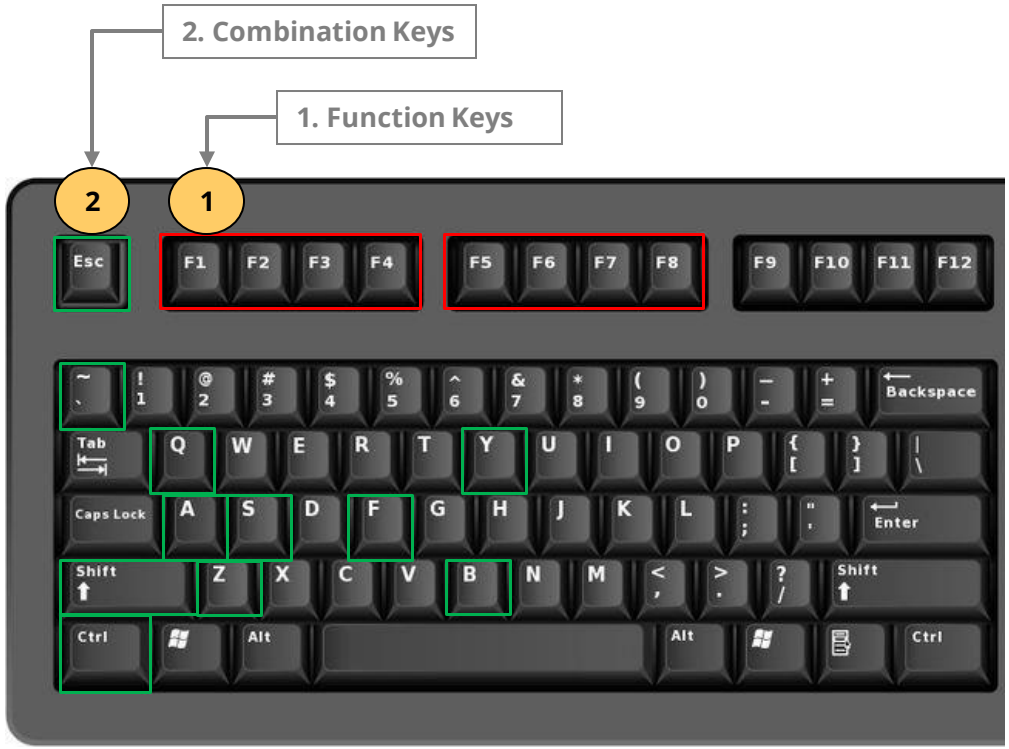
# 4. Function Keys

- 3D FastView supports function keys to quickly access certain functions:
  - **Function Keys**
  - **Combination Function Keys**

1

| | | |
|---|---|---|
| Pan | **F1** | Pan |
| Rotate | **F2** | Model rotation by Pivot |
| Rotate | **F3** | Model rotation by Orbit |
| Mode | **F4** | Perspective/Parallel mode |

| | |
|---|---|
| Visual Style – Wireframe | **F5** |
| Visual Style – Rough Shading | **F6** |
| Visual Style - Smooth Shading | **F7** |
| Align View | **F8** |




2

| | |
|---|---|
| Cancel Operation | **ESC** |
| Zoom-In | **Z** |
| Zoom-All | **S** |
| Align View | **F8** |
| Select features in left window selection | **Shift + Left Window Drag** |
| Select Features in Left Window Selection | **Shift + Right Window Drag** |
| Select All Features or Components | **CTRL + A** |
| Individual Feature or Component Select | **CTRL + LMC (Left Mouse Click)** |
| Undo Action | **CTRL + Z** |
| Redo Action | **CTRL + Y** |
| Quick Search Component | **CTRL + F** |
| Hide Selected Component | **`** |
| Snapshot | **Q** |
| Hide Entire Model | **CTRL + Shift + B** |

# 3D FastView

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1. 3D FastView User Interface
2. Menu Browser
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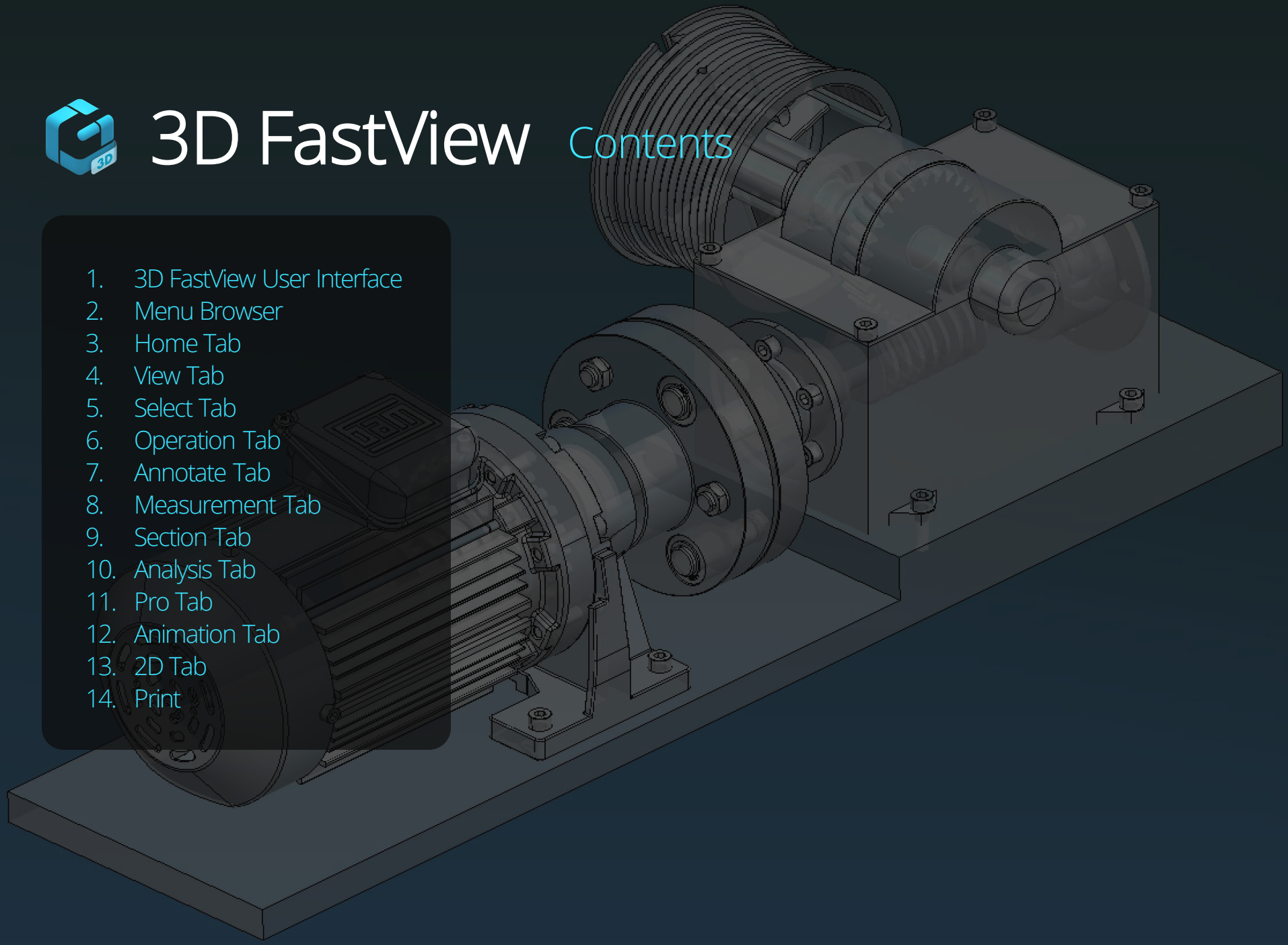
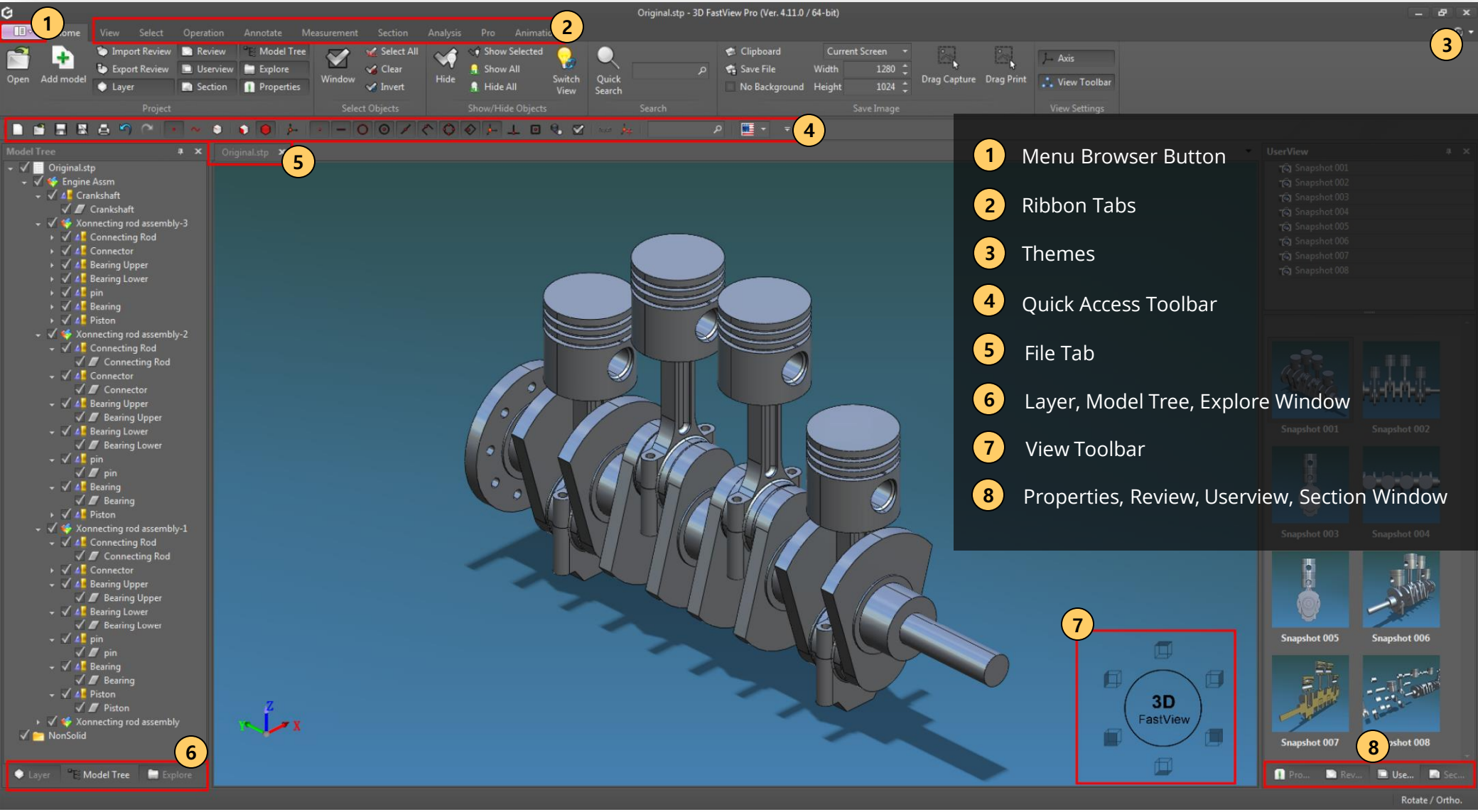
11. Pro Tab
12. Animation Tab
13. 2D Tab
14. Print

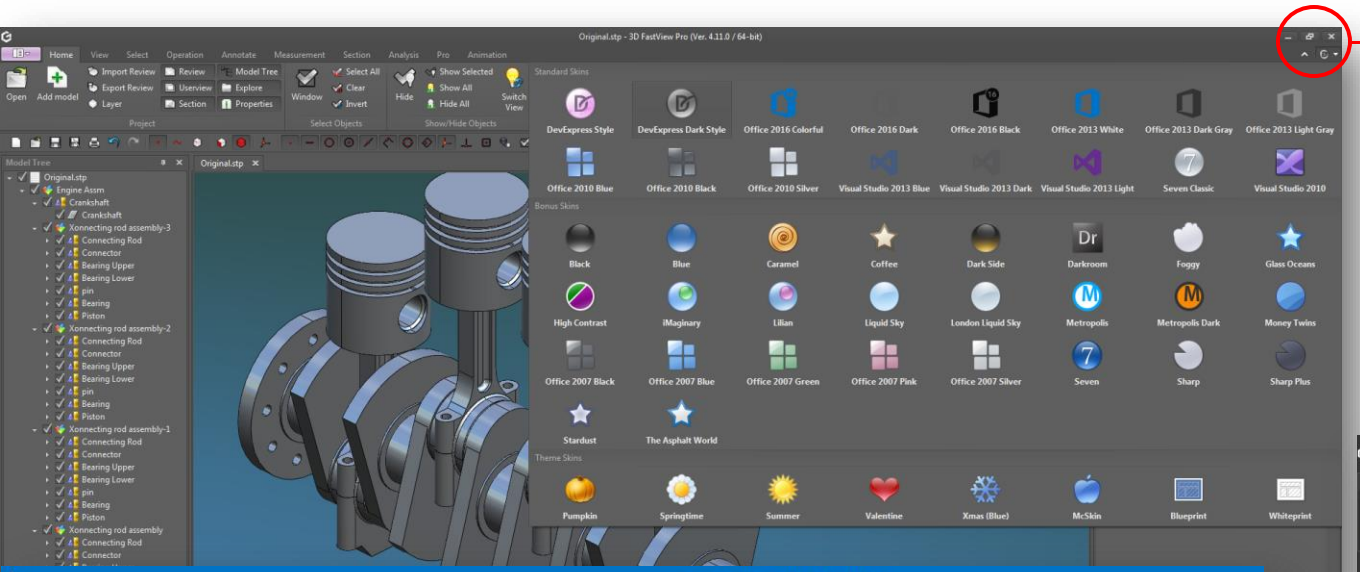
# 1. 3D FastView User Interface

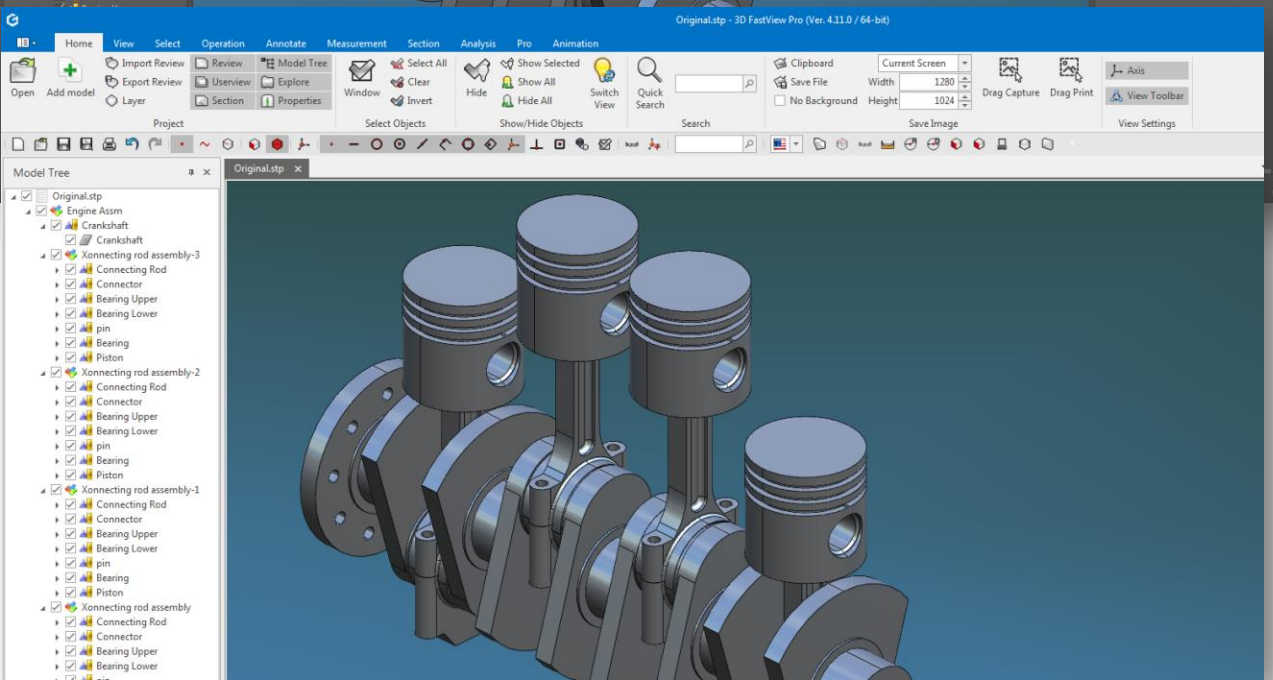
3D FastView intuitive, easy-to-use interface enables novice and experienced users alike to explore most popular types of 2D/3D CAD file.

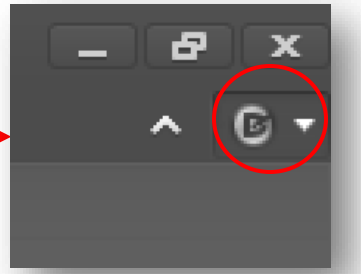


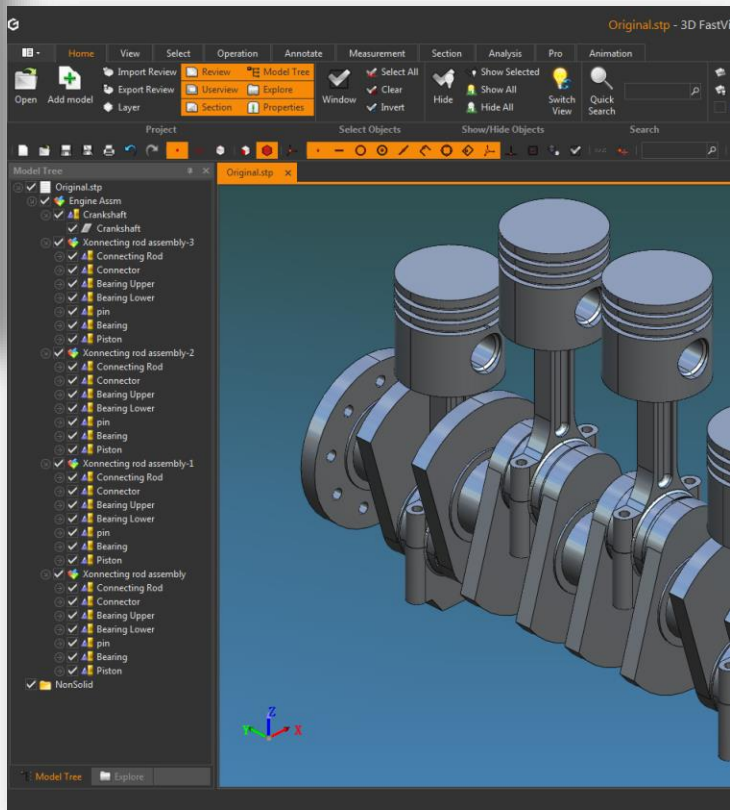
## 1.1 Themes

- 3D FastView supports themes for user's custom interface visualization.



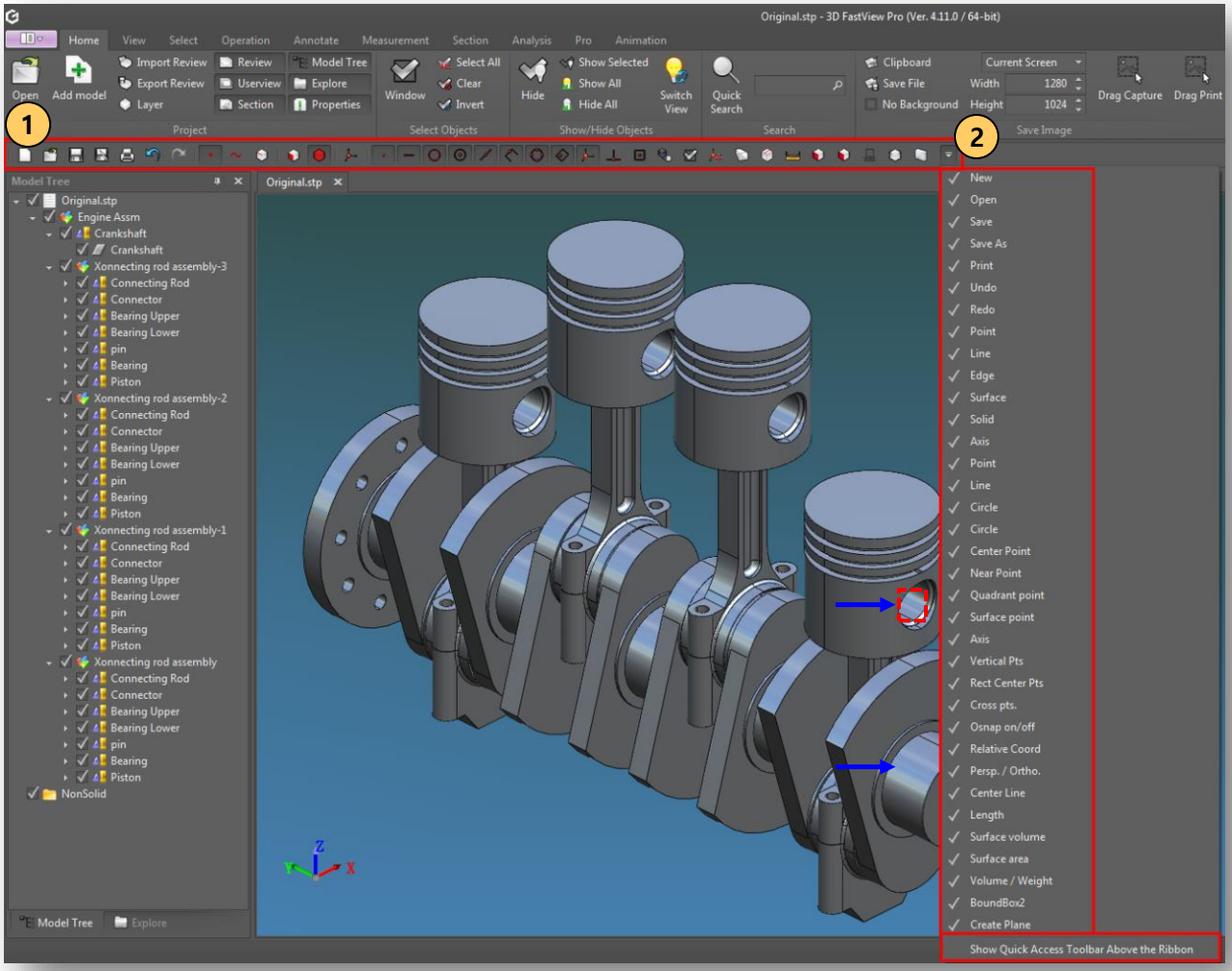






## 1.2 Quick Access Toolbar

- You can take advantage of commonly used commands by adding and deleting them on the Quick Access Toolbar.




**1 Quick Access Toolbar**

-New
-Open
-Save
-Save As..
-Print
-Snap tools
-Quick Search
-Language Setting
-Etc...

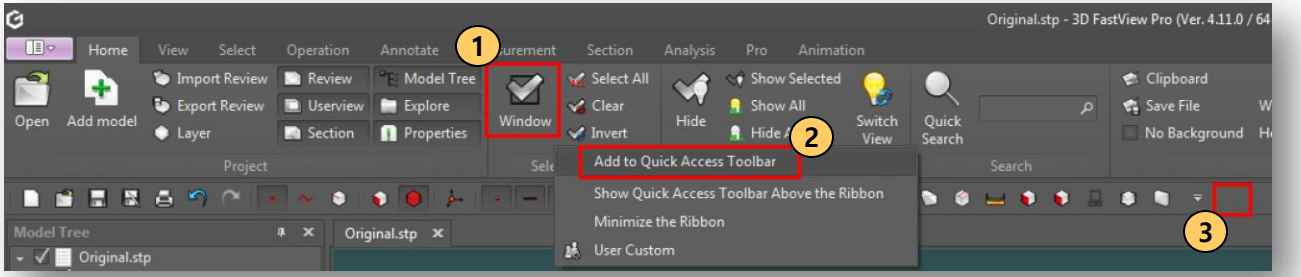
**2 Quick Access Toolbar List**

-Turn on/off commands from list.
-Show Quick Access Toolbar above the Ribbon

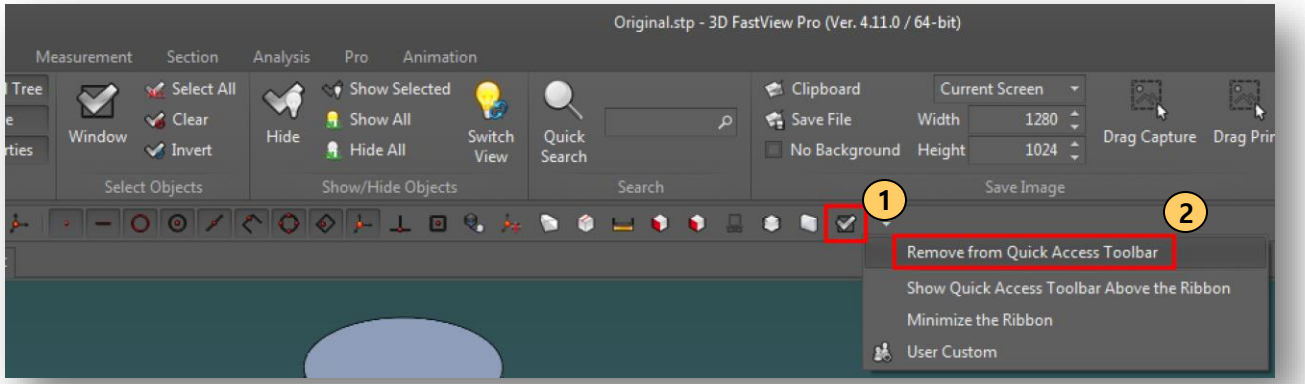
# 1.3 Quick Access Toolbar (Add/Remove Icons)

- Adding and removing frequently used icons or commands from Quick Access Toolbar.

### A [Add Quick Access Toolbar Icons]




### B [Remove Quick Access Toolbar Icons]




**A** **Add Quick Access Toolbar Icons**

1. Right-click icon or command on the ribbon

2. Select " Add to Quick Access Toolbar" option

3. Check for the icon added to the toolbar

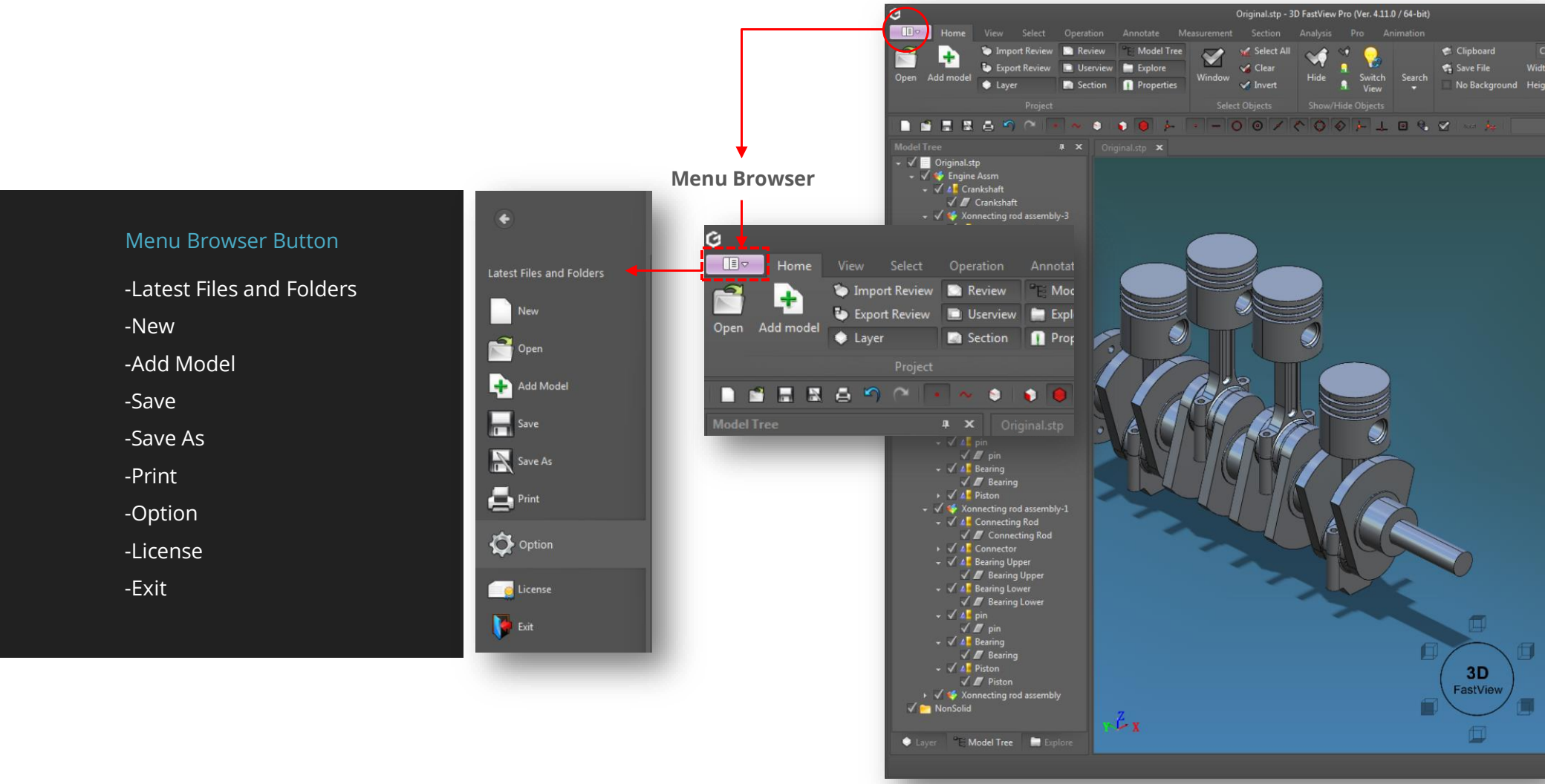
**B** **Remove Quick Access Toolbar Icons**

1. Right-click icon or command on the toolbar and select "Remove from Quick Access Toolbar" option

2. Check for the icon removed from the toolbar

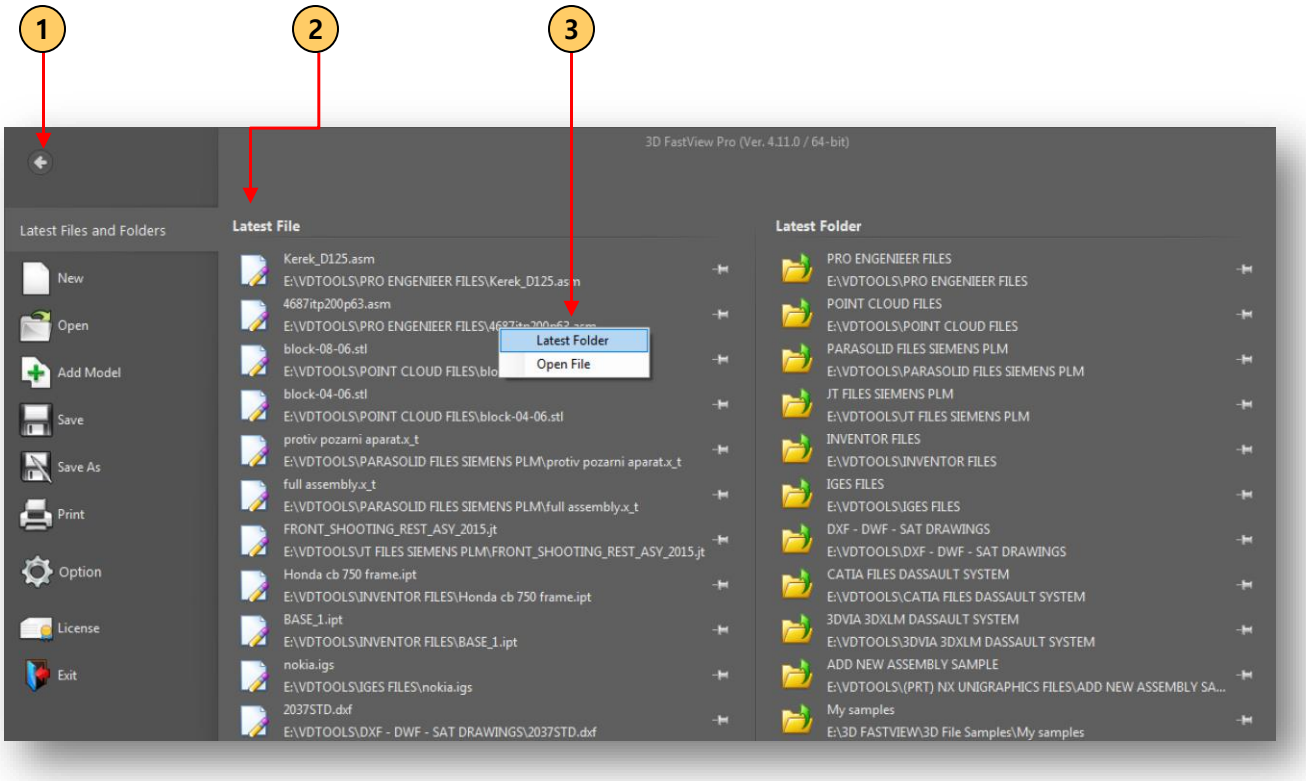
# 2. Menu Browser

A collection of commands for running the latest files and folders, preferences, and License Manager.



# 2.1 Menu Browser (Latest Files and Folders)

Manage lists of recently used files and folders.




**1** **Back to “Home” Button**

**2** **Latest Files and Folders**

Manage list of recently opened files and folders. Files and folders can be pined according to user priority.

**3** **Context Menu**

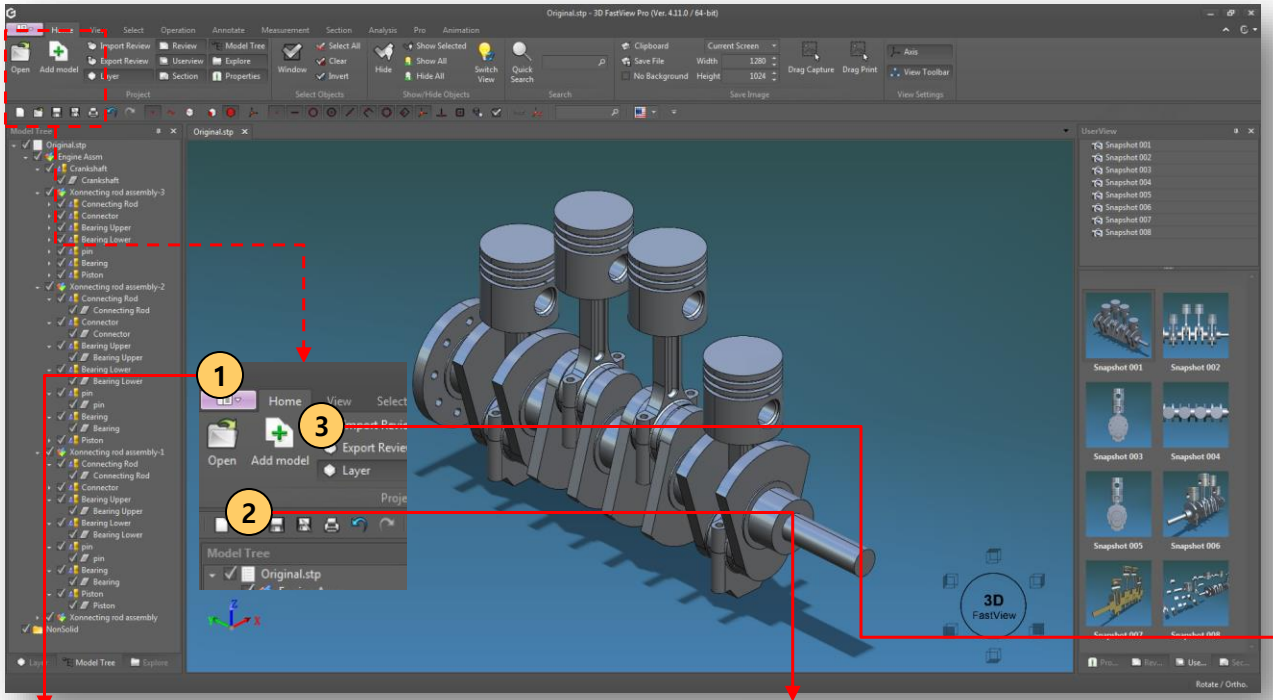
Right-click a latest file in the list to pop up two options from context menu:

-Latest Folder: Opens the latest file contained.

-Open File: Opens file selected.

## 2.2 Open File

Open 3D models and 2D drawings. You can open multiple files by selecting them in the open file dialog box. [Method 1] Open  [Method 2] New  [Method 3] Add Model




**1 Open (CTRL + O)**

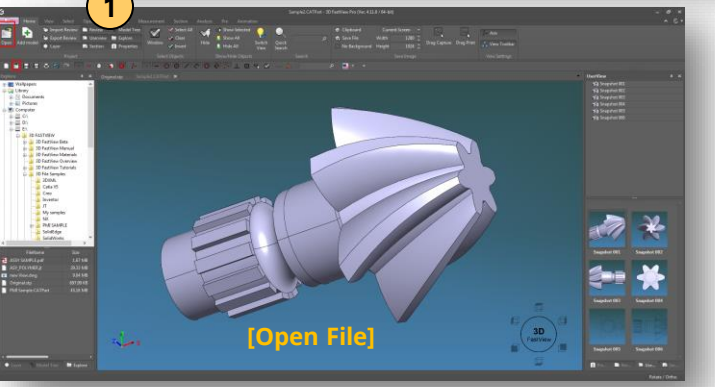
-Opens 3D models and 2D Drawings.

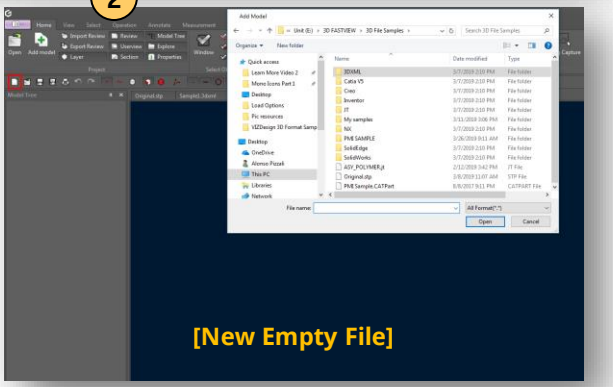
**2 New**

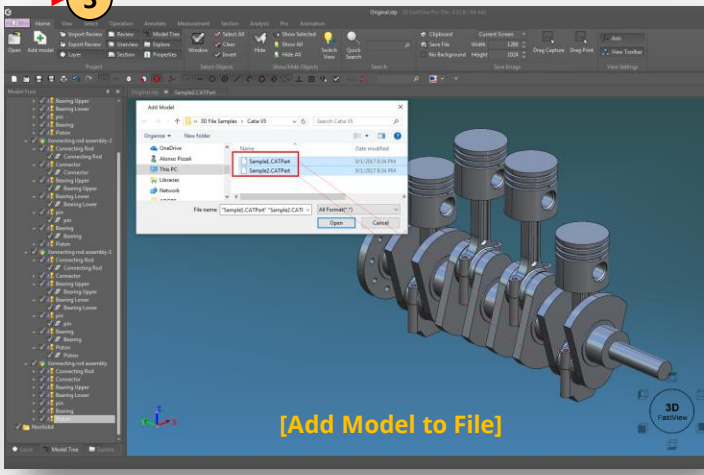
-Creates a new empty file.

**3 Add Model**

-Adds files to current opened file.

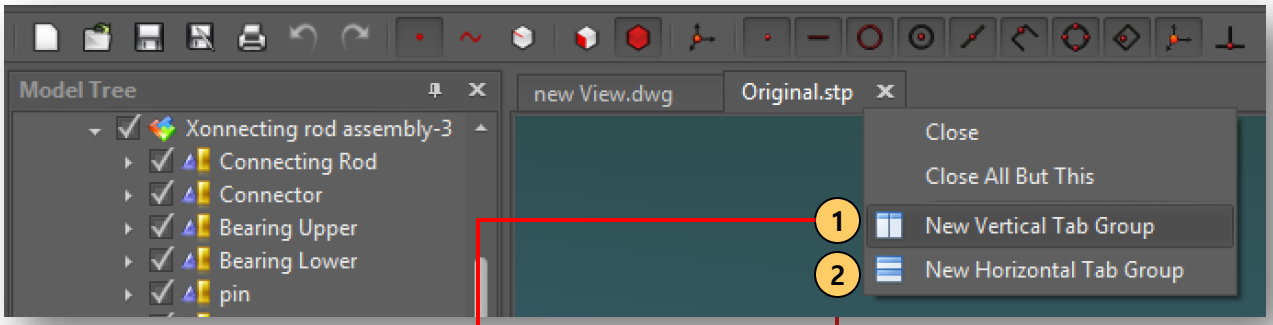


## 2.3 Tab File Groups

Allows vertical and horizontal visualization between 3D models or 2D drawings at same time in two file tab group states.

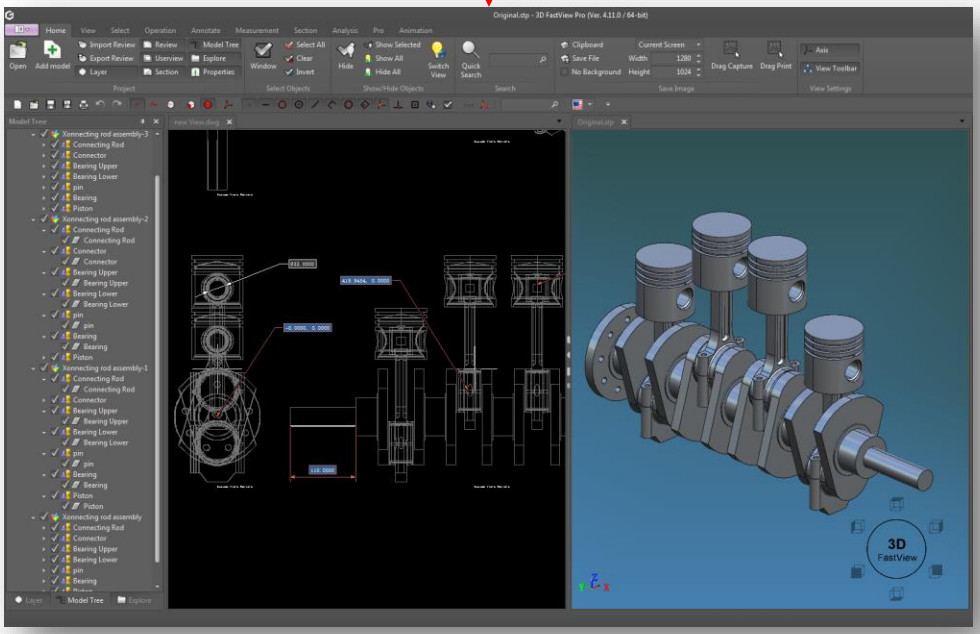


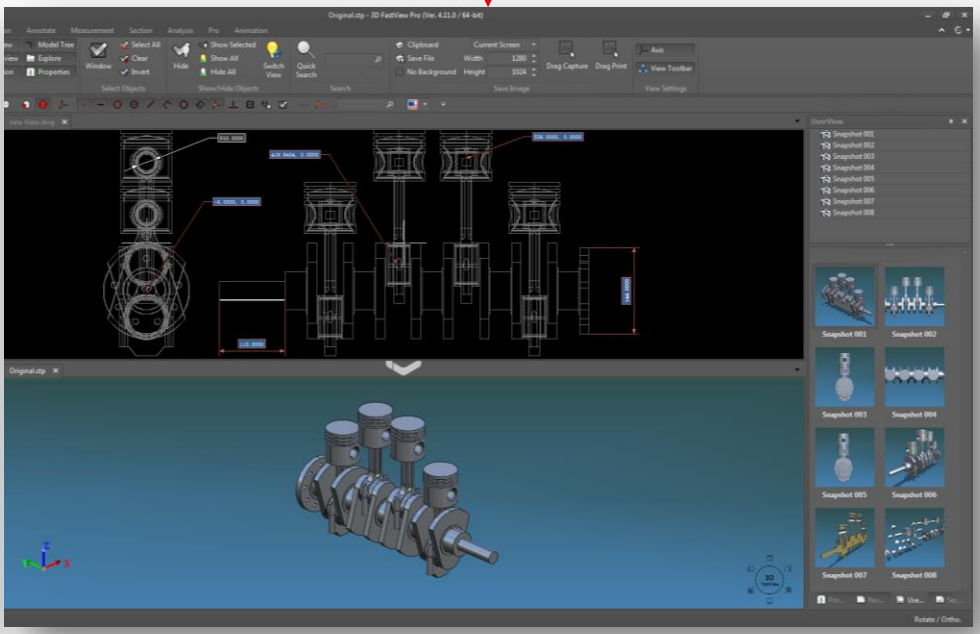

**1 New Vertical Tab Group**

-Aligns tab groups vertically.

**2 New Horizontal Tab Group**

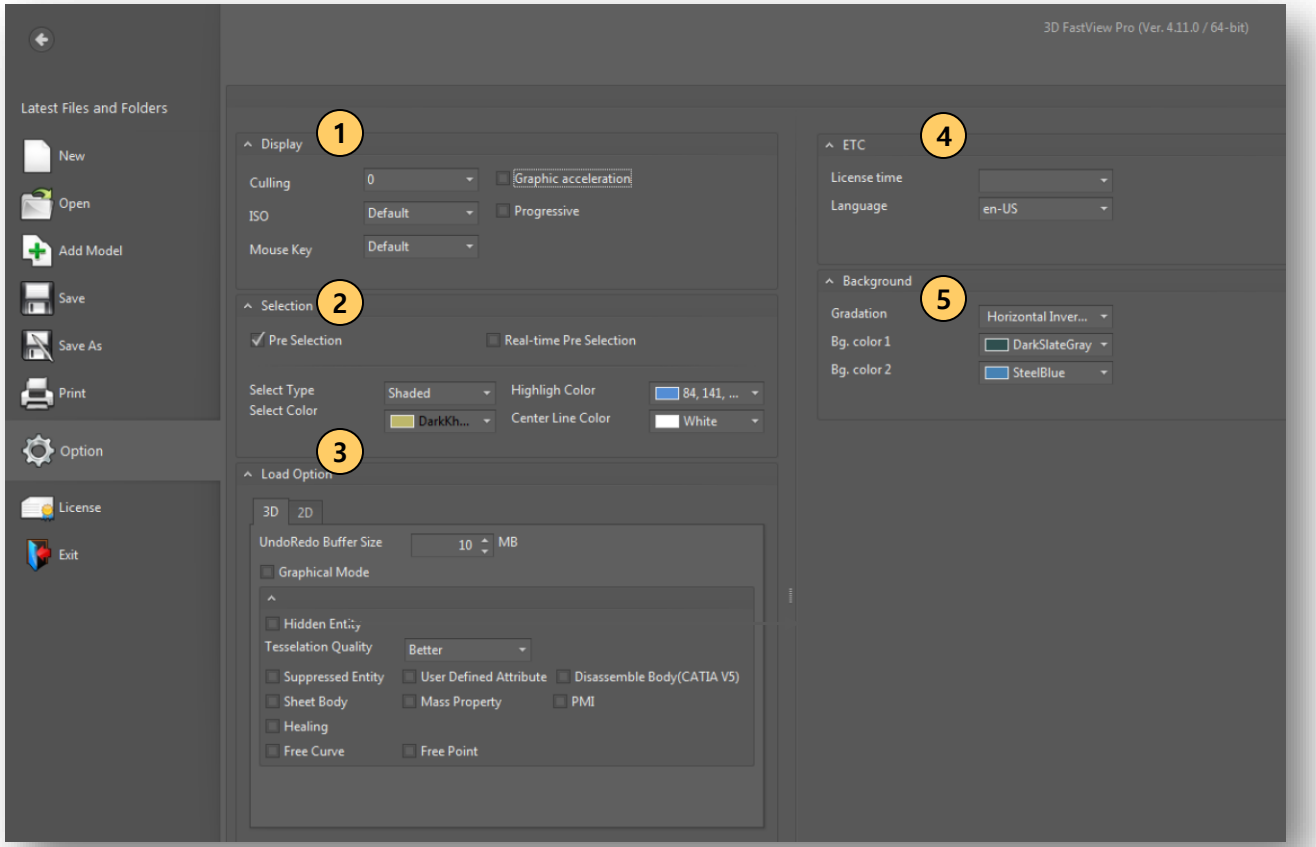
-Aligns tab groups horizontally.





## 2.4 Option

Provides settings for display, selection, file data loading, license time and screen background.
- System environment & default setting support
- Auto save preferences when UI is closed




### 1 Display

-Sets ISO view and mouse behavior options.

### 2 Selection

-Settings for selection type, color and highlight color for model or component selection.

-Set Pre Selection or Real-time Pre Selection.

### 3 Load Option

-Sets different options for specific 3D CAD files when loading plus tessellation quality options for graphical display.

### 4 ETC

-Supports for setting license return time when using floating license and language.

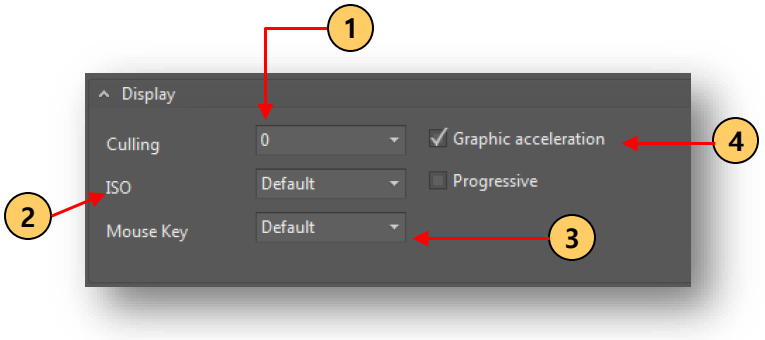
### 5 Background

-Sets background screen gradient.

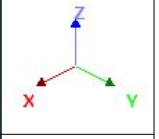
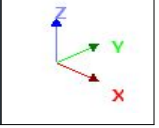
# 2.5 Display

**Option > Display**

- Configuration for setting iso and mouse type and whether to accelerate graphics card.




## 2 ISO : View Orientation

| | |
|---|---|
| Default | |
| CATIAV5 |  |
| NX |  |

## 3 Mouse Key Setting

| | L (1) | Middle (2) | Wheel (2) | | R (3) | |
|---|---|---|---|---|---|---|
| Default | Select Rotate | Pan | UP | out | Pop-up | |
| | | | DN | in | | |
| CATIAV5 | L (1) | Middle (2) | Wheel (2) | | R (3) | (2) + (1) |
| | Select | Pan | UP | in | Pop-up | Rotate |
| | | | DN | out | | |
| NX | L (1) | Middle (2) | Wheel (2) | | R (3) | (2) + (3) |
| | Select | Rotate | UP | out | Pop-up | Pan |
| | | | DN | in | | |

## 4 Graphic-card acceleration Verifying [ Shift+ ~ ]

**On ::** VRam : 81.6930(99.1200) / 2147.4836 MBytes, Tri Count : 4113451, ( 100 / 0 ), Edge Count : 3494686 ( 236 ) FPS : 4

**Off ::** VRam : 0.0000(0.0000) / 0.0000 MBytes, Tri Count : 4113451, ( 100 / 0 ), Edge Count : 3494686 ( 236 ) FPS : 8

### 1 Culling

-By default the best display value is '0'. However, when using graphics card acceleration.

### 2 ISO

-Different model view orientations by default, CATIAV5 and NX types.

### 3 Mouse Key

-Three types of mouse handling options are supported: Default, CATIAV5, NX.

### 4 Graphic Acceleration

-Set graphic card to use VRAM options.
-By enabling graphic acceleration, basic operations applied to 3D CAD model (pan, rotation, zoom) runs faster.

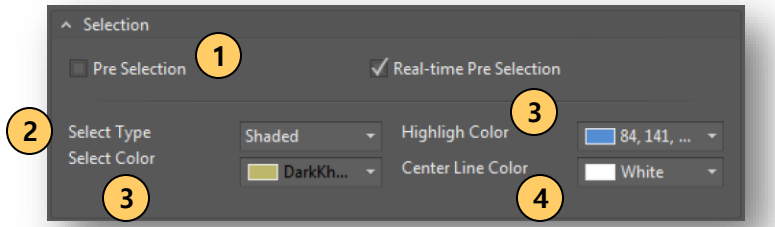
### Progressive

-Progressive display for more than 100 million tri-angle & edge entity in models will be supported in future versions.

# 2.6 Selection

**Option > Selection**

- When selecting a part or component users can setup color selection and visual style.




### 1 Pre Selection

-Makes transparent a part or component if the mouse is placed over it.

### Real-time Pre Selection

-Highlights a part or component with a predefined color in real-time.

### 2 Select Type

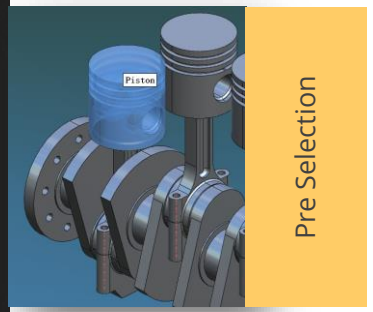
-Three types of selection modes are supported: Shade style, Object Boundary and Whole Boundary.

### 3 Select and Highlight Color

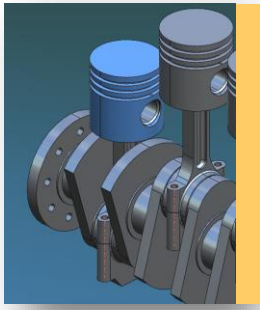
-Sets the color needed especially for any “Select Type” option. The highlight color choose can be displayed at pre selection mode only.

### 4 Center Line

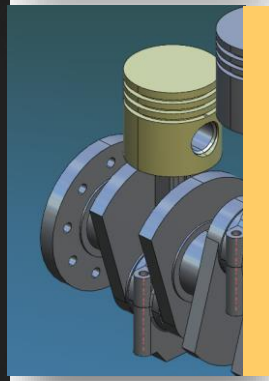
-Sets color for center line when it is created.



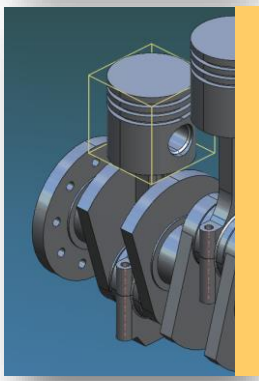

Pre Selection



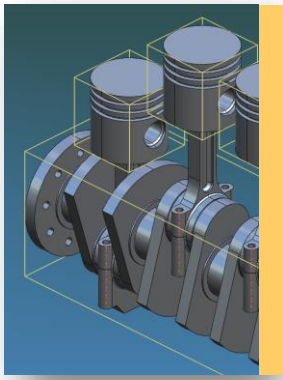
Real-time Pre Selection



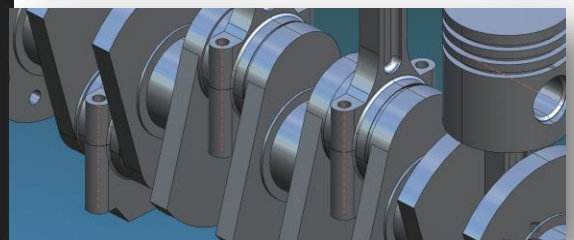
Shade Style

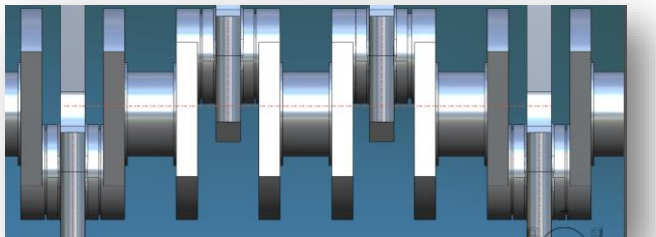


Object Boundary



Whole Boundary

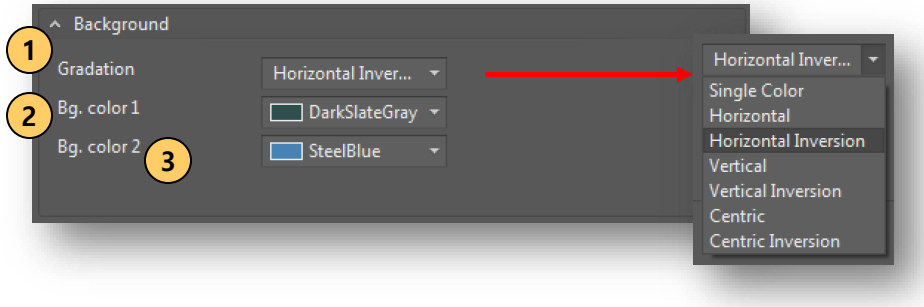




# 2.7 Background / License & Language

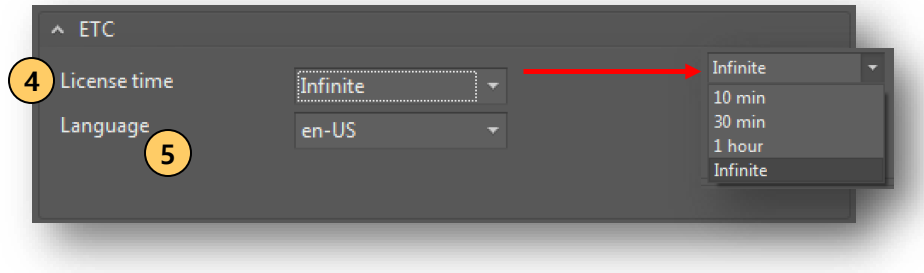
## Option > Background

- Supports setting background colors for viewers workspace.




## Option > License & Language

- Supports setting license return time when using floating license.
- Supports different software language.




**1 Gradation**

-Sets different color gradation patterns for workspace background: Single Color, Horizontal, Horizontal Inversion, Vertical, Vertical Inversion, Centric and Centric Inversion.

**2 Background Color 1**

-Choose the first background color from a color palette to be applied to gradation.

**3 Background Color 2**

-Choose the second background color from a color palette to be applied to gradation.

**4 License Time**

-Sets the license return time about 10, 30 minutes, 1 hour or infinite.
-Only when authenticated through the license server.
-Returns the license if there is no activity for the set time after setting.

**5 Language**

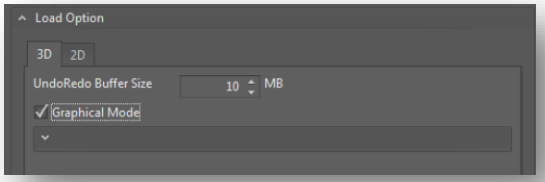
-Sets the language the users prefer. More languages will be implemented during future versions.

# 2.8 Load Option

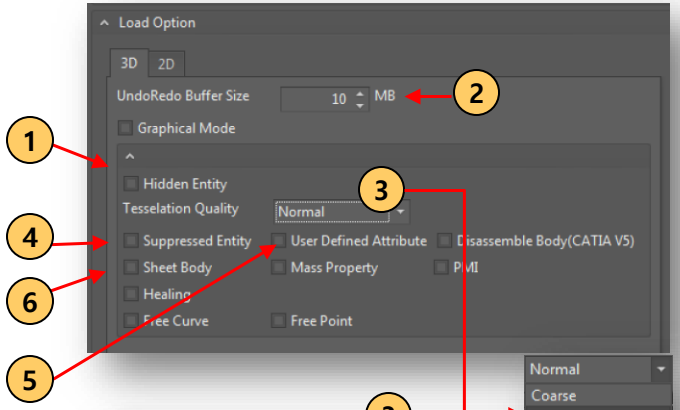
**Option > Load Option**

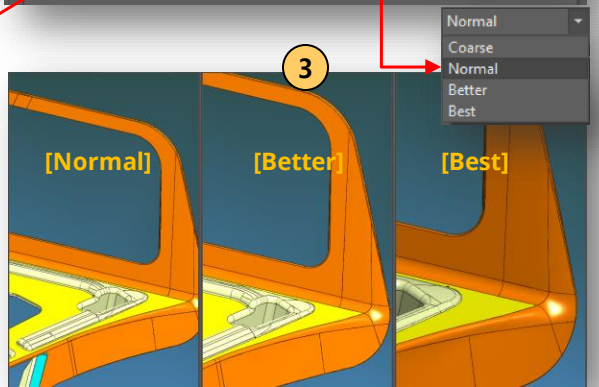
- Load options configured in Graphical mode and ACIS (B-rep) mode.
 - Graphical Mode :: Open graphical visualization data that is contained in 3D-CAD files.
 - ACIS Mode :: Open BREP-data in 3D-CAD files / Support cad file conversion.

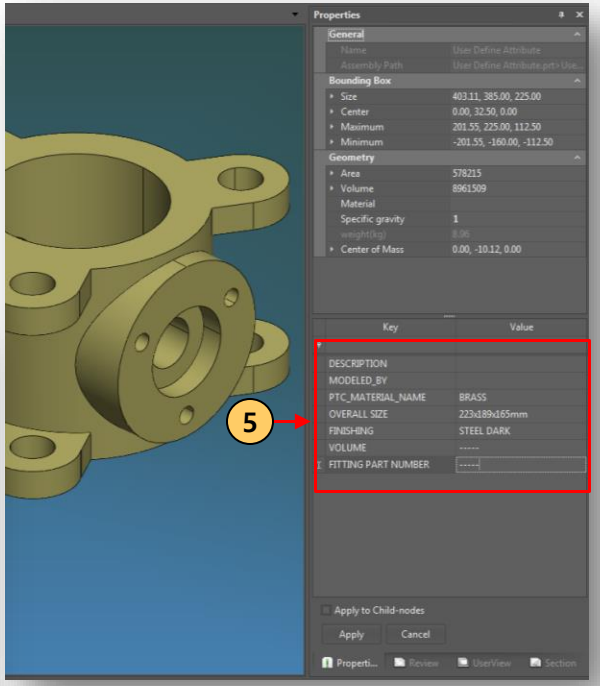
## Graphical Mode

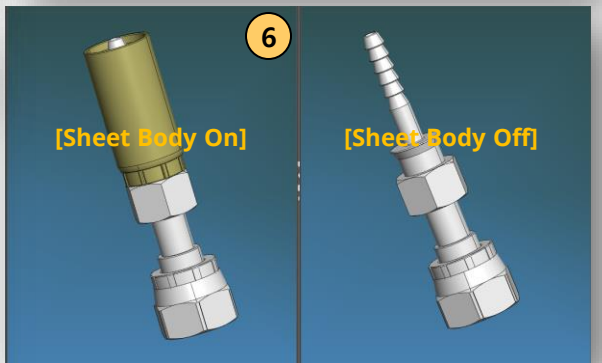



## ACIS Mode




**1 Hidden Entity**

-Opens or loads a 3D CAD file that contains hidden geometry.

**2 Undo/Redo Buffer Size**

-Undo/redo command status storage size setting.

**3 Tessellation Quality**

-Four options are supported regarding to 3D model quality visualization: Coarse, Normal, Better and Best.

**4 Suppressed Entity**

-Opens or loads a 3D CAD file that contains suppressed entities.

**5 UDA (User Defined Attribute)**

-Opens or loads a 3D CAD file that contains attributes. The user can see and add attributes to current model.

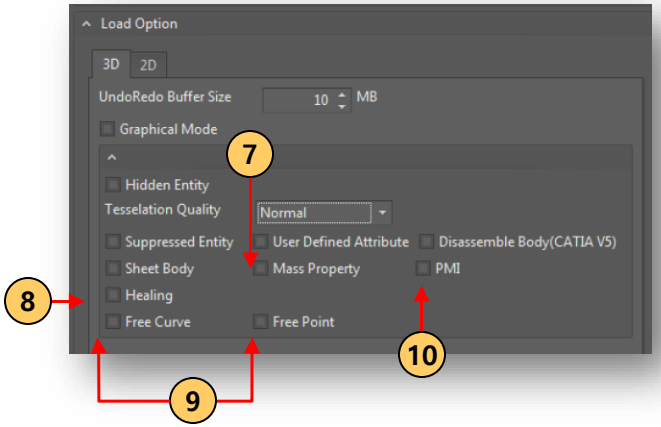
**6 Sheet Body**

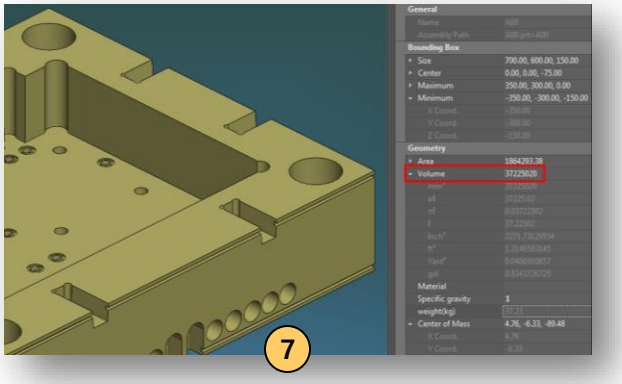
-Opens or loads a 3D CAD file with sheet body especially from .IGES files.

# 2.8 Load Option

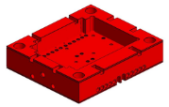
**Option > Load Option > ACIS Mode**

- Opens BREP (Boundary Representation) data with other options.



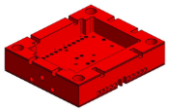




**Mass :: OFF**

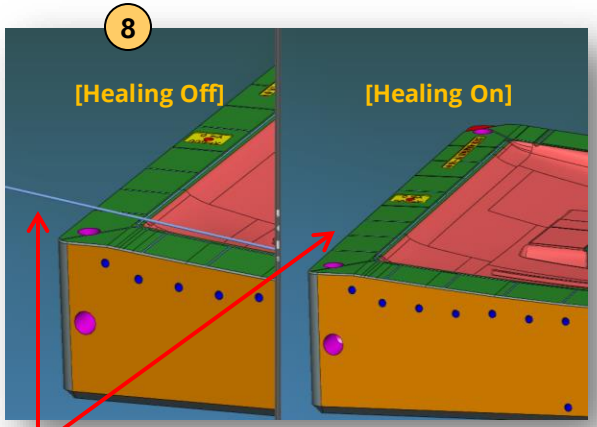


3722,5020 mm3

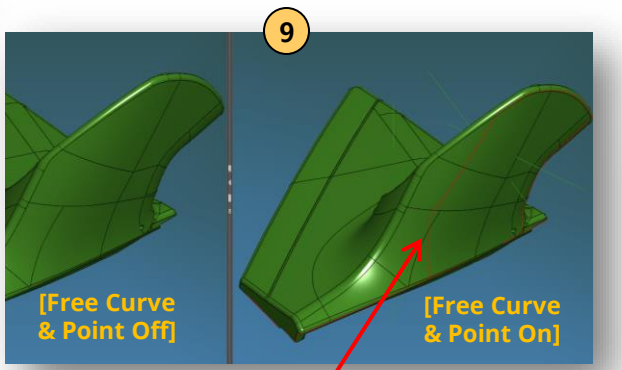
**Mass :: ON**



3724,4148 mm3




Fixing topologies error of Geometry




Parting Line

**7 Mass Property**

-Opens or loads a 3D CAD file that contains mass value predefined by the native file.

**8 Healing**

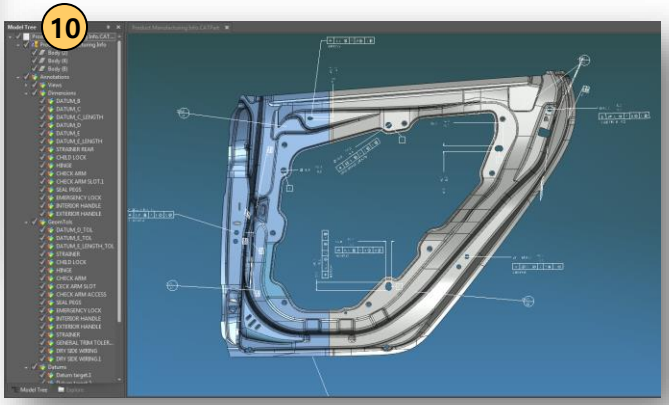
-Fix topologies error of 3D CAD geometry data when loading a 3D CAD file.

**9 Free Curve & Free Point**

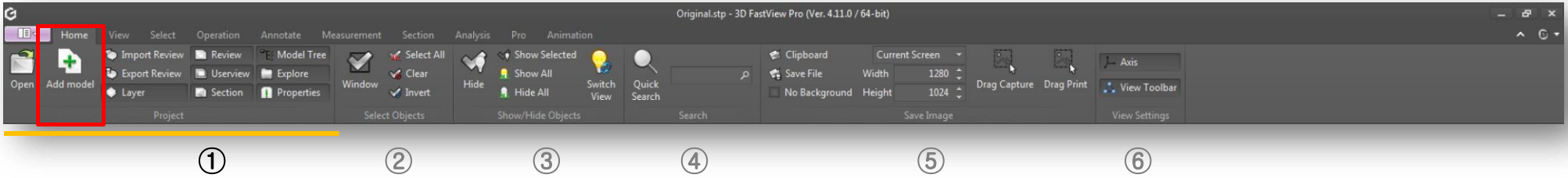
-Opens or loads a 3D CAD file containing and displaying curves geometry and reference axis lines.

**10 Disassemble Body & PMI**

-Opens or loads a 3D CAD file containing components set to be disassembled.
-Opens or loads a 3D CAD file containing PMI (Product Manufacturing Information).

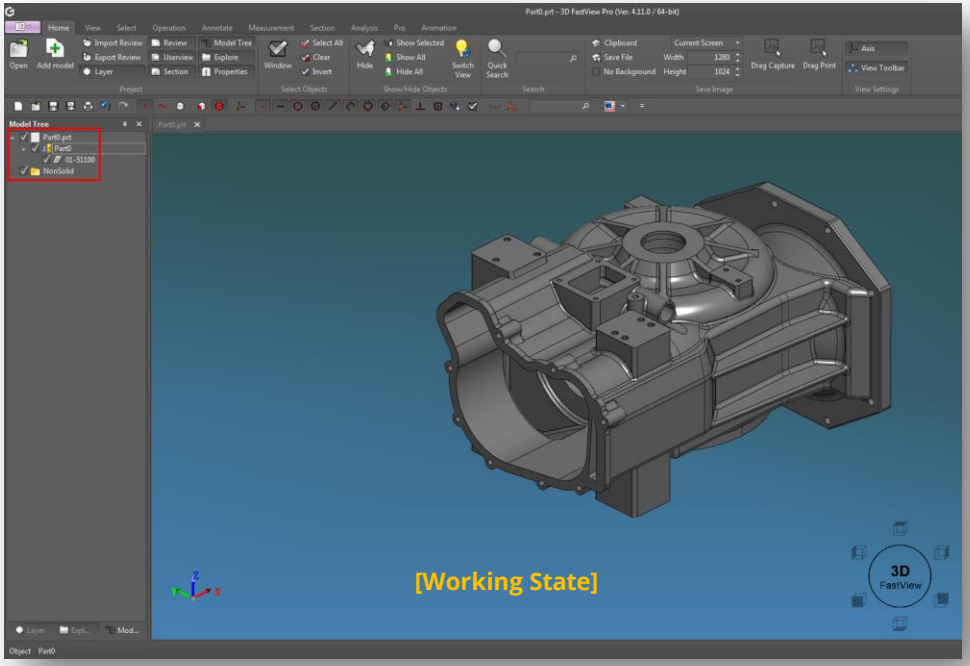


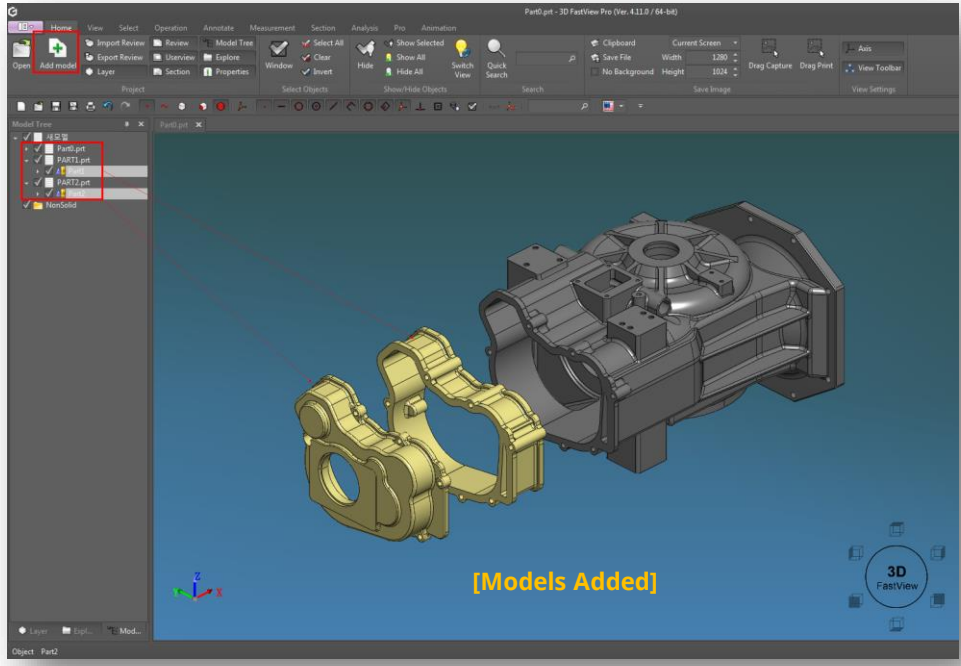
# 3. Home Tab > Project Panel



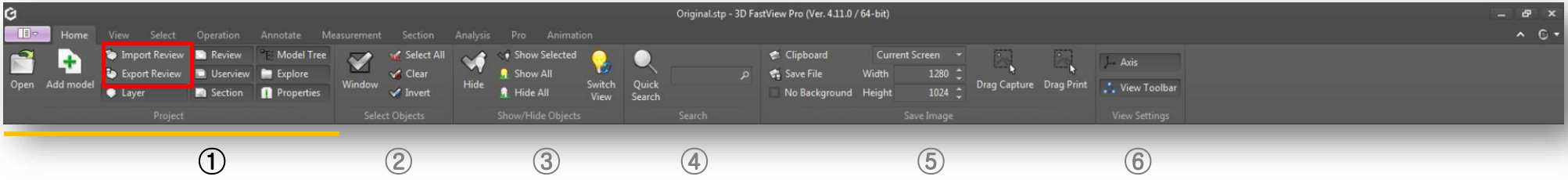

**Project Panel**

**Add Model:** You can merge models into your current working file. All 3D CAD file formats supported can be added by 3D FastView except 2D CAD files.



# 3. Home Tab > Project Panel




## Import Review

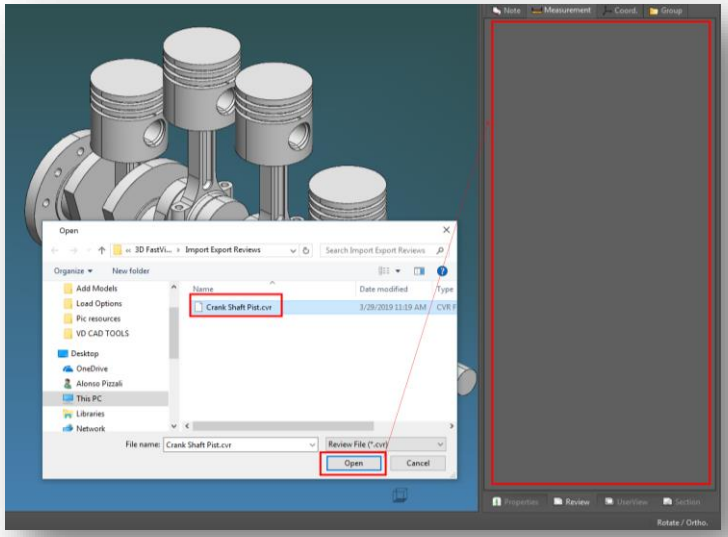
-Loads review information file such as “Userview”, “Measurement” and “Annotations” saved in (*.cvr).

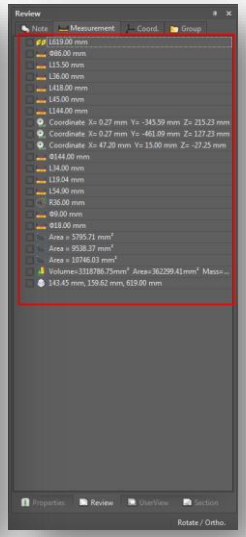
-When recalling a review file, the model used to generate review information must be opened first.

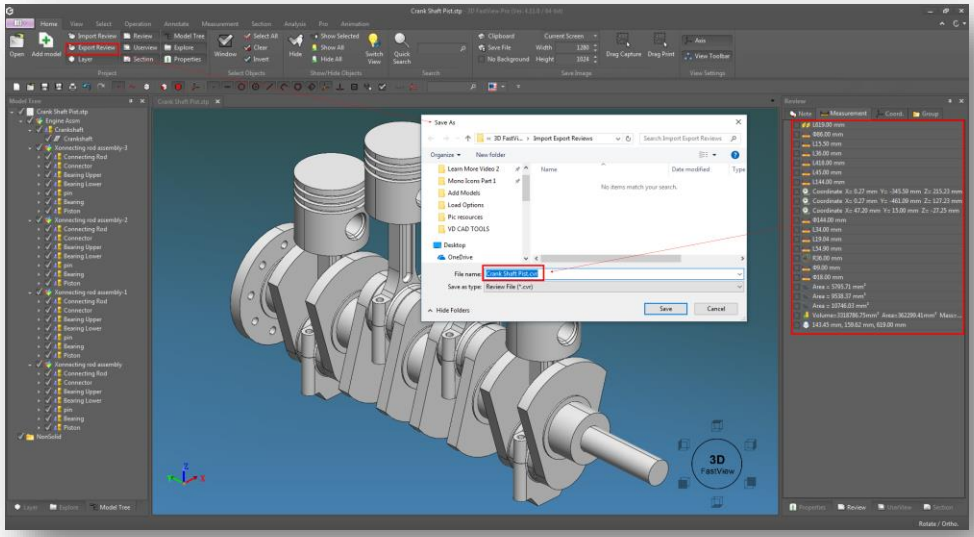
## Export Review

-Exports review information such as “Userview”, “Measurement” and “Annotations” to a (*.cvr) file.

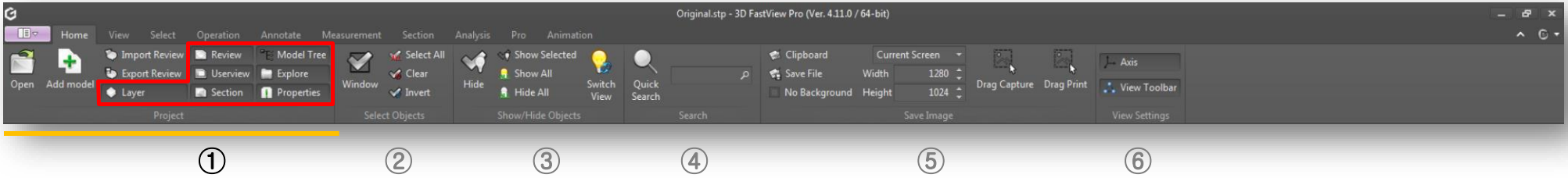
-When creating a review file, create the same file name that you are working on for easier management.



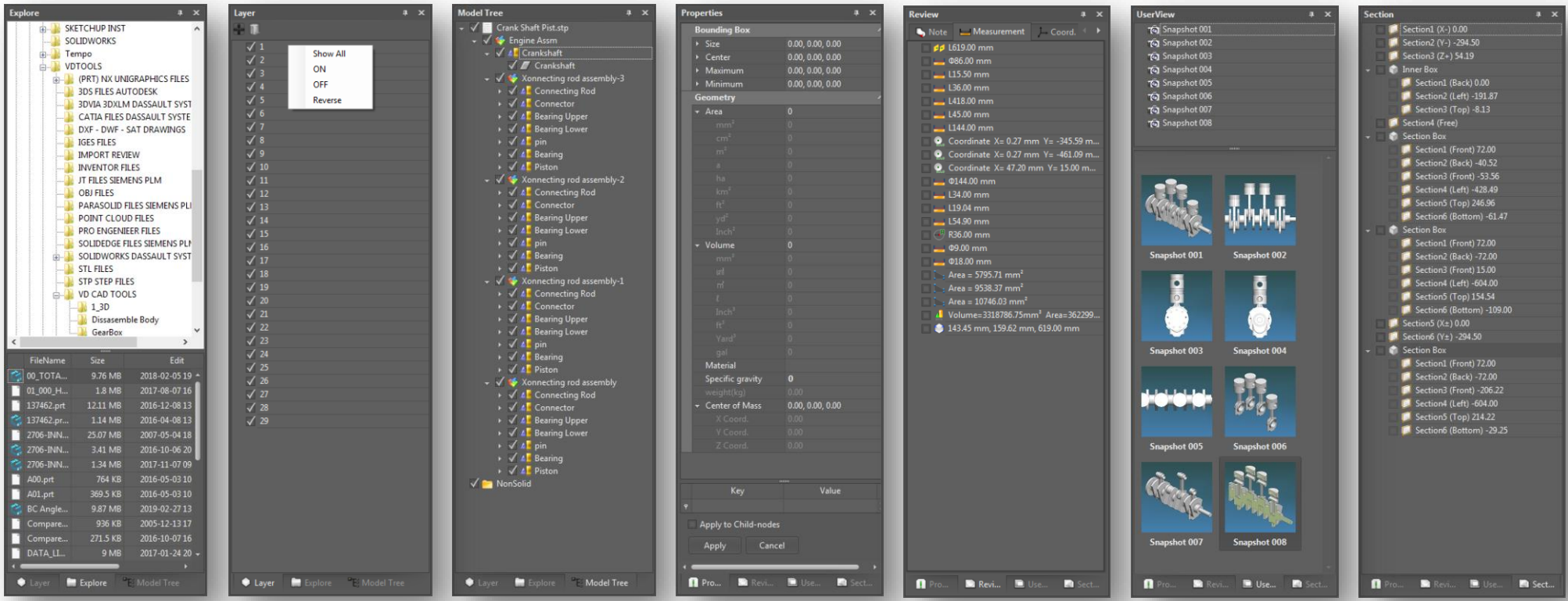


# 3. Home Tab > Project Panel

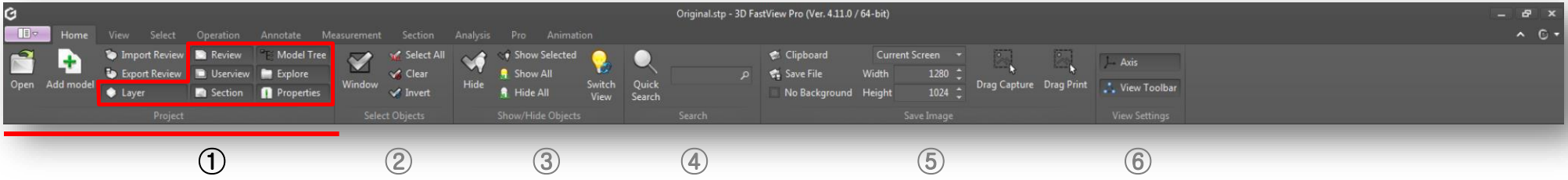



## Information Windows

1) Supports 7 kinds of information windows such as "Review", "UserView", "Section", "Model tree", "Explorer", "Layer", and "Properties"
2) Each information window can be active or inactive and can be docked and undocked at any desired location on the screen



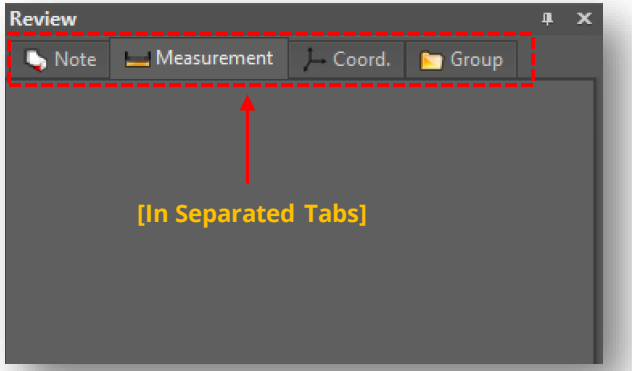
# 3. Home Tab > Project Panel



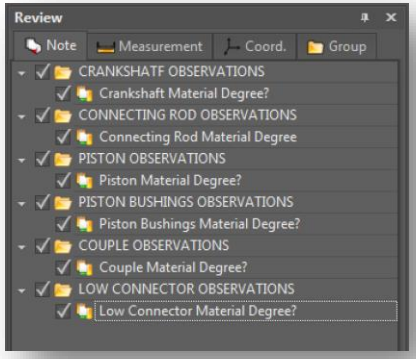

## Review Window

1) Manage tabs for notes, measurements, axis coordinates, and group information in separate tabs.
2) Modify, show, hide, remove, etc options from context menu by right-clicking any measurement, note, coordinate or group information.

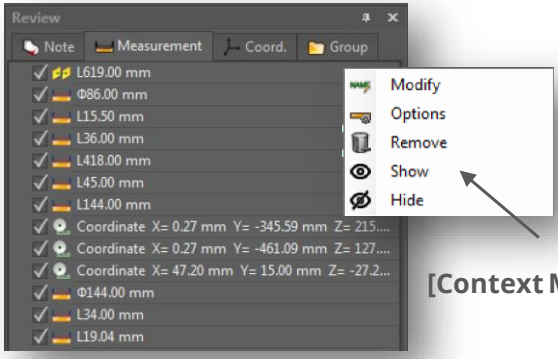
**[Review Window]**




**[Note Tab]**

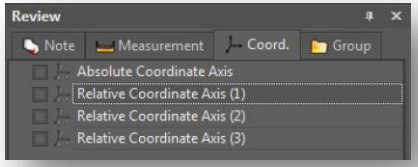



**[Measurement Tab]**

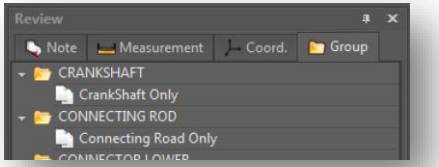



**[Context Menu]**

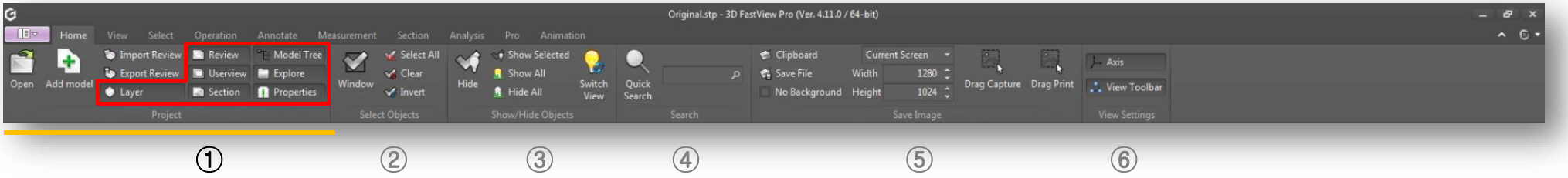
**[Coordinate Tab]**




**[Group Tab]**



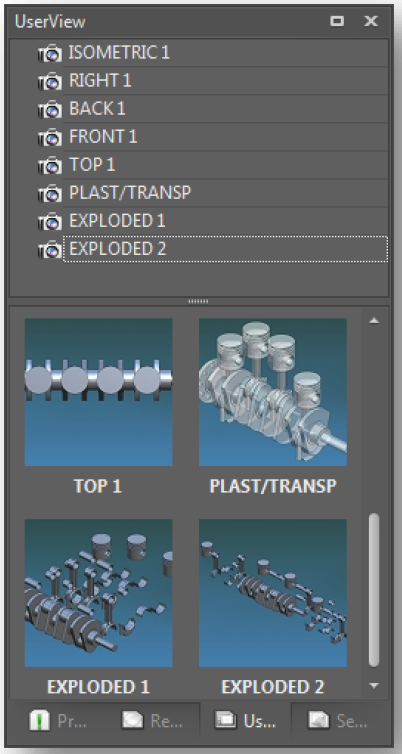
# 3. Home Tab > Project Panel




## Userview Window

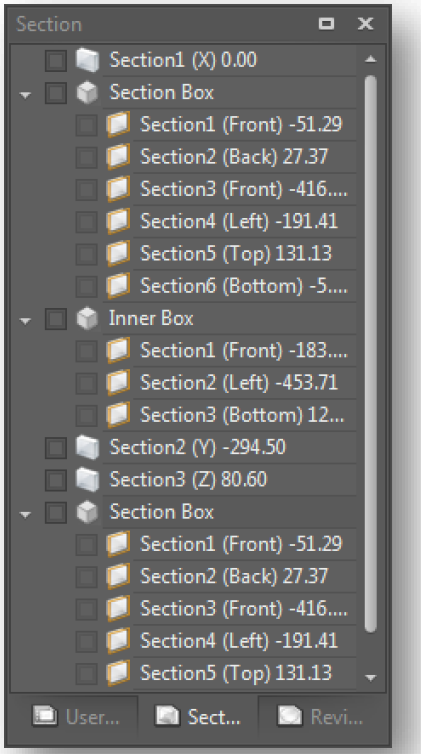
-Manages all screenshots taken.

-Used as scene key when working with dynamic animation.



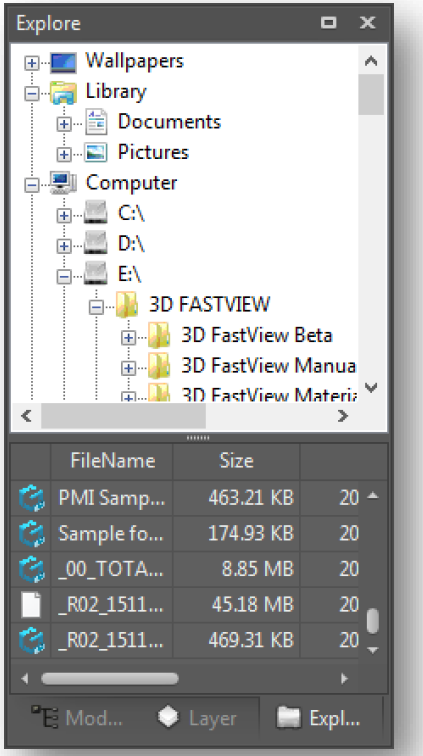

## Section Window

-Manages (show, hide, rename, delete from context menu) all section types performed to a CAD model




## Explore Window

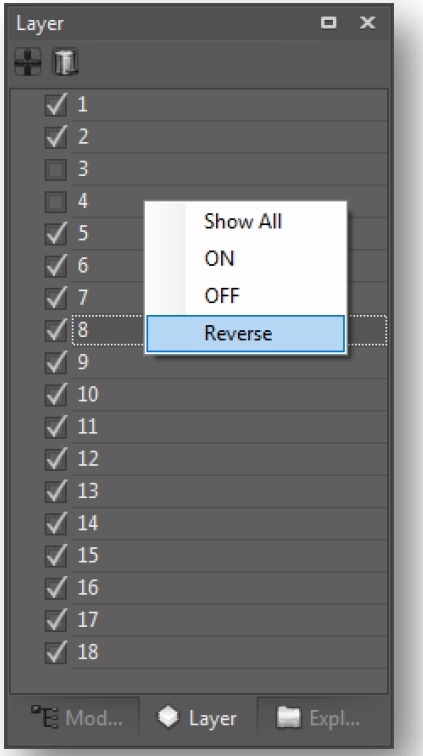
-Quick access and search of files stored on local PC.



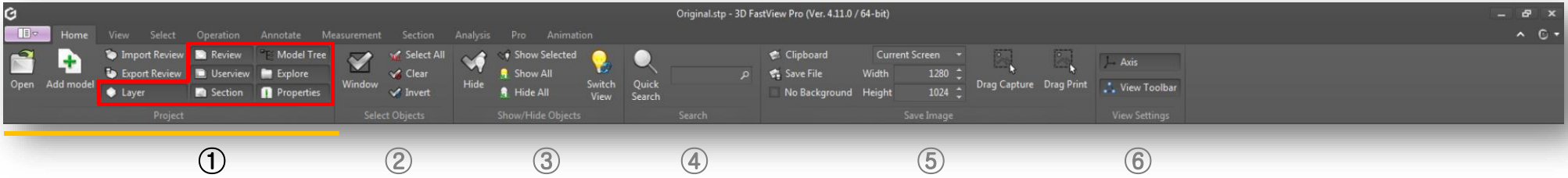

## Layer Window

-Creates, shows, hides layers of selected part.

-0~255, Supports the same number of layers as NX.

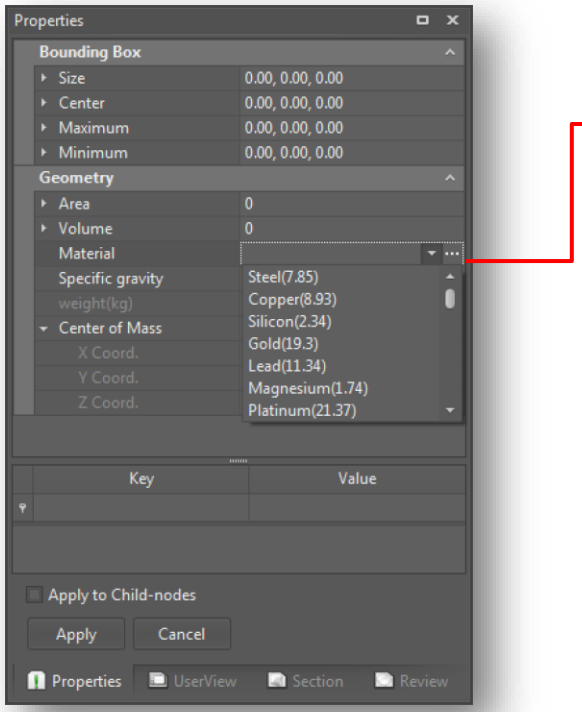


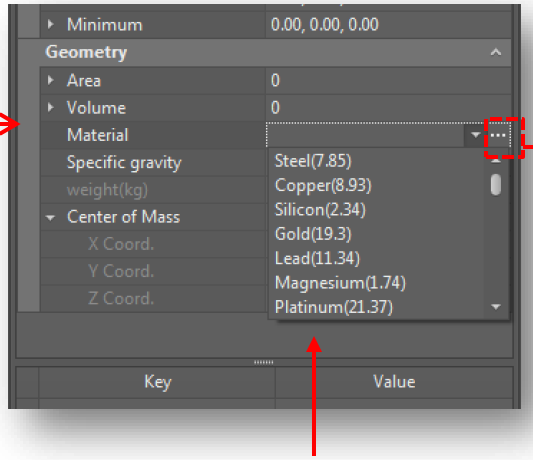
# 3. Home Tab > Project Panel




## Properties Window

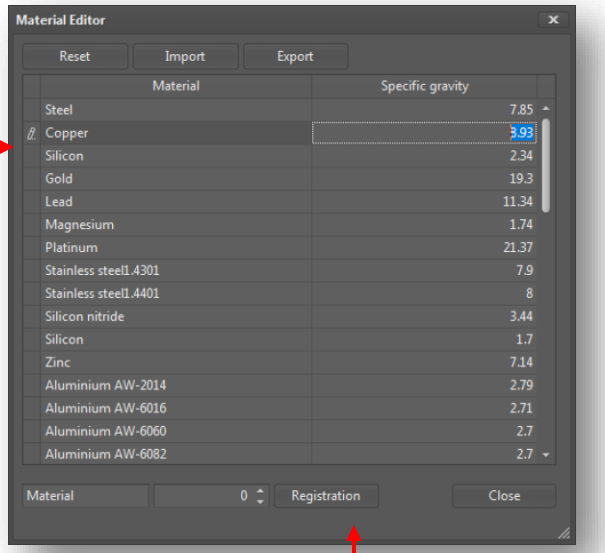
1) See attribute information for selected model.
2) You can use the provided material values, import, export and add your own material.




※ Material specific gravity value standard DB

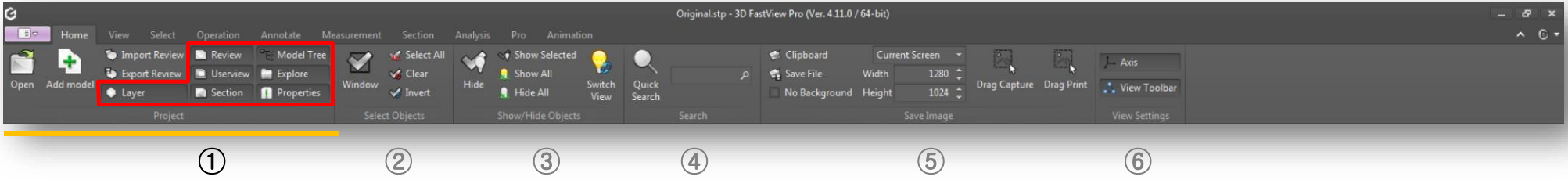
※ Material Editor




※ Material specific gravity value standard DB

1) Add, modify and delete material related to weight.
2) You can export or import DB files.

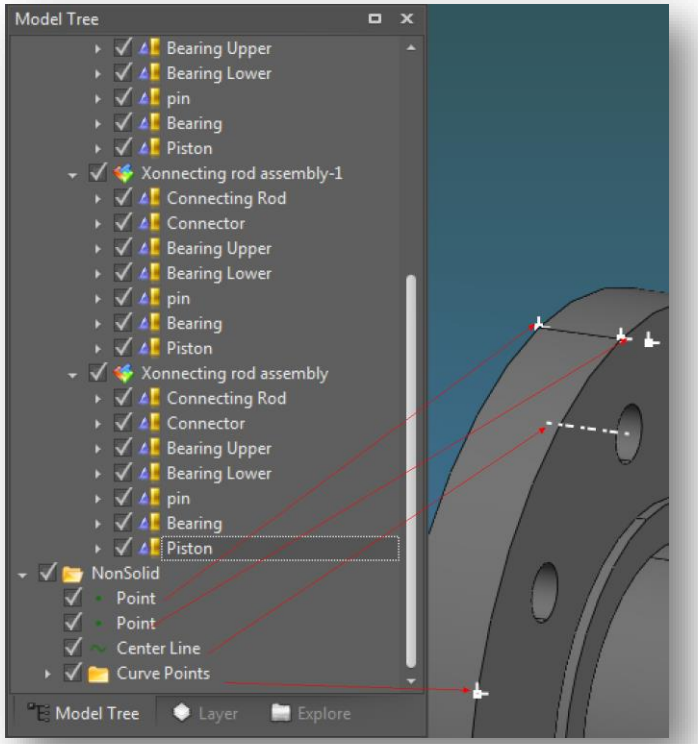
# 3. Home Tab > Project Panel

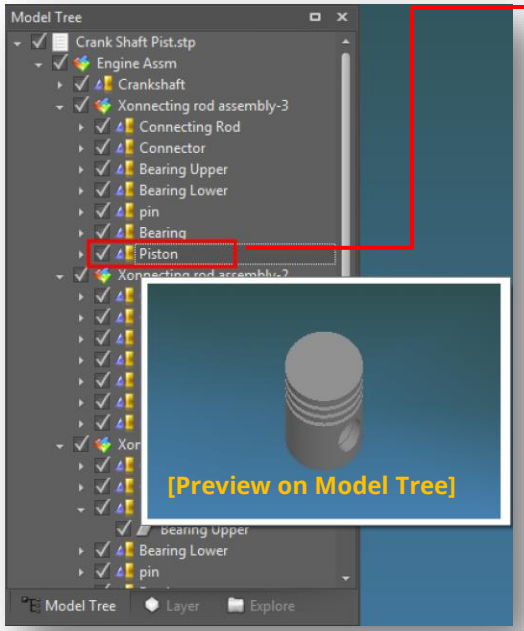


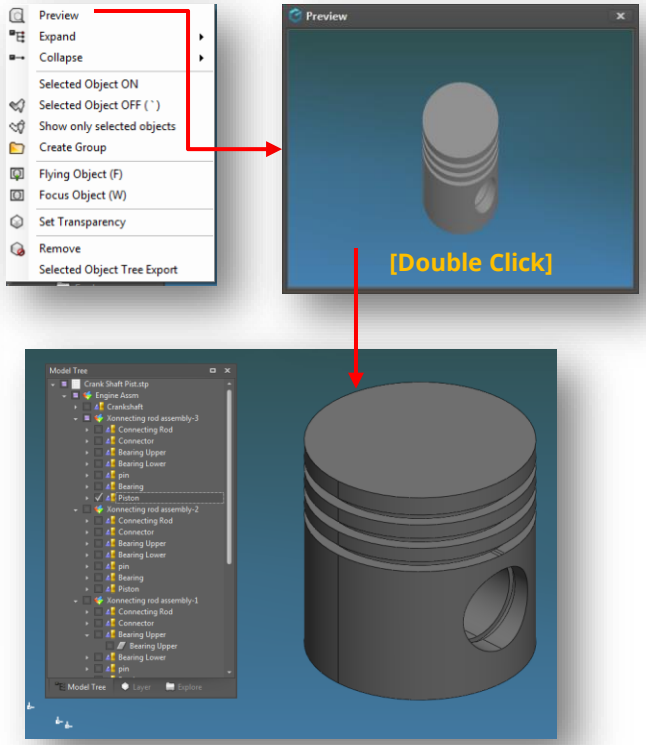

## Model Tree Window

-Shows model parts or components list in hierarchical tree included non-solid geometry like point and line.

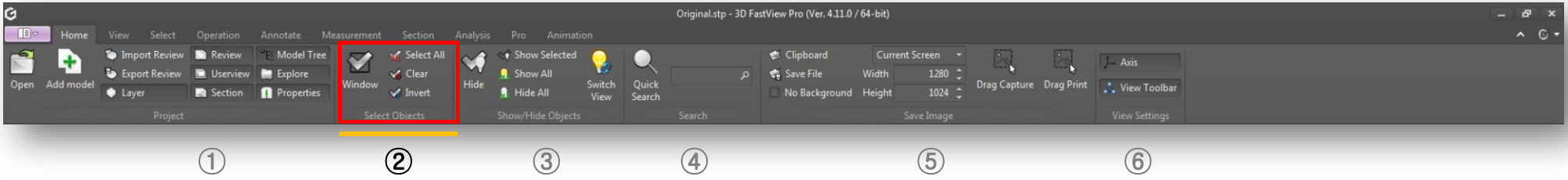
-Preview a part or component by selecting it on the list and placing the mouse for 1 second.
-Select "Preview" in the context menu by right-clicking in a part or component to view it in a small window. Double-click in the small window to see the selected part or component on workspace.



# 3. Home Tab > Select Objects Panel

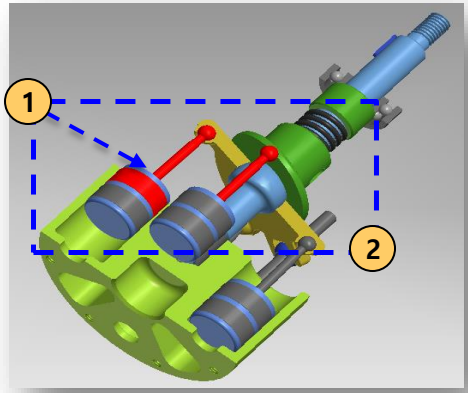



## Select Objects Panel

1) **Window:** Selects all parts within a window area of two points.
2) **Select All:** Selects all parts or components on screen (CTRL + A).
3) **Clear:** Deselects previous selected parts.
4) **Invert:** Selects all parts except the current selected part.
5) CTRL + Click (select and deselect parts)

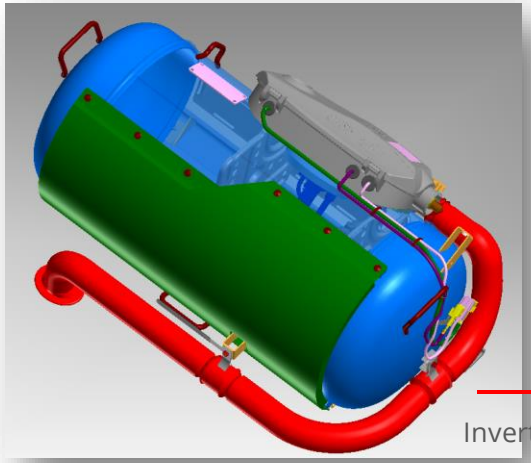
### Window Selection 1

Select parts by window selection area [Shift + Left mouse click (1) & drag to second point (2)

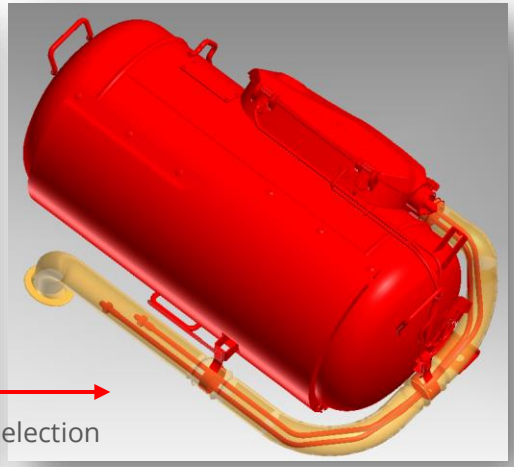



[Left select → right drag]

### 1) Window Selection

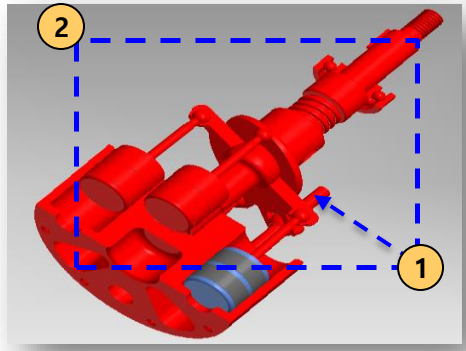


### 2) Invert Selection



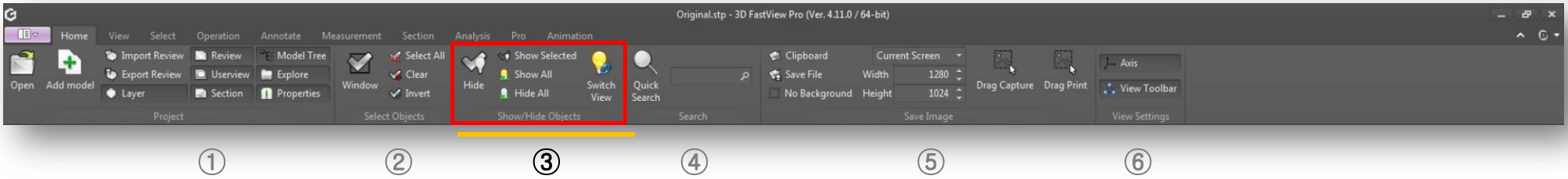

### Window Selection 2

Select parts by window selection area [Shift + Left mouse click (1) & drag to second point (2)




[Right select → Left drag]

# 3. Home Tab > Show/Hide Objects Panel

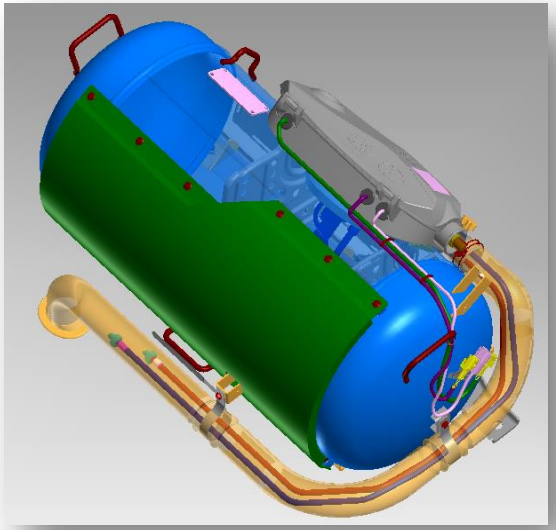



## Show/Hide Objects Panel

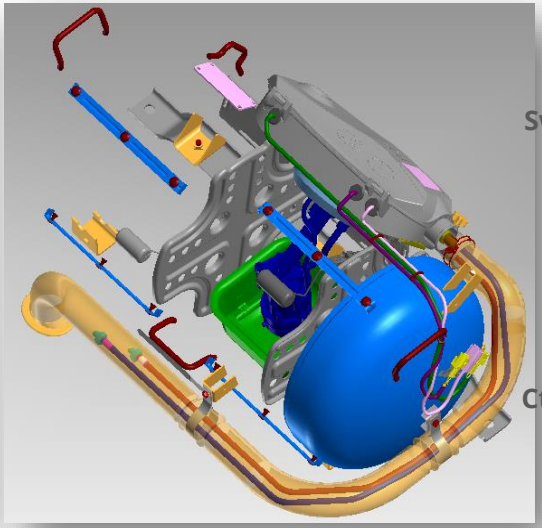
1) **Hide:** Hides selected part or component on screen [Function key : ~]
2) **Show Selected:** Only the selected part is shown on the screen.
3) **Show All:** Show all hidden parts in the model tree and screen.
4) **Hide All:** Hide all the parts in the model tree and screen.

5) **Switching View:** Shows/hides between selected and non-selected parts in the model tree and screen by pressing [CTRL + Shift + B]

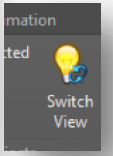
### 1) Original View



### 2) Hide Select parts



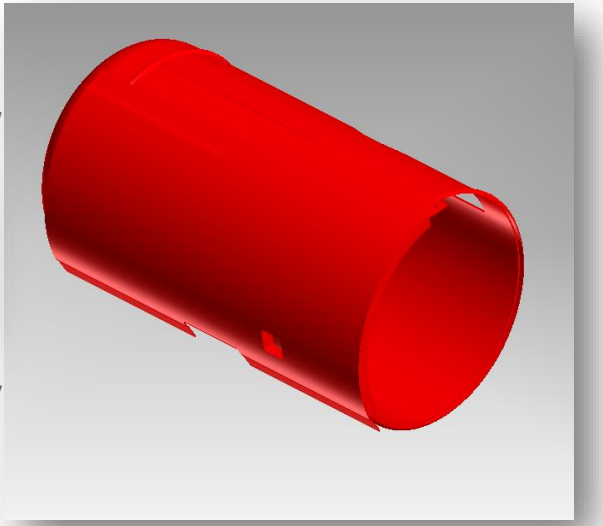
Switching View



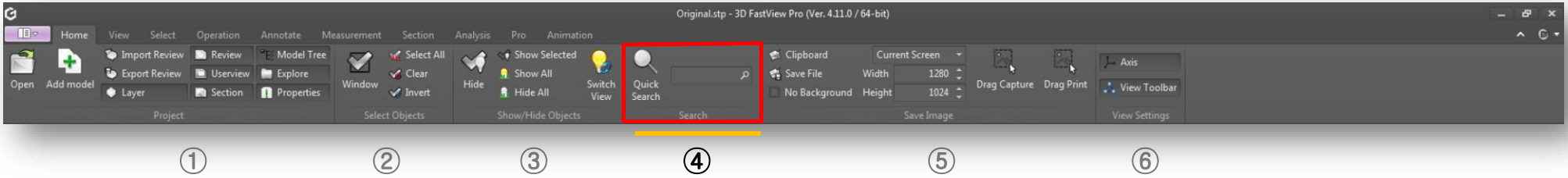

or

Ctrl & Shift + 'B'

### 3) Show only Selected Object



# 3. Home Tab > Search




## Select Objects Panel

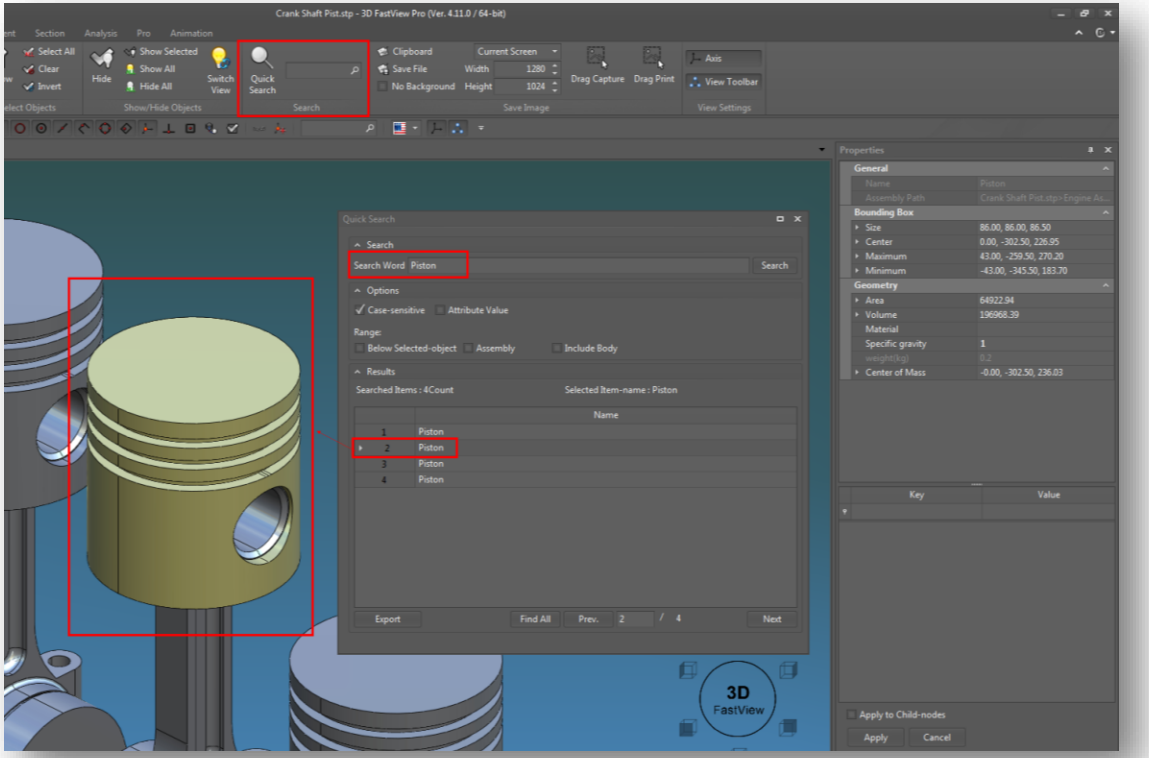
1) **Quick Search [CTRL + F]:** Search for file name and property value within assembly part.

2) In the list of search results, fly to the object when the part is selected (Flying Object).

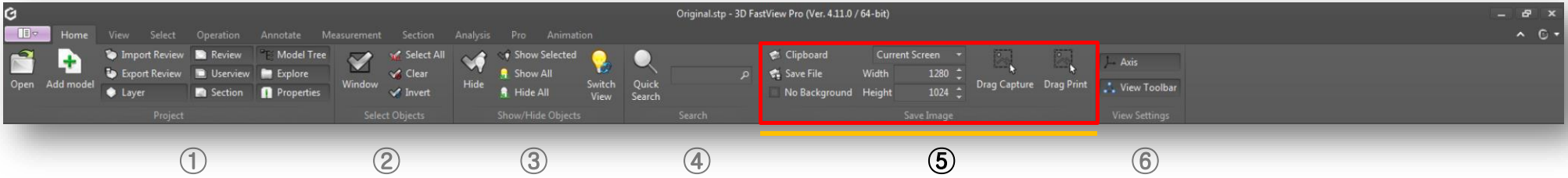
3) Options:
   -Case Sensitive
   -Attributes
   -Range: Selected Object Below / Assembly.

4) Select the “Prev./Next” button to move a part.

5) “Find All” : Select all the parts on the search list.



# 3. Home Tab > Save Image




## Save Image

1) **Clipboard:** Copies entire model shown on screen to clipboard.

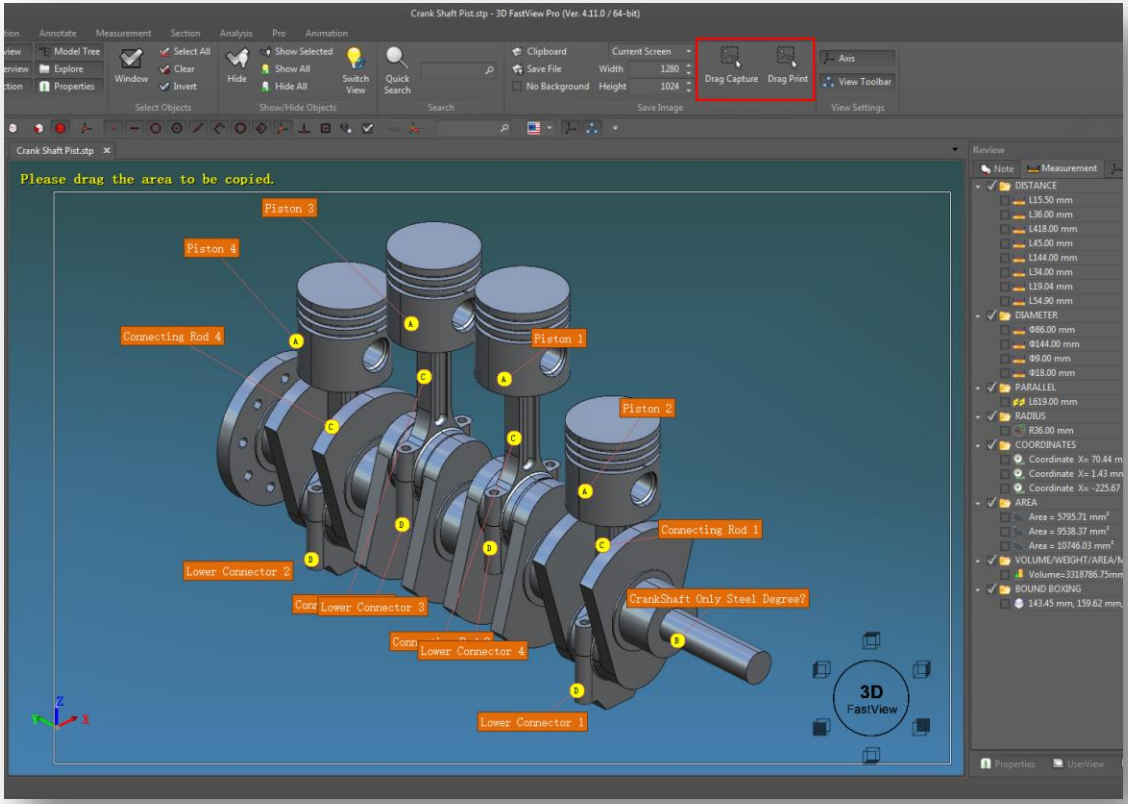
2) **Save File:** The entire model on the screen can be saved a file (*.bmp, *.jpg).

3) **No Background:** Specifies no background color for image when “Copy to Clipboard, Save to File”.

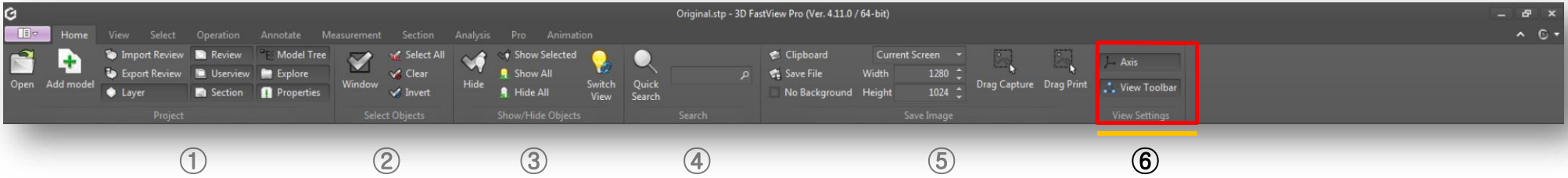
4) Set Image Size:
   -Current Screen, User Defined Size, 640x480 etc.
   -Width/Height Setting.

5) **Drag Capture:** Copies only user selection area to clipboard.

6) **Drag Print:** Prints only user selection area directly.



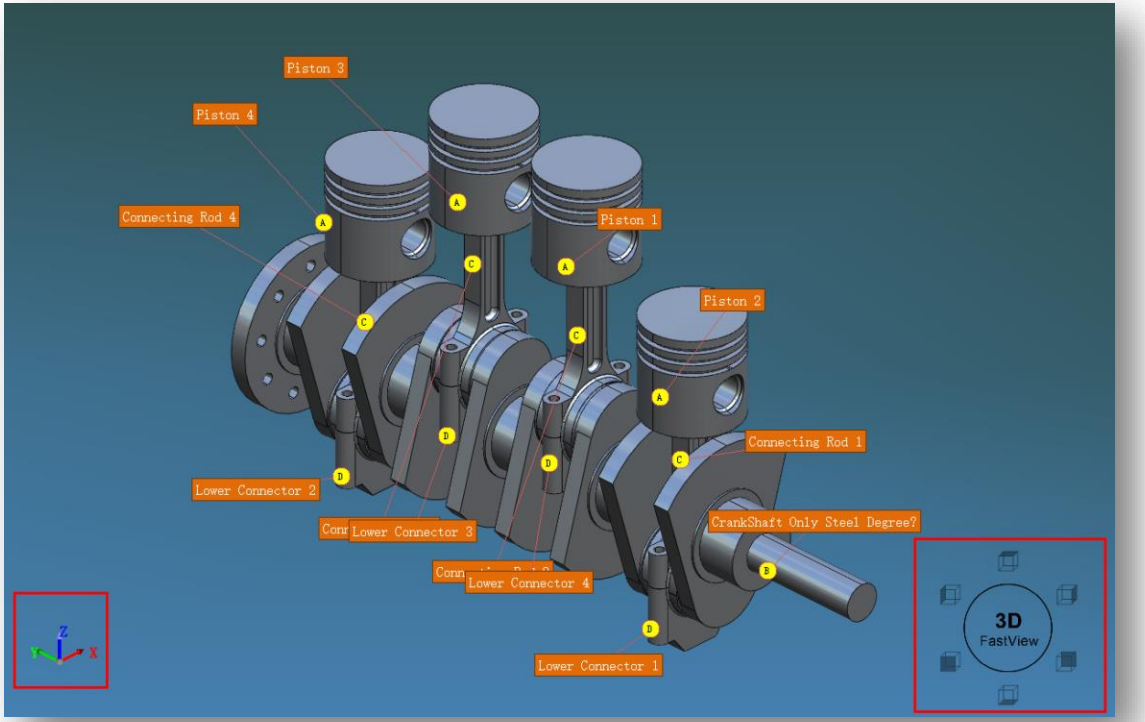
# 3. Home Tab > View Settings



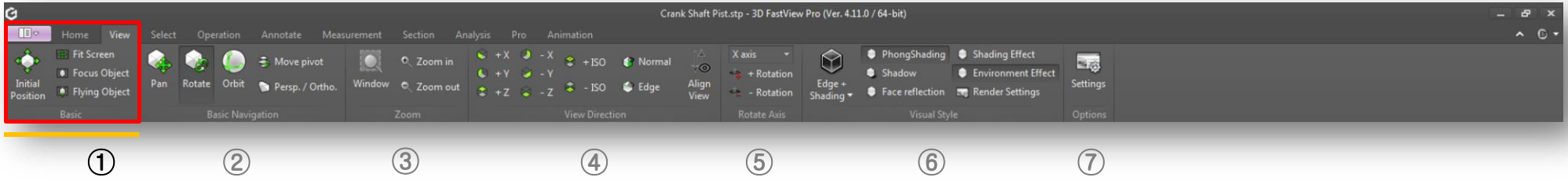

### Axis and View Toolbar

1) **Axis:** Located at bottom left of screen area, select whether to hide or show the axis icon.

2) **View Toolbar:** Choose whether to show or hide the view toolbar. With the view toolbar users can change views like top, right, back, bottom, front, left and isometric.



# 4 View Tab > Basic




## Basic Panel

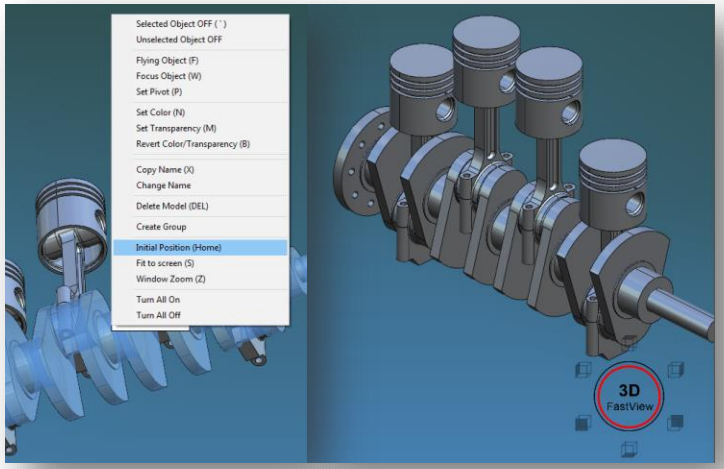
1) **Initial Position:** Switches model view to initial open state.

2) **Fit Screen:** Fits the model view onto the screen.

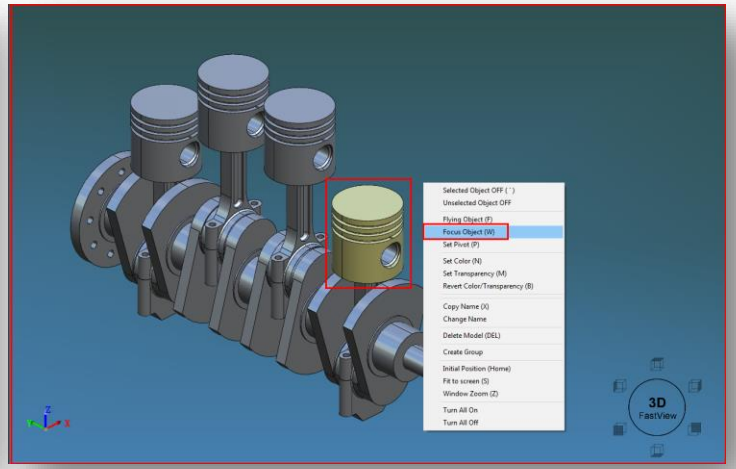
3) **Focus Object:** Moves a selected model to middle screen.

4) **Flying Object [F]:** Enlarges the selected model on the screen.

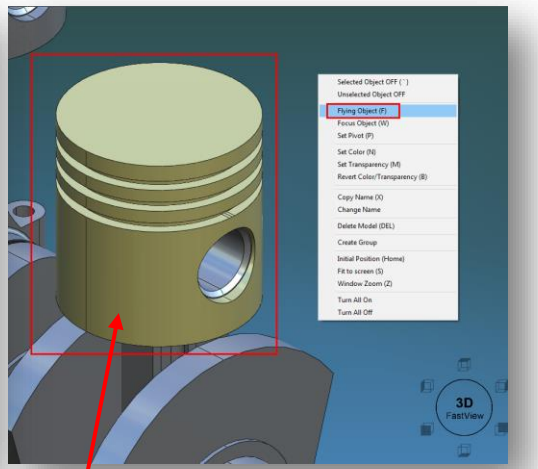
### 1) Initial Position




### 2) Focus Object

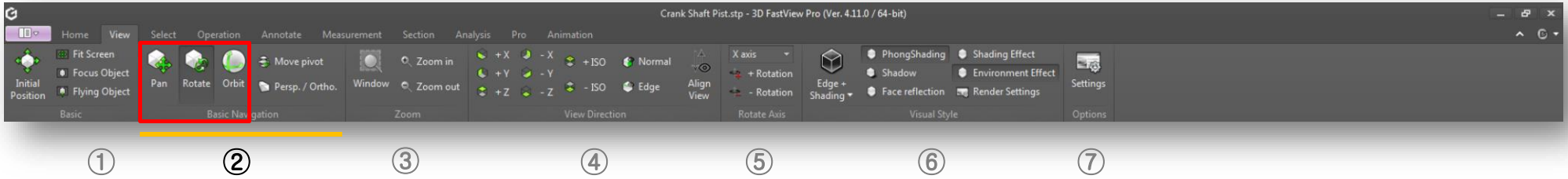



### 3) Flying Object




※ When double-clicking the model, execute the same command as the Flying Object function

# 4. View Tab > Basic Navigation



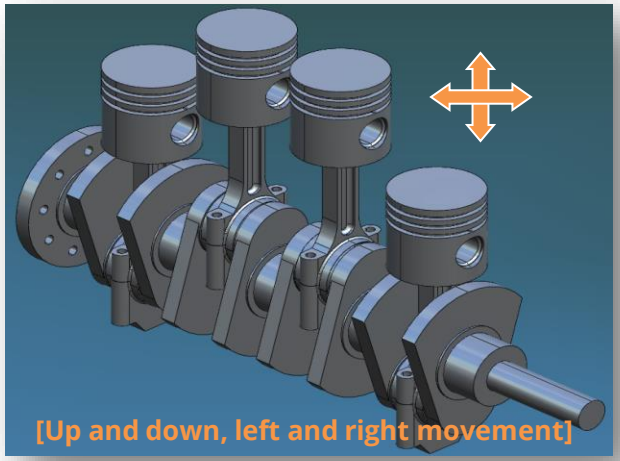

## Basic Navigation Panel

1) **Pan (F1):** Moves model on screen up/down/left/right only.

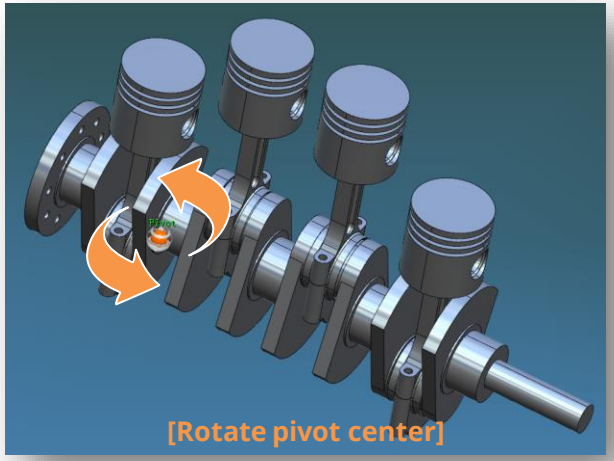
2) **Rotate (F2):** Click and drag the mouse middle(wheel) button to move the model up/down/left/right as in "Pan mode.

3) **Orbit (F3):** Orbit rotation around the zero point of the model's coordinate system.

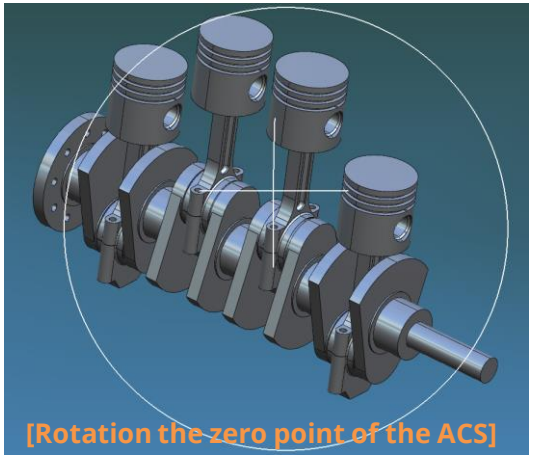
### A) Pan Mode




### B) Rotate Mode



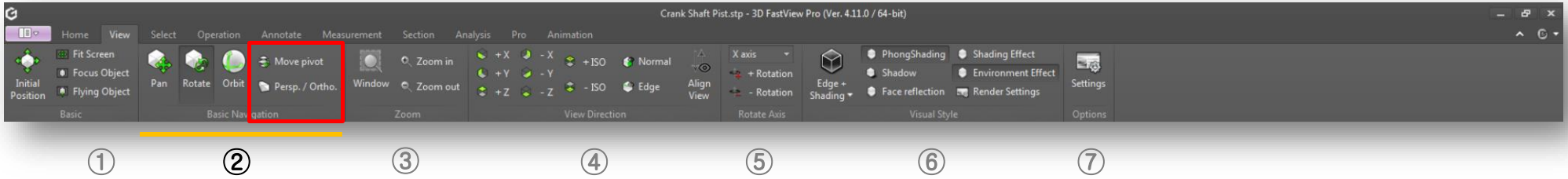

### C) Orbit Mode




□ **To set the pivot**

1) Left mouse button 1 second click at a specific point in the model to pivot point.
2) Click the Move Pivot icon to select the pivot point directly on the model.

# 4. View Tab > Basic Navigation

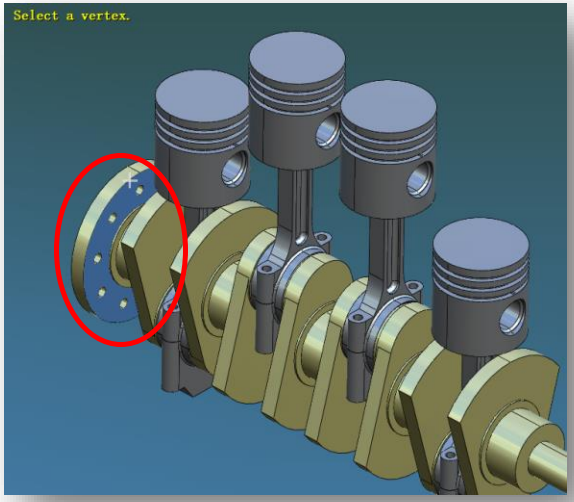



## Basic Navigation Panel

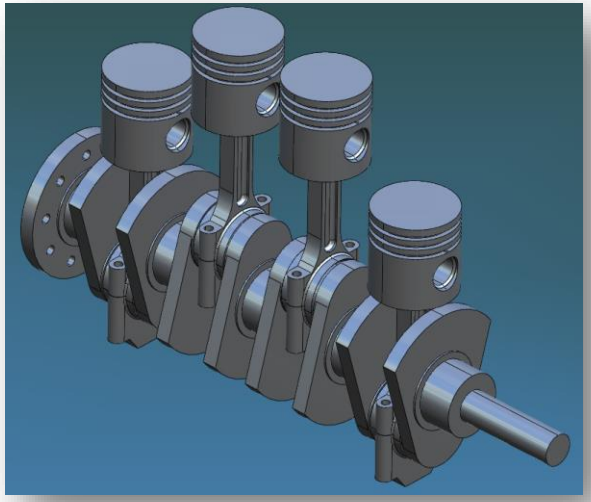
1) **Move Pivot:**
-Click the Move Pivot icon to select the pivot point directly on the model.
-If you see the "Select a vertex" message, you can select a pivot set point.

2) **Persp. / Ortho:** Adjust the perspective view of the model (balanced mode as default).

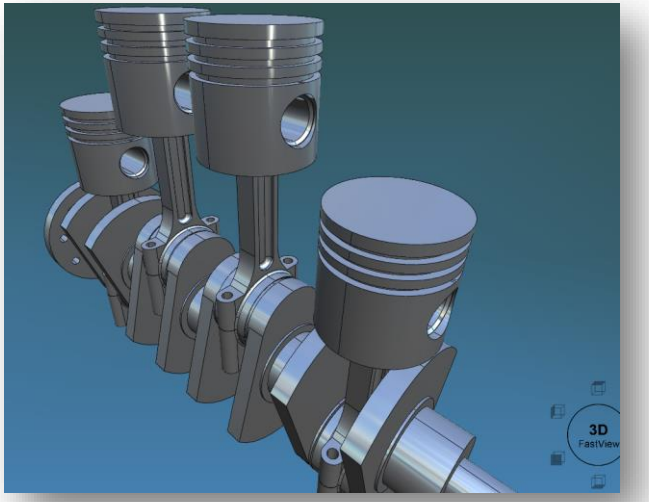
### A) Pivot Moving



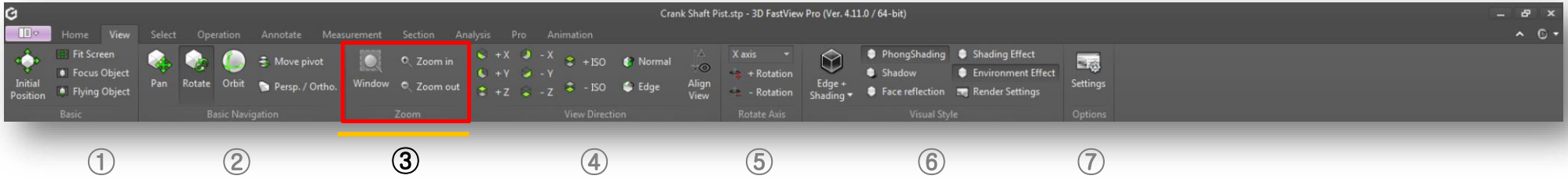

### B) Balanced mode



### C) Perspective Mode



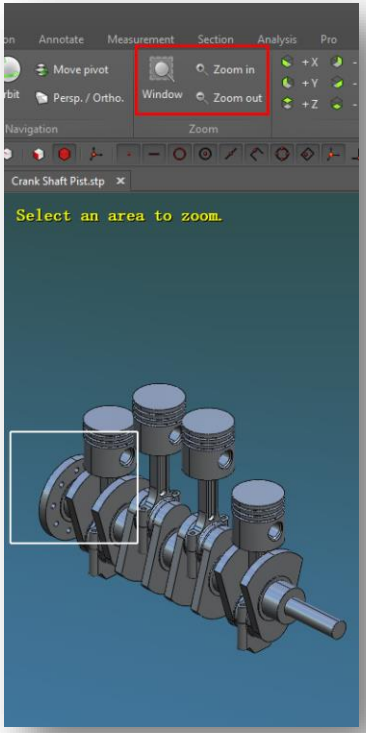
# 4. View Tab > Zoom

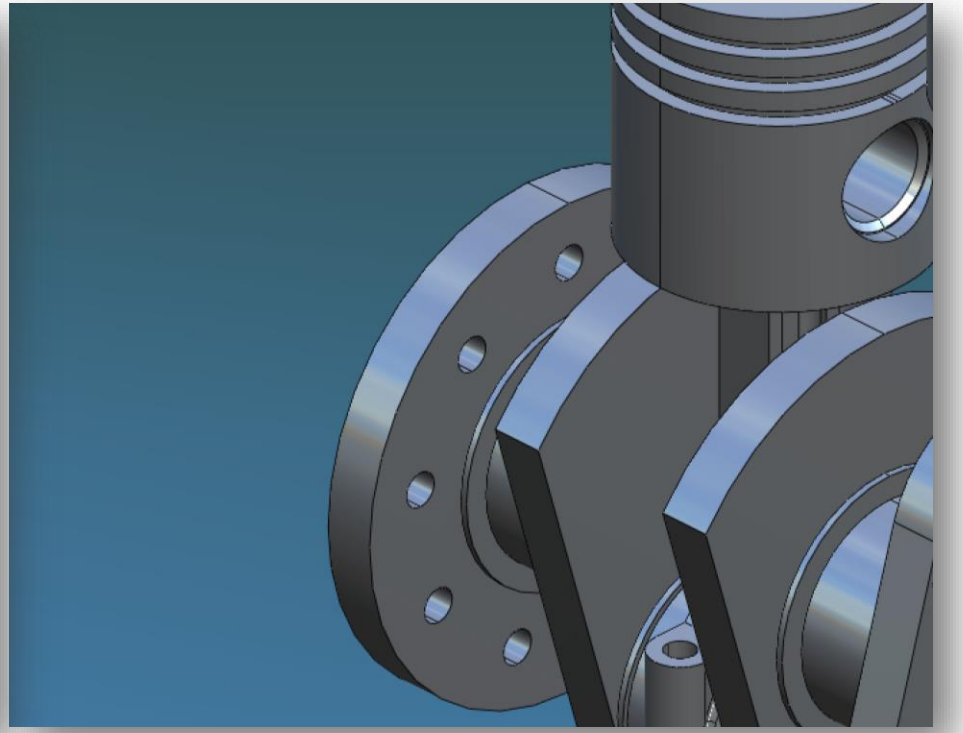



## Zoom Panel

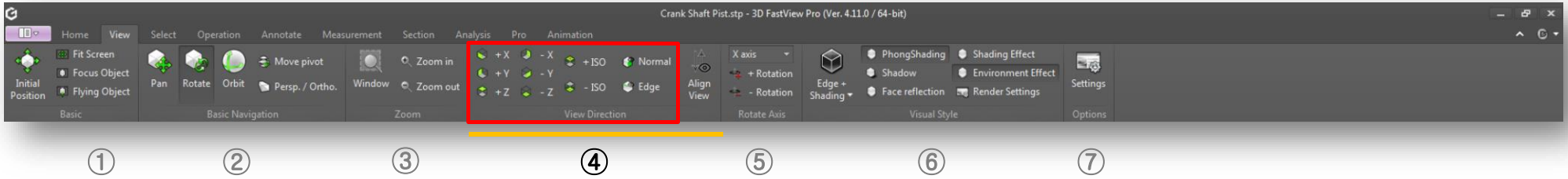
1) **Window (Z):** Window select a specific area of the model to zoom in.

2) **Zoom in / Out:** Enlarges / Reduces model display on screen.



# 4. View Tab > View Direction

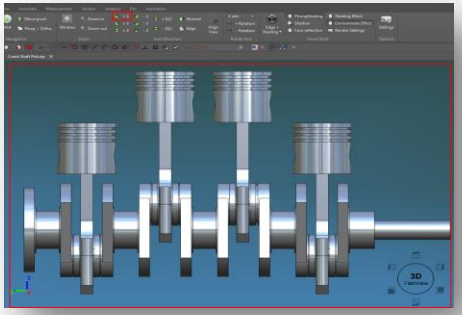



## View Direction Panel

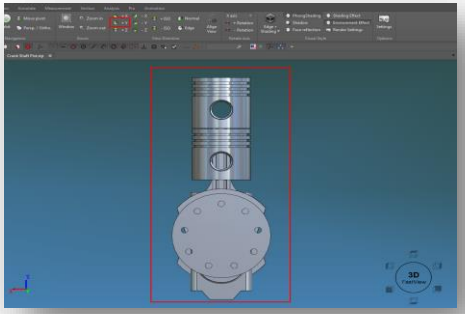
1) **+-X/Y/Z/ISO:** Changes model views by adjusting the camera position to the desired axis direction. Fix the camera position by "ISO" when opening the initial model.

2) **Normal:** Changes model view to normal direction of a selected face.
3) **Edge:** Changes model view based on the selected edge.

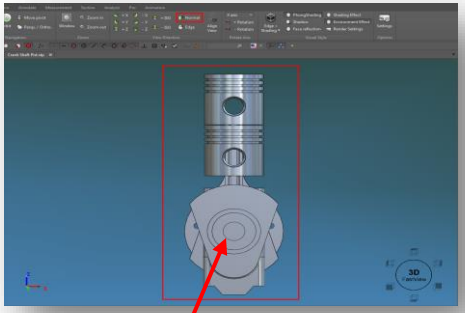
### A) +X



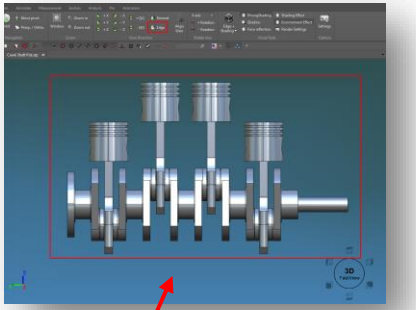
### B) +Y



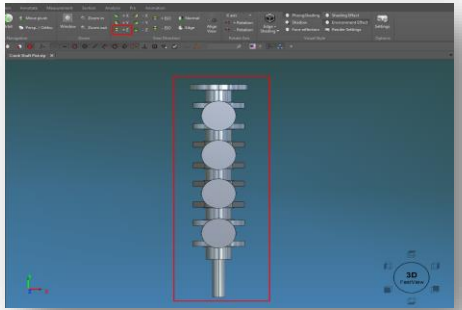
### E) Normal View



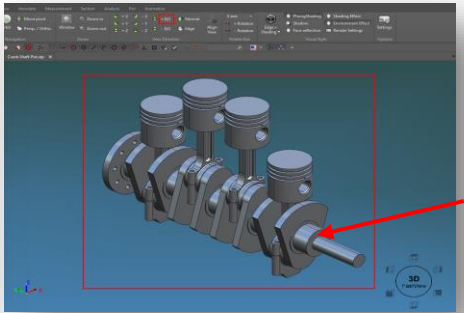
### F) Edge View



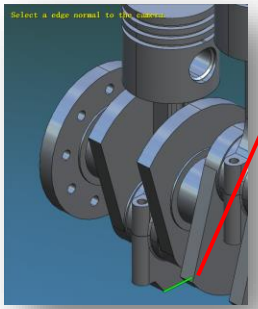
### C) +Z



### D) +ISO

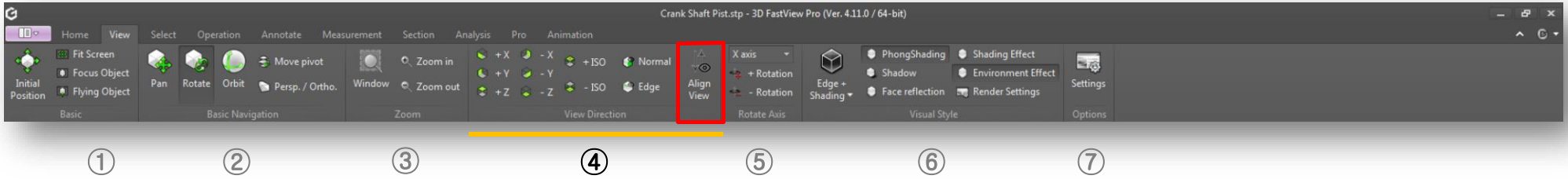


Normal View:
The selected face of the model make it look front on the screen.



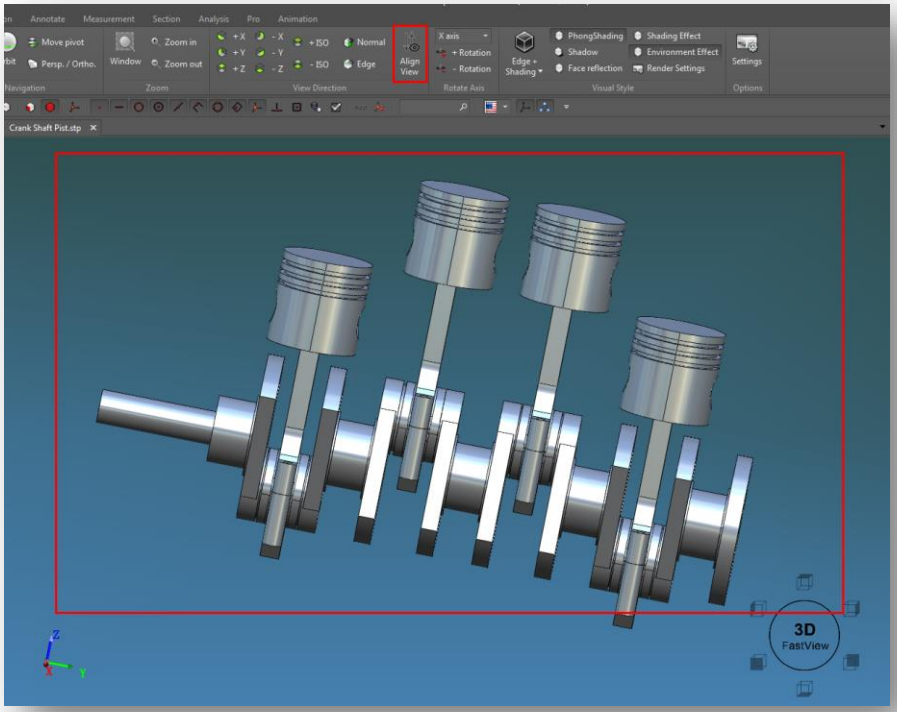

Edge View:
The selected edge of the model make it look front on the screen

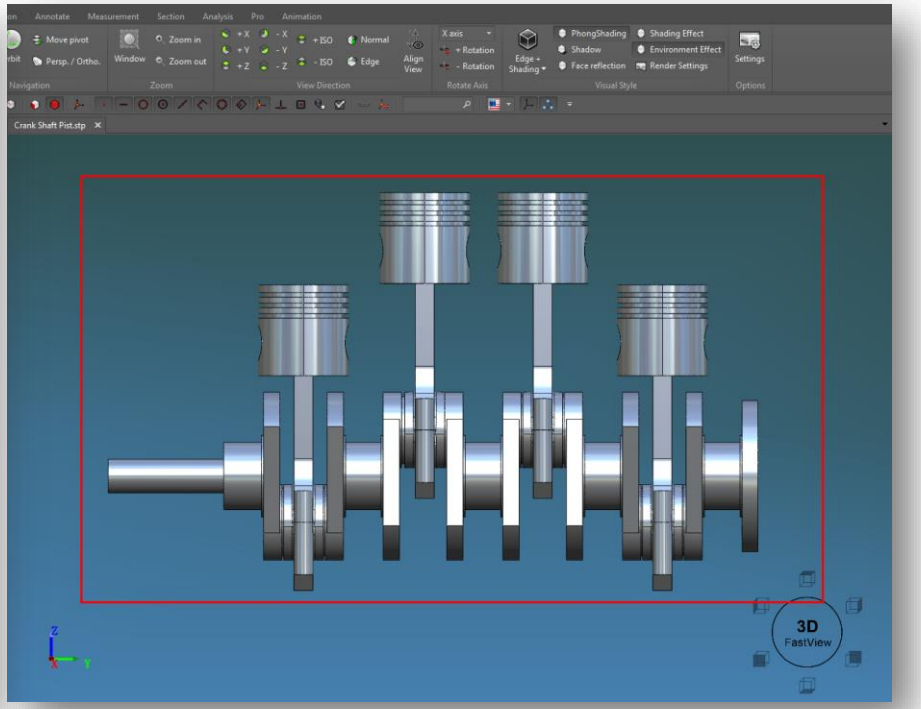
# 4. View Tab > View Direction



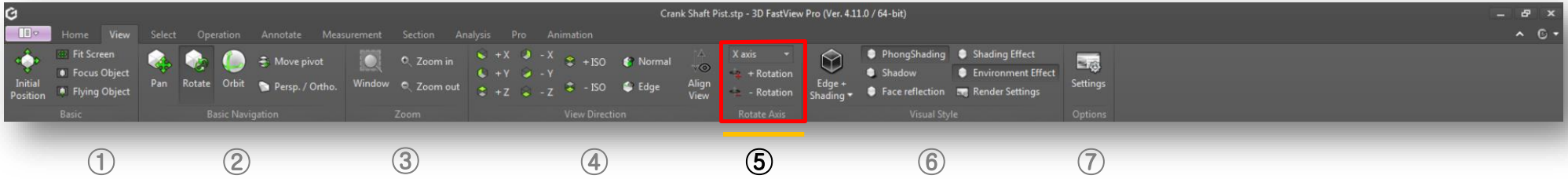

**View Direction Panel**

**Align View:** Click “Align View” icon or press F8 key to view the nearest default axis direction.



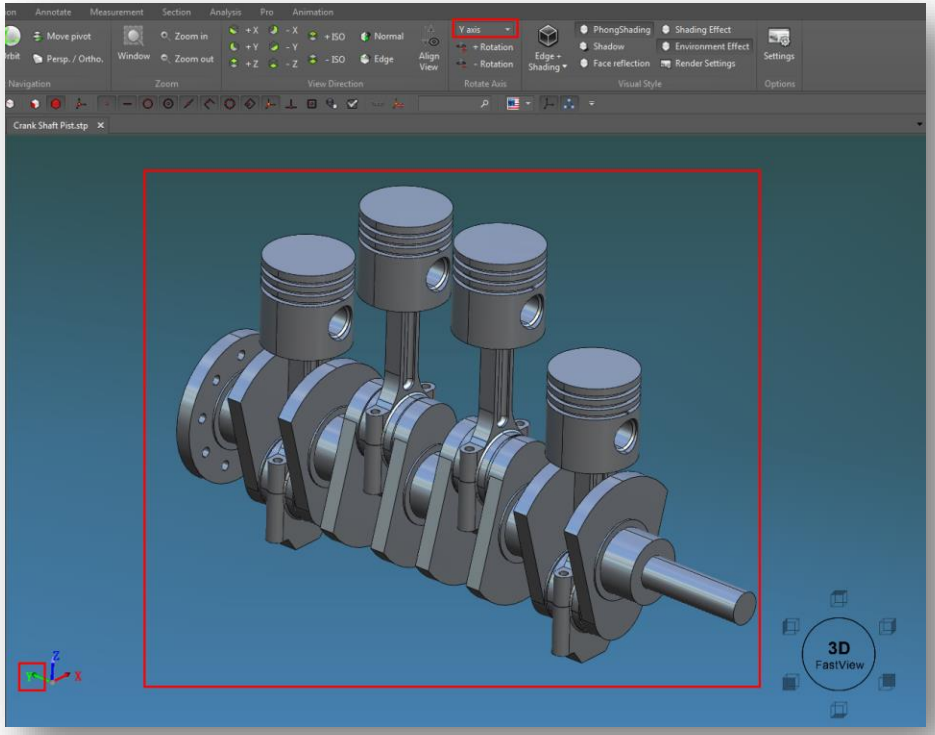



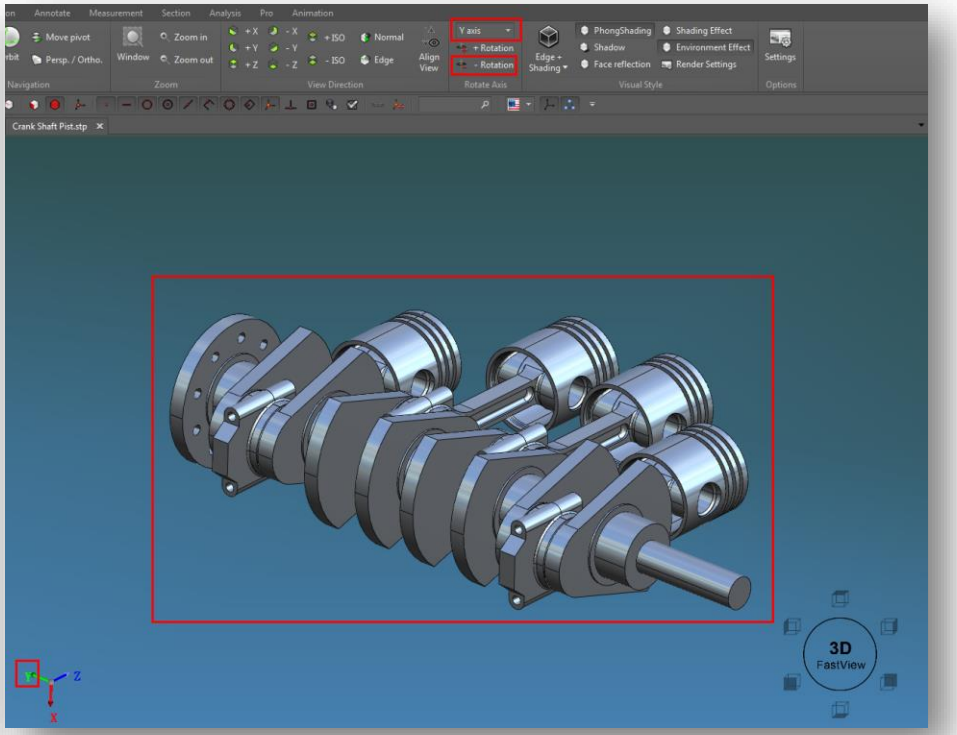
# 4. View Tab > Rotate Axis



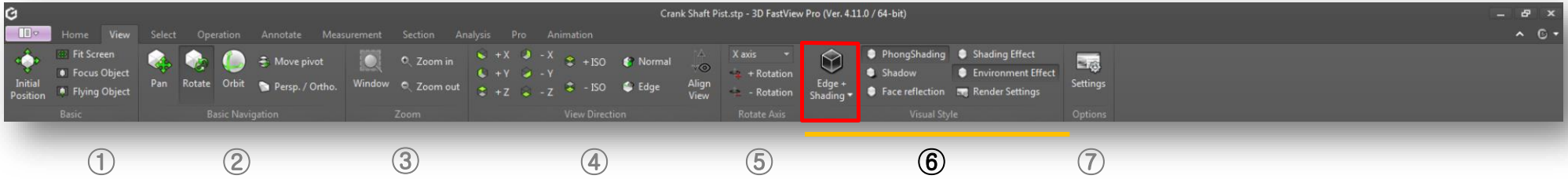

**Rotate Axis Panel**

1) Rotates the model in +/- directions relative to selected axis.
2) Arrow keyboard rotation function supported: View tab > Options panel > Setting – Change the screen Rotation Angle value



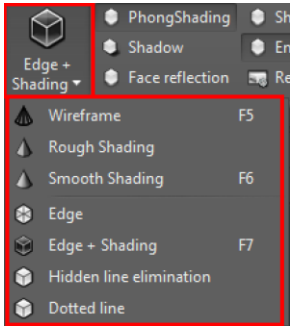



# 4. View Tab > Visual Style

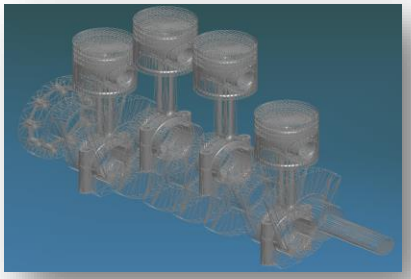



**Visual Style Panel**

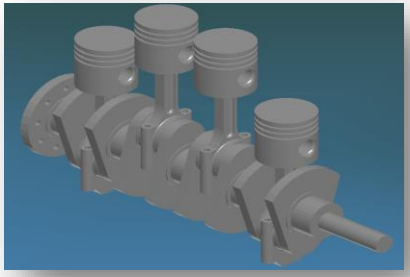
Supports seven visual styles that control the display of edges, shading, background, and shadows of 3D solids and surfaces on current workspace.



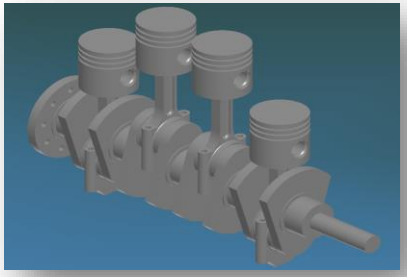

### A) Wire Frame



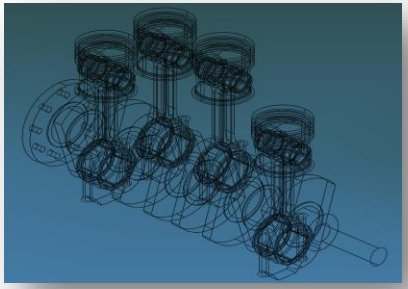
### B) Rough Shading



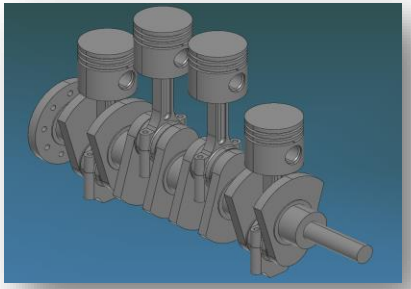
### C) Smooth Shading



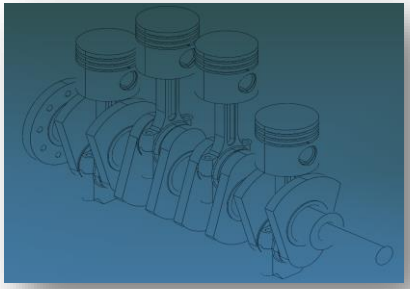
### D) Edge



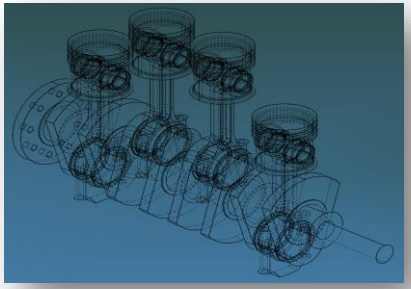
### E) Edge with Shading (default)



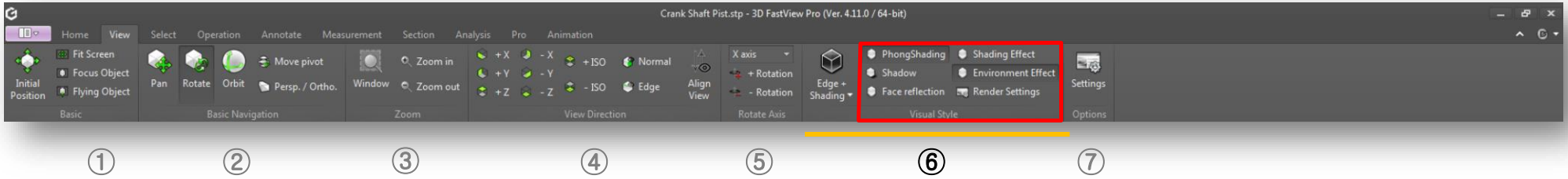
### F) Hidden Line Elimination



### G) Dotted line



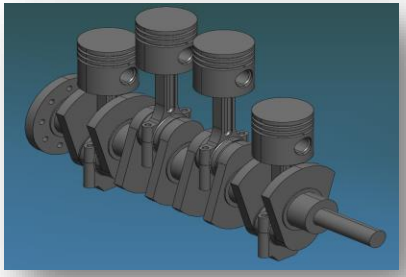
# 4. View Tab > Visual Style



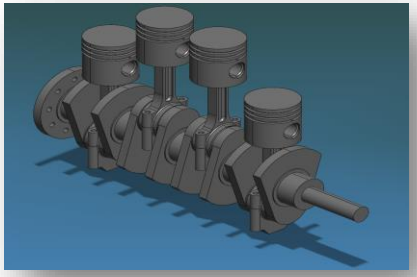

## Visual Style Panel

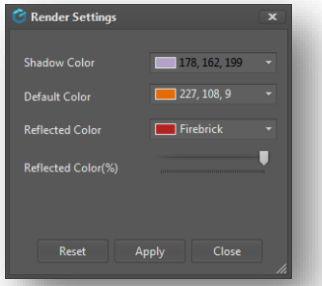
1) **PhongShading:** Computes a shaded surface based on the color and illumination at each pixel.
2) **Shadow:** Applies shadow to current model.
3) **Face Reflection:** Reflects the model on current scene.
4) **Shading Effect:** Displays the model using smooth shading effect.
5) **Environment Effect:** Displays the model with ambient lighting.
6) **Rendering Settings:** Sets shadow and reflected color options. It provides the ability to set the reflection intensity and ratio of reflected color.

### A) Phong Shading Mode

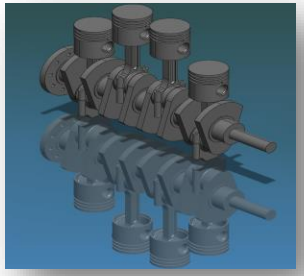


### B) Shadow Mode

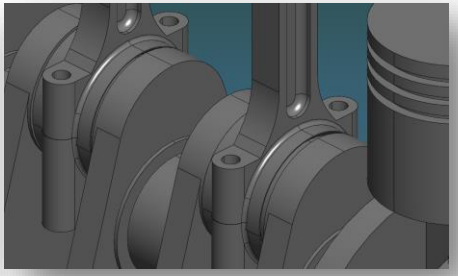




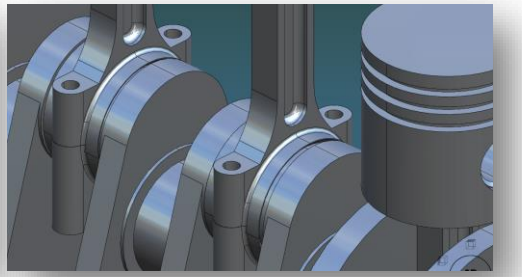

### C) Face Reflection Mode



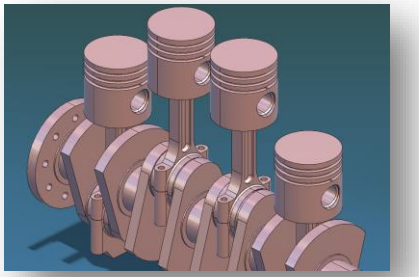
### D) Shading Effect Mode



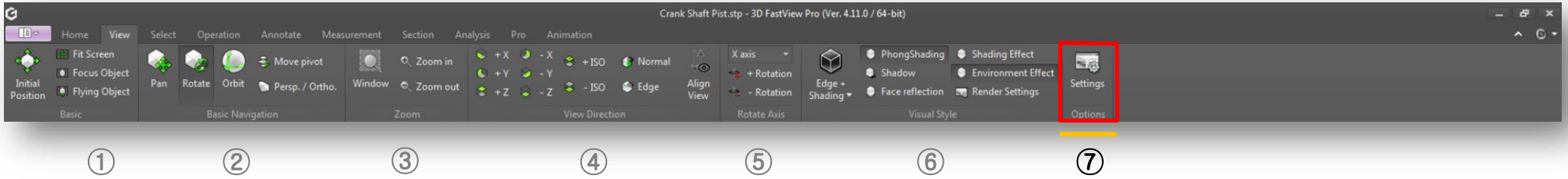
### E) Environment Effect Mode



### G) Example of applying rendering options



# 4. View Tab > Options




## Options Panel

**View Setting**

Sets view options for viewing.

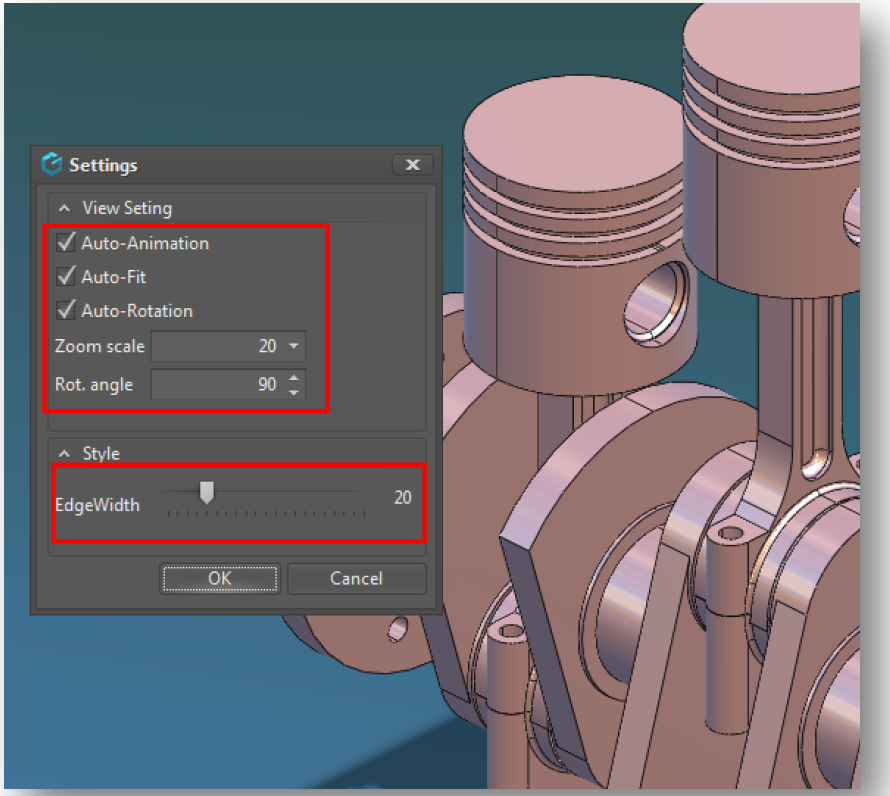
1) **Auto-Animation:** Applies animation effects when rotating / moving the model.

2) **Auto-Fit:** Auto-fit optimal screen display when adding, deleting or changing model on viewer screen.

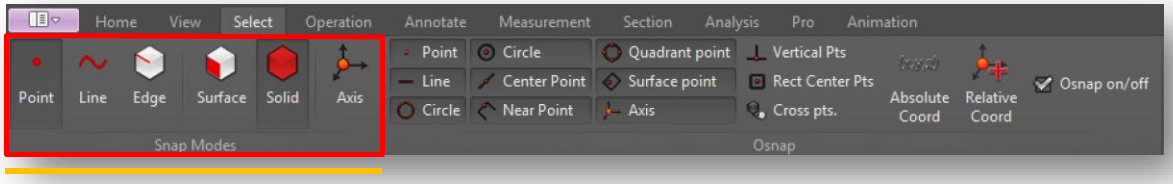
3) **Auto-Rotation:** Free continuous rotation mode according to moving distance by mouse control.

4) **Zoom Scale:** Sets zoom scale.

5) **Rotation Angle:** Sets the basic angle of rotation at "Axis rotation".



# 5. Select Tab > Snap Modes

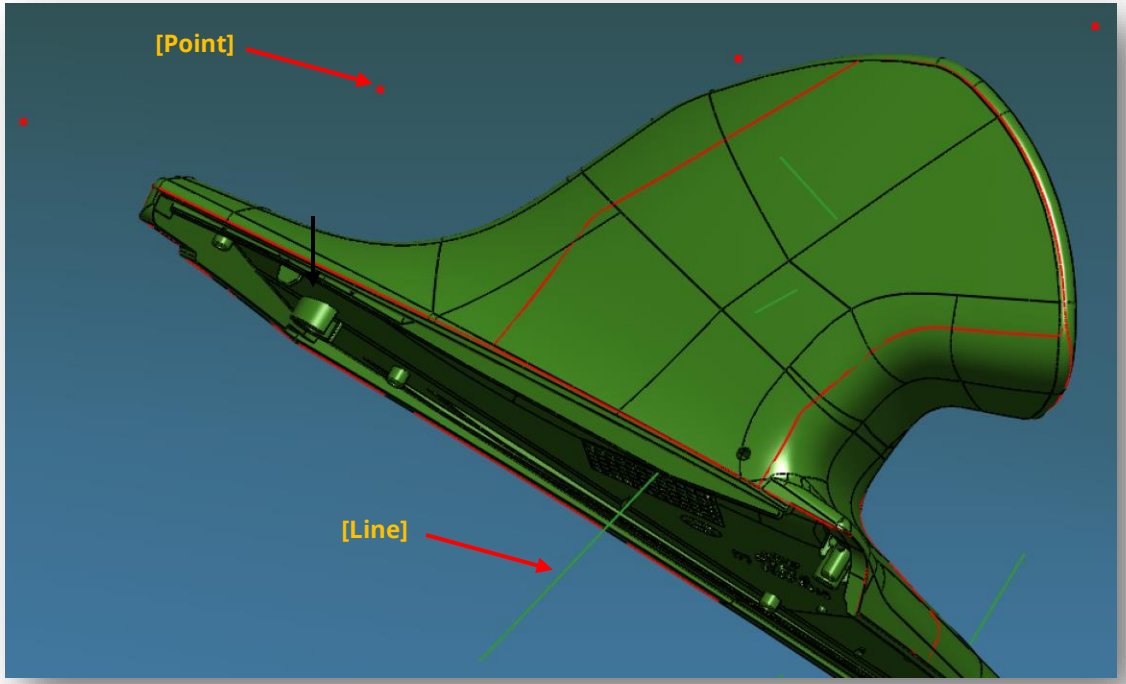


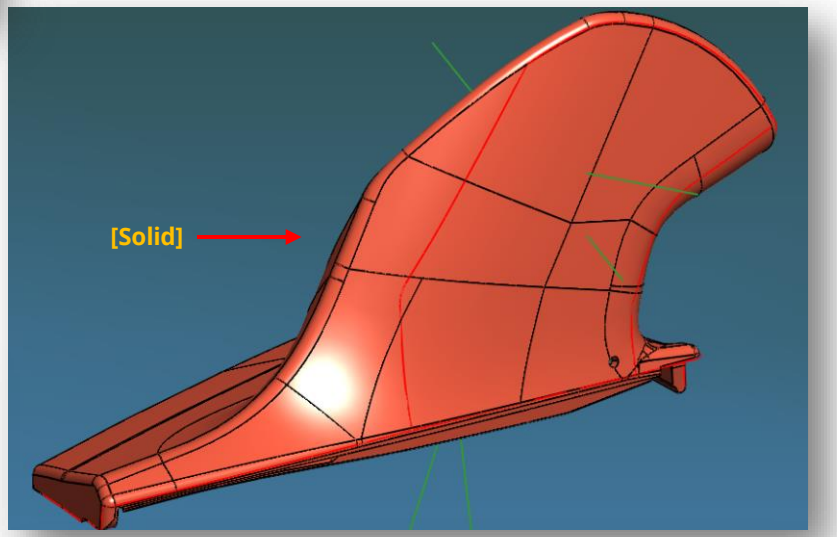

①

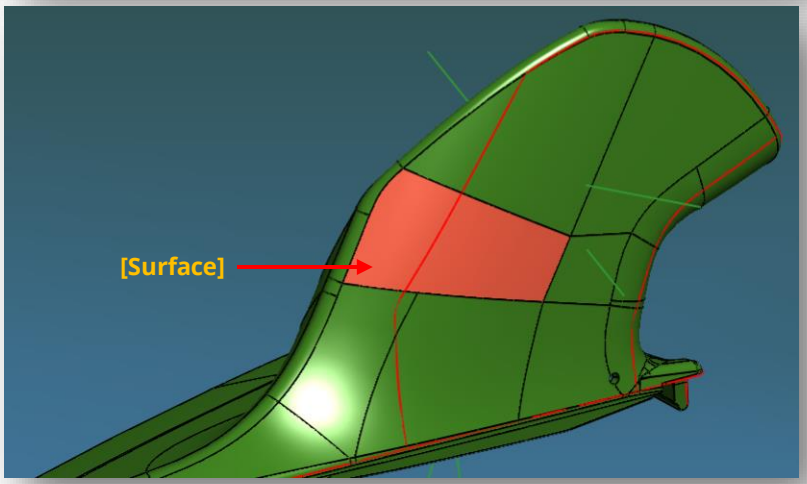
②

**Visual Style Panel**

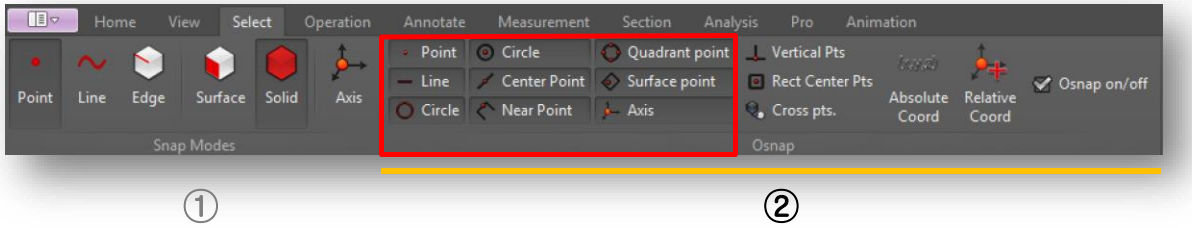
Supports Point, Line, Edge, Surface, Solid and Axis snap modes for accurate selection of entities.



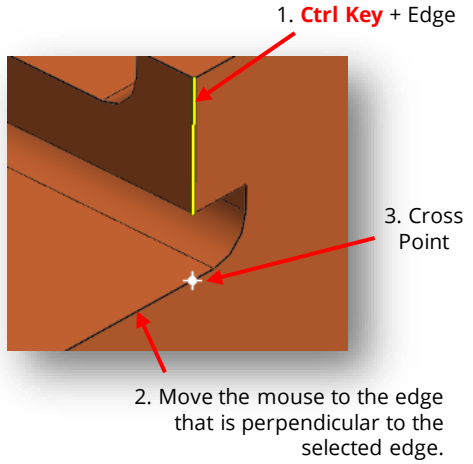



# 5. Select Tab > Osnap




## Osnap Panel

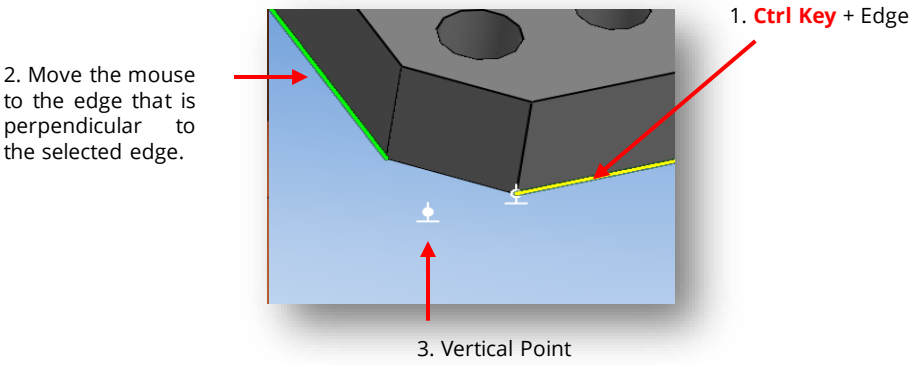
**Basic Osnap**
Basic osnap commands like Point, Circle, Quadrant, Line, Center/Surface Point, Center Circle, Near Point and Axis used to select points whose characteristics are among the points constituting the object.

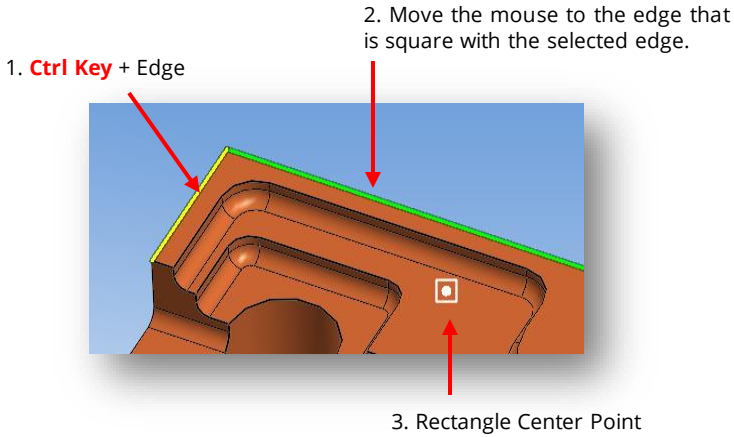



**Vertical Pts (Points):** While measuring, hold down CTRL key, select a corner and move the mouse to the vertical point.

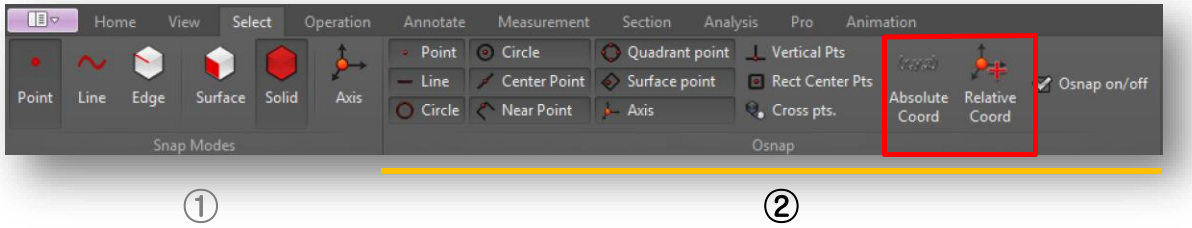
**Rect. Center Pts (Rectangle Center Points)**
While measuring, hold down CTRL key, select a corner and move the mouse to a corner that is square with the selected corner.

**Cross Pts (Cross Points)**
While measuring, hold down CTRL key, select the edge and move the mouse to a corner to measure the intersection point.



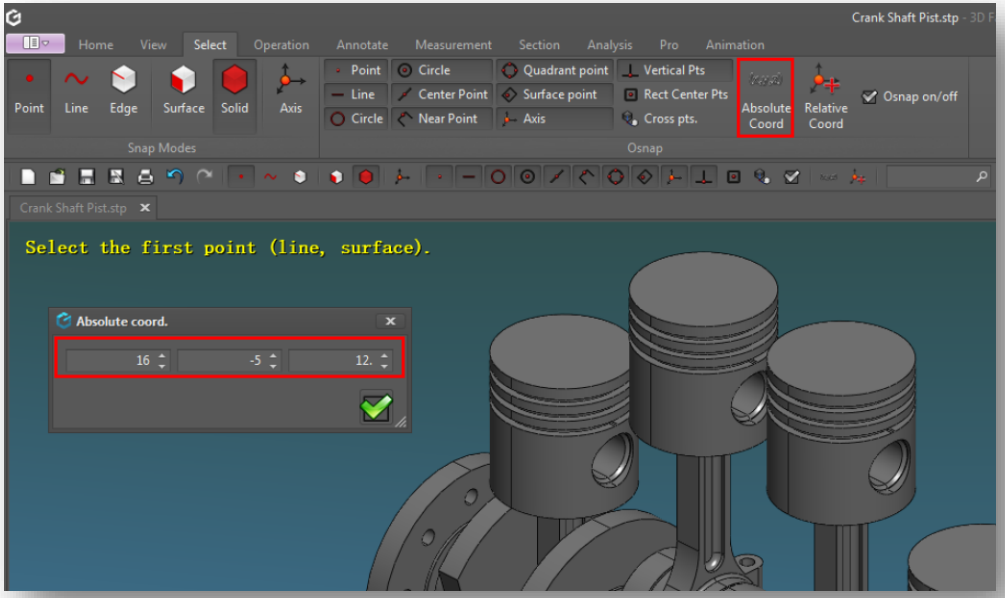
# 5. Select Tab > Osnap

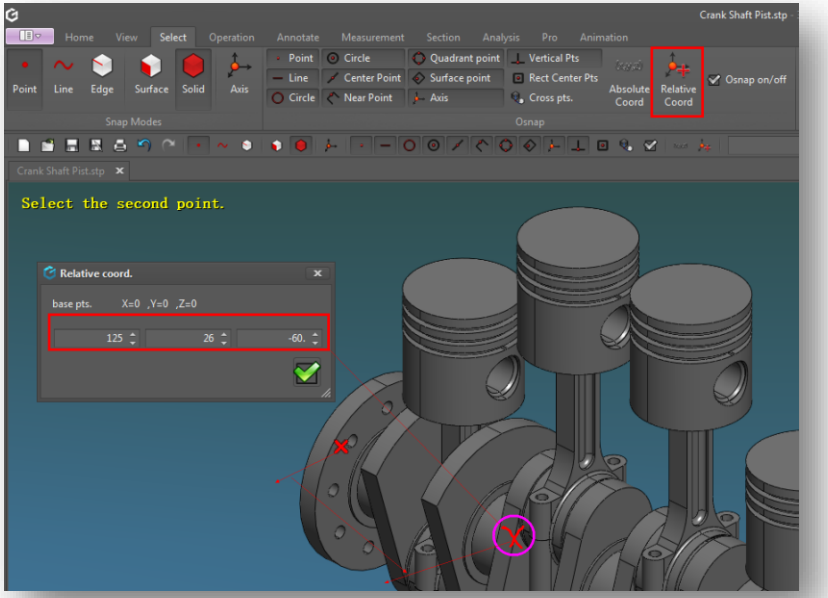



## Osnap Panel

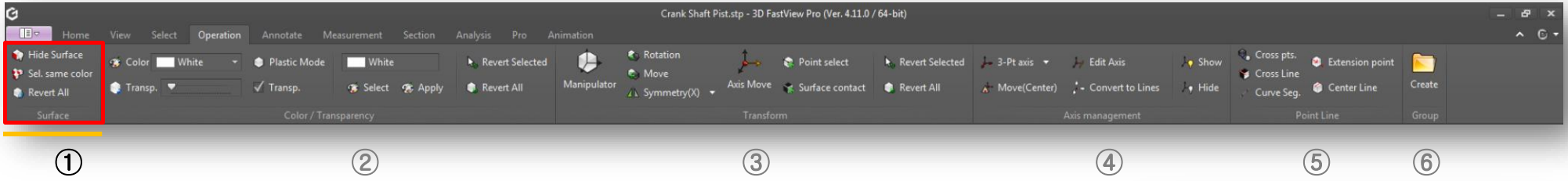
**Absolute Coord:** If you want to specify the reference point during measurement, you can select coordinates.

**Relative Coord:** During the measurement, select CTRL key + Point and click the “Relative Coord” icon to enter the coordinate value.



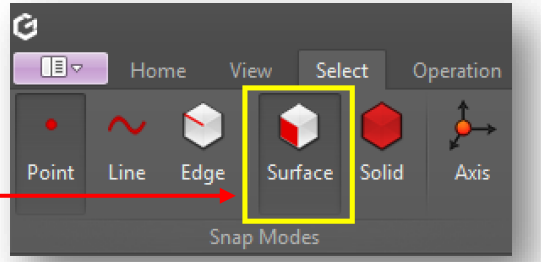



# 6. Operation Tab > Surface

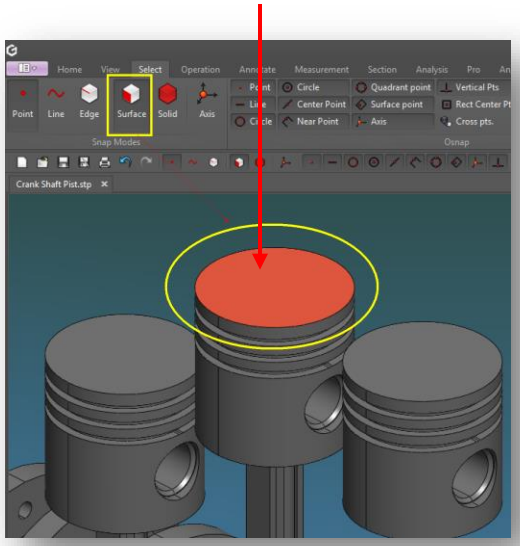



**Surface Panel**

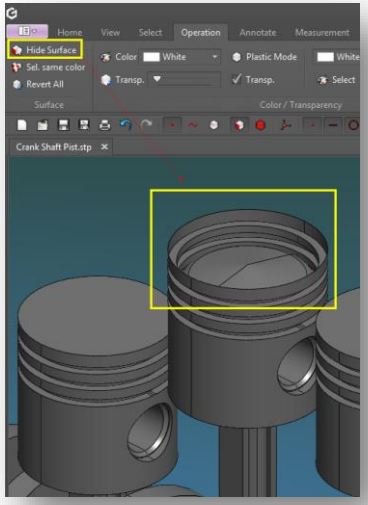
1) **Hide Surface:** Hides only selected faces of a model [Select > Snap Modes > Surface].
2) **Sel. Same Color:** Selects a batch of faces of same color as the selected face by left mouse button.
3) **Revert All:** All hidden surfaces of a model will be restored as its initial display state.



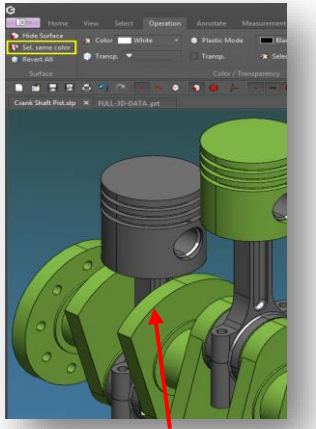

Select surface with "Surface" snap



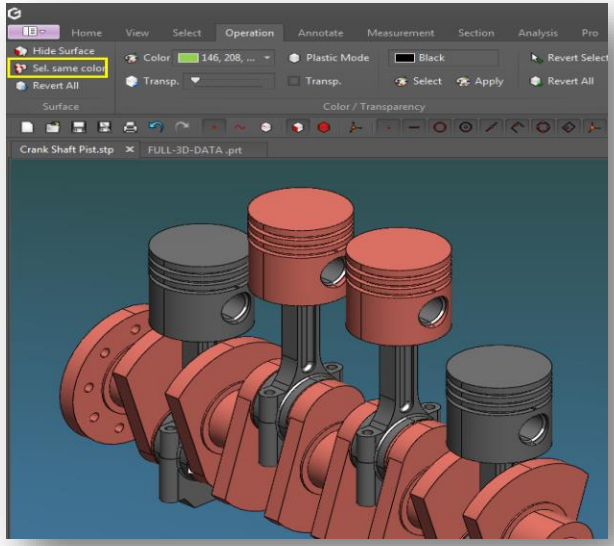
1) Hide Surface



2) Sel. Same Color

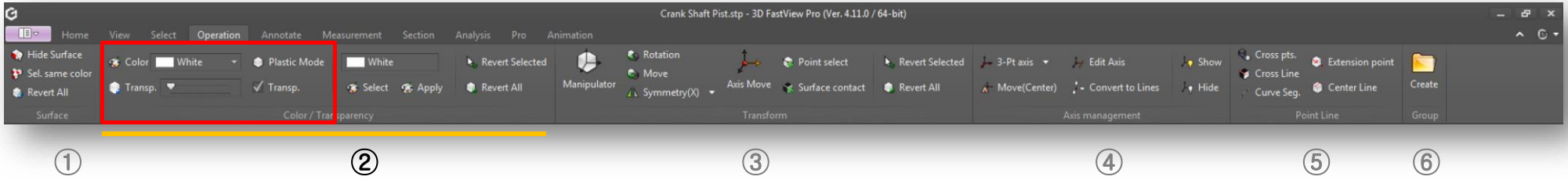


1) Select surface
2) Sel. Same Color icon



Same color selected

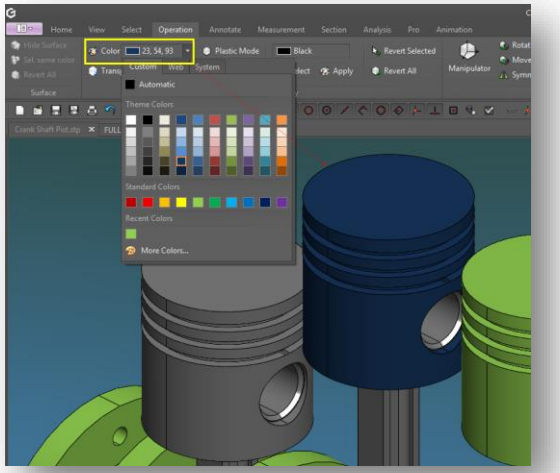
# 6. Operation Tab > Color / Transparency



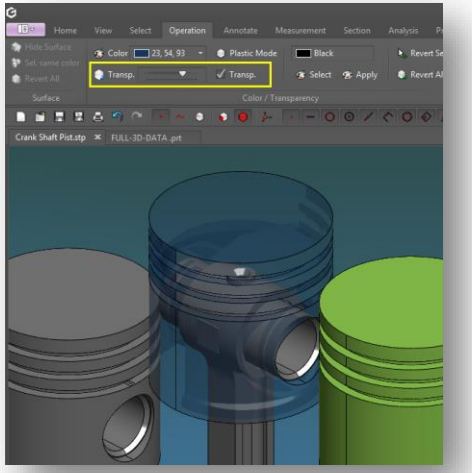

**Color / Transparency Panel**

1) **Color (N):** Changes the color of a selected part, component or entire model.
2) **Transparency (M):** Adjusts transparency of a selected part or component (Range = 0% -> 100%).
3) **Plastic Mode:** Applies color / transparency (color: white, transparency: 50%) to the entire model.
4) **Transparency on/off:** Turns on/off the transparency mode applied to a model.

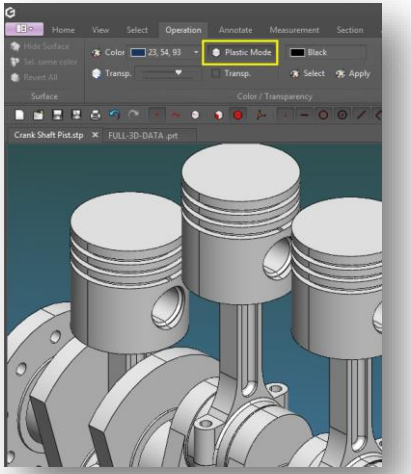
### 1) Color Change



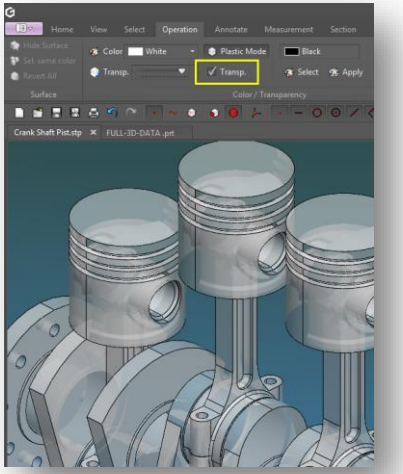
### 2) Transparency



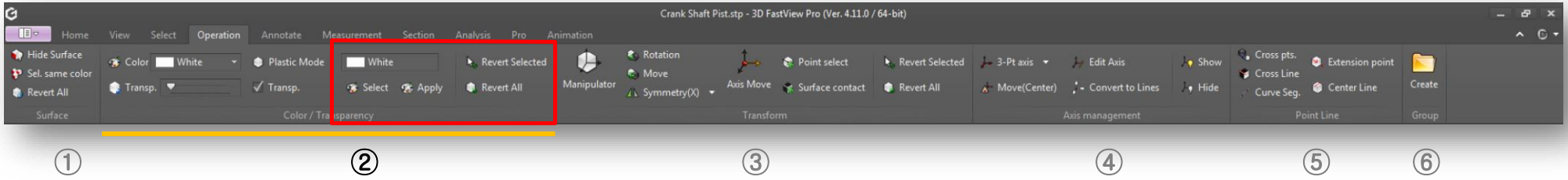
### 3) Plastic Mode



### 4) Transparency



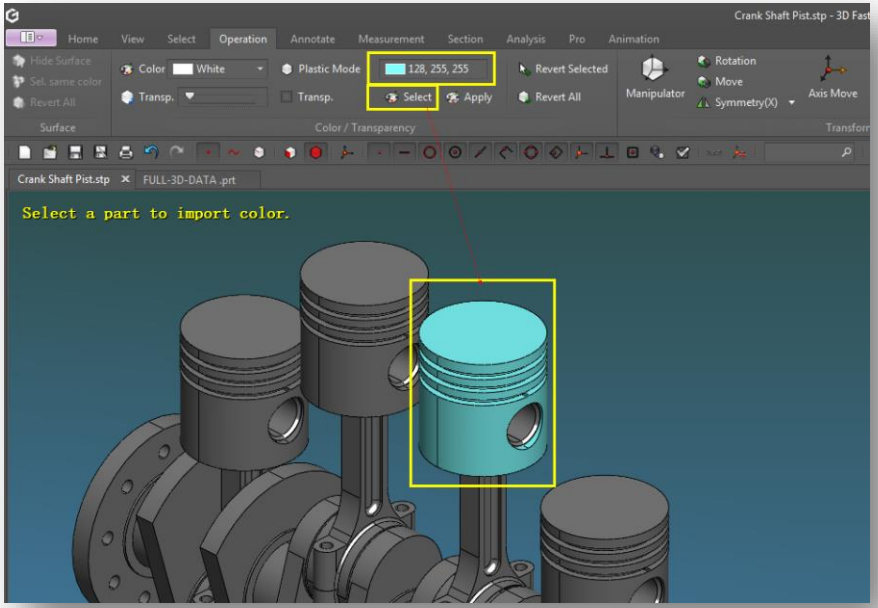
# 6. Operation Tab > Color / Transparency



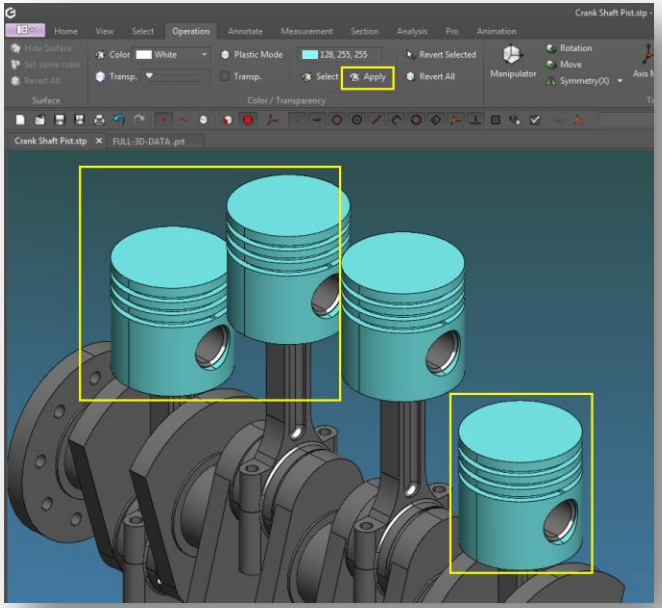

**Color / Transparency Panel**

1) **Select:** Selects a color from part or component to be later applied.
2) **Apply:** Duplicates the previous selected color to be applied to another part or component.
3) **Revert Selected:** Restores to selected model's original color [CTRL + B].
4) **Revert All:** Restores to original color the entire model.

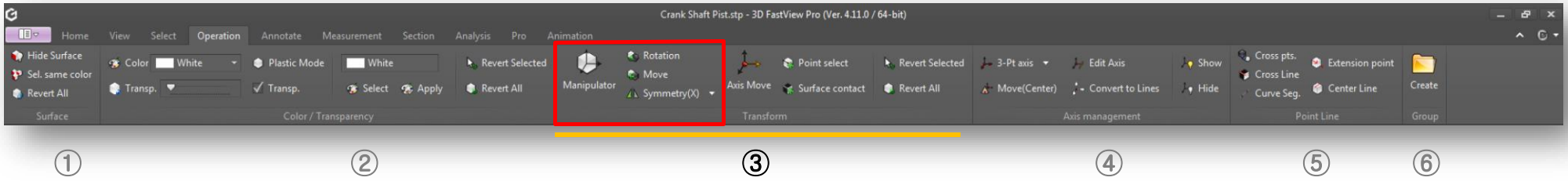
### 1) Select Color




### 2) Apply Color

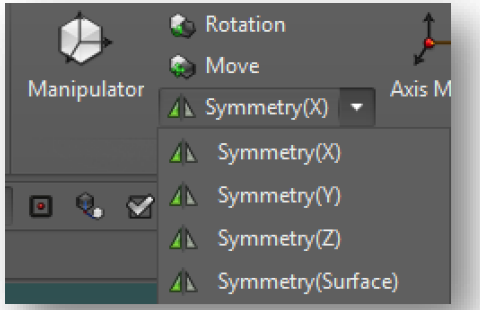


# 6. Operation Tab > Transform

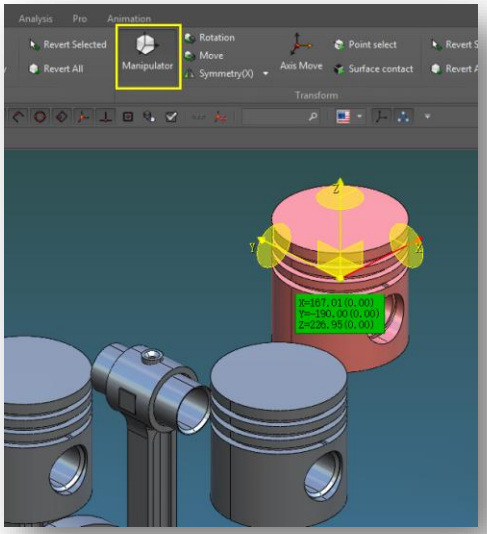



**Transform Panel**

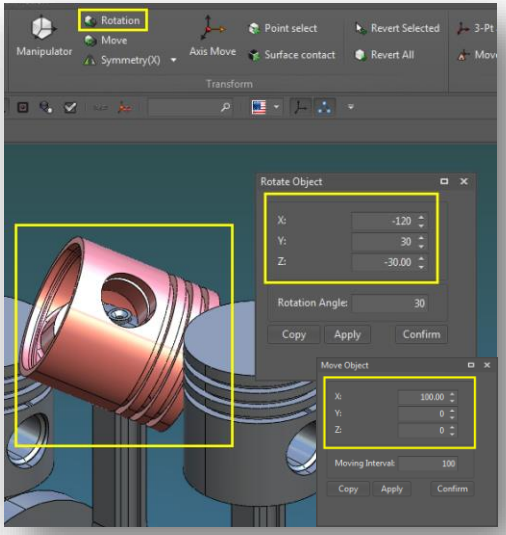
1) **Manipulator [CTRL+H]:** Moves and rotates a selected part by X/Y/Z axis using the manipulator tool.
2) **Rotate [CTRL+R]:** Rotates a selected part by X/Y/Z axis, the selected part or component can be copied.
3) **Move [CTRL+M]:** Moves selected part relative to X/Y/Z axis, the selected part or component can be copied.
4) **Symmetry:** Moves selected part or component symmetrically from a reference axis/face selected.



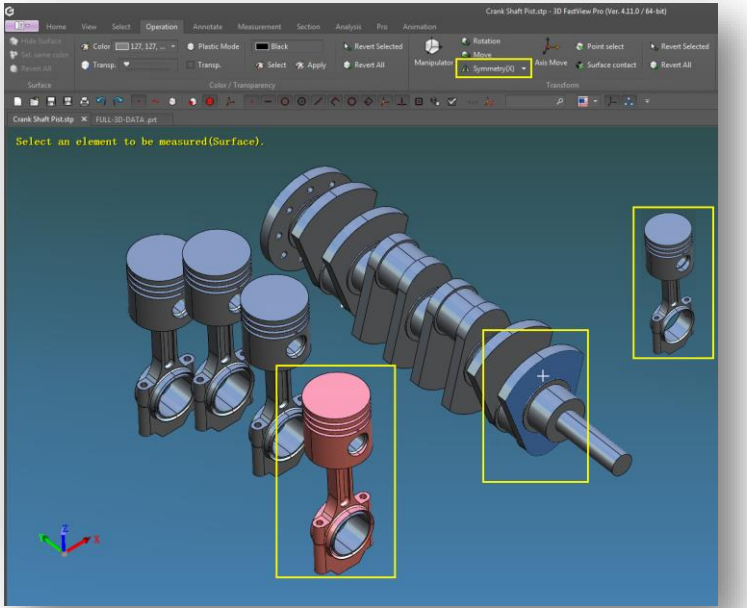

### 1) Manipulator



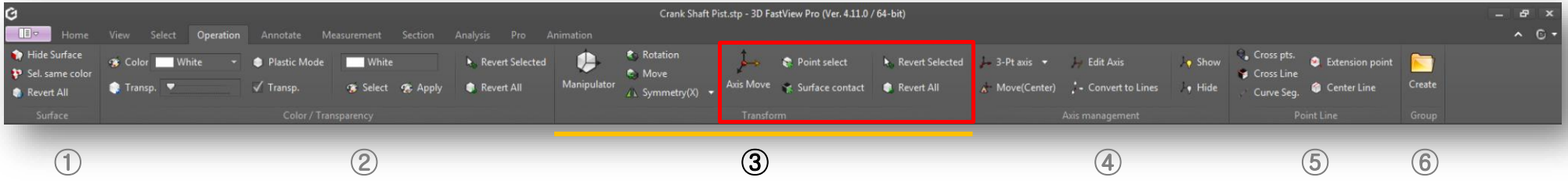

### 2-3) Rotate / Move




### 4) Symmetry



# 6. Operation Tab > Transform




## Transform Panel

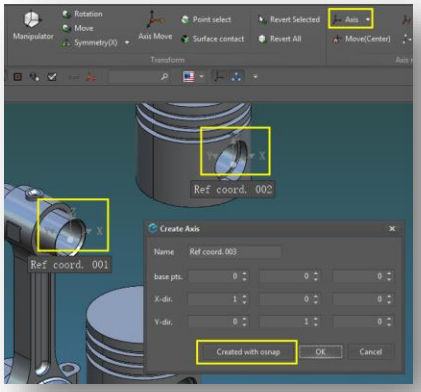
1) **Axis Move:** Moves a part or component by two axis references.
2) **Point Select:** Moves a part or component from snap point to point.
3) **Surface Contact:** Aligns a part or component on selected target surface.
4) **Revert Selected/All:** Restores to original display state a selected part or entire model.

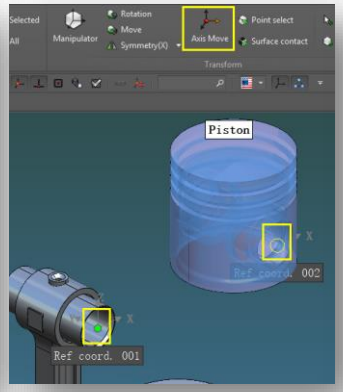
### 1) Axis Move

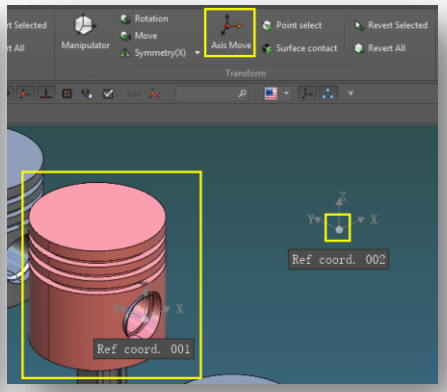
A. Create at least one or two relative coordinate axes with snap from Transform > Axis Management > Create with snap button, then select a snap point on the model.

B. Select the part, then click "Axis Move" icon and select first and final axis reference point.

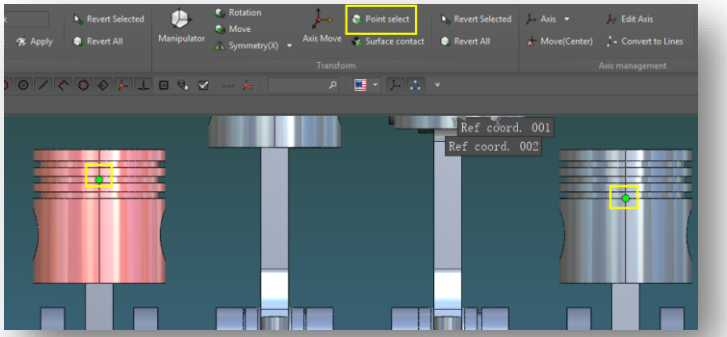
C. Selected part will be moved according to final axis reference selected. The axis reference created will remain visible after moved part axis shifting.



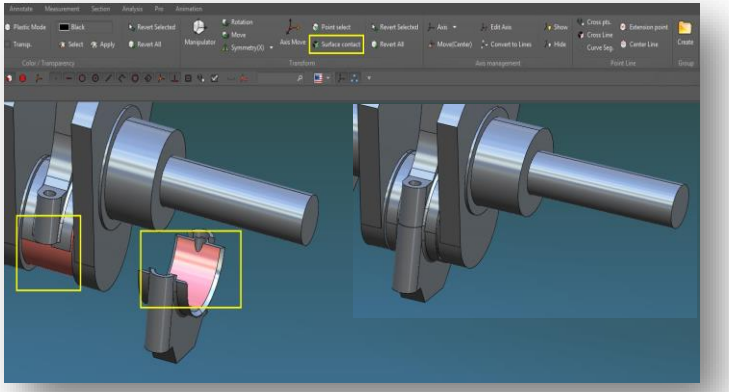



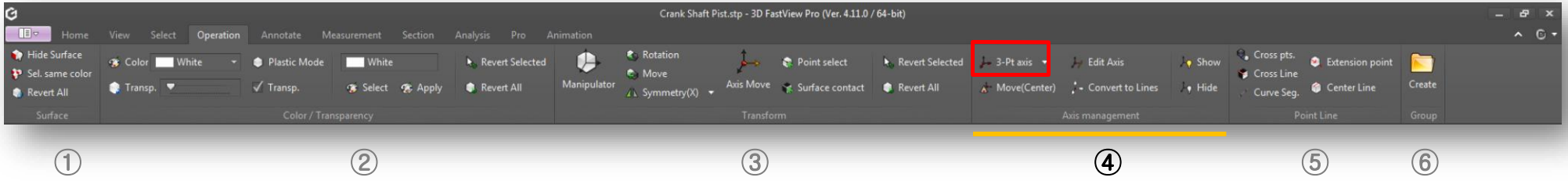

### 2) Point Select




### 3) Surface Contact

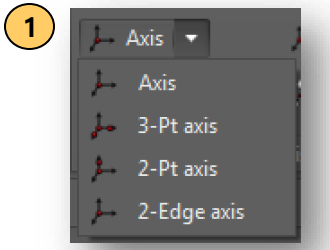


# 6. Operation Tab > Axis Management

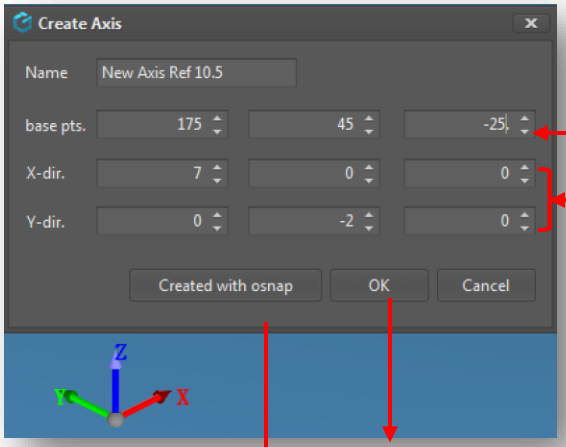



## Axis Management Panel

1) **Axis:** Creates absolute coordinates by manually inputting axis values or creates relative coordinate axis with osnap.




### 1. Create Axis



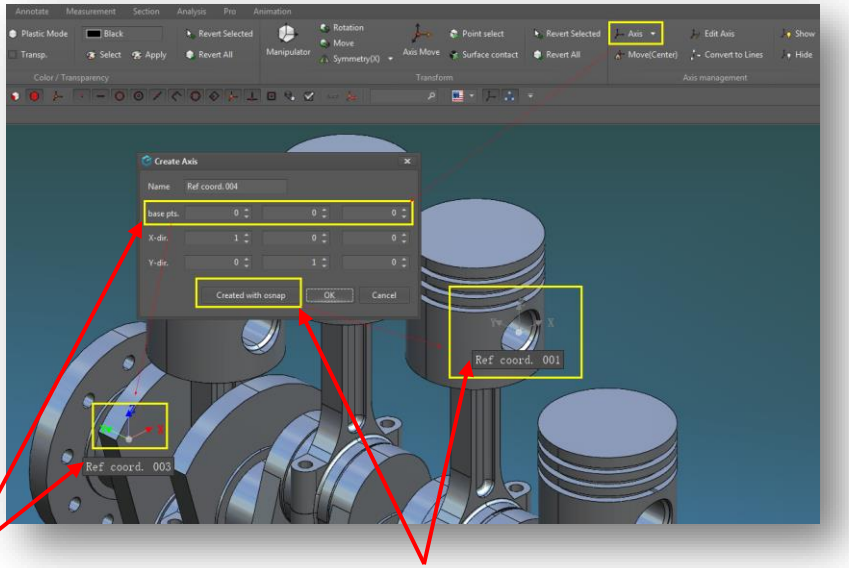

Input X/YZ value (Create axis on absolute coordinates when 0,0,0 is entered).

Set X and Y axis orientation (based on ISO).

ISO View

OK Button : Creates coordinate axis based on specified value.

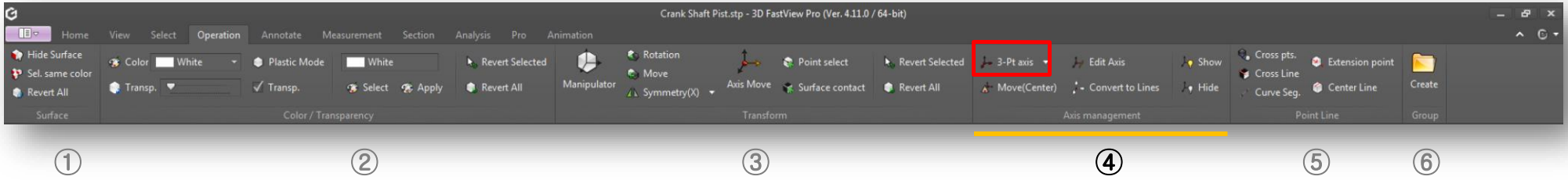
Osnap Button : Creates an Axis at the Object Point of model.




Example of coordinate axis created 0,0,0 values by default.

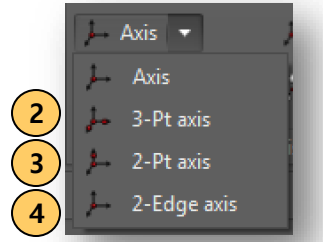
Example of coordinate axis created with osnap point.

# 6. Operation Tab > Axis Management

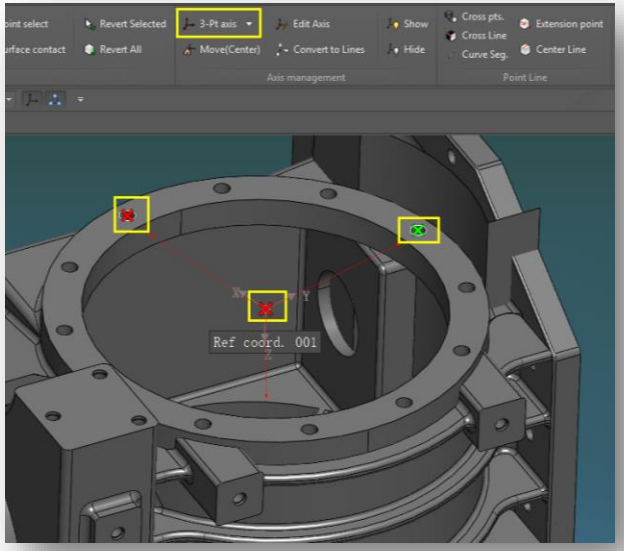



## Axis Management Panel

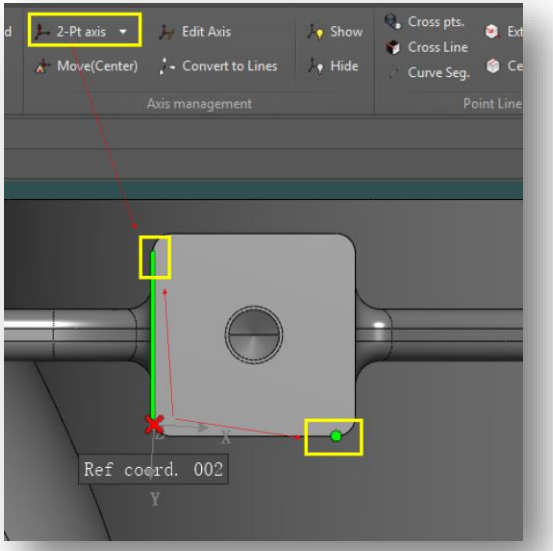
2) **3-Pt Axis:** Creates an axis by specifying three points of the model.
3) **2-Pt Axis:** Creates an axis by specifying two points and edges of the model.
4) **2 Edges Axis:** Creates an axis by selecting two corners of the model.



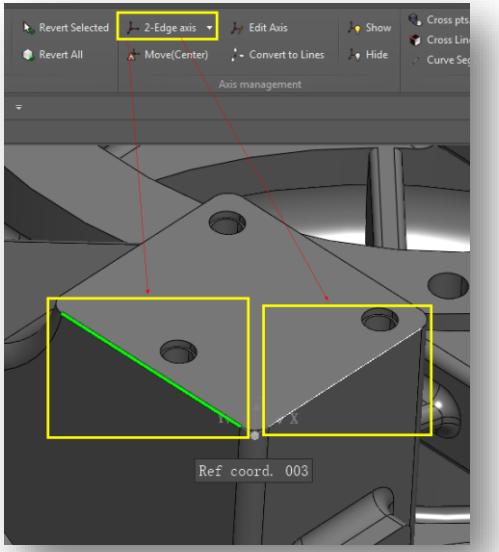

### 2) Example of 3-Pt Axis



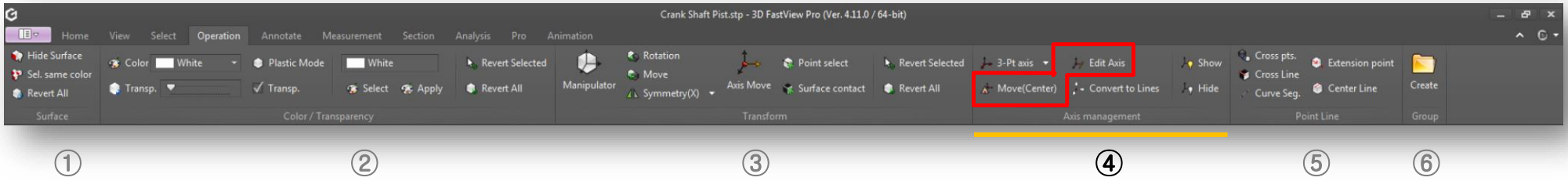

### 3) Example of 2-Pt Axis




### 4) Example of 2 Edges Axis



# 6. Operation Tab > Axis Management



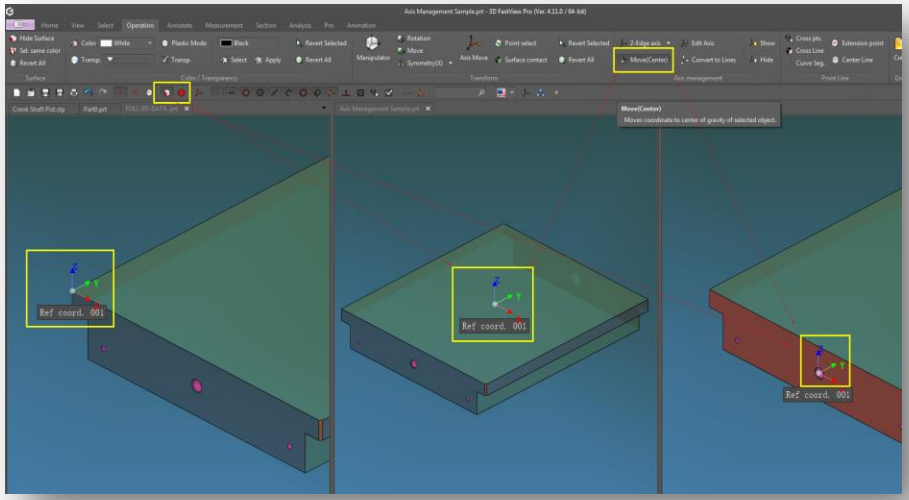

## Axis Management Panel

**Move (Center):** Moves a reference axis to the center of the selected part.
A) Selecting a Solid: Moves axis to center of gravity of selected part.
B) Selecting a Surface: Moves axis to the center of the selected part.

**Edit Axis:** Moves the position of a reference axis equidistantly by location, direction and rotation or by using manipulator and osnap.

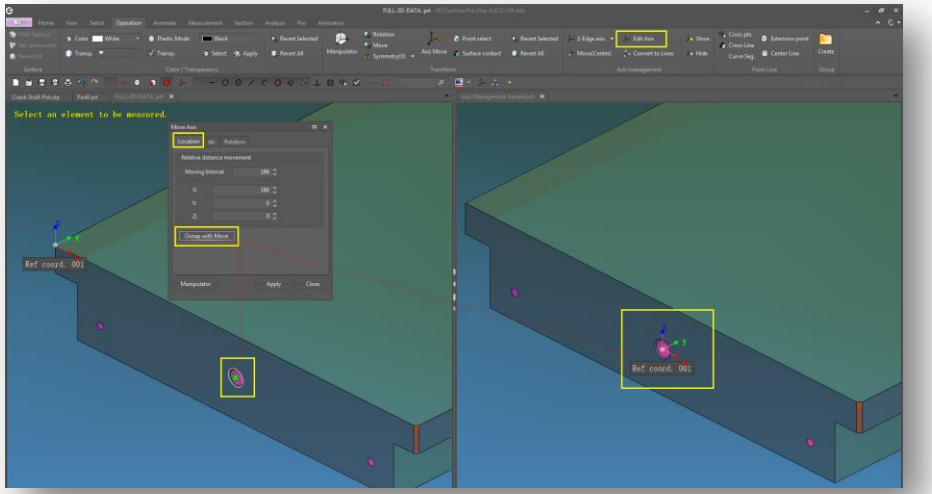
### Move Center Solid and Surface

At least you must create a reference axis whether way (see previous page for reference axis creation). Then you can move the referenced axis to center of gravity of a model if "Solid" osnap is active or move to center of a selected surface if "Surface" osnap is active.

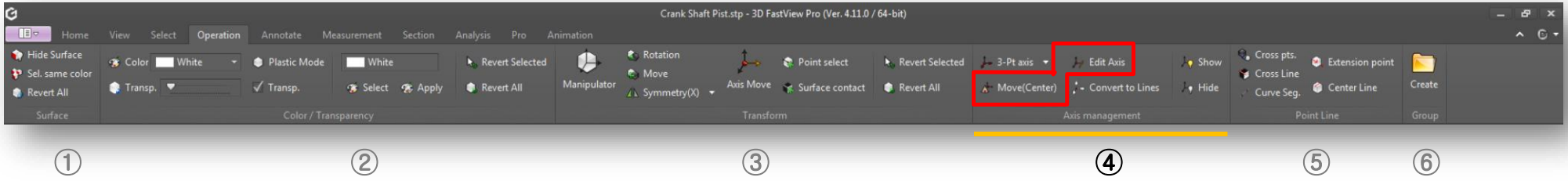



### Edit Axis Location

A) Equal Spacing Movement: Enter interval reference value.
B) Direct Movement: Enter X/Y/Z values.
C) Move with Osnap: First select the part, then select a object snap point.

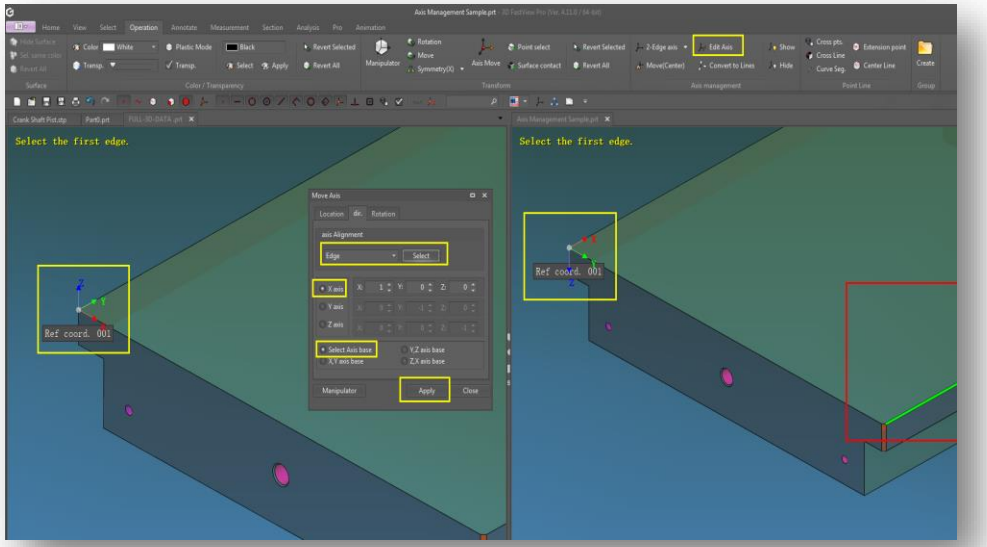


# 6. Operation Tab > Axis Management



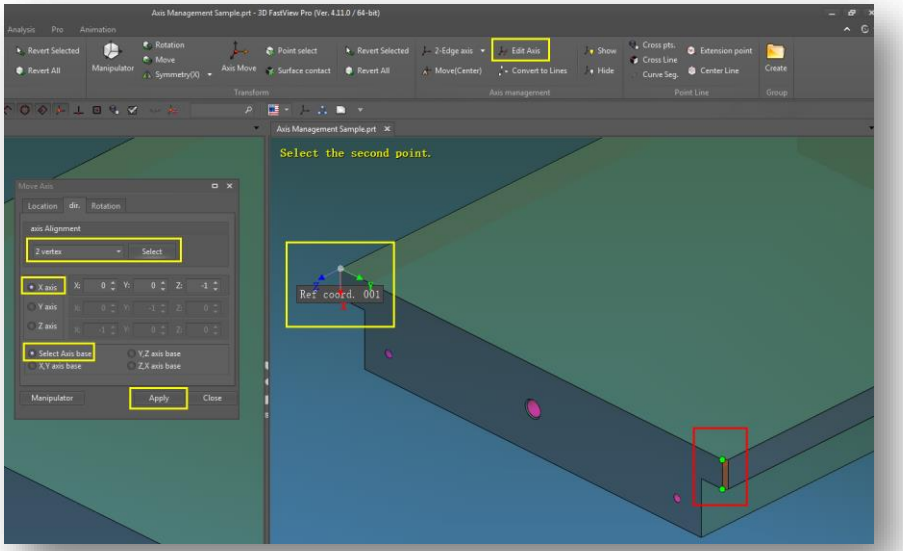

## Edit Axis Direction by Edge Option

A) Select “Edge” option, then select single axis option (X/Y/Z) or any axis base combination.
B) Click “Select” button and select an edge on the model.
C) Click “Apply” button to see the axis reference changing effect.

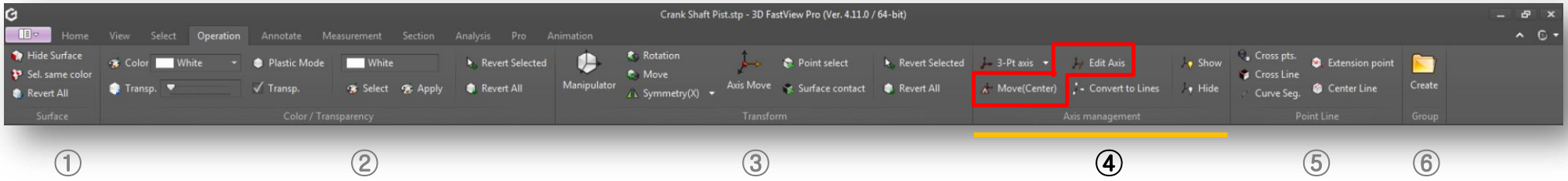



## Edit Axis Direction by 2 Vertex Option

A) Select “2 Vertex” option, then select single axis option (X/Y/Z) or any axis base combination.
B) Click “Select” button and select two vertices on the model.
C) Click “Apply” button to see the axis reference changing effect according to vertices selected.

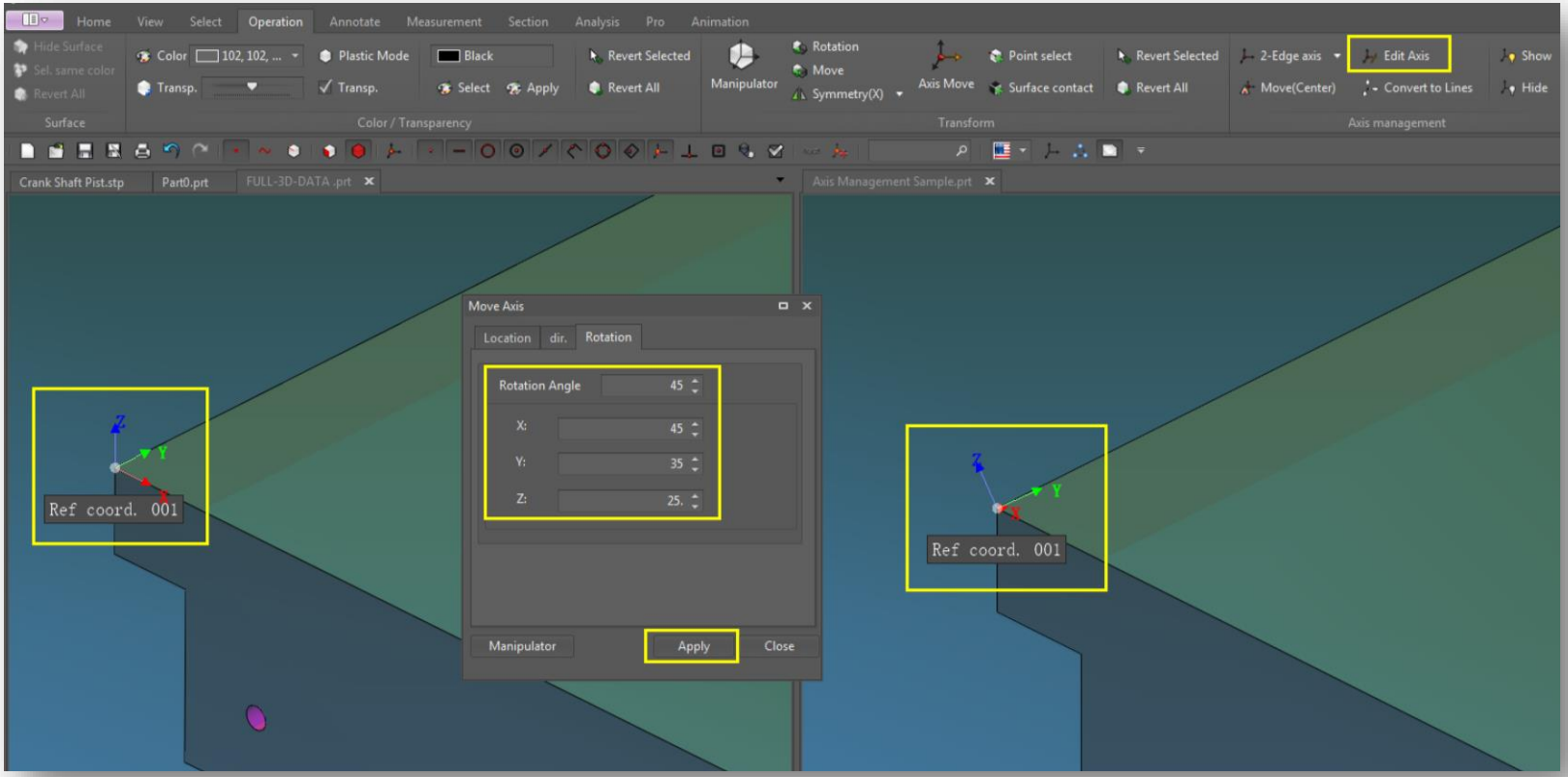


# 6. Operation Tab > Axis Management

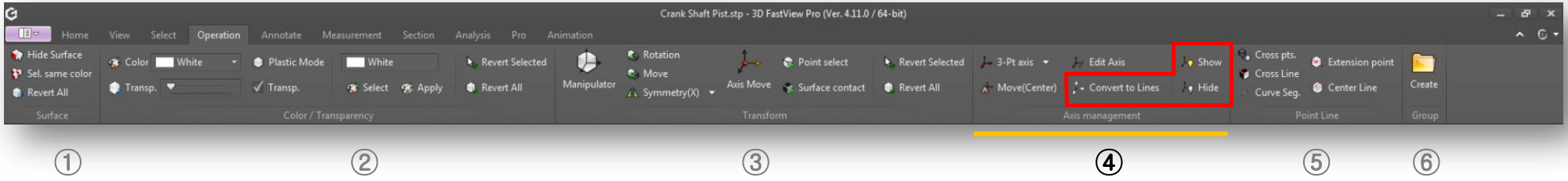



## Edit Axis Rotation Angle

A) In Rotation tab, change or input a rotation angle value.
B) You can input positive or negative value to each axis.
C) Click “Apply” button to see the axis rotation effect in real-time.



# 6. Operation Tab > Axis Management

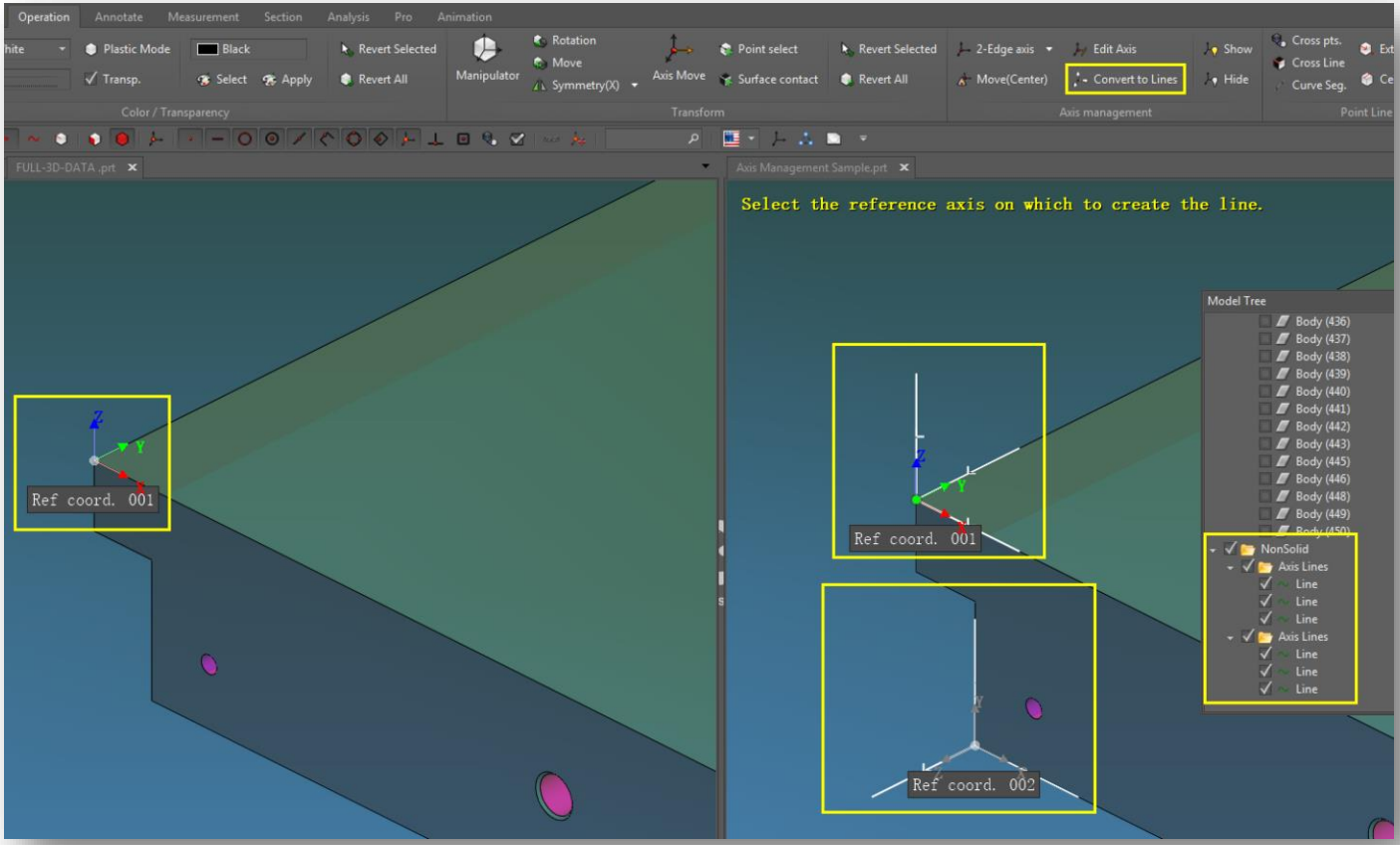



## Axis Management Panel

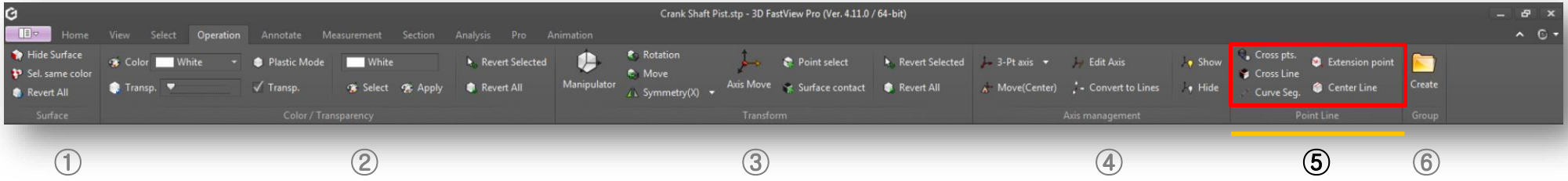
**Convert to Lines:** Converts a reference axis to lines. The lines will be created as independent non-solid geometry in the model tree window.

A) To convert a reference axis you must create a reference axis.
B) Click "Convert to Lines" icon from the ribbon, then select the reference axis base point.

**Show/Hide:**
A) Show: Displays all reference axis created on screen.
B) Hide: Hidden all reference axis created on screen.



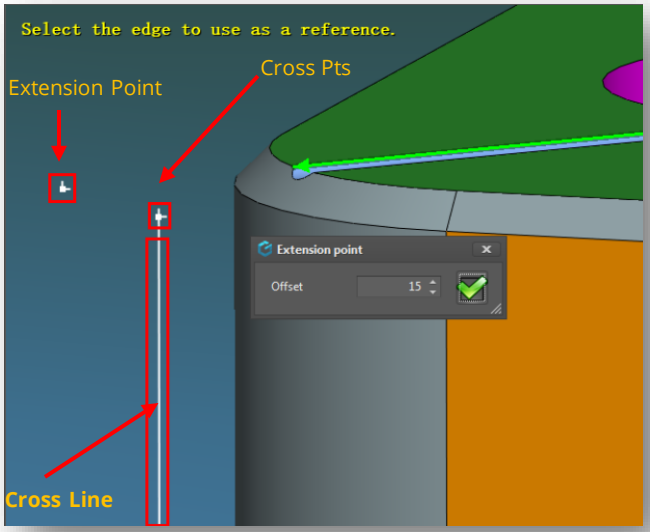
# 6. Operation Tab > Point Line



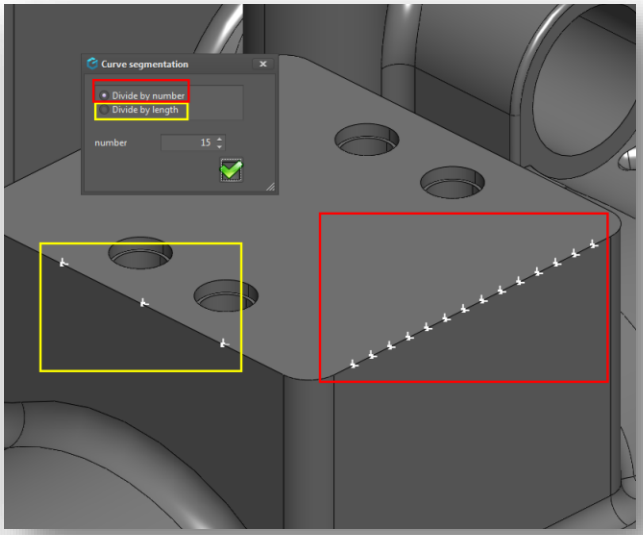

## Point Line Panel

1) **Cross pts:** Creates intersection points by selecting two edges.
2) **Cross Line:** Creates a line that intersects two sides.
3) **Extension Point:** Creates an extension point at a distance of certain value along the selected edge.
4) **Curve Seg:** Creates a split point on the selected edge by length or quantity value.
5) **Center Line:** Creates a center line by points or edges selection.

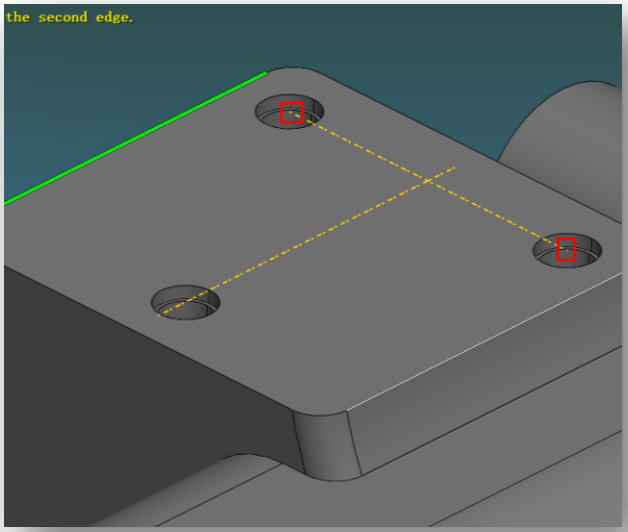
### 1) Cross Pts / 2) Cross Line / 3) Extension Point



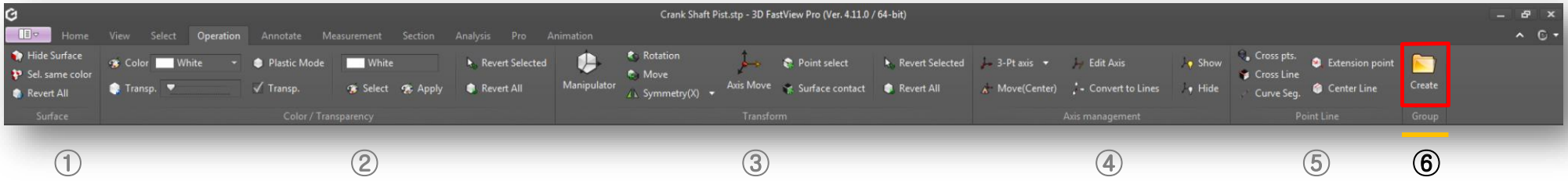

### 4. Curve Segment




### 5. Center Line

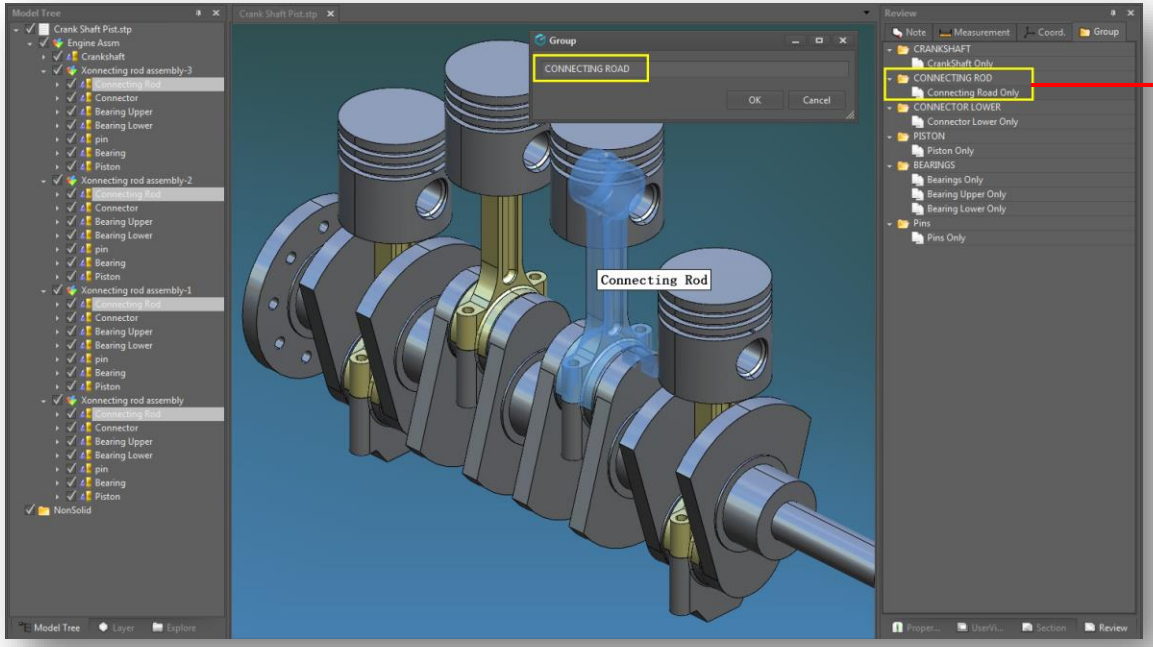


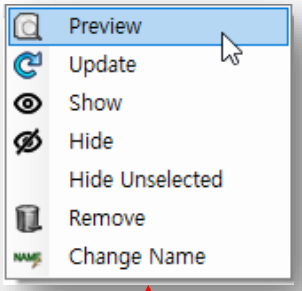
# 6. Operation Tab > Group



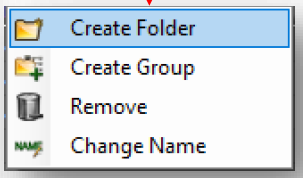

## Group Panel

**Create:** Creates a group for single or multiple selected parts of a model. In "Review" window, you can create and organize folders containing groups created. Preview, update, show, hide, hide unselected, remove and change name options are available from context menu when right-clicking a group.



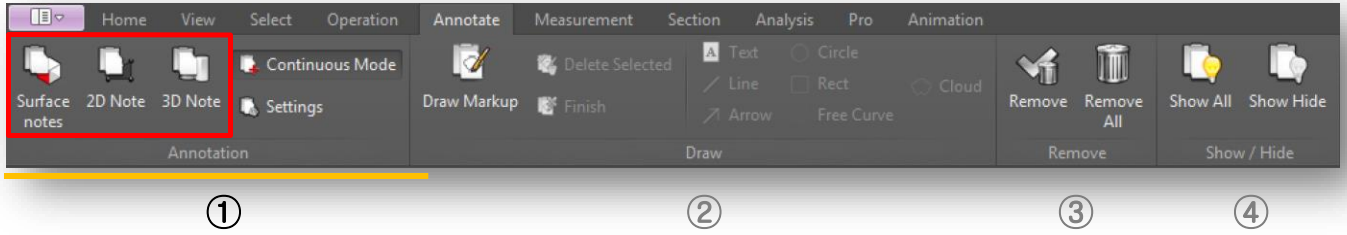




**Create:** Preview the selected group in small window.
**Update:** Updates group for added or removed parts.
**Show/Hide:** Shows/hides selected group on the screen.
**Hide Unselected:** Hides all unselected parts.
**Remove:** Removes the selected group.
**Change Name:** Changes group name.



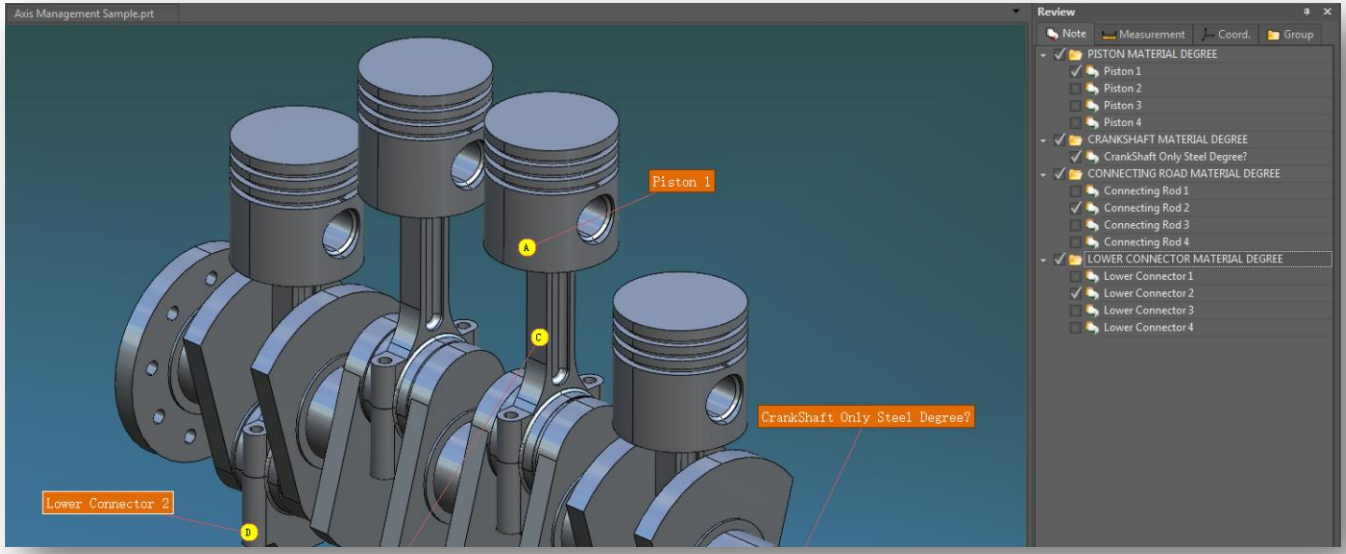

**Create Folder:** Creates a folder and subfolder on group list.
**Create Group:** Creates a group of a selected part whether on group list or within a folder.
**Remove:** Removes the selected folder or subfolder.
**Change Name:** Changes folder or subfolder name.

# 7. Annotate Tab > Annotation

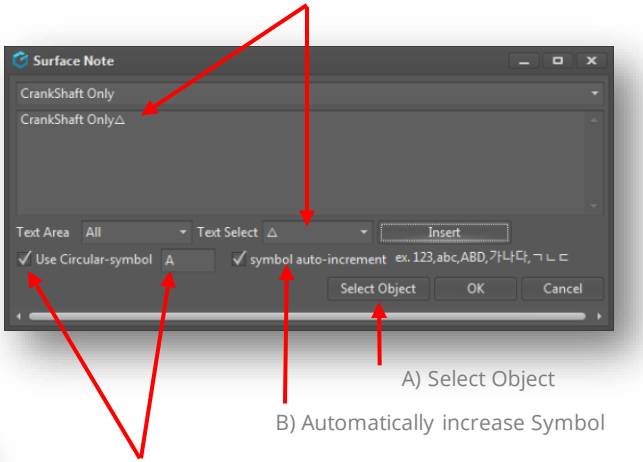


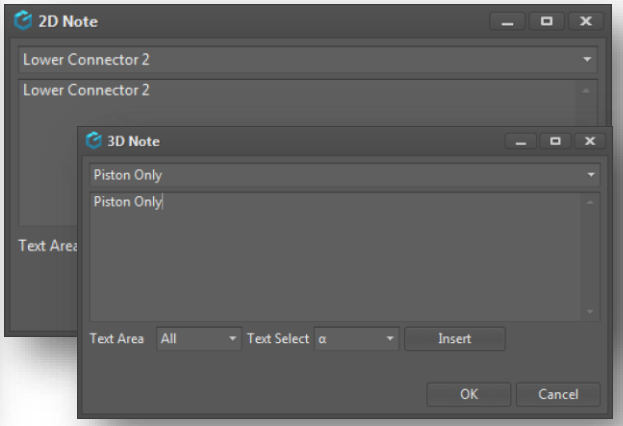

## Annotation Panel

1) **Surface Notes:** Creates a note on a selected surface of a model.
A) If you click “Select Object” button, the corresponding object or part name is displayed, Select "OK" button to display "Custom Notes“.
B) If you check "Use Circular Symbol" and "Automatically Increase Symbol”, a circular symbol will be displayed continuously and incrementally.
C) Select a text symbol and insert it into your custom notes by clicking “Insert: button.
2) **2D Note:** Creates a 2D note based on a specific point in the screen.
3) **3D Note:** Create a 3D note on screen. The 3D note will move according to viewer camera.

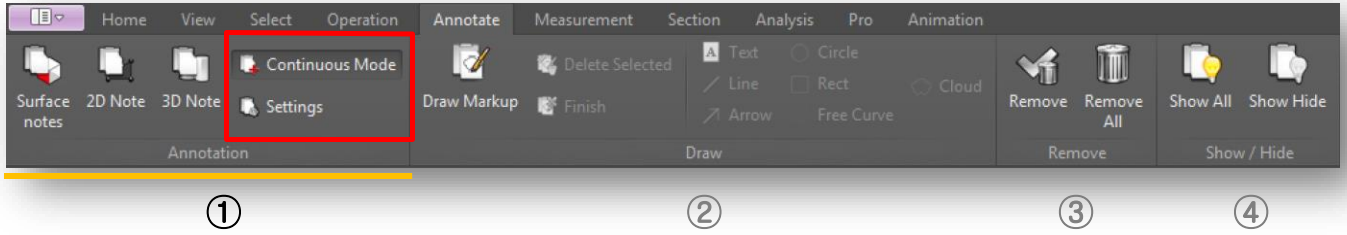



C) Select special symbol and insert it in custom notes



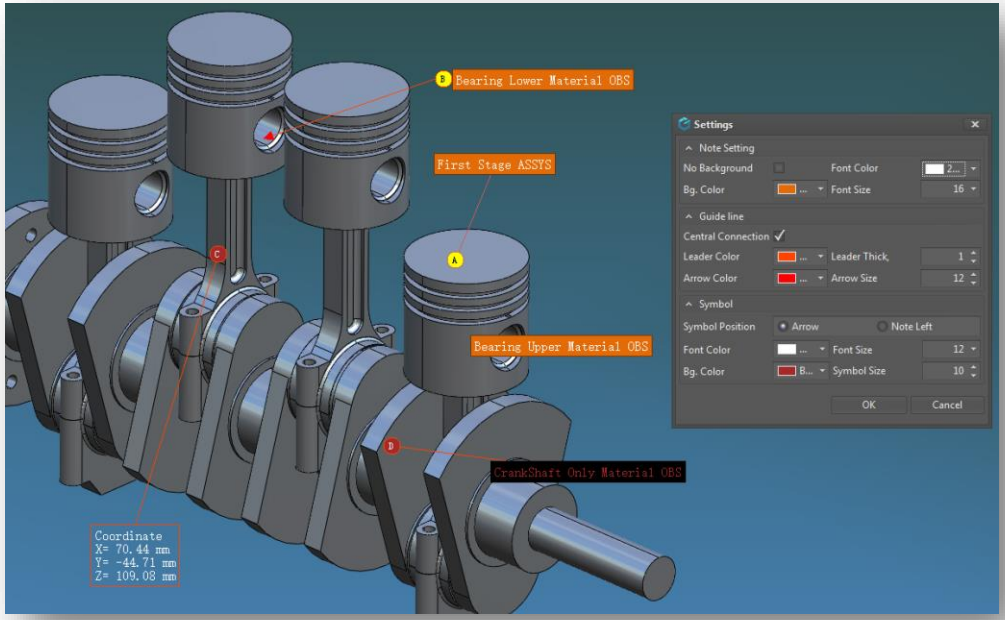



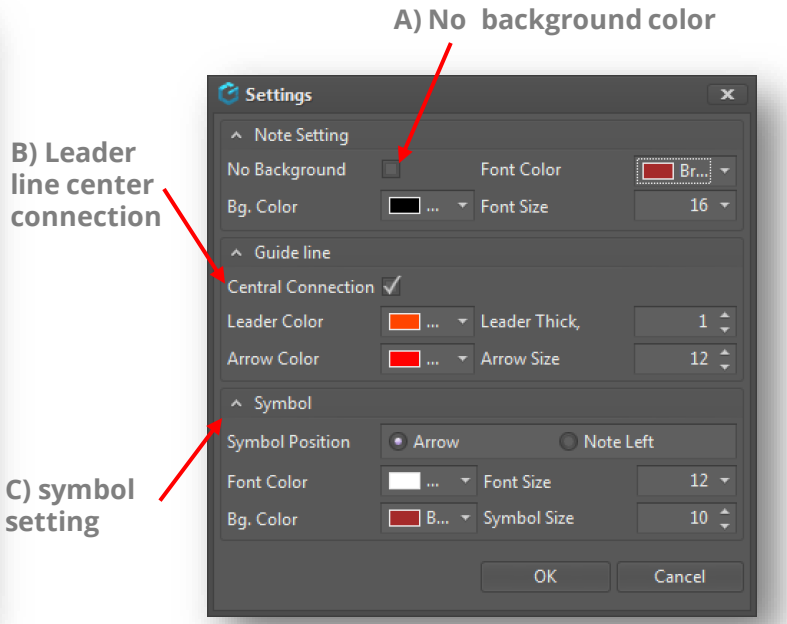
# 7. Annotate Tab > Annotation



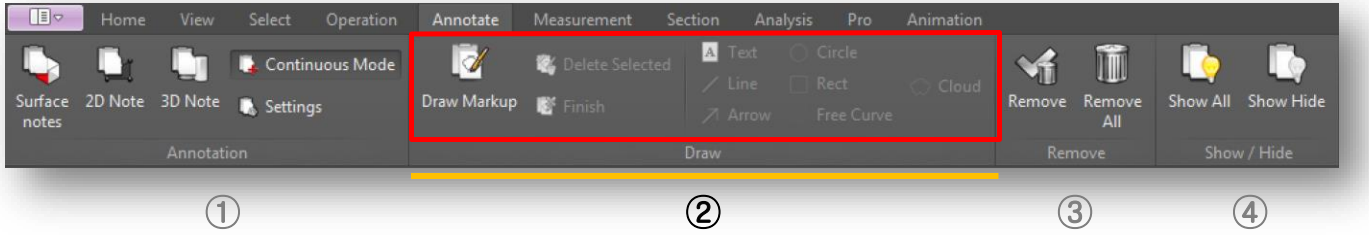

## Annotation Panel

1) **Continuous Mode:** If this option is active, “Surface Notes”, “2D Note” and “3D Note” can be created consecutively.
2) **Settings:** Background, font color and size change settings for notes, leaders, symbols.
A) Note Setting: No background color: Delete background color of created note box.
B) Guide Line setting: Leader center connection: Leader line connected to the center of the note square box.
C) Symbol setting: Set symbol position, background color & character size, etc.
Tips) Select "Shift" and when positioned on screen you can align the leader line by axis.



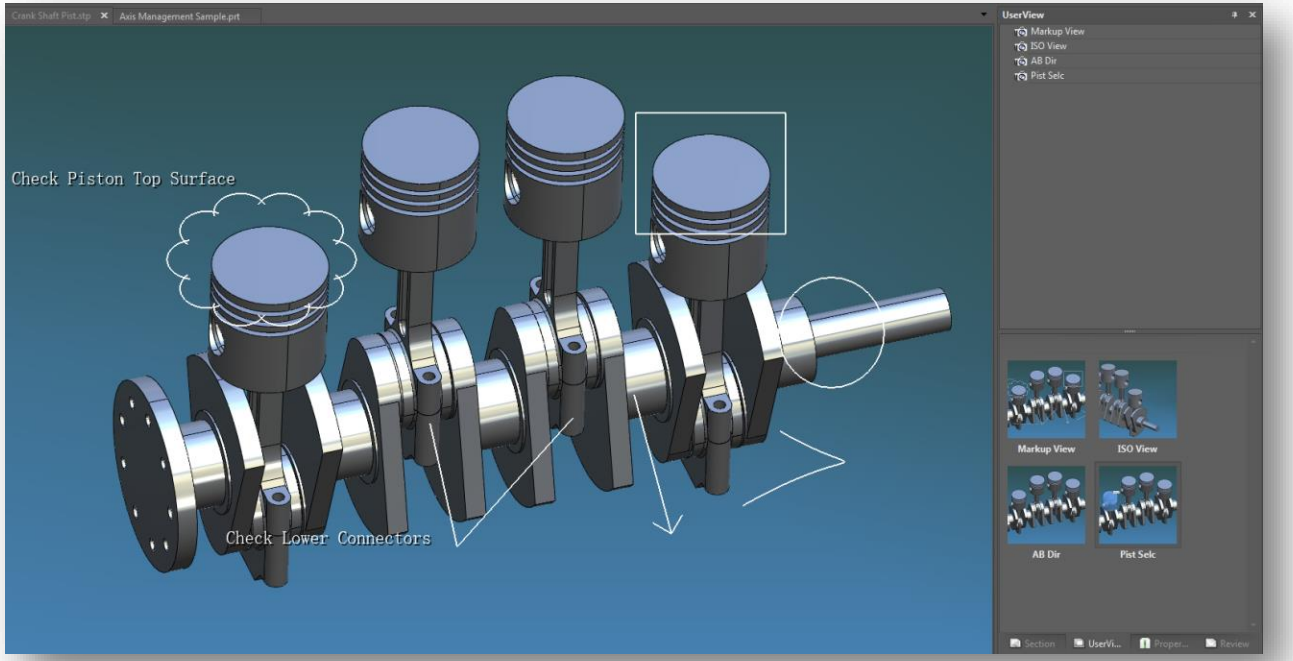



# 7. Annotate Tab > Draw




## Draw Panel

1) **Draw Markup:** If this option is active, you can select any 2D draw tool as markup.
2) **Delete Selected:** Deletes a selected 2D markup entity.
3) **Finish:** Finishes the markup process.
4) **Text:** Creates a text as 2D markup entity.
5) **Line:** Creates a line as 2D markup entity.
6) **Arrow:** Creates an arrow as 2D markup entity.
7) **Circle:** Creates a circle as 2D markup entity.
8) **Rect:** Creates a rectangle as 2D markup entity.
9) **Free Curve:** Creates a curved line as 2D markup entity.
10) **Cloud:** Creates a revision cloud as 2D markup entity.




Tips:

-After you draw any markup entity, make sure to press “Finish” button to end markup process and exit to normal state.

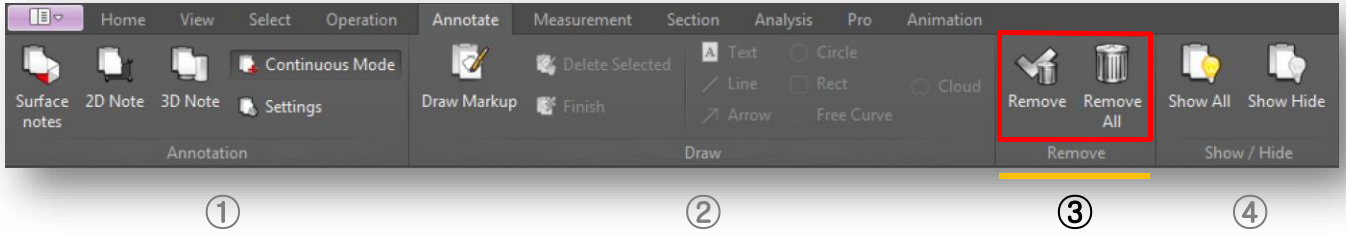
-If you pan or rotate a model with markup entities, those will disappear from workspace.

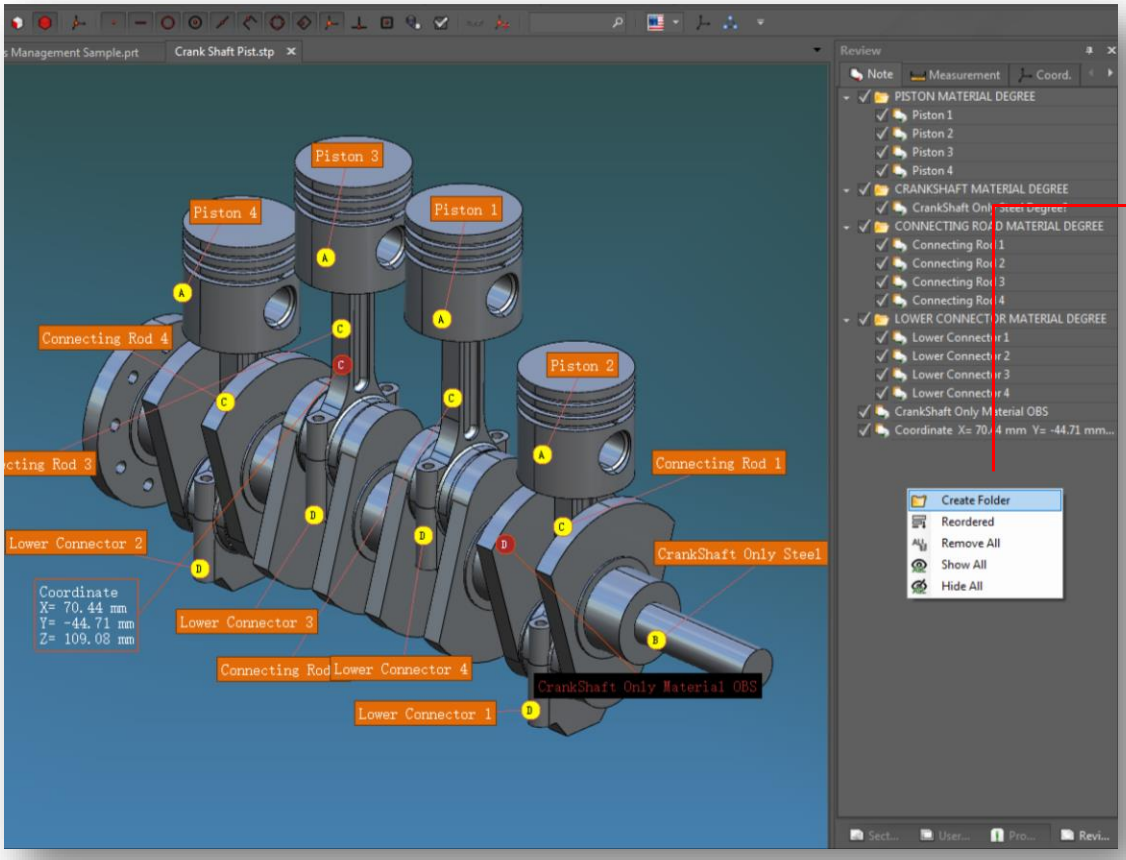
-To store markup entities applied to workspace, press “Q” key to create a snapshot which can be seen and accessed from UserView window.

-You can save as and share markup entities by saving as current file or saving as image to later share it.

-Markup entities can’t be recorded at Review window.

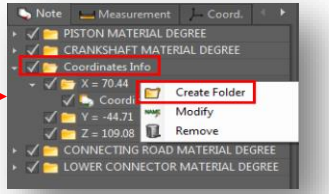
# 7. Annotate Tab > Remove



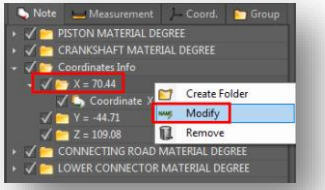




## Context Menu

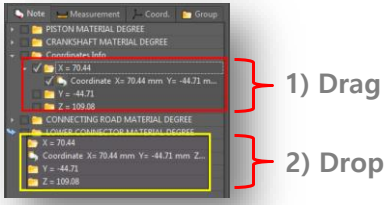
### A. Create folder




### B. Change folder name




### C. Drag & Drop




## Remove Panel

1) **Remove:**

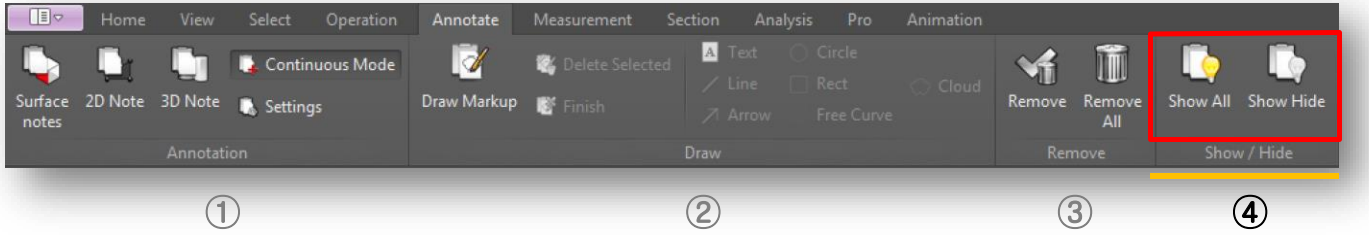
Removes or deletes a selected note.

2) **Remove All:**

Removes or deletes all notes created.

Tip: You can delete a selected note from workspace or note list by right-clicking it to pop up a context menu and selecting “Remove” option.

# 7. Annotate Tab > Show/Hide

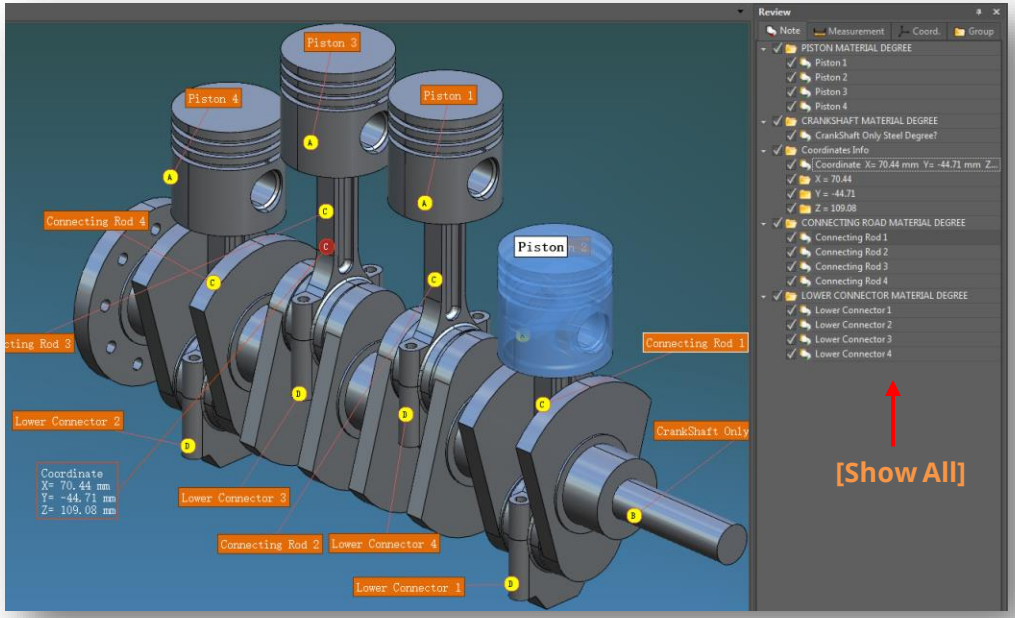


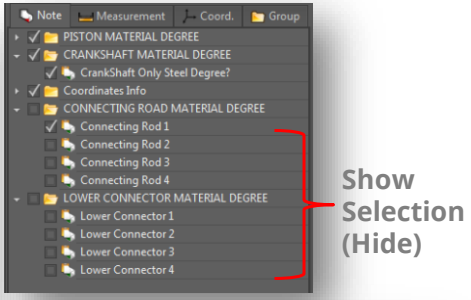

## Show/Hide Panel

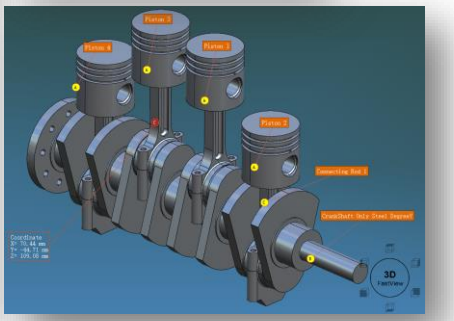
1) **Show All:** Shows or display all notes created on workspace.
2) **Hide All:** Hidden all notes.

Tips:
-You can hide a note by context menu or simply uncheck it from note list.
-You can show a note by checking it from note list.

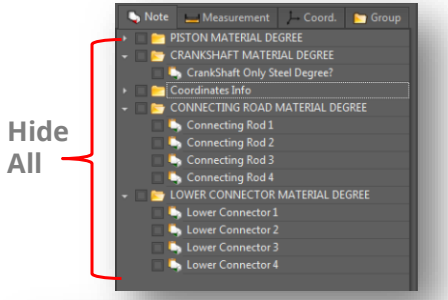
### 1) Show all

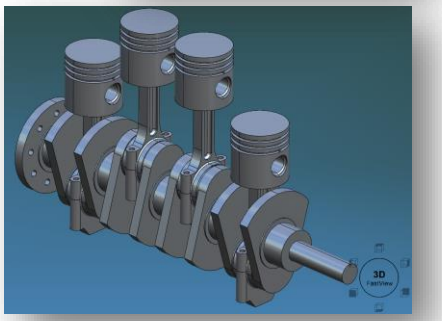


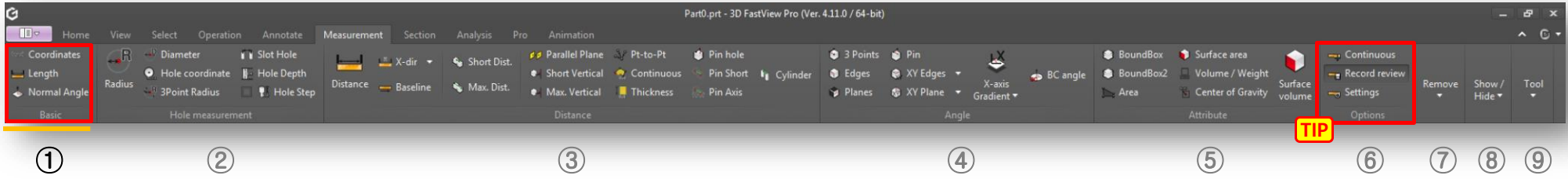



### 2) Hide all



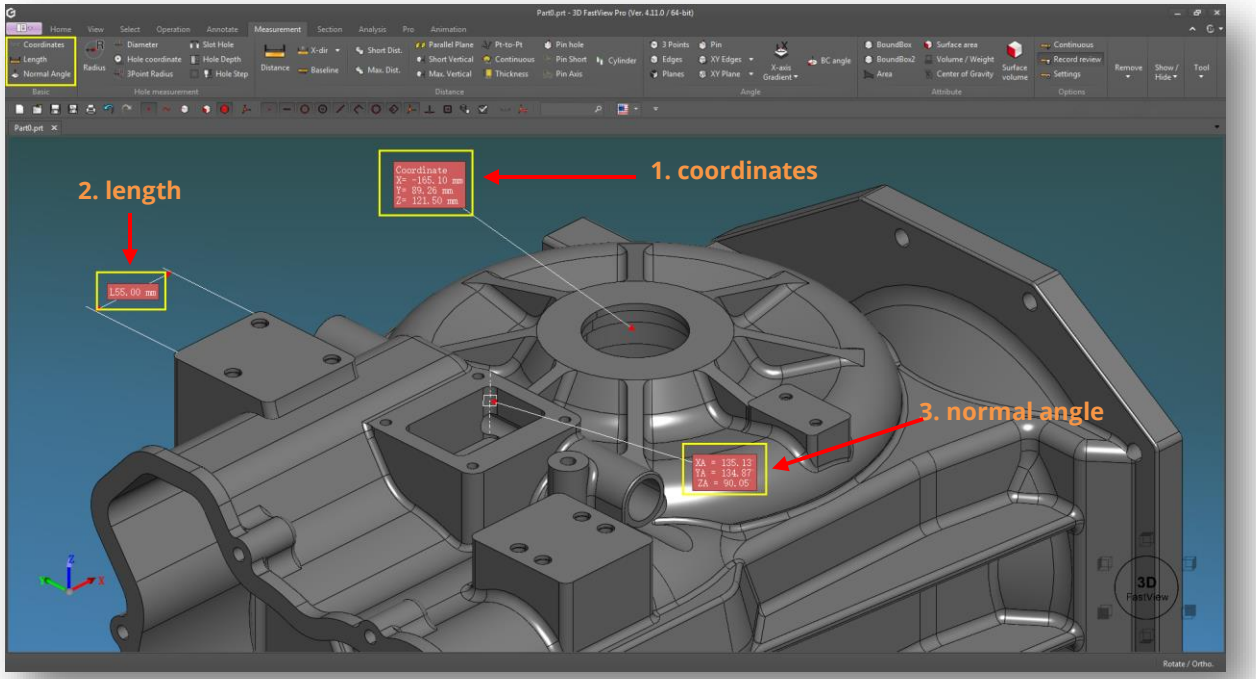



# 8. Measurement Tab > Basic



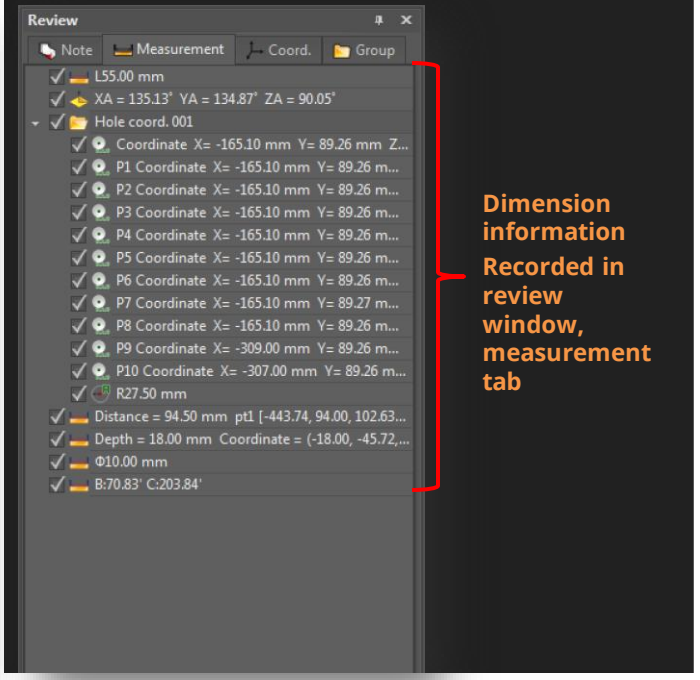

## Basic Panel

1) **Coordinates:** Based on absolute coordinates, measures the coordinates of a point.
2) **Length:** Measures the length of an edge.
3) **Normal Angle:** Based on absolute coordinates, measures normal edge of a surface.

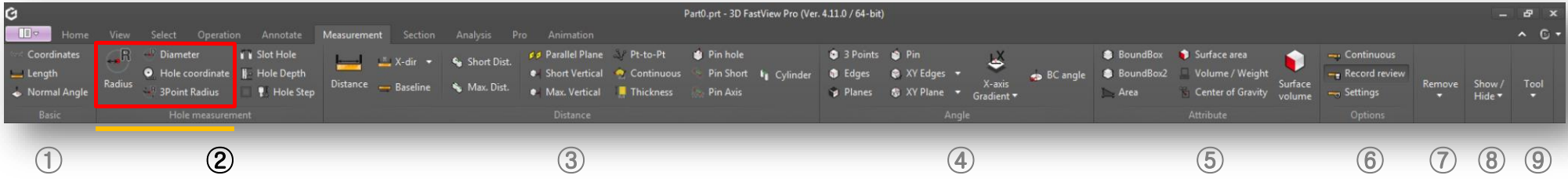



**TIP**

When measuring, “Record Review” icon must be selected in order to record any measurement information within the Review window > Measurement tab



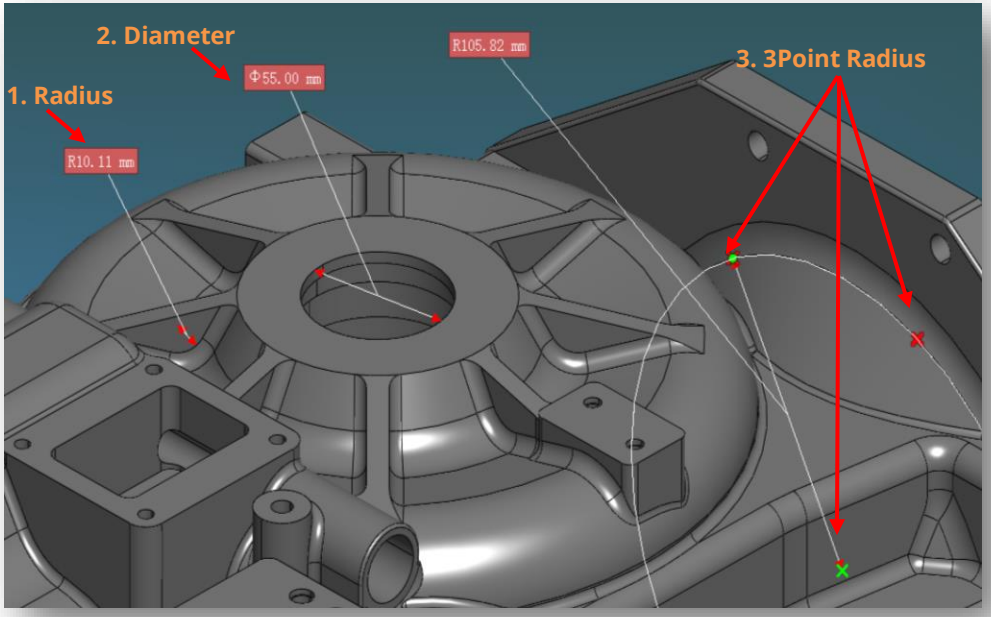
# 8. Measurement Tab > Hole Measurement



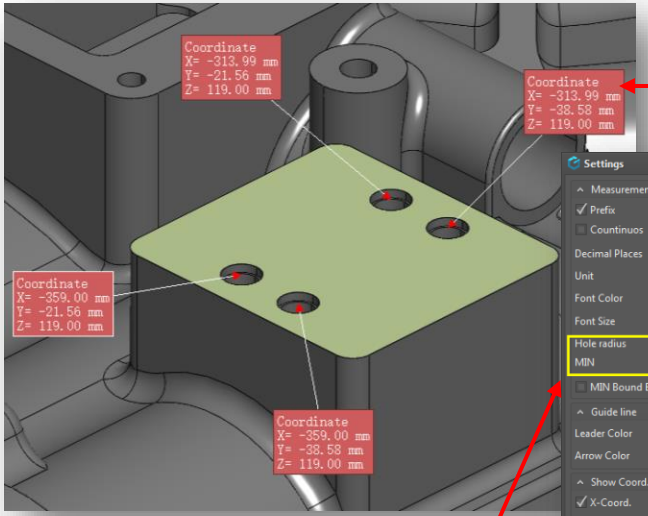

## Hole Measurement Panel

1) **Radius:** Measures the radius of selected circle or arc segment.
2) **Diameter:** Measures the diameter of selected circle or arc segment.
3) **Hole Coordinate:** Measures coordinates of all holes of a model.
4) **3Point Radius:** Measures the radius by 3 points of the edge.

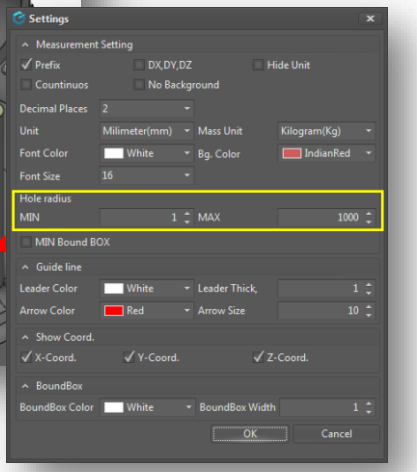
### 1 ~ 3) Radius, diameter and 3-point radius




### 4) Hole coordinates

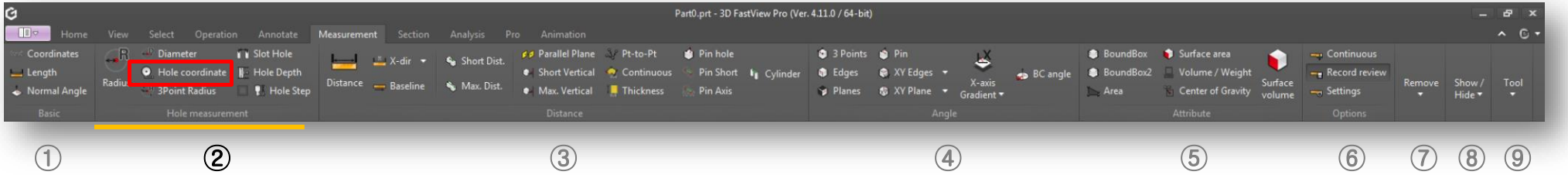



A) Selecting a surface
B) Clicking the hole coordinates




Hole radius measurement range
⑥ Options > Setting

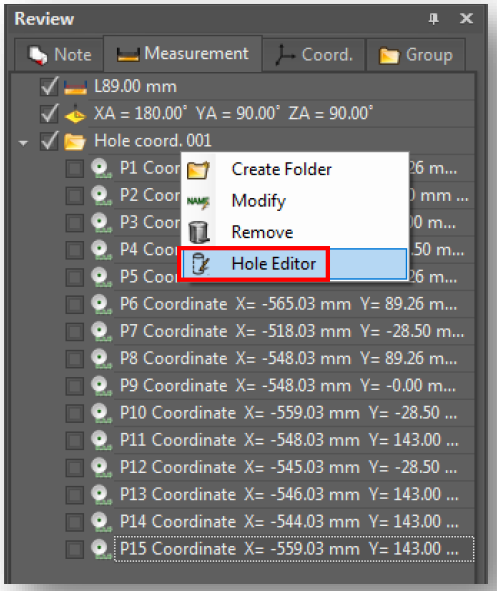
# 8. Measurement Tab > Hole Measurement



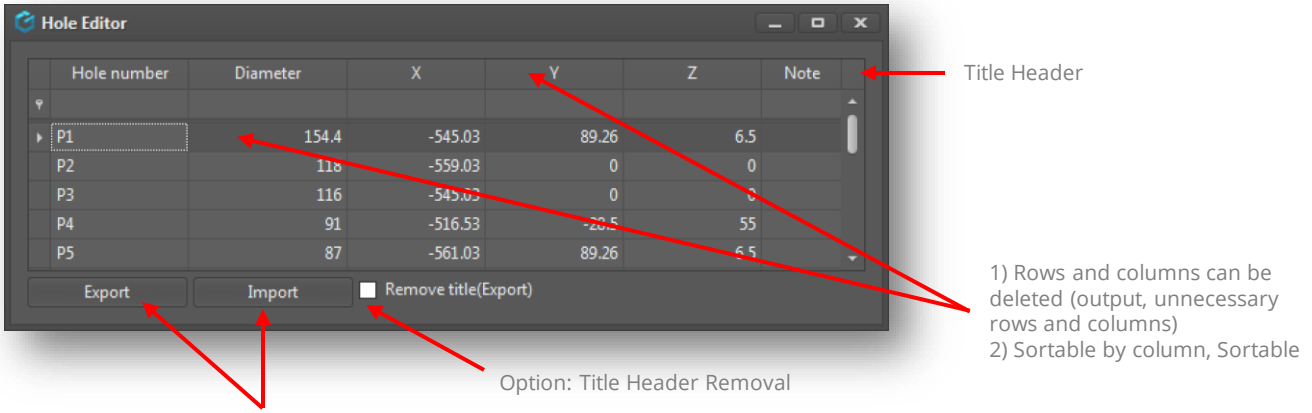

**Hole coordinates:** Hole coordinate value measured through hole coordinate editor can be edited.

## A) List of hole coordinates

Right-click "Hole Coordinate" folder and select "Hole Editor" option.

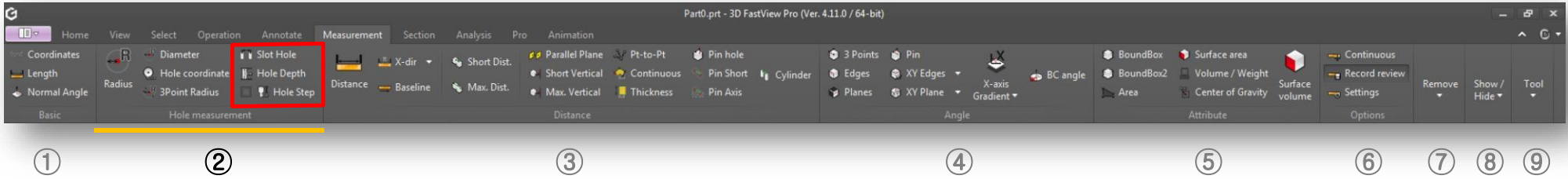



## B) Coordinate Editor




Export and Import the hole coordinate information as Excel, CSV and text file format.

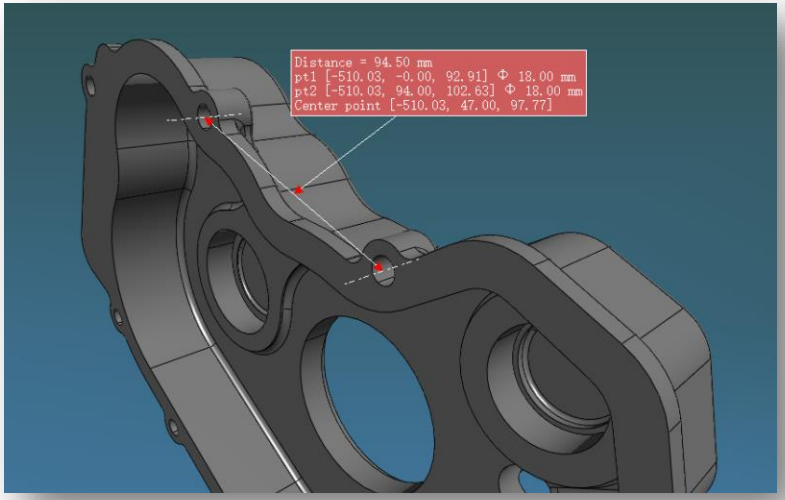
# 8. Measurement Tab > Hole Measurement



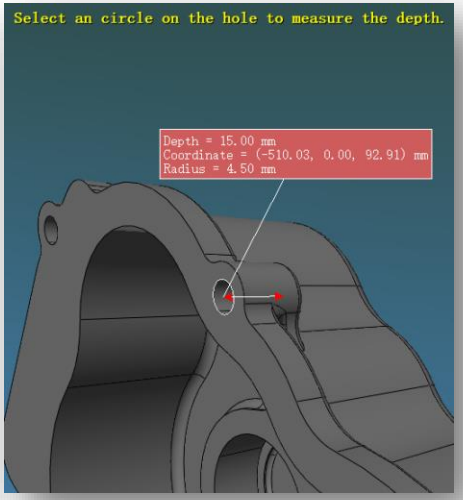

## Hole Measurement Panel

5) **Slot Hole:** Measures center distance from hole to hole (including point coordinate information of selected hole).
6) **Hole Depth:** Measures hole depth. If "Hole Step" option is checked, it will include the step hole measurement information.

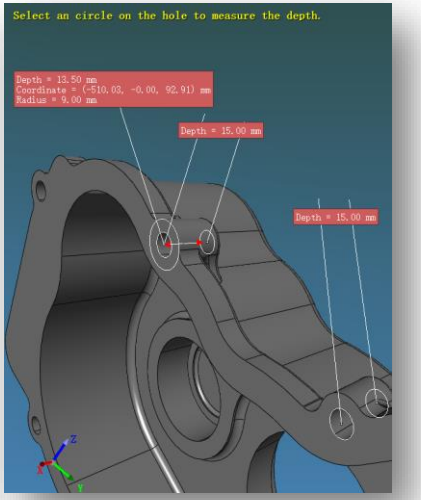
### 5) Slot hole



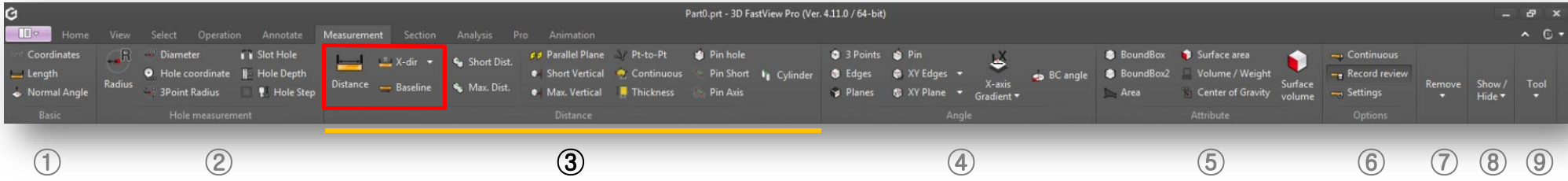

### 6) Hole depth




### 6) hole depth wih hole step



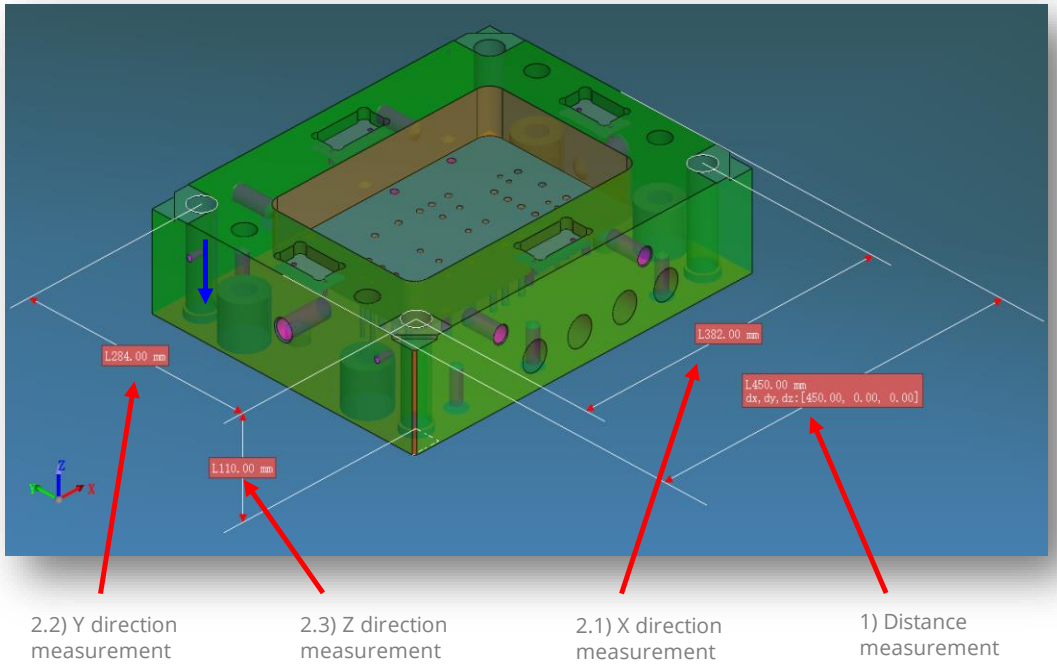
# 8. Measurement Tab > Distance



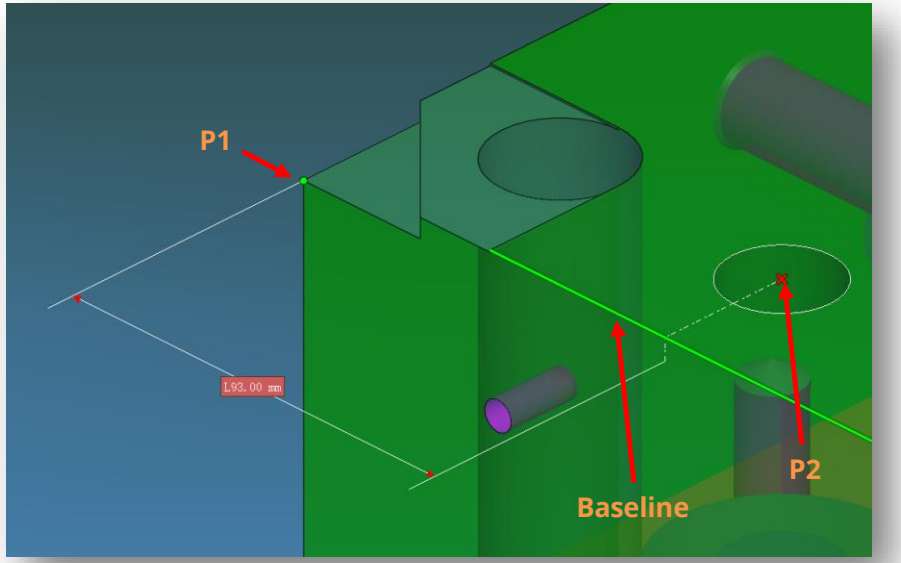

## Distance Panel

1) **Distance:** Measures distance between two points, edges or surfaces.
2) **X/Y/Z-Dir:** Distance measurement based on the axial direction between two points.
3) **Baseline:** Distance between two points is measured based on baseline direction.

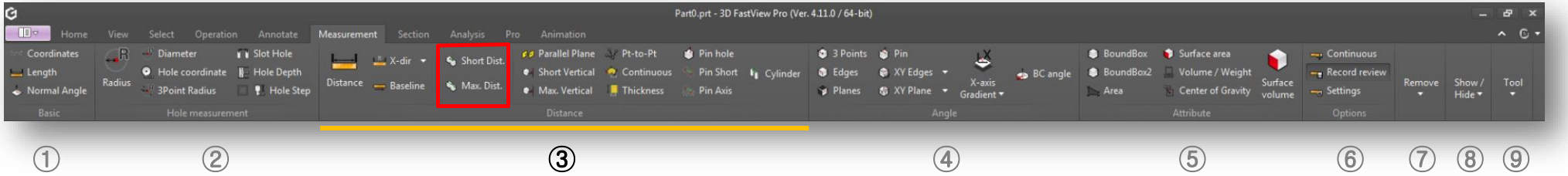
### 1 ~ 2) Distance measurement & X (Y / Z) direction




### 3) Baseline direction



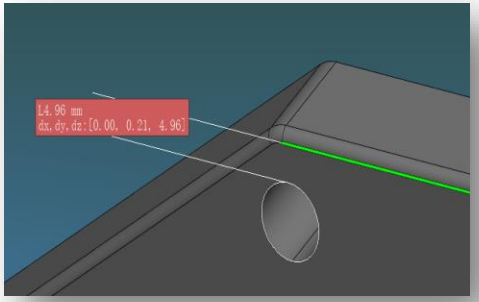
# 8. Measurement Tab > Distance



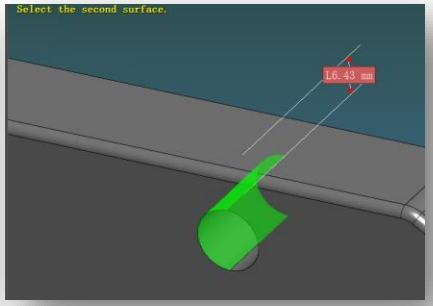

## Distance Panel

4) **Short Dist:** Measures the shortest distance between two selected edges, surfaces or parts in case of assembly.
5) **Max. Dist:** Measures the maximum distance between two selected edges, surfaces or parts in case of assembly.

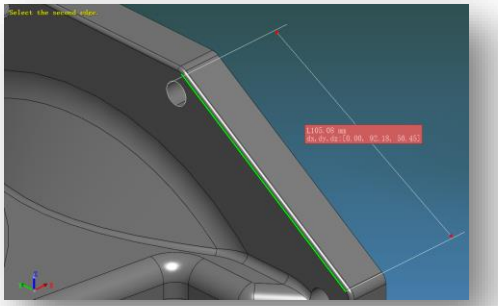
### A) Shortest distance (edge to edge)



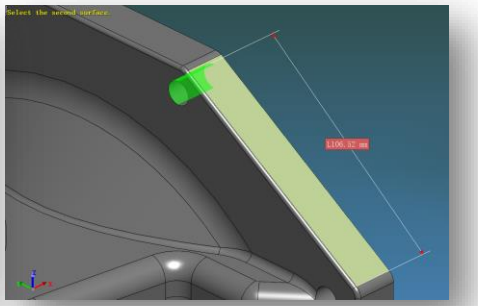

### B) Shortest distance (face to face)



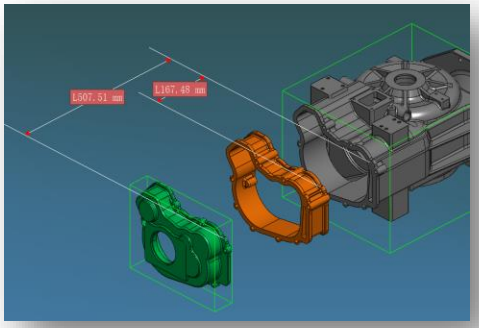

### A) Maximum distance (edge vs edge)



### B) Maximum distance (face vs face)



### C) Shortest distance (part vs part)



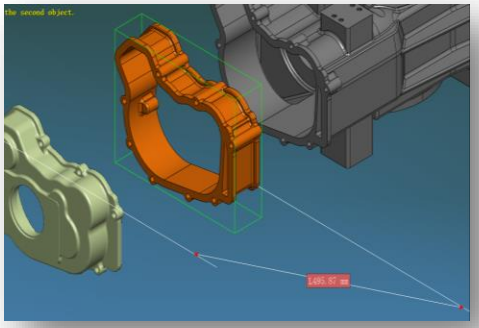

**Short Distance Measurement Ways:**

A) To measure edge to edge distance, you must active “Solid” osnap.

B) To measure face to face distance, you must active “Face” osnap.

C) To measure part to part distance, you must active “Solid” osnap.

### C) Maximum distance (part vs part)



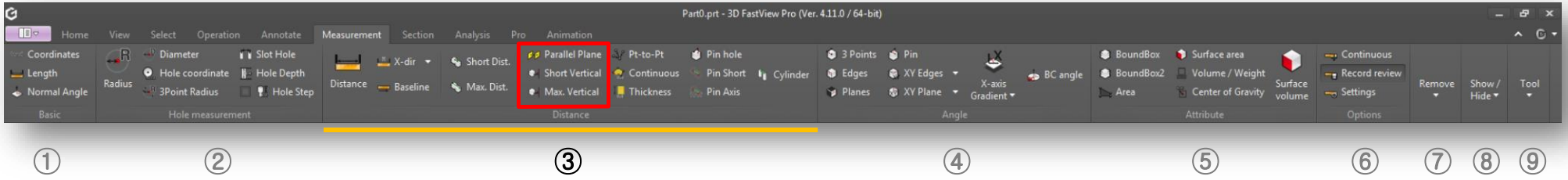

**Maximum Distance Measurement Ways:**

A) To measure edge to edge distance, you must active “Solid” osnap.

B) To measure face to face distance, you must active “Face” osnap.

C) To measure part to part distance, you must active “Solid” osnap.

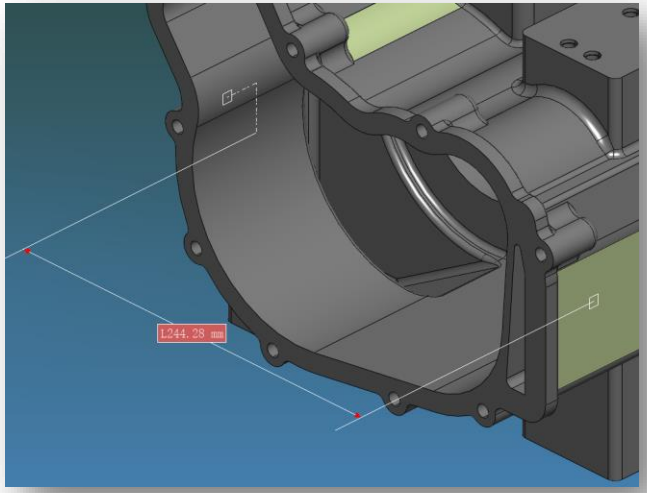
# 8. Measurement Tab > Distance



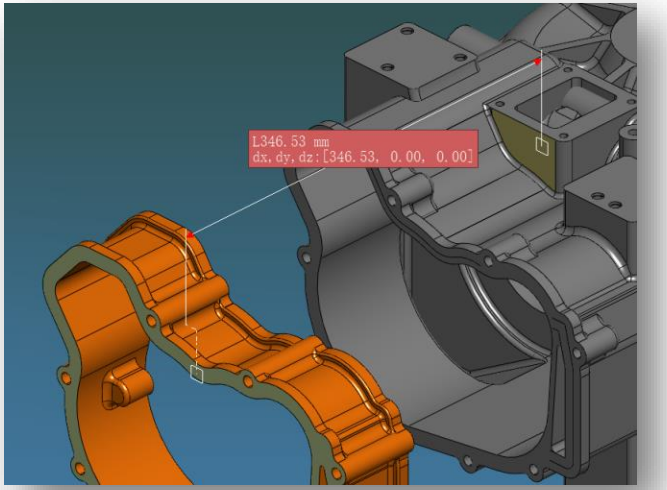

## Distance Panel

6) **Parallel Plane:** Measures the distance between two parallel surfaces.
7) **Short Vertical:** Measures the shortest vertical distance between the selected surface and the nearest edge or face.
8) **Max. Vertical:** Measures the vertical maximum distance between the select surface and a curvature point of the select surface.

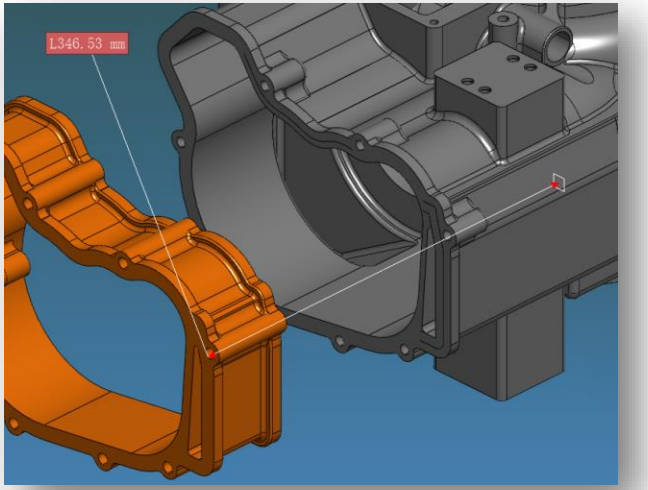
### 6) Parallel surface distance



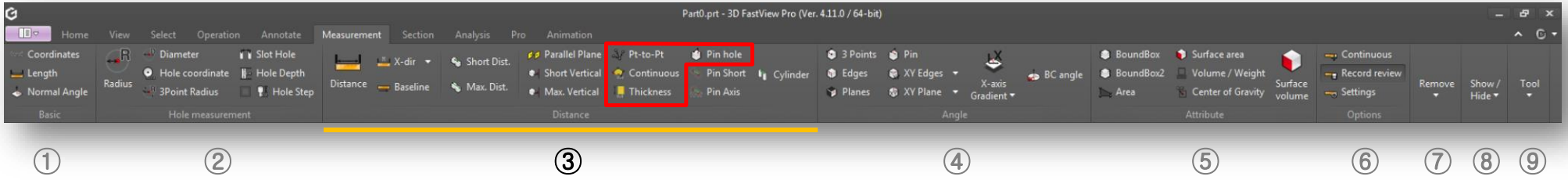

### 7) Vertical shortest distance




### 8) Vertical maximum distance



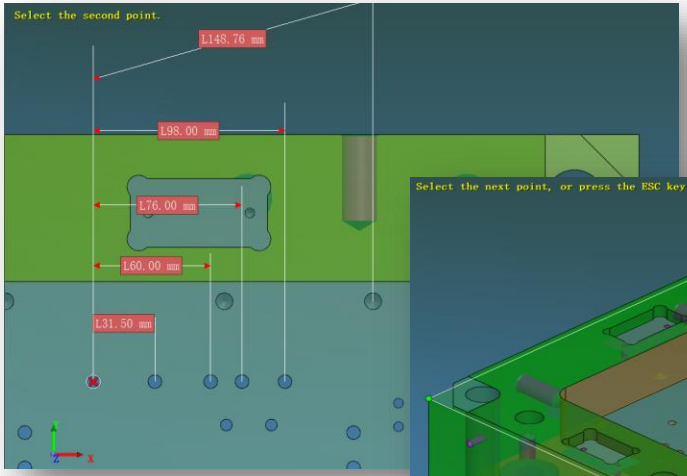
# 8. Measurement Tab > Distance



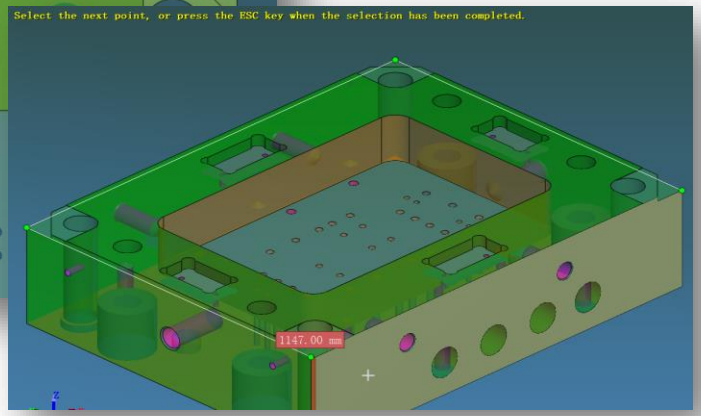

## Distance Panel

9) **Pt-to-Pt:** Measures continuous distance of selected coplanar points with a reference point.
10) **Continuous:** Measures the distance between successive points based on one point.
11) **Thickness:** Measures the surface thickness of the selected part.
12) **Pin Hole:** Measures the distance from the parallel plane to the selected pin (hole).

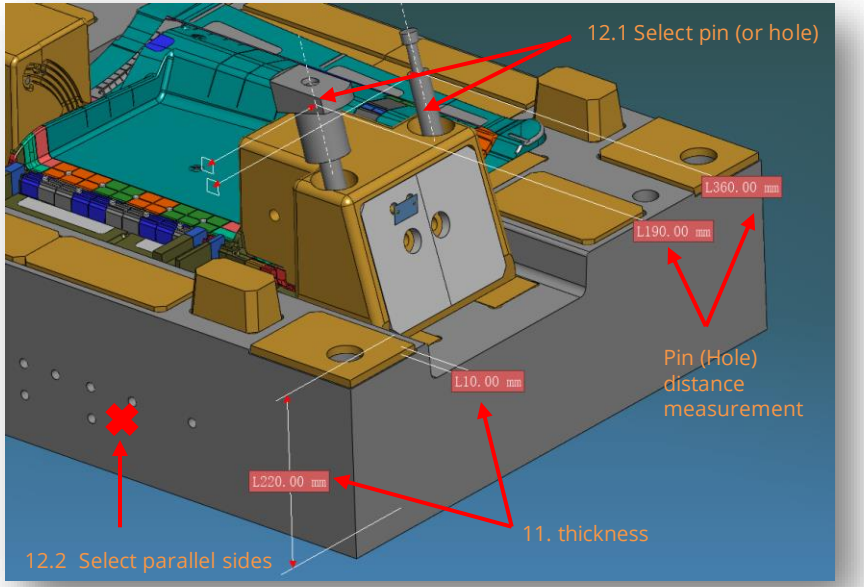
### 9) Point to point multiple points



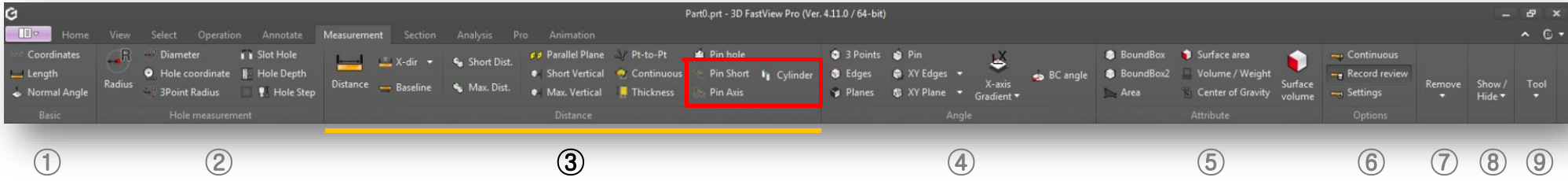

### 10) Continuous distance




### 11 ~ 12) Thickness & pin (hole) distance



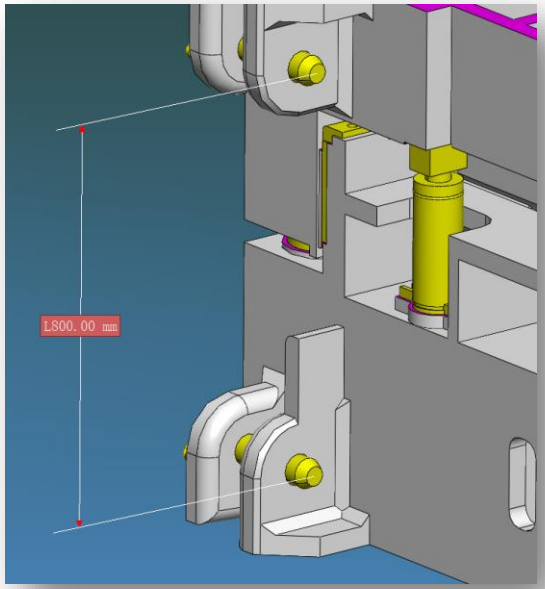
# 8. Measurement Tab > Distance



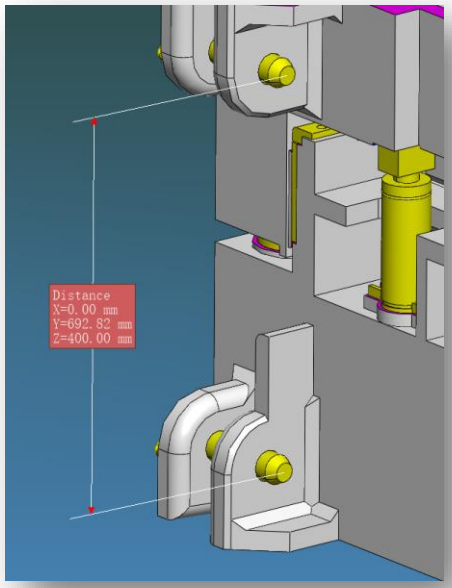

## Distance Panel

13) **Pin Short:** Measures the shortest distance from center point of pin (hole) and pin (hole).
14) **Pin Axis:** Measures the distance in the direction of the center line of the pin (hole) and pin (hole) (X,Y,Z distance value).
15) **Cylinder:** Measures the vertical center line reference distance between pin (hole) and pin (hole).

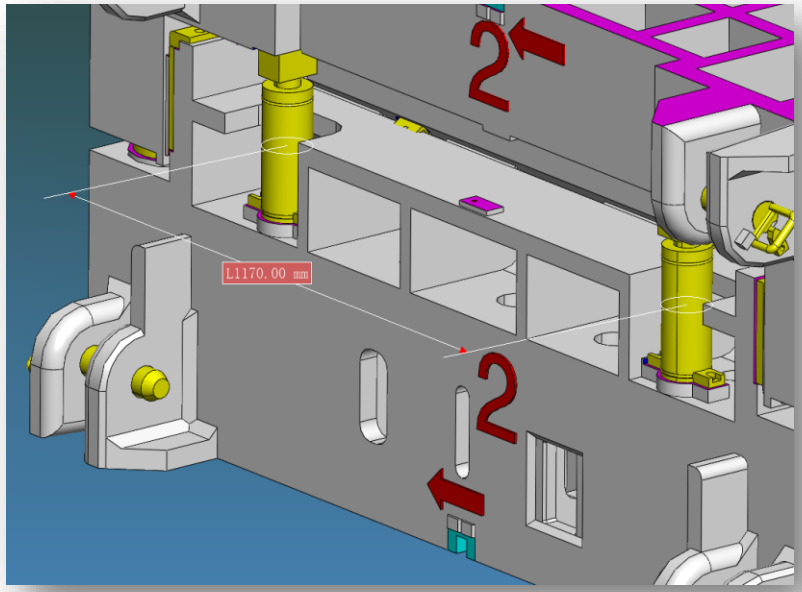
### 13) Pin to pin shortest distance



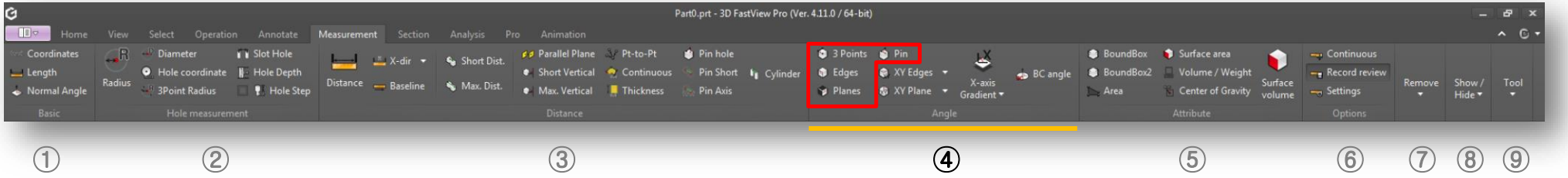

### 14) Pin to pin axis distance




### 15) Cylinder distance



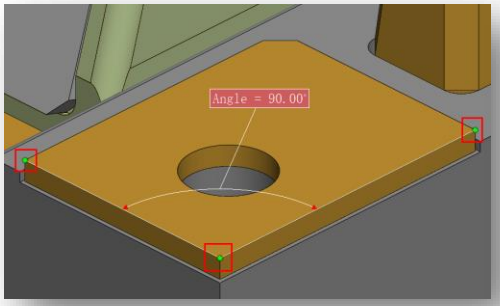
# 8. Measurement Tab > Angle



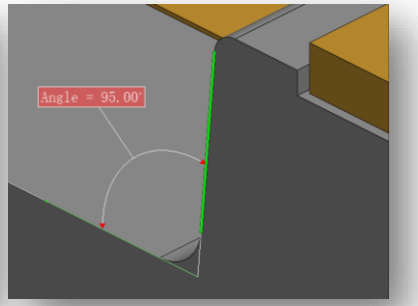

## Angle Panel

1) **3 Points:** Measures the angle by selecting 3 points.
2) **Edges:** Measures the angle between two select edges.
3) **Planes:** Measures the angle between two selected faces.
4) **Pin:** Measures the angle between the selected pin (cylinder) and the selected face.

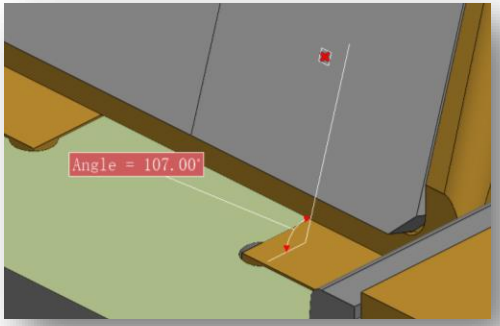
### 1) 3 Points angle



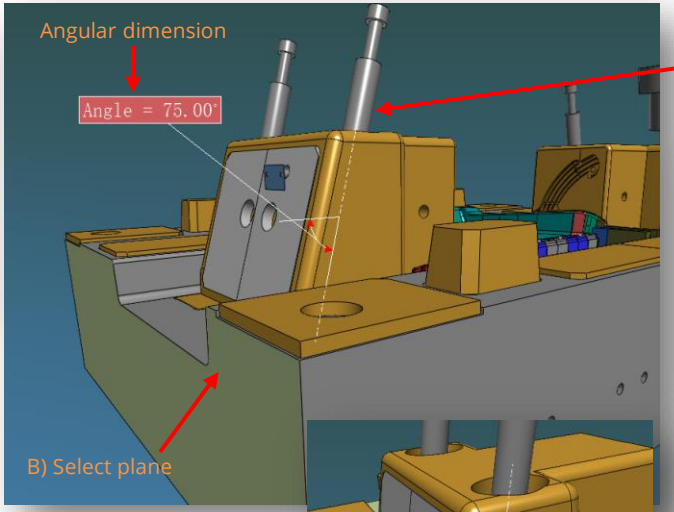

### 2) Edges angle

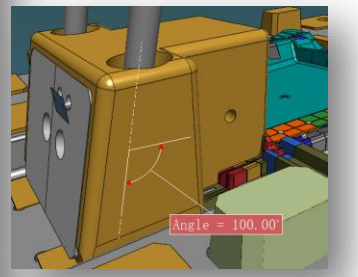


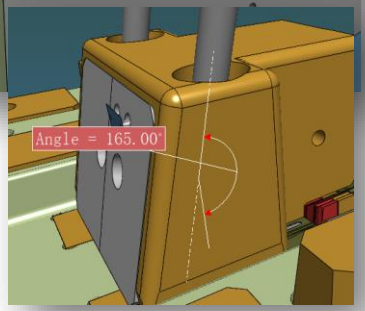

### 3) Planes angle

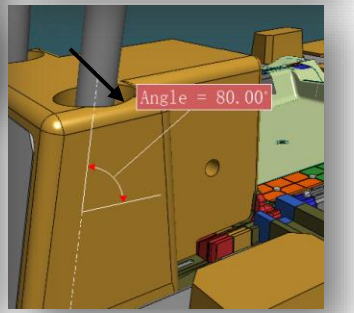



### 4) Pin angle



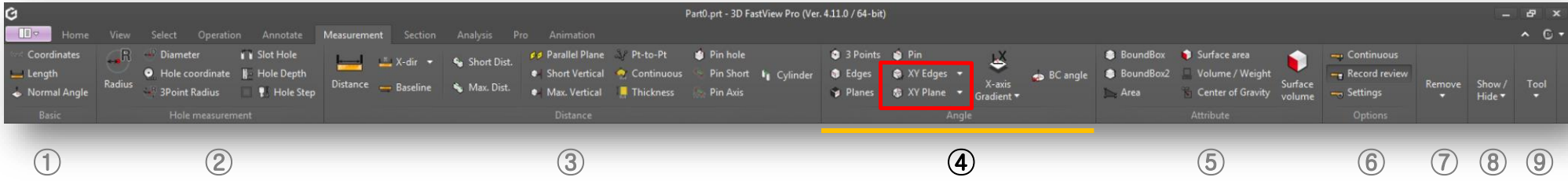




Tip) After selecting the angular dimension, press 'A' key to toggle the angle dimension direction

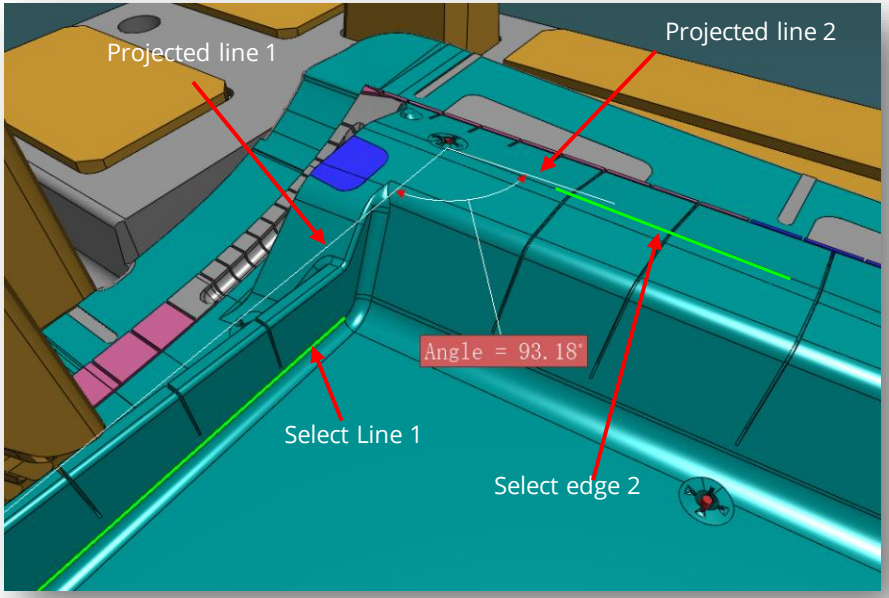
# 8. Measurement Tab > Angle



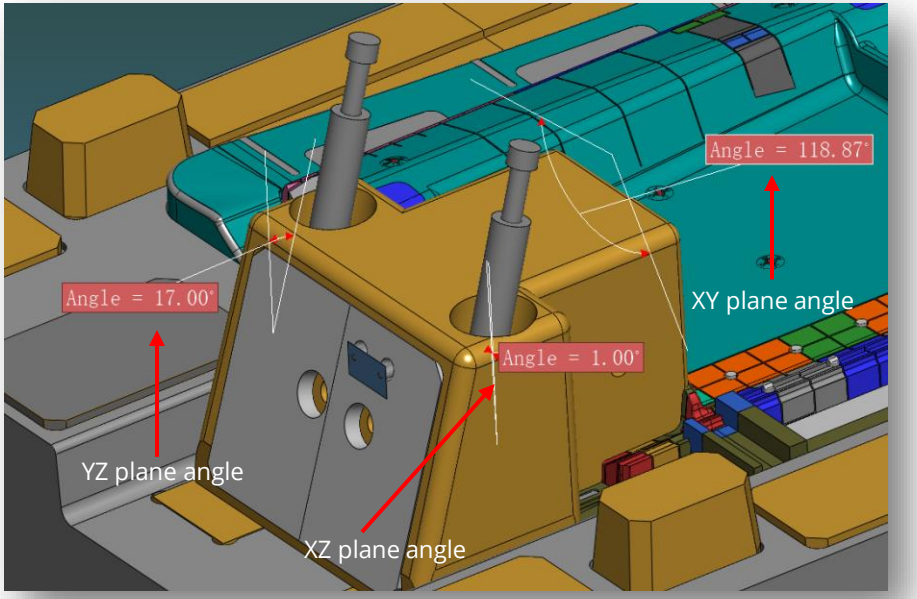

## Angle Panel

5) **XY/YZ/ZX Edges:** Projects a selected line onto XY (YZ/ZX) plane of the selected line Angle measurement between straight lines.
6) **XY/YZ/ZX Plane:** Measures the angle between a selected plane and the XY (YZ/ZX) plane.

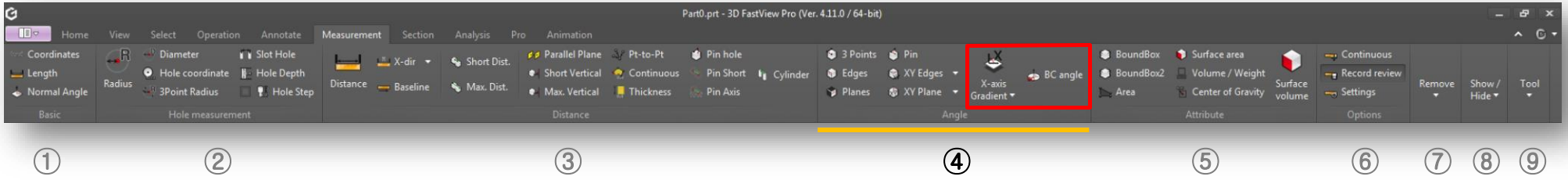
### 5) XY/YZ/ZX edges angle




### 6) XY/YZ/ZX Plane angle



# 8. Measurement Tab > Angle



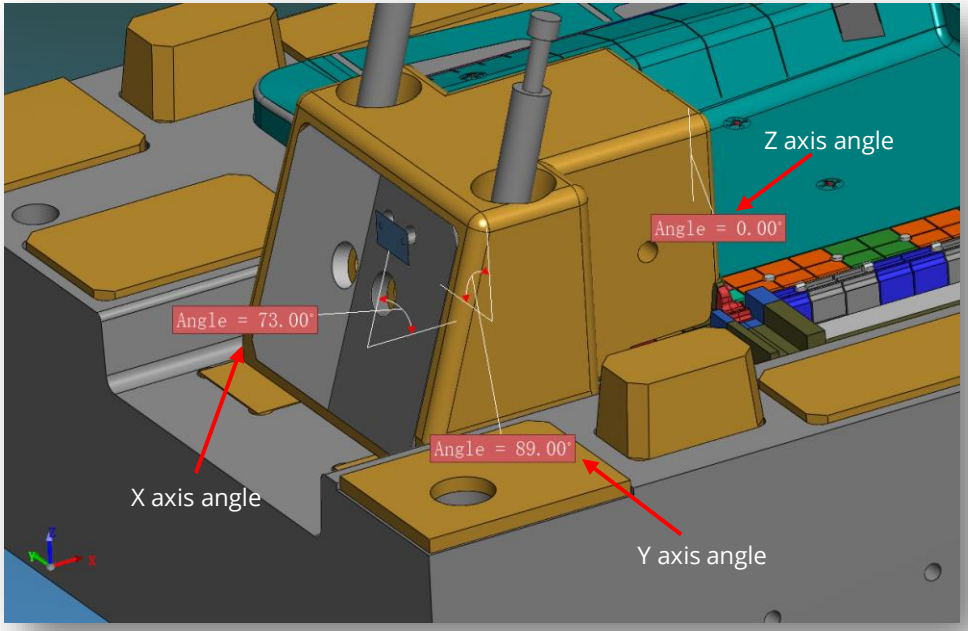

## Angle Panel

7) **X/Y/Z Gradient:** Measures the gradient angle between a selected plane point and the X (Y/Z) axis.
8) **BC Angle:** Measures spindle rotation angle (C angle) and tool entry angle (B angle) of the tool for a selected plane, hole edge & cylindrical face.

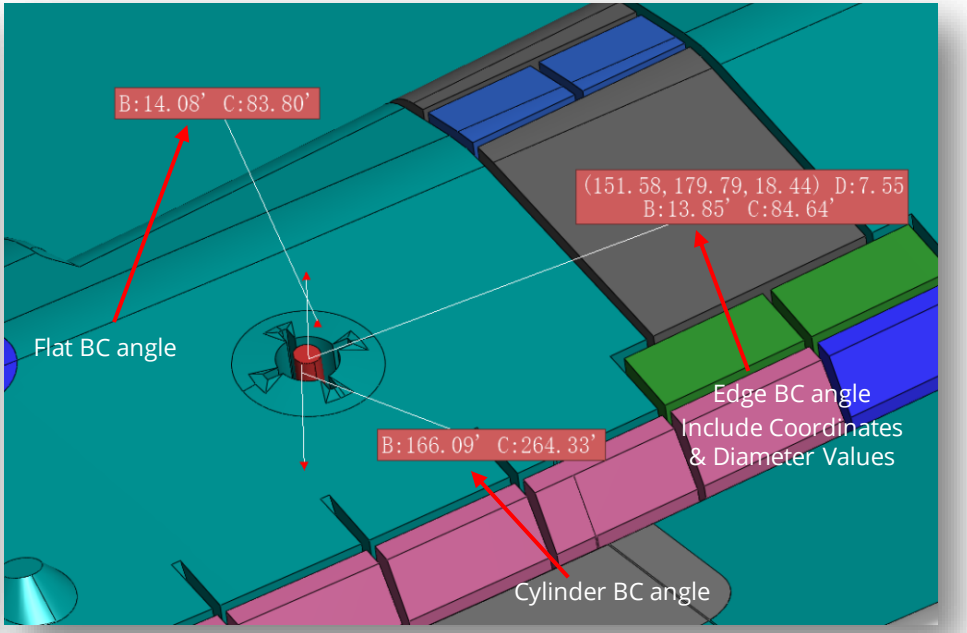
**'C' angle (360)**

**'B' angle (± 110)**

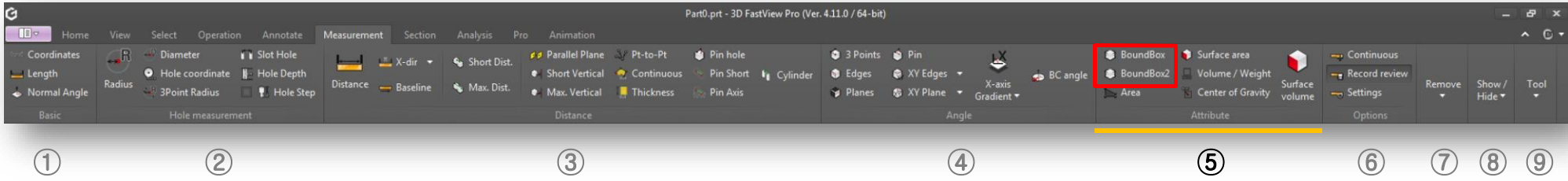
### 7) X/Y/Z axis gradient angle




### 8) "B"/"C" angle



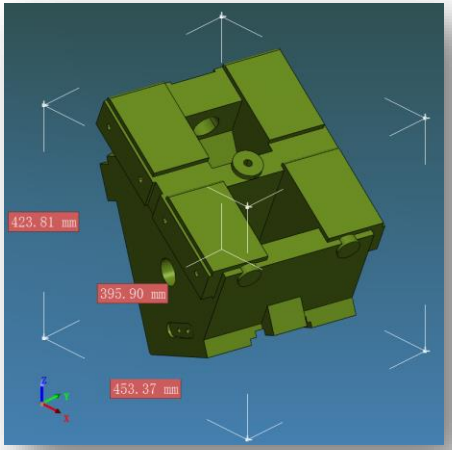
# 8. Measurement Tab > Attribute



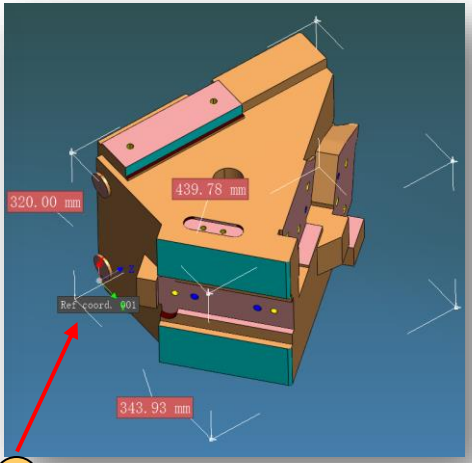

## Attribute Panel

1) **Bound box:** A) Measures the size of the optimum outer reference relative to the reference coordinate system for the selected model.
B) Measures the size of the user's selected reference frame relative to the selected contour. After activating the user coordinate, the bound-box measurement automatically measures coordinate.
2) **Bound box2:** C) Bound box measurement based on the selected face.
D) Minimum Bound Box: measures the minimum bounding box of the selected object.
Measurement Options> Measurement Settings> Minimum Bound Box Enabled - On

### 1. A) Bound box based on reference Axis

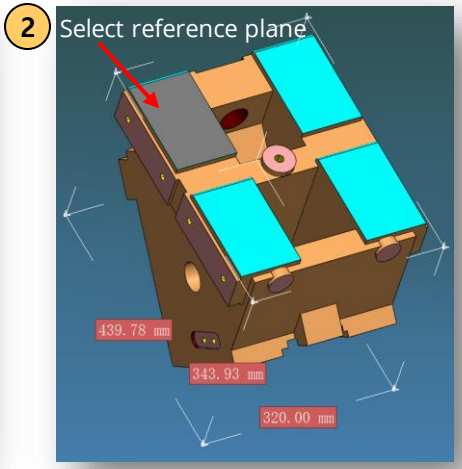



### 1. B) User-selected coordinate-based bounding box



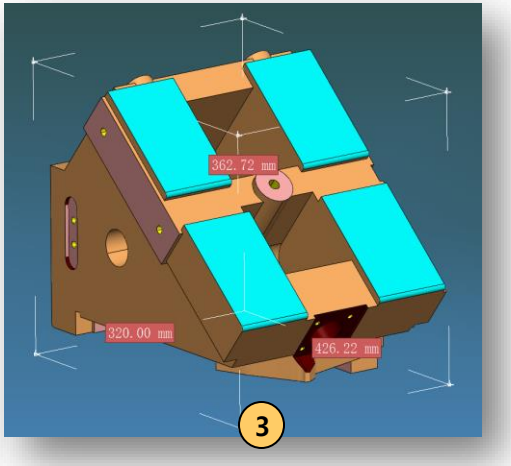

1 User-selected coordinates, activation

### C) Reference standard plane, bound box

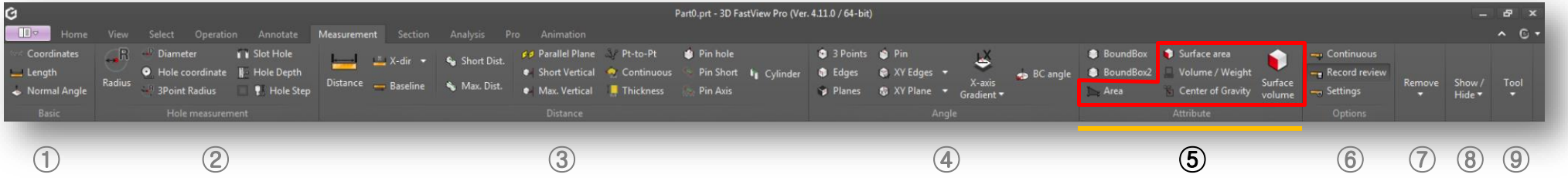



1. Select model> 2. Click Bound box2 icon> 3. Select the reference plane

### D) Minimum Bound Box



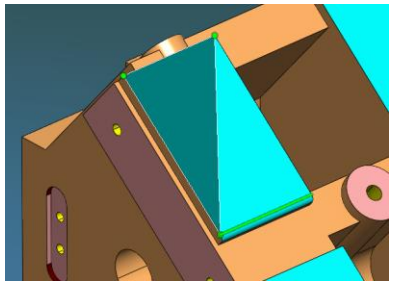
# 8. Measurement Tab > Attribute




## Attribute Panel

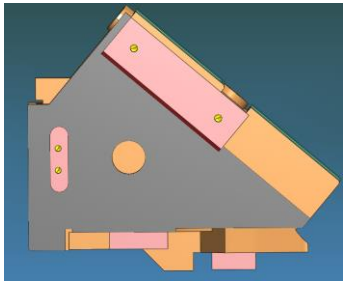
3) **Area:** Measures the area of selected points on the model.
4) **Surface area:** Measures the area of one or more selected surfaces.
5) **Volume/Weight:** Measures volume and weight of a selected part.
6) **Center of Gravity:** Measures the center of gravity of a selected part.
7) **Surface Volume:** At first instance, input the thickness value, then select the surface to be multiplied to get its proper volume.

### 3) Area



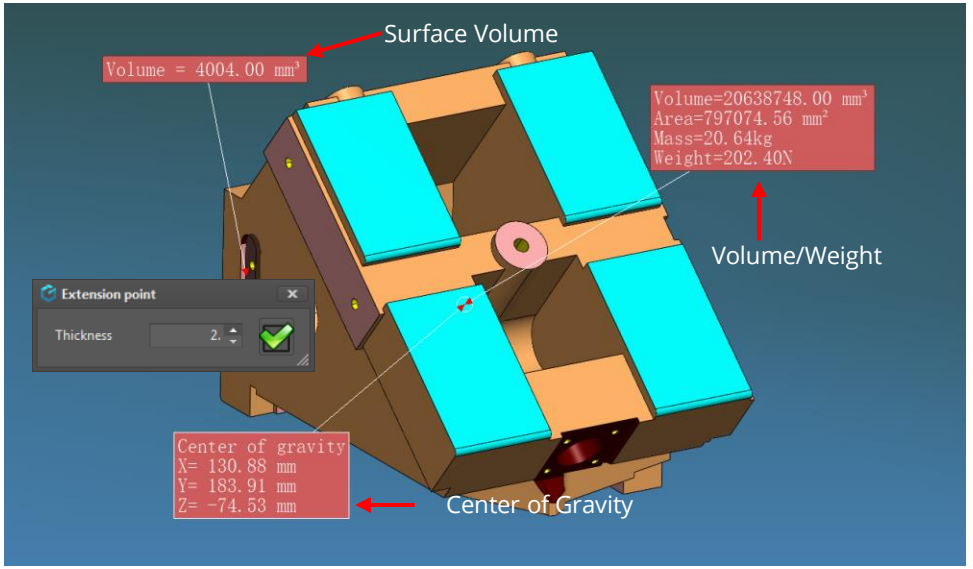

**Tip:**
To perform “Area” measurement, you must active “Solid” option osnap.

### 4) Surface Area



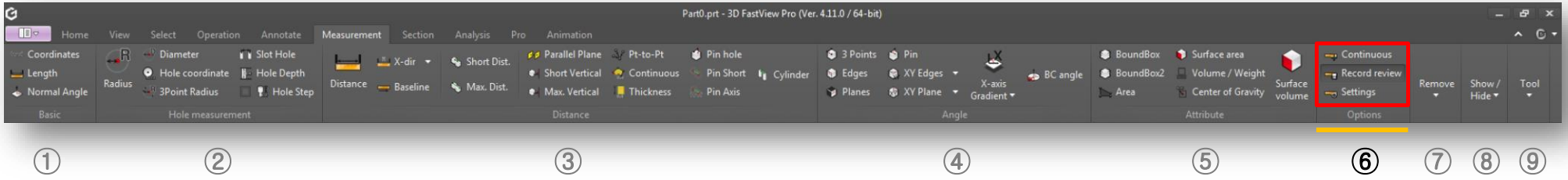
**Tip:**
To perform “Surface Area” measurement, you must active “Face” option osnap.

### 5 ~ 7) Volume/Weight, Center of Gravity & Surface Volume




The surface volume equation is the thickness value times by the surface selected

# 8. Measurement Tab > Options




## Options Panel

1) **Continuous:** After checking this option, you can continue using the same measurement function.
2) **Record Review:** After checking this option, all measurement, coordinates, groups created and most relevant notes performed will be recorded in “Review” window to later export it.
3) **Settings:** Sets options for measurement.

### Settings Dialog Box

**A) Measurement Setting**

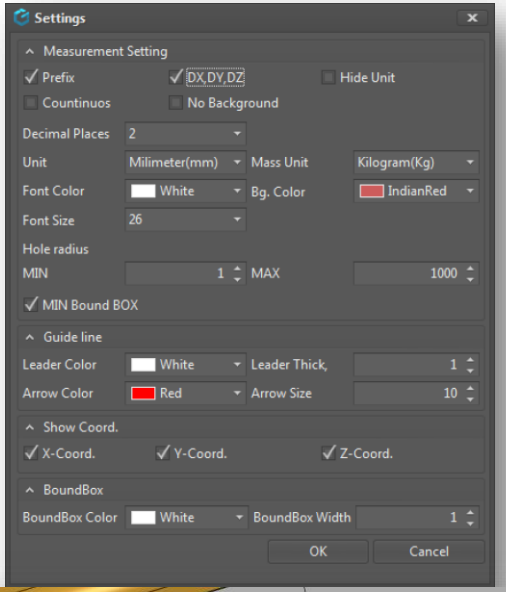
☐ Prefix ☐ DX, DY, DZ : Sets visibility of measurement results of Prefix & DX/DY/DZ
☐ Continuous Dist: Displays continuous distance on screen.
☐ No background: No background color for measurement text background.
- Decimal places: Sets the number of decimal places for measurement result.
- Unit: Sets unit of distance (mm, cm, m, inch, feet) - Mass Unit: Sets for weight unit (g, kg).
- Font Color, Background Color, Font Size: Sets the text displayed in the measurement result.
- Hole radius: Sets the radius ranges included in the measurement when measuring the hole coordinates.
☐ Min Bound Box: measured minimum "bounding box" when measuring bounding box

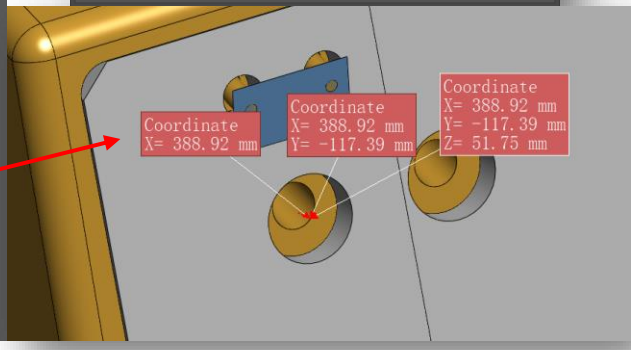
**B) Guide Line**

- Set Leader: Set the color, thickness, and color of the dimension leaders

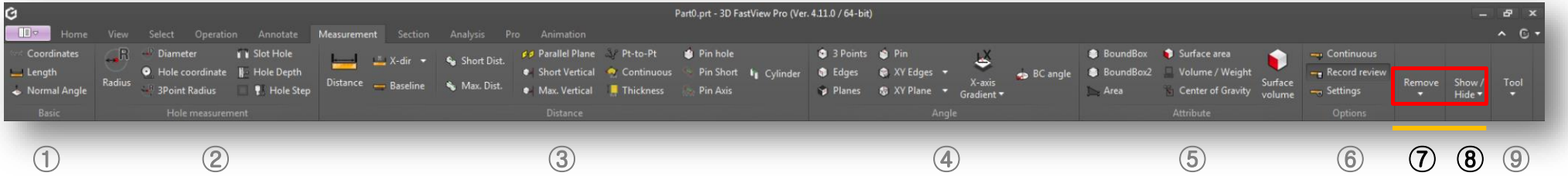
**C) Show Coord**

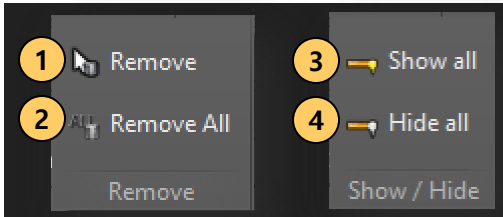
- Coordinate display: When measuring dimension, select axis of dimension to represent.



# 8. Measurement Tab > Remove & Show/Hide

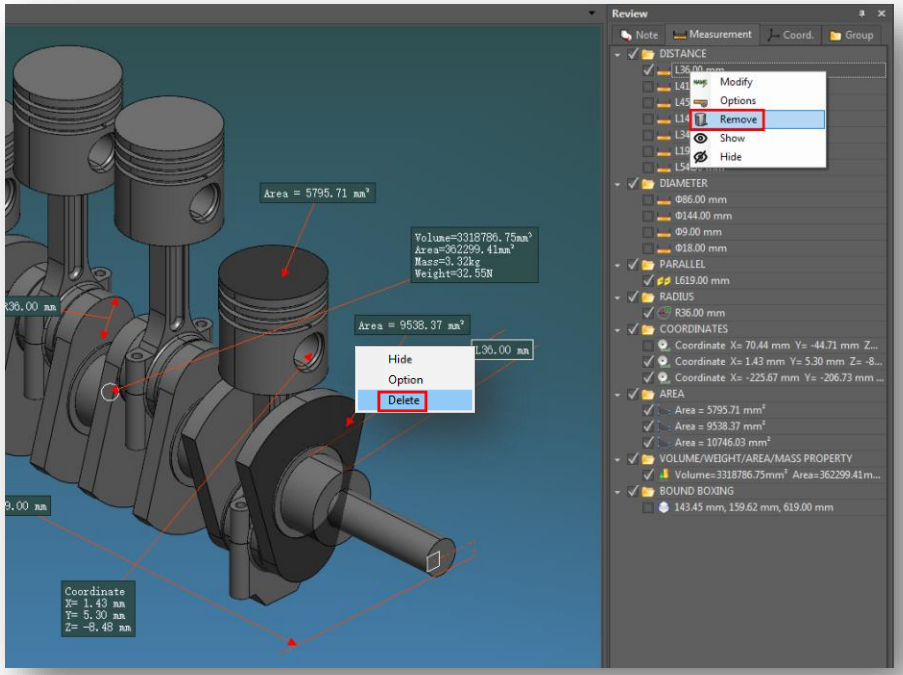


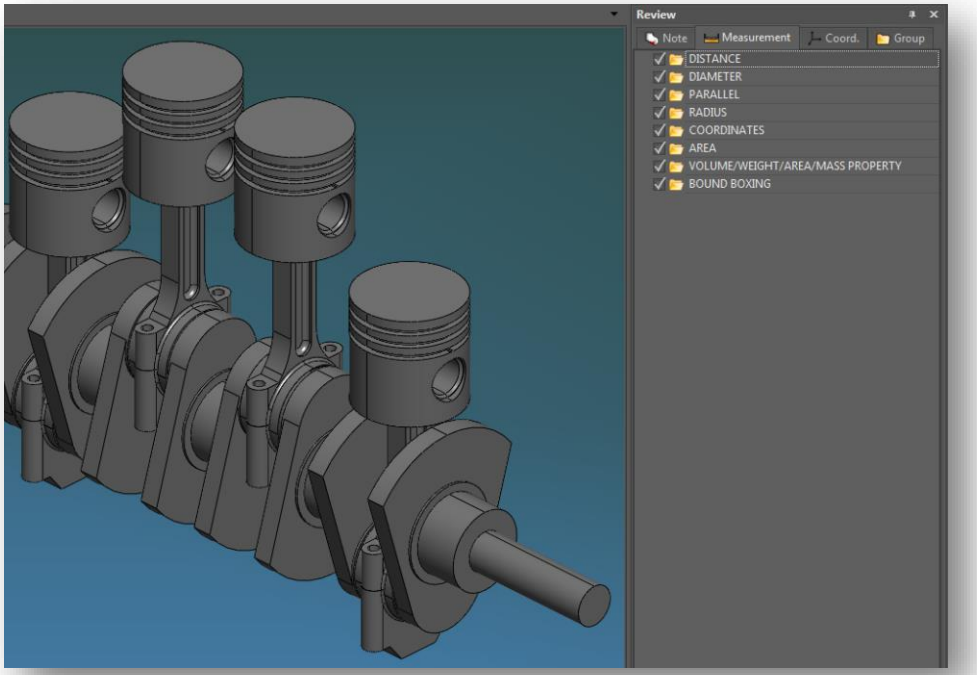

### Remove & Show/Hide Panel

1) **Remove:** Deletes selected measurement information from measurement list or from context menu option.
2) **Remove All:** Deletes all measurement information displayed on screen.
3) **Show All:** Shows all measurement information on screen.
4) **Hide All:** Hidden all measurement information on screen.

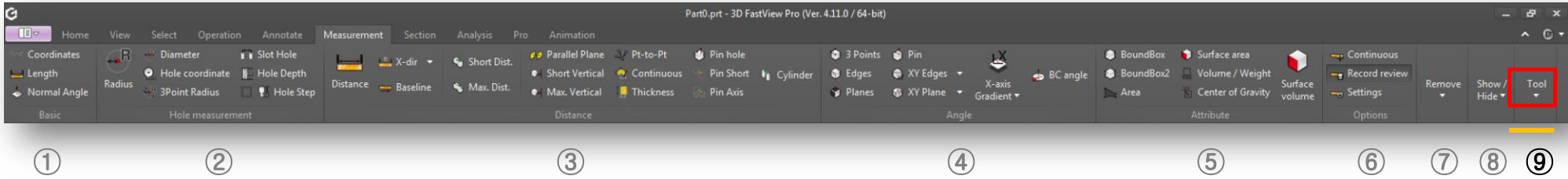
### 1 & 3) Remove & Show All

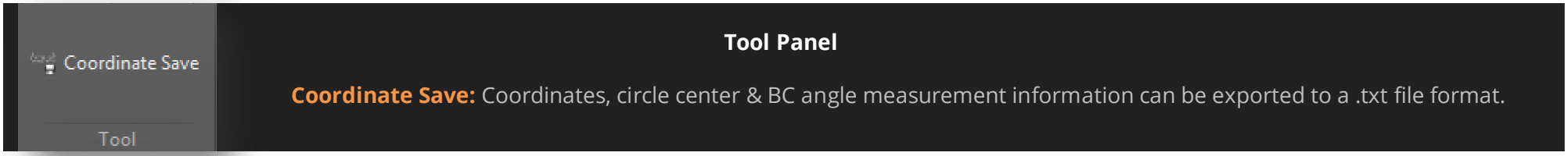



### 2 & 4) Remove All & Hide All



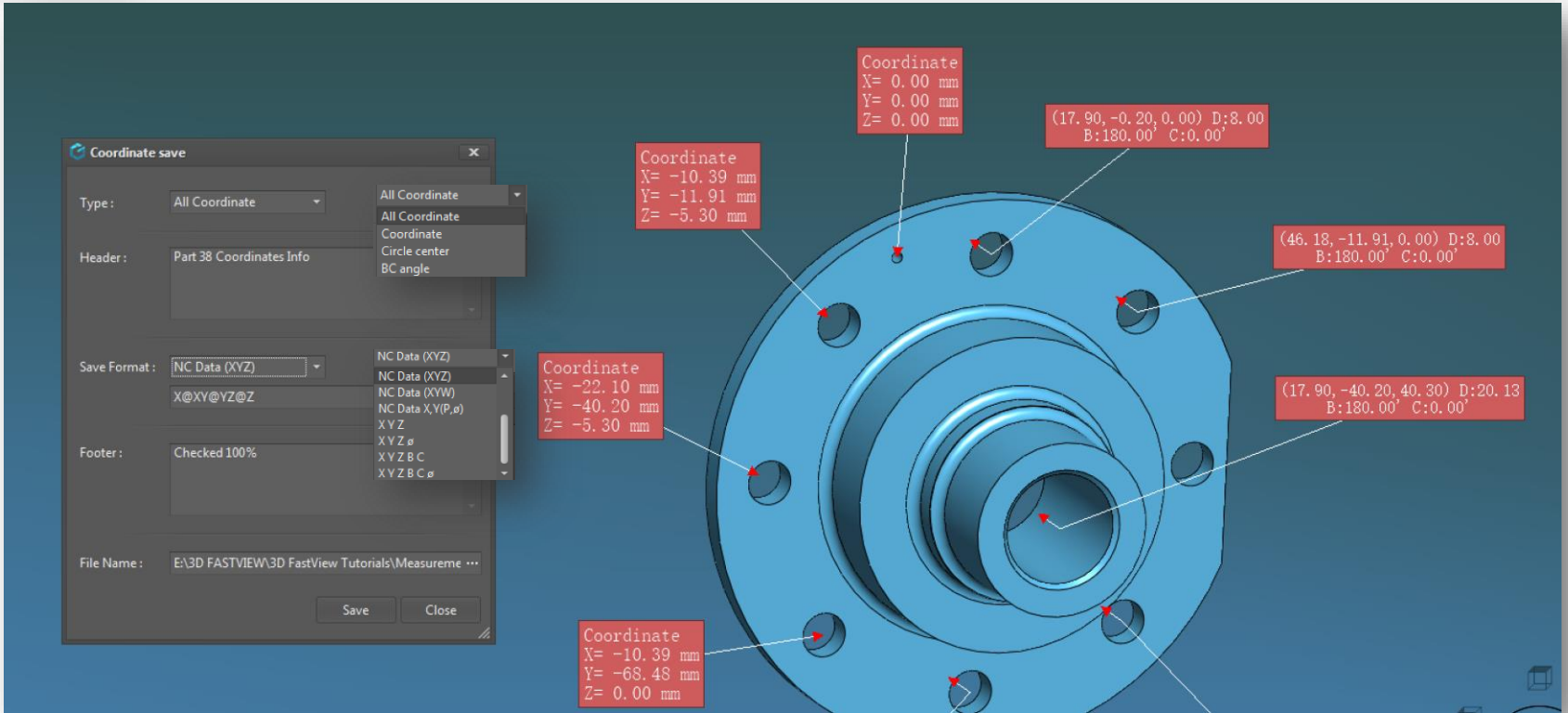
# 8. Measurement Tab > Tool



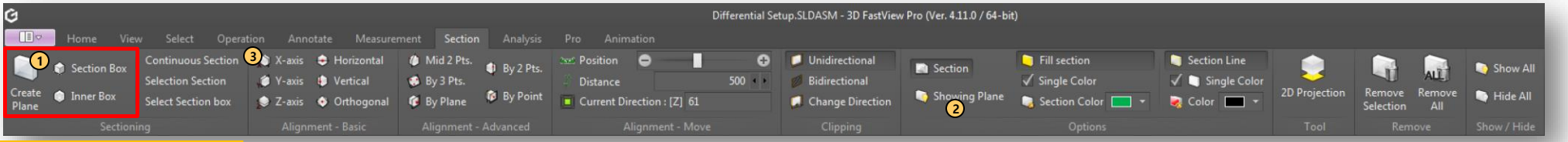




**Tool Panel**

**Coordinate Save:** Coordinates, circle center & BC angle measurement information can be exported to a .txt file format.



# 9. Section Tab > Sectioning

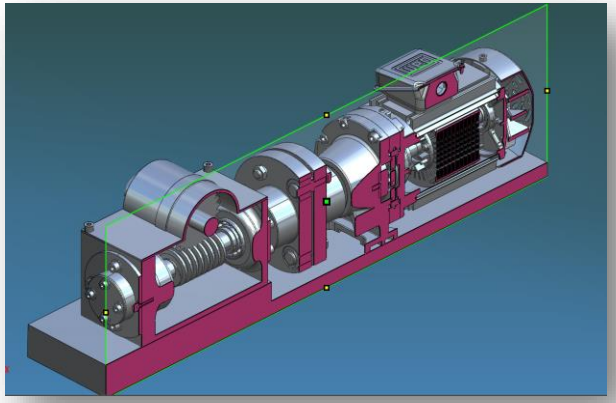



## Sectioning Panel

1) **Create Plane:** Creates a cross section based on X, Y, Z axis.
2) **Section Box:** Creates a box-type section based on X, Y, Z axis.
3) **Inner Box:** Creates a inner box-type section based on X, Y, Z axis.

① Click "Create Plane" icon to create a section plane.
② Active "Showing Plane" to show the section Plane.
③ Select "X-Axis or Y-Axis, Z-Axis for alignment plane.

### 1) Create Plane (X, Y, Z Section)

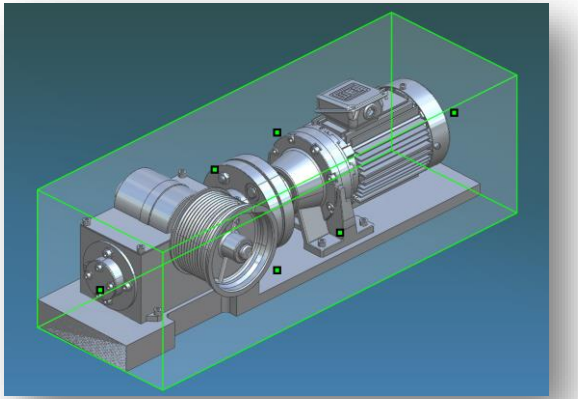


**Tip**

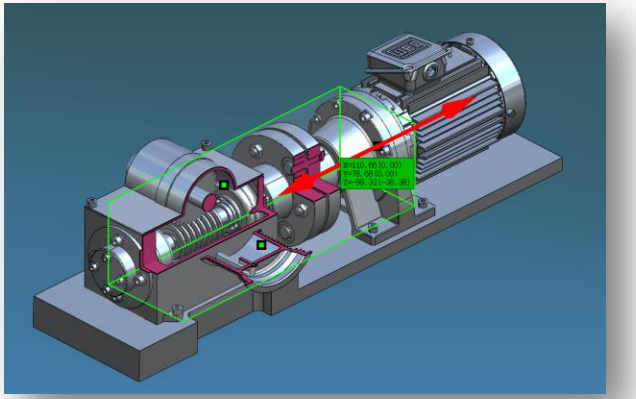
-Yellow rectangular grips on the section plane boundary can be used to rotate the plane.

-Green rectangular grip on the middle of the plane can be used to move plane location.

### 2) Section Box



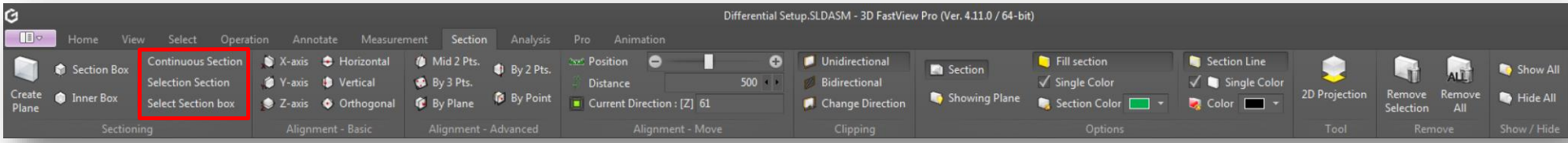
### 3) Inner-box



**Tip**

-If you perform whether "Section Box" or "Inner Box" function, the green rectangular grips on each face of the box plane can be used to move a plane face location to get custom section cut visualization.

# 9. Section Tab > Sectioning



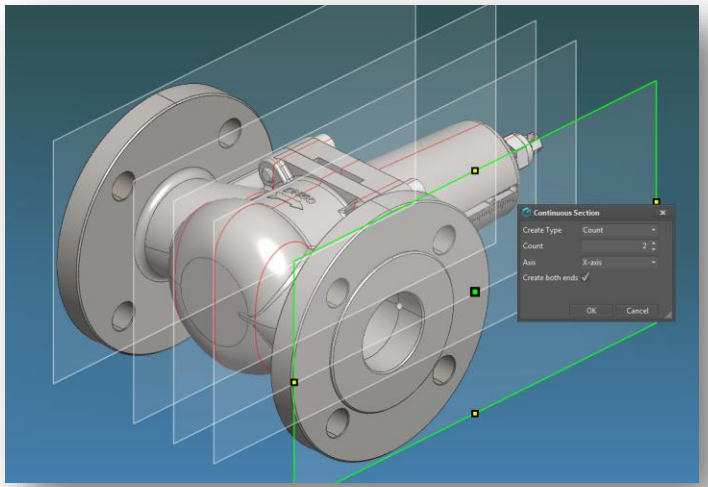

**Sectioning Panel**

4) **Continuous Section:** Creates continuous sections by equally dividing the model.
- Creation of both ends: Creation of section at the outermost surface of the model.

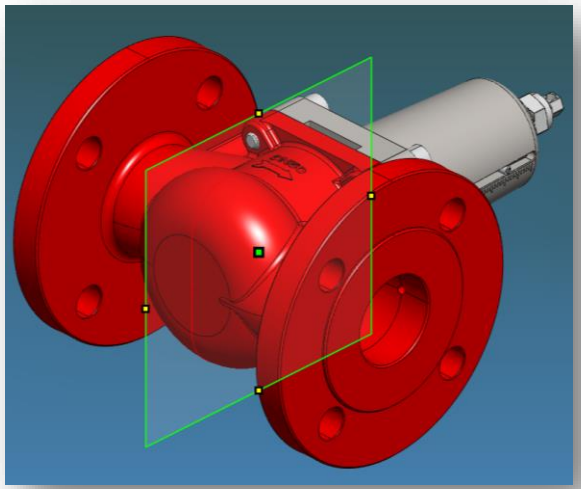
5) **Selection Section:** Only one section is applied for the selected model .

6) **Select Section Box:** Applies section box with selected geometry.

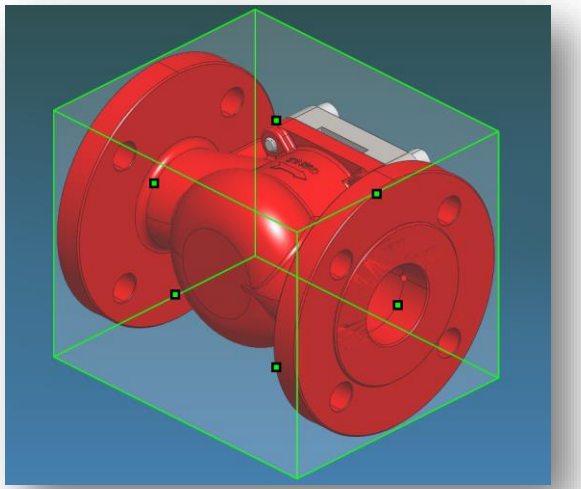
### 4) Continuous Section Plane



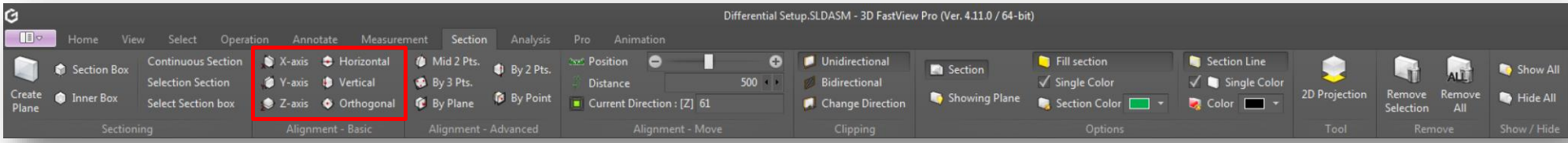
### 5) Selection Section



### 6) Select Section Box



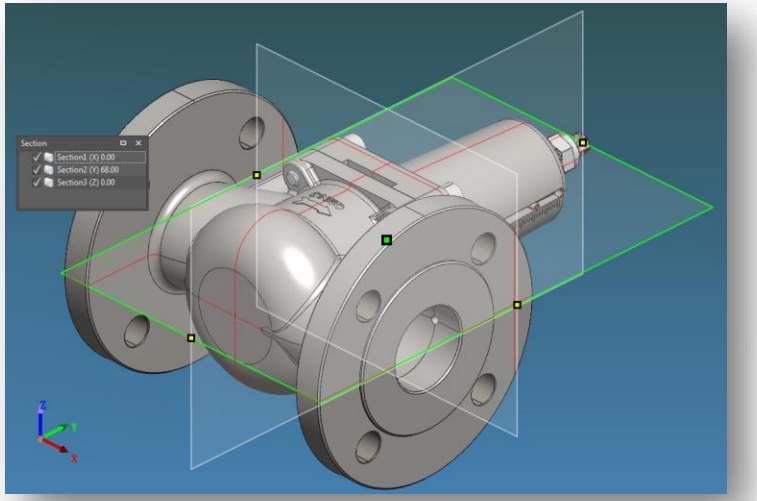
# 9. Section Tab > Alignment - Basic



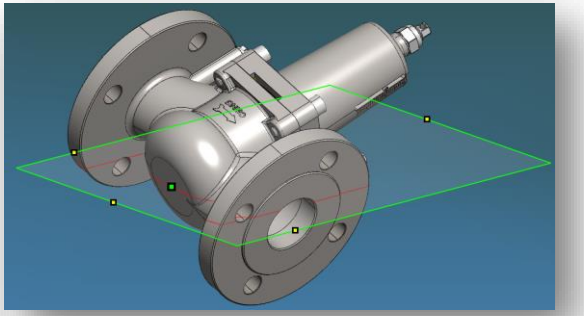

## Alignment - Basic Panel

1) **X-axis:** Aligns the created section Plane to X-axis.
2) **Y-axis:** Aligns the created section Plane to Y-axis.
3) **Z-axis:** Aligns the created section Plane to Z-axis.
4) **Horizontal:** Aligns a section plane horizontally based on a selected point.
5) **Vertical:** Aligns a section plane vertically based on a selected point.
6) **Orthogonal:** Aligns a section plane orthogonal based on a selected point.

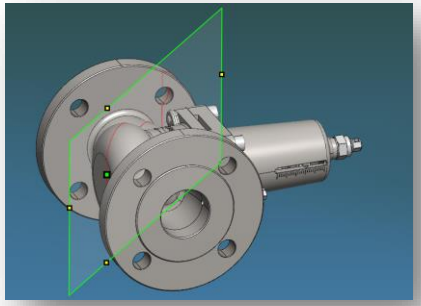
### 1~3) X(Y/Z) axis



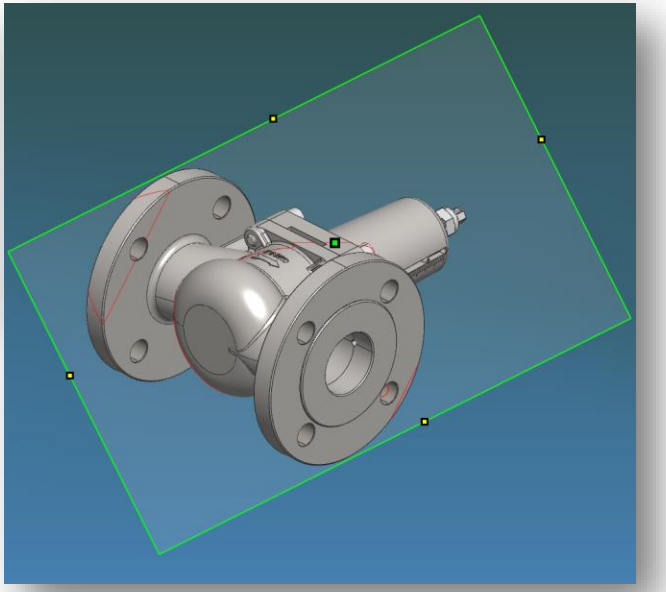
### 4) Horizontal



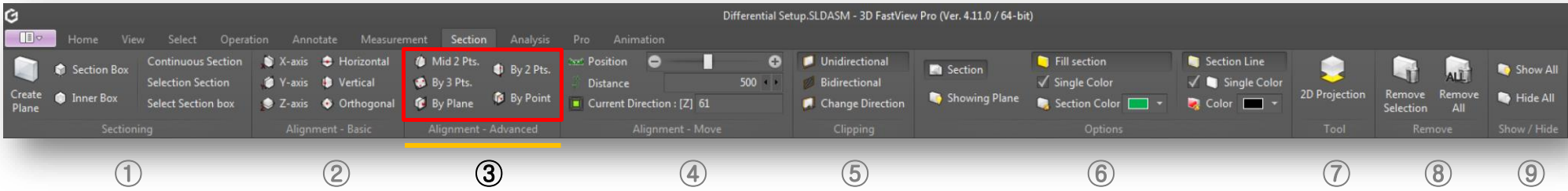
### 5) Vertical



### 6) Orthogonal



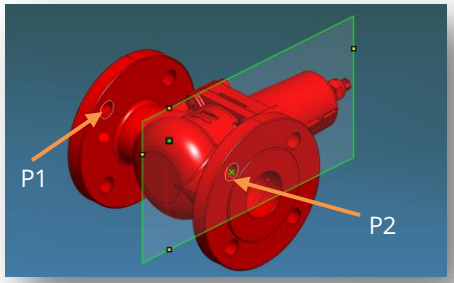
# 9. Section Tab > Alignment - Advanced



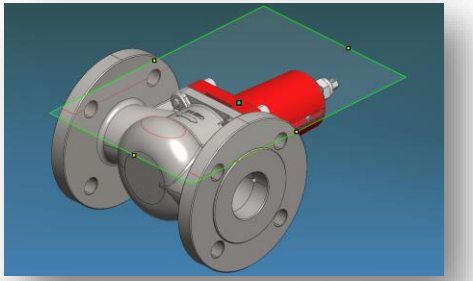

## Alignment - Advanced Panel

1) **Mid 2 Pts:** Aligns the section plane orthogonal between two points.
2) **By 3 Pts:** Aligns the section plane by selecting three points.
3) **By Plane:** Aligns the section plane parallel to a selected face.
4) **By 2 Pts:** Aligns the section plane perpendicular by selecting two points.
5) **By Point:** Moves the already created section to the selected point.

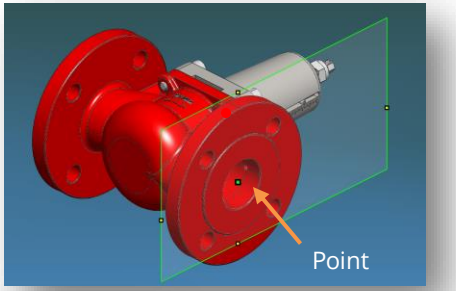
### 1) Mid 2 Points



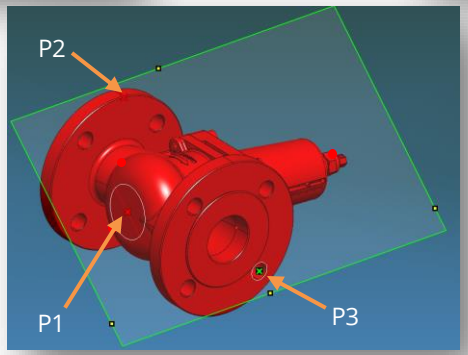

### 3) By Plane



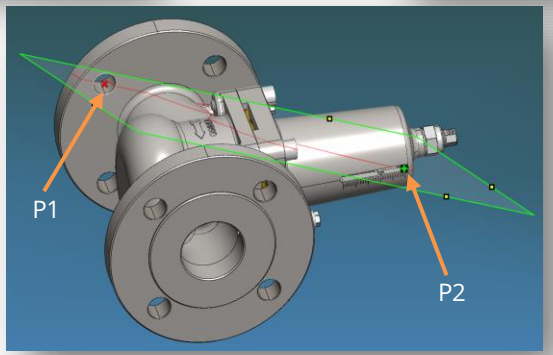
### 5) By Point



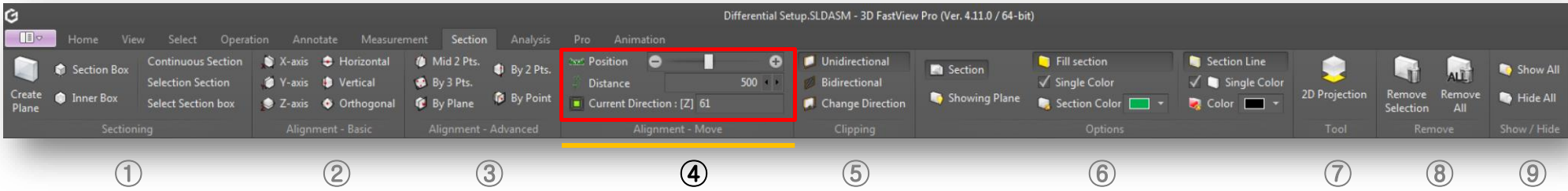

### 2) By 3 Points




### 4) By 2 Points



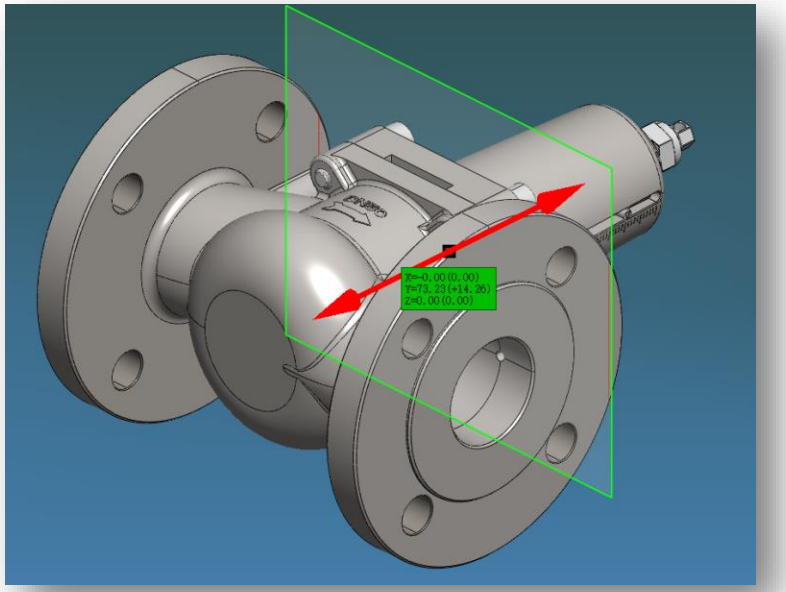
# 9. Section Tab > Alignment - Move



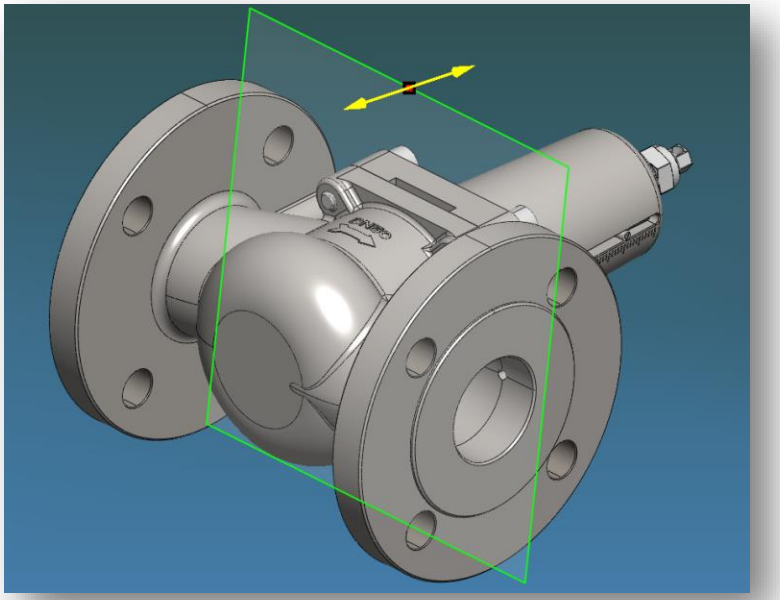

## Alignment - Move Panel

Adjusting the position of the section based on the center of the plane (green point) and the rotation of the edge center of the plane (yellow point).
1) **Position:** Moves the position of the activate section plane by clicking the "-" & "+" button. Moving "forward / backward" with the mouse wheel button activates the same function on the positioning bar.
2) **Distance:** Moves the section plane position by distance value.
3) **Current Direction:** Directly input desired coordinate position based on Absolute coordinate.

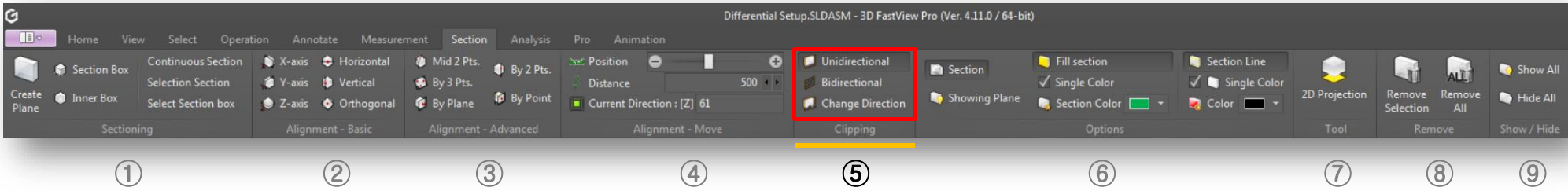
**1) Position based on center of selected cross section (green point)**



**2) Adjust the rotation to the edge center of the selected section (yellow point)**



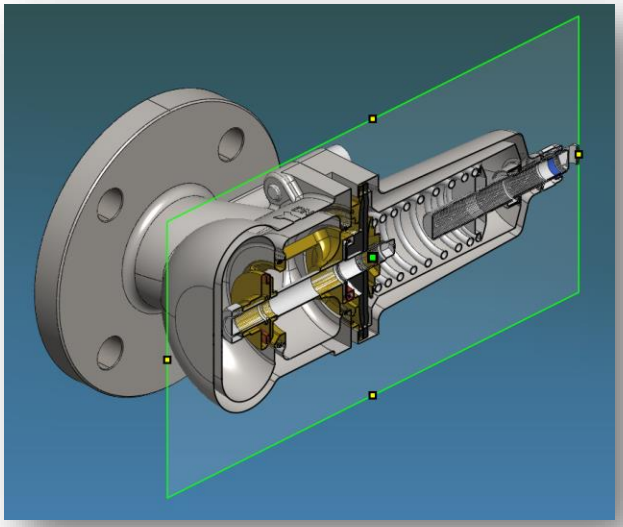
# 9. Section Tab > Clipping



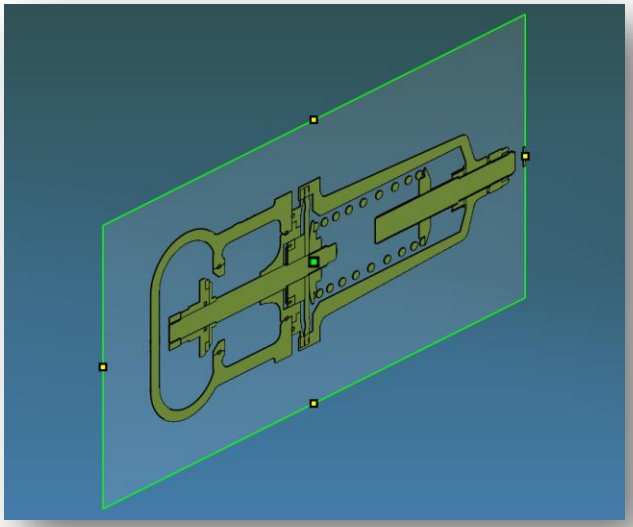

## Clipping Panel

1) **Unidirectional:** Shows/hides cross section according to plane axis direction.
2) **Bidirectional:** Shows/hides the cross section by removing the entire model.
3) **Change Direction:** Switches between half model of cross section applied.

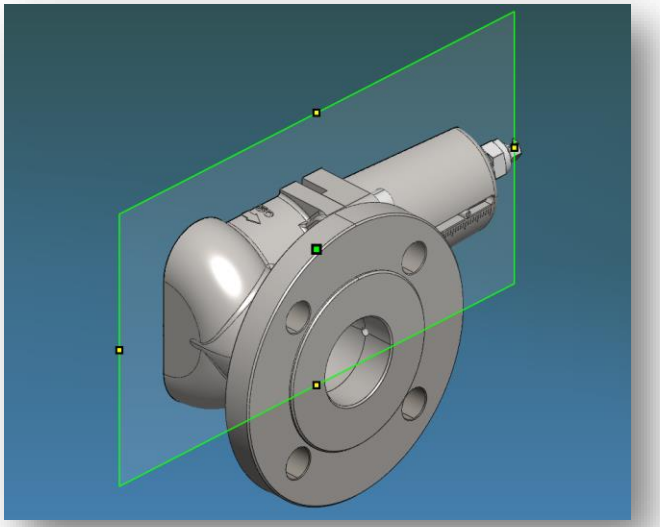
### 1) Unidirectional (One way Sectioning)



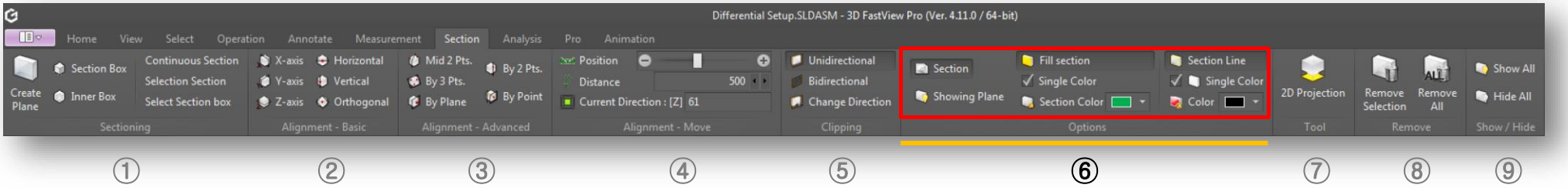
### 2) Bidirectional (Two way Sectioning)



### 3) Changing Direction



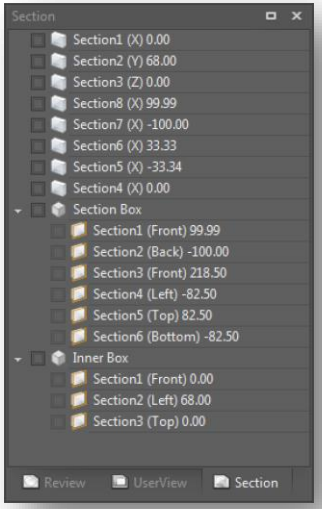
# 9. Section Tab > Options



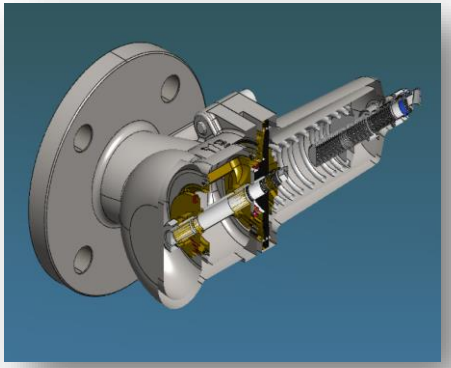

### Options Panel

1) **Section:** Enables/disables dockable section list window.
2) **Showing Plane:** Shows/hides section box and section plane boundary.
3) **Fill Section:** Fills with color current section.
4) **Section Color:** Specifies the fill color for current section.
5) **Section Line:** Enables/disables the section line on the model.
6) **Single Color:** Displays the color of the section line in one color.
7) **Color:** The color used in "Single color section line display".

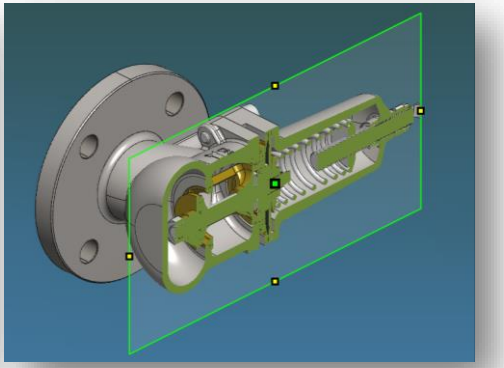
**Section list on**



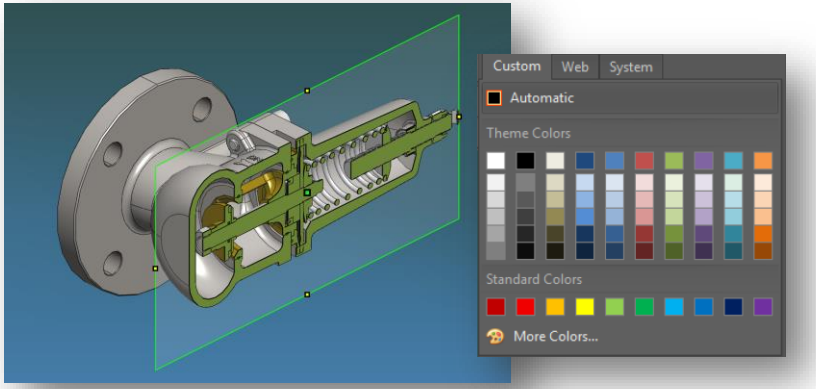

**Showing Plane/Fill Section/Section Color off**



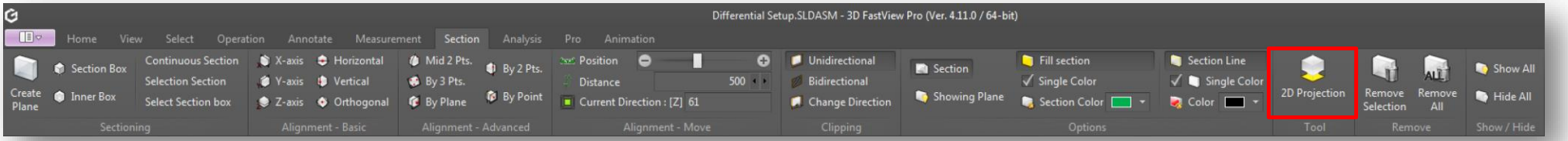
**Showing Plane/Fill Section/Section Color on**



**Section Line/Single Color/Color on**



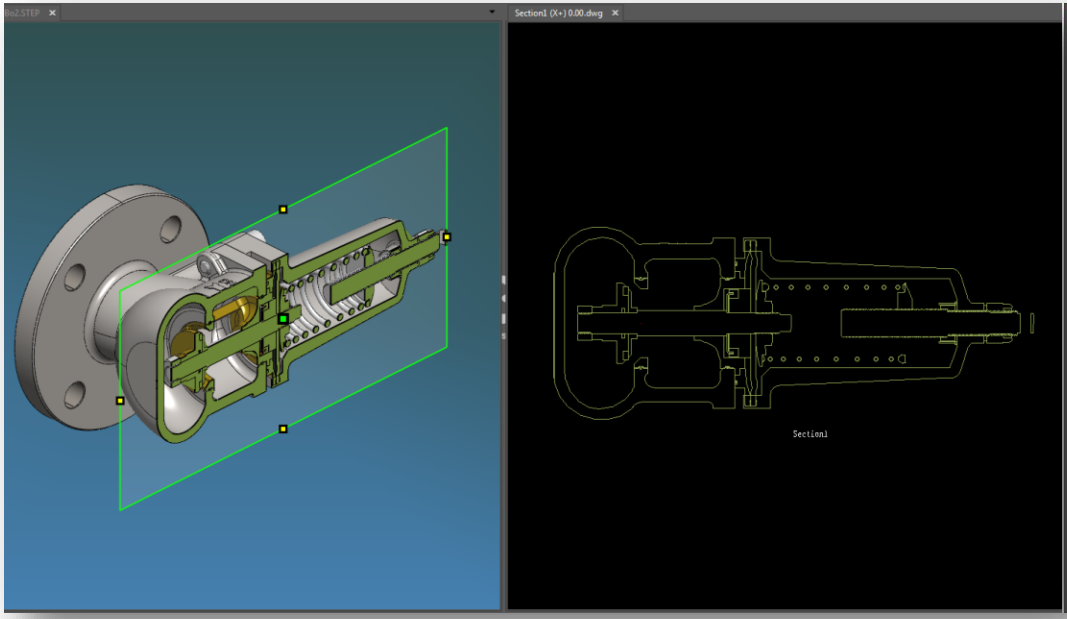
# 9. Section Tab > Options



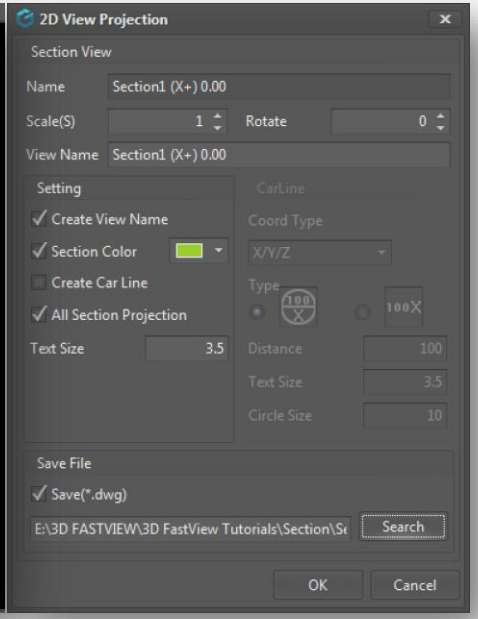

## Tool Panel

**2D Projection:** Save a 2D projection of the section geometry as a dwg file.

### 2D Projection



### 2D View Projection Dialog Box

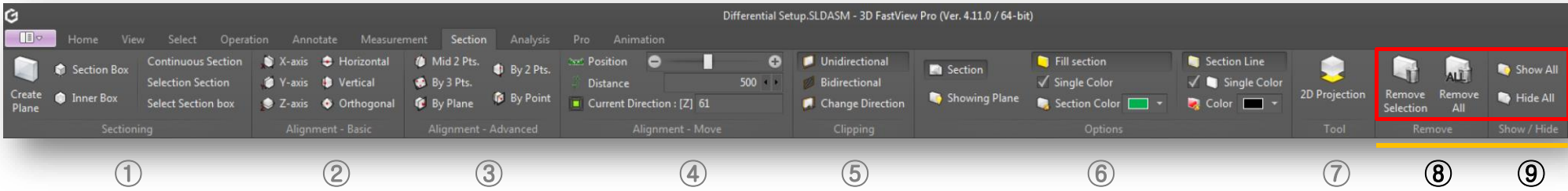



**Section View**
Name: Section name by default.
Scale: Sets scale for section projection on 2D drawing.
Rotate: Sets rotation for section projection on 2D drawing.
View Name: Displays section view name on 2D drawing.

**Setting**
Create View Name: Creates predefined view name.
Section Color: Sets color for section line on 2D drawing.
Create Car Line: Creates a car line by defining its settings like coordinate type, symbol type, distance, text and circle size.
All Section Projection: Creates full section lines view on 2D drawing.
Text Size: Sets text size on 2D drawing.

**Save File**
Save(*.dwg): Saves current 2D view projection as dwg file if it's checked. You can browse and save .dwg file to a prefer location. If you press "OK" button, the 2D drawing will be open automatically.

# 9. Section Tab > Options



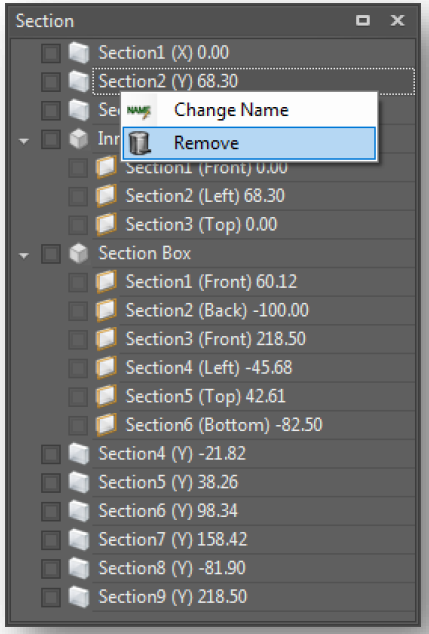

### Remove Panel

1) **Remove Selection:** Deletes a selected section. At section list, select any section, right-click it and select “Remove” from menu.
2) **Remove All:** Deletes all sections created from section list.

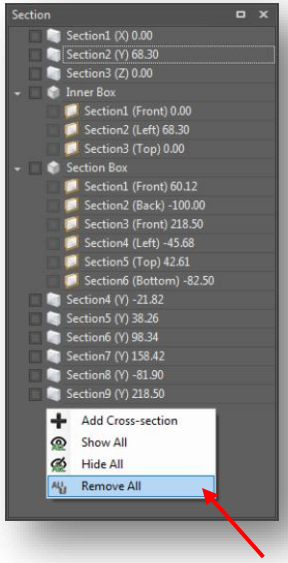
### Show/Hide Panel

1) **Show All:** Shows all sections created at section list and screen. This operation allows you to use maximum six clipping plane.
2) **Hide All:** Hidden all sections created whether at section list and screen.

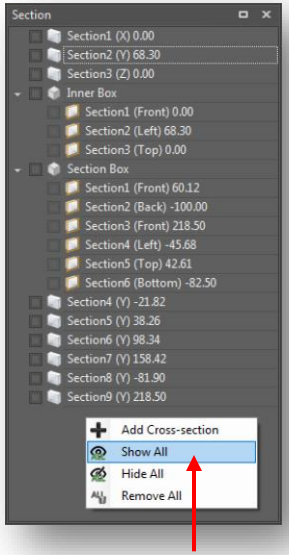
### 1) Remove Selection



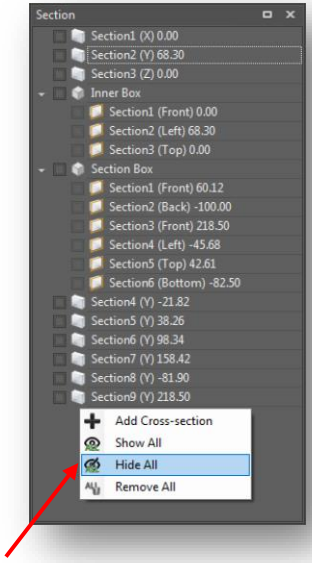

### 2) Remove All




### 1) Show All

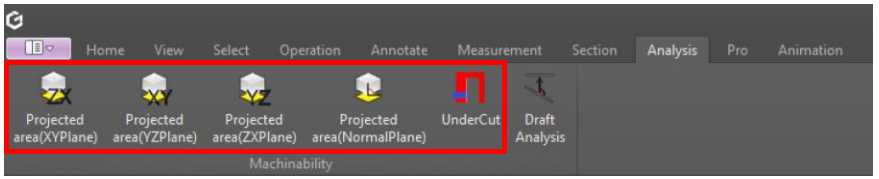



### 2) Hide All




Right-click mouse on empty space on the section list window to open up the context menu

# 10. Analysis Tab > Machinability

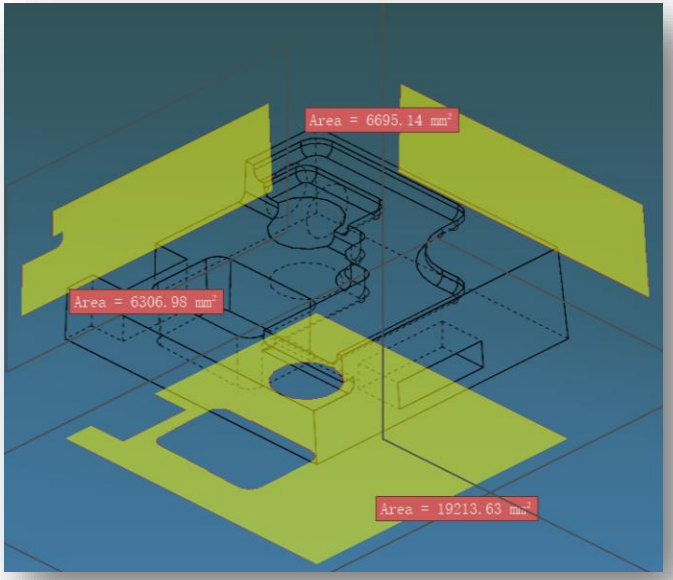



①

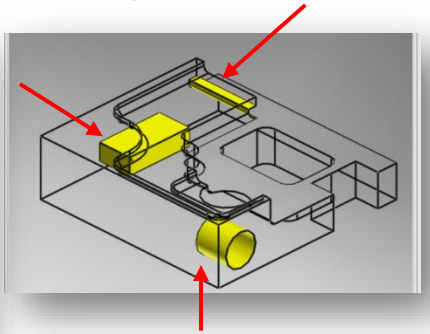
## Machinability Panel

1) **Projected Area XY/YZ/ZX Plane:** Crossover projection to user selected plane (XY, YZ, ZX).
2) **Projected Area Plane:** Select a point on the plane and project it in the normal direction.
3) **Undercut:** Based on parting face, check for embossed or embossed features that interfere with product extraction.

### 1 ~ 2) Projected Area

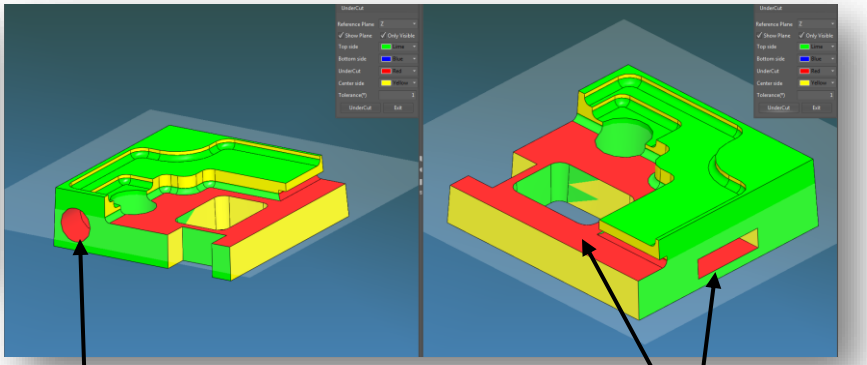



### 3) Undercut



:: Undercut features (3 locations)
- Side square pockets
- Side hole shape
- Side drill pockets
- Perform undercut analysis for molded and casted parts.

### Undercut Analysis Result



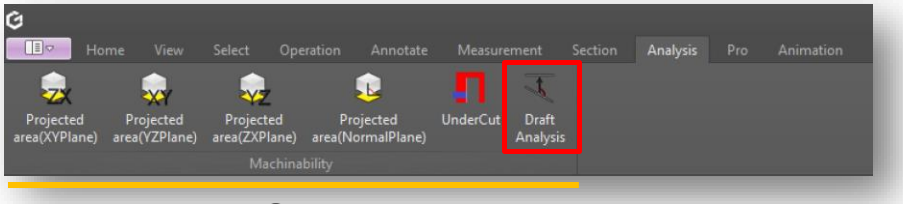
**Undercut OK**

**Undercut shape ok**

**Undercut**

Remark: In the upper projection, it is recognized as an undercut feature by including a part of the lower red wide plane.

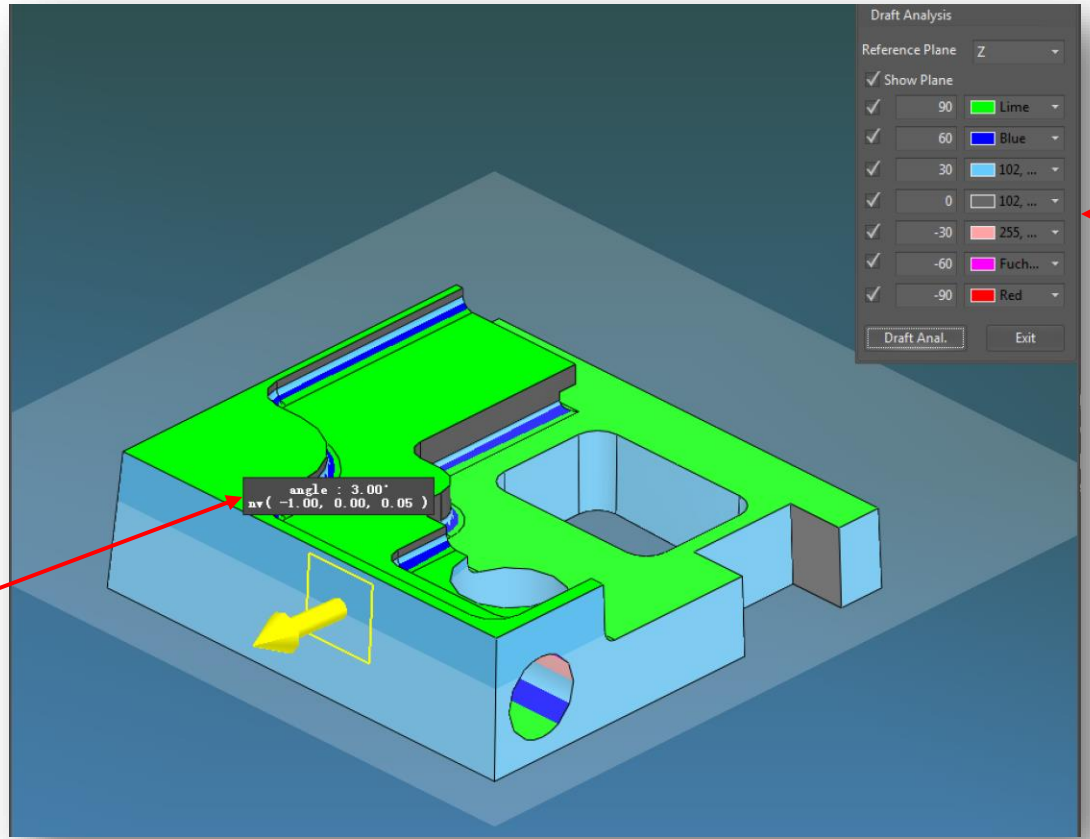
# 10. Analysis Tab > Machinability




①

## Machinability Panel

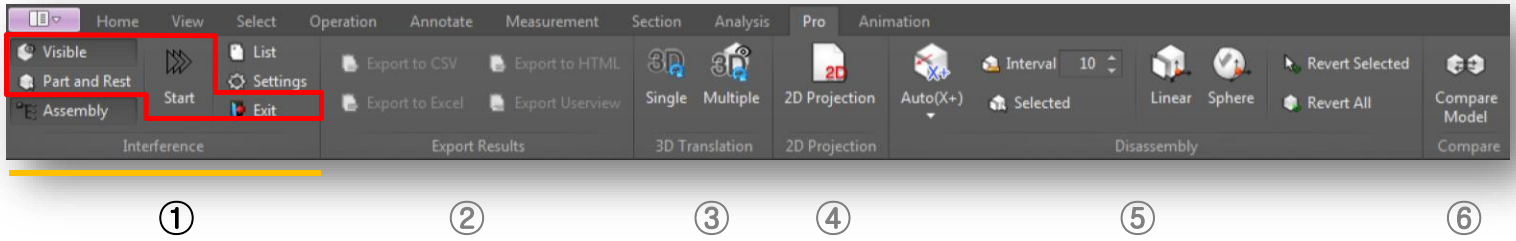
1) **Draft Analysis:** Analyzes the model for proper draft angles from different axis.




Set color for each section of the draft angle

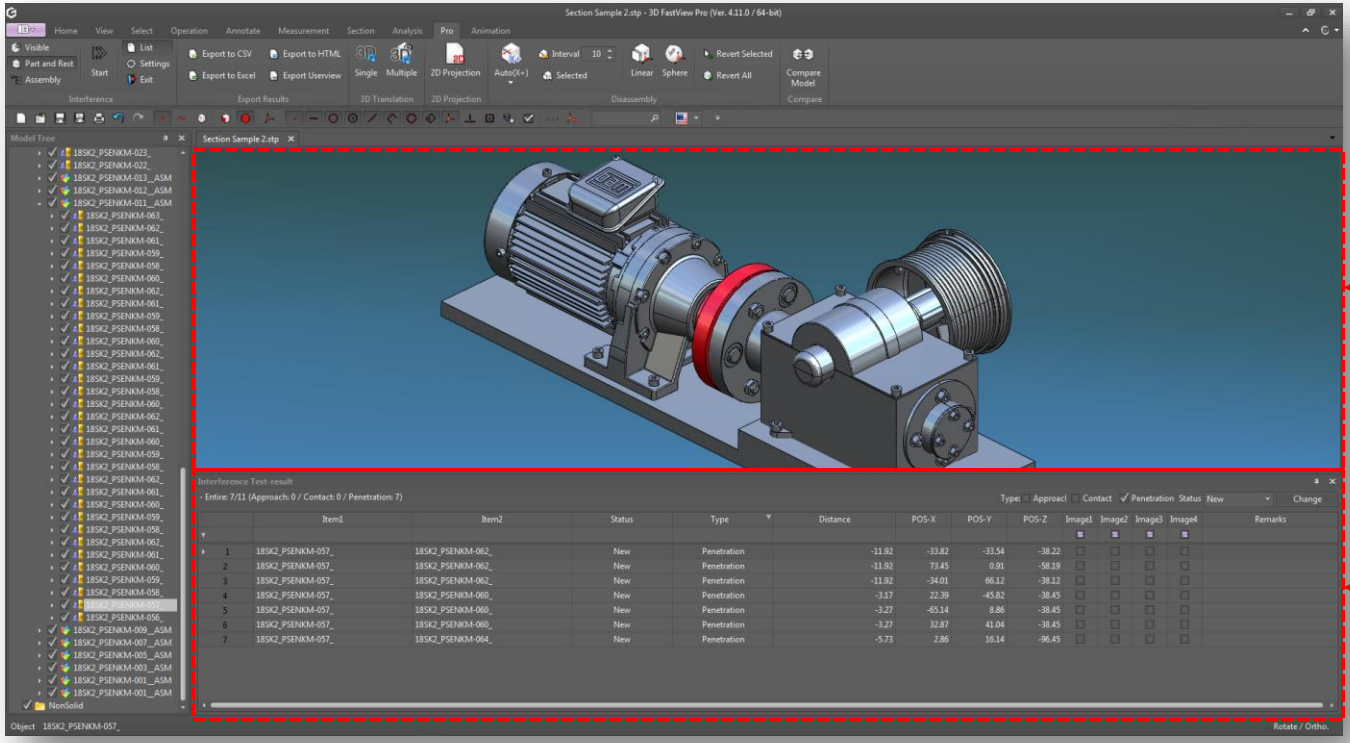
Display normal angle according to mouse point position

# 11. Pro Tab > Interference




## Interference Panel

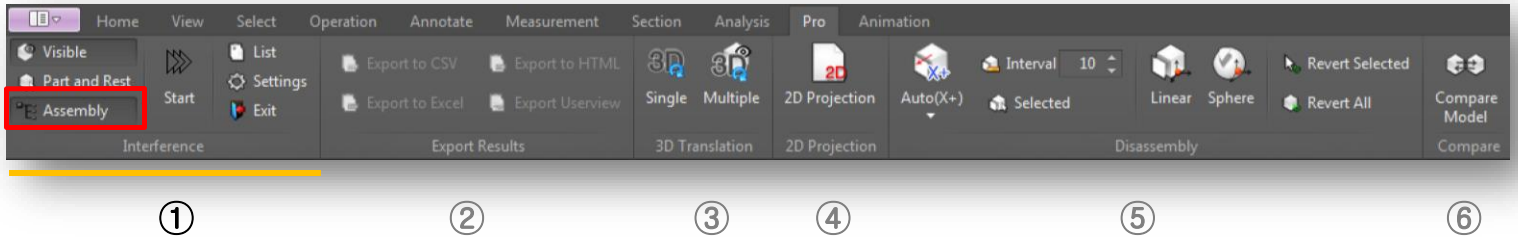
1) **Visible:** Performs interference check on only the visible parts.
2) **Part and Rest:** Performs interference checking between the model selected by the user and the rest of the model.
3) **Start:** Starts interference check according to option of performing interference check.
4) **Exit:** Finishes of interference check function.



Interference check View results

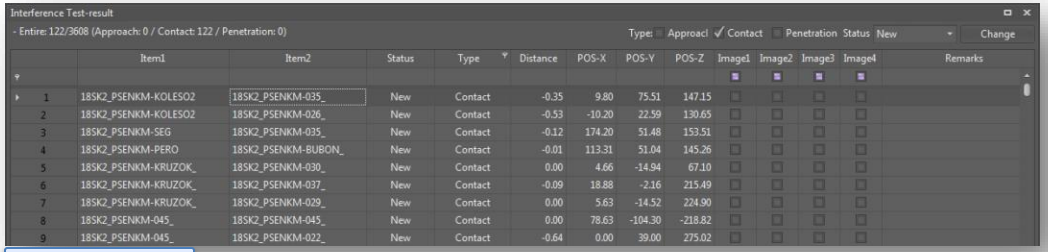
Interference check Result list

# 11. Pro Tab > Interference

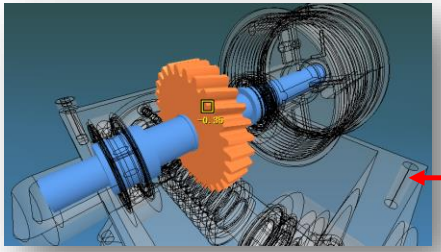



## Interference Panel

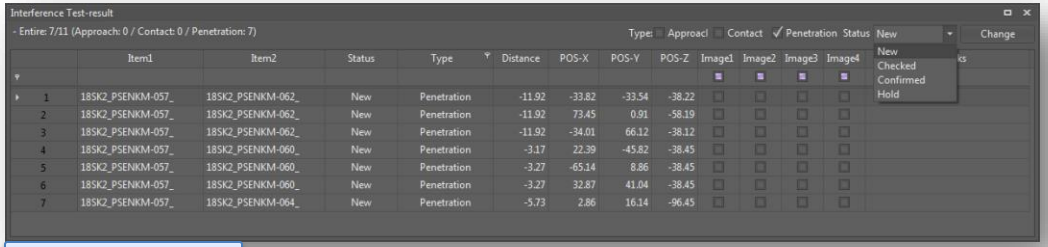
**Assembly:** Sets the interference result unit as assembly.
A) When the assembly icon is deactivated, the check and results are generated on a part-by-part basis.
B) When the assembly icon is activated, it performs interference check by grouping the lower parts belonging to the upper assembly into one group, and shows the interference result in each group.
C) Part and Rest: Option to perform interference checking between the model selected by the user and the rest of the model.



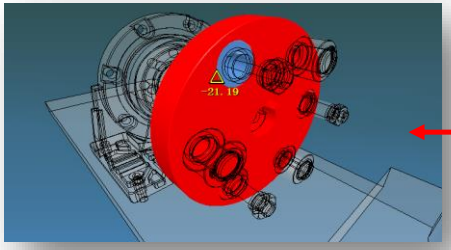

**Assembly**



Assembly Group

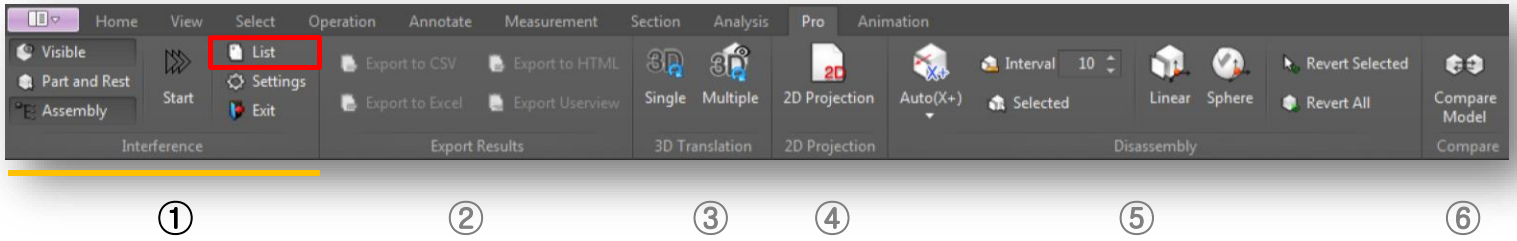



**Part unit**



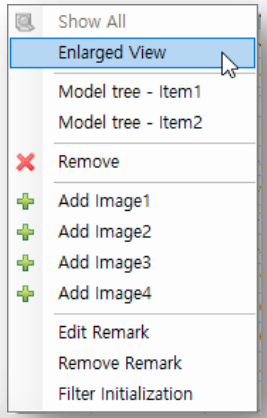
Part by Part

# 11. Pro Tab > Interference



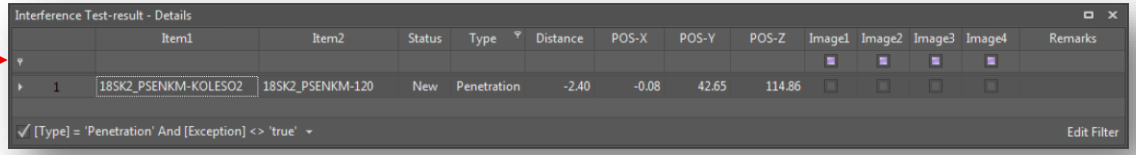

## Interference Panel

**List:** A list that can manage the results of performing the interference check.
A) User identification Status management : New / Checked / Confirm / Hold.
B) Save the resulting image : Output from interference test export.
C) Delete results and attach comments.
D) With "Assembly" icon activated, double-click the interference result data check the interference results of sub-parts.

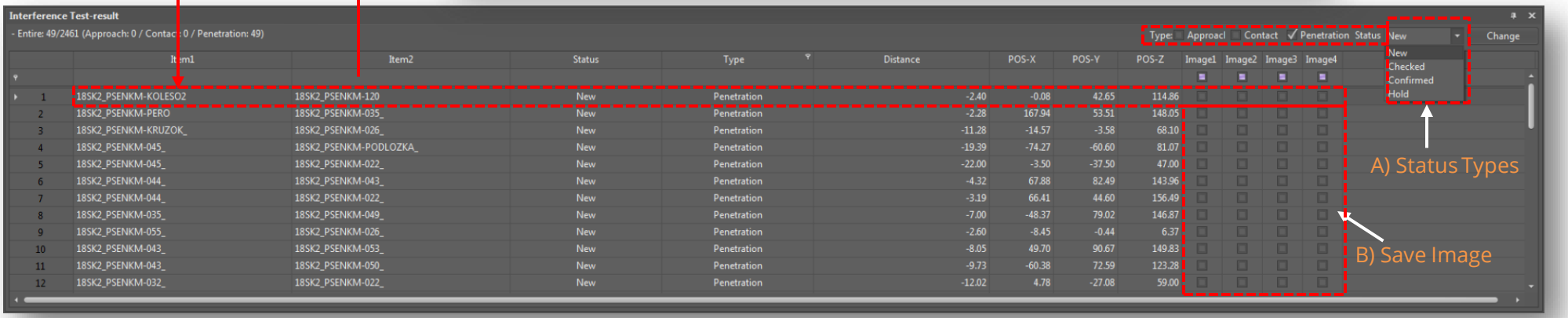



C) Context menu options.

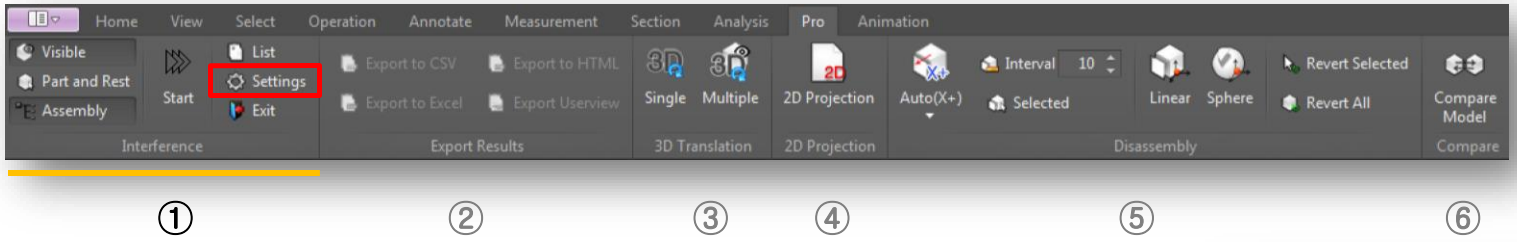
D) Enabled when interference is tested on an assembly basis.




Interference check
Double-click the result



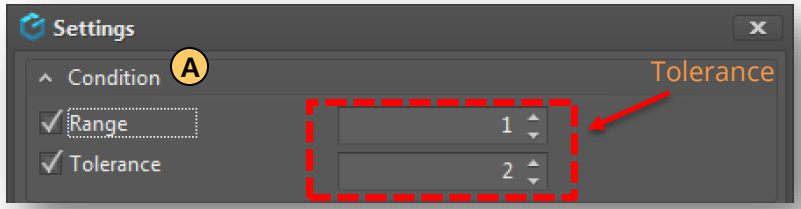
# 11. Pro Tab > Interference

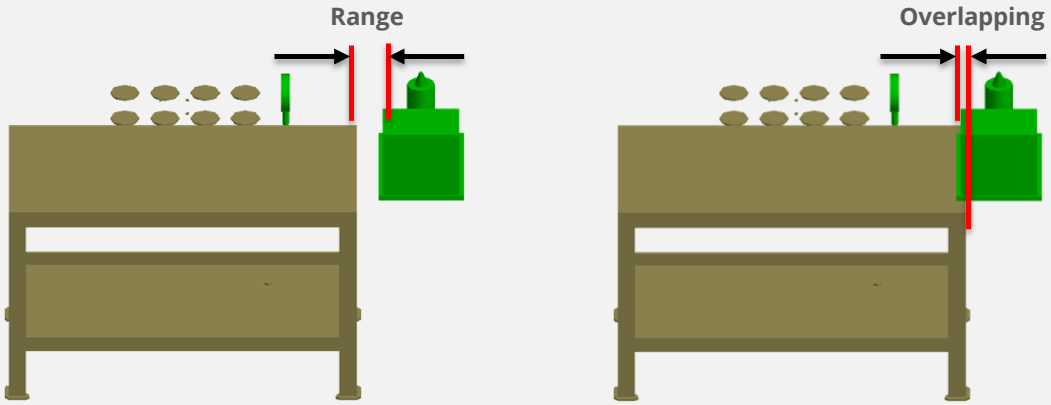



## Interference Panel

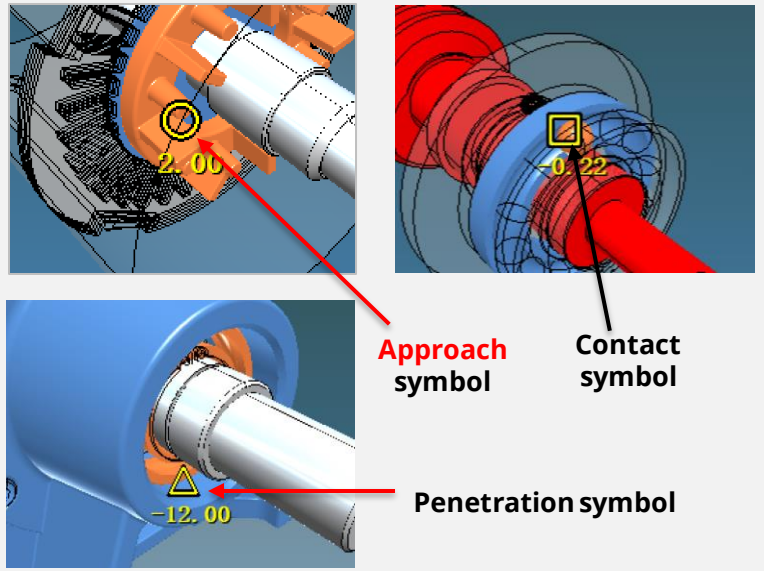
**Settings:** Sets the options for viewing the conditions and results of the interference check.
**A) condition:** Sets condition when performing interference check.
☐ Range: Permissible range value for determining proximity of two parts.
☐ Tolerance: Tolerance value to judge contact between two parts.

**※) Interference type definition**
a) Approach: Although it is not actual interference, if the distance between two parts is closer than tolerance, it is judged that interference occurs.
b) Contact: Both parts are in contact (interference distance = 0 mm).
c) Penetration: Two parts overlapping.

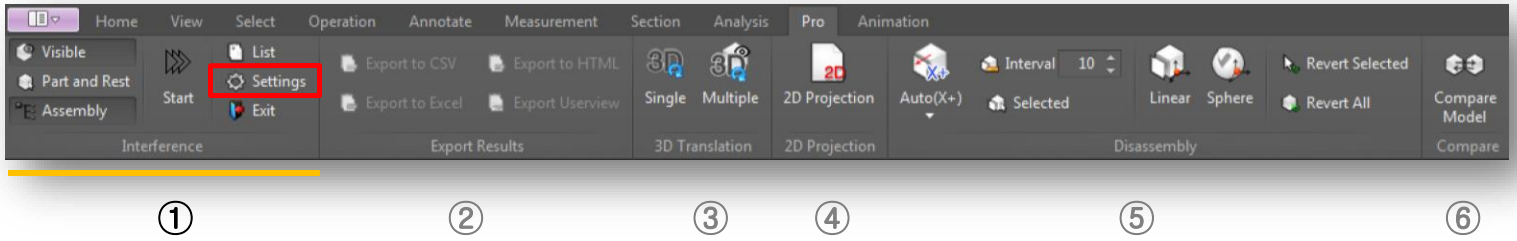



※

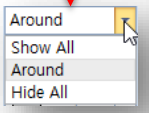


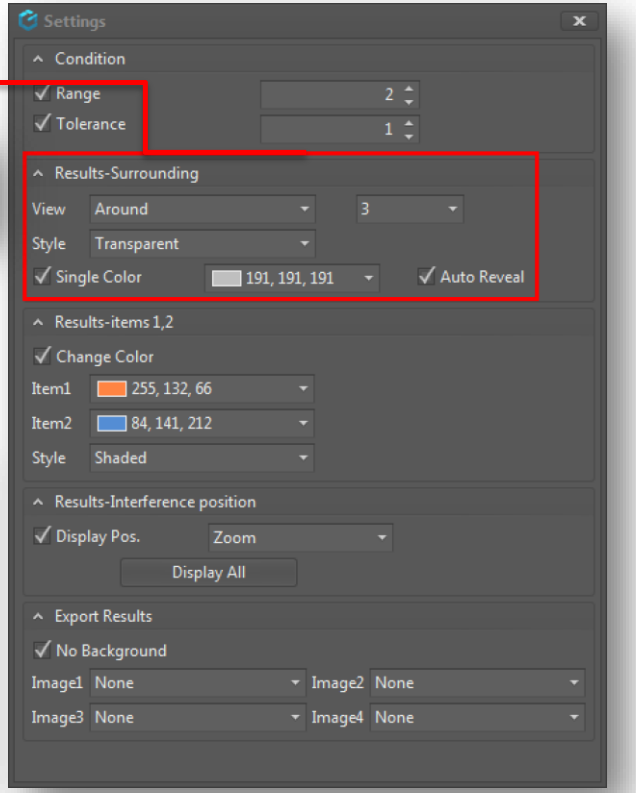
# 11. Pro Tab > Interference



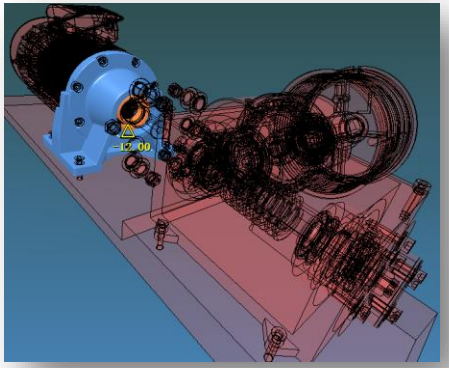

## Interference Panel

**B) Results-Surrounding:** Sets condition when performing interference check.
View - Defines interference check result view type.
A) Show all: Shows entire model included the interference parts.
B) Around: Hiding the model around the interference parts (ratio 1 to 10).
C) Hide All: View the interference parts only.

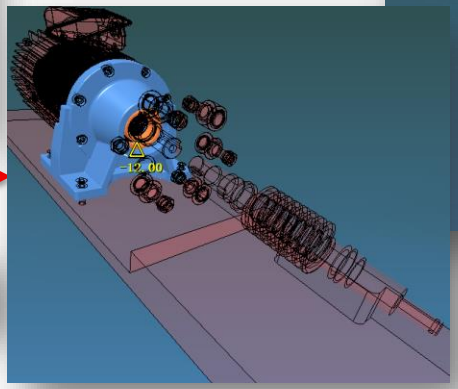


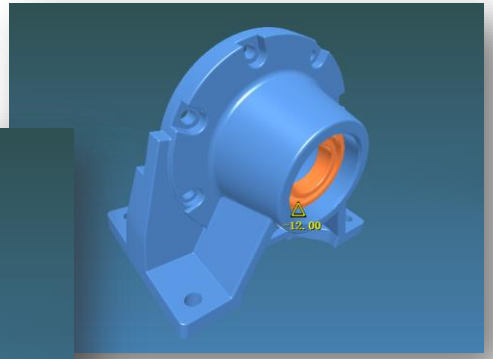

A) View - Show All



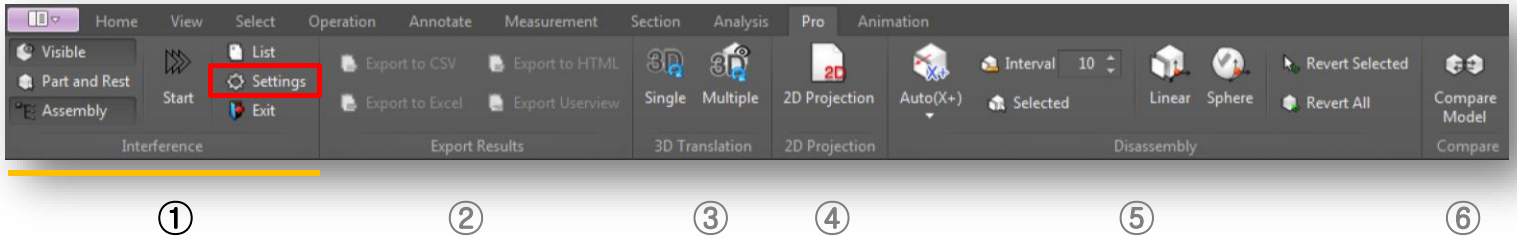
B) View - Around



C) View - Hide All

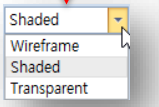


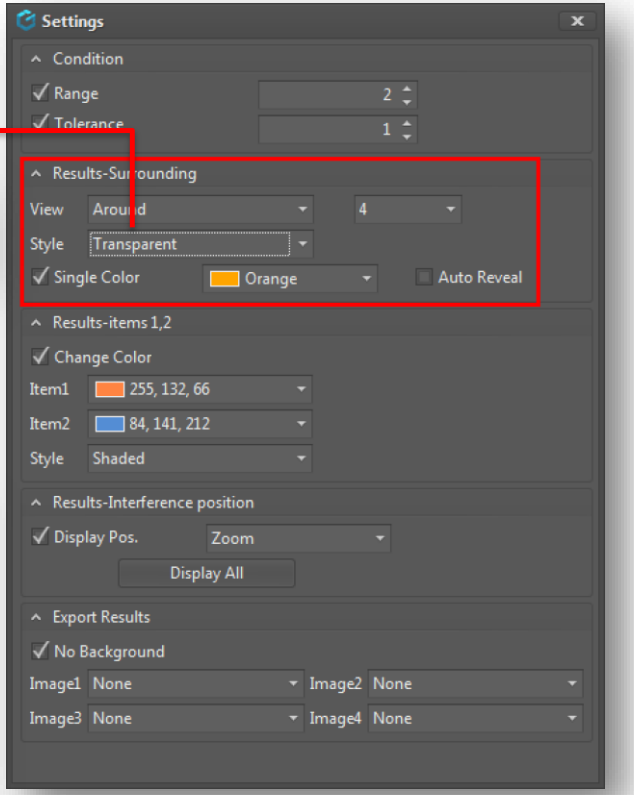
# 11. Pro Tab > Interference



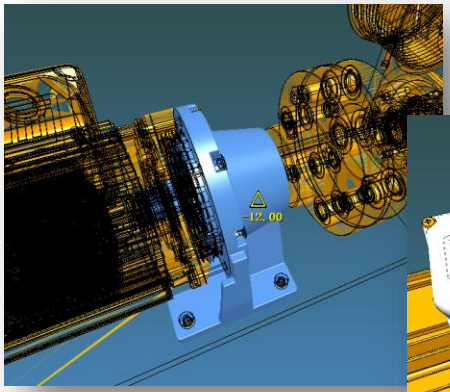

## Interference Panel

**B) Results-Surrounding:** Sets condition when performing interference check.
View Style- Defines interference check result visual style.
A) Wire: Wire frame view applied to interference parts surrounding.
B) Shaded: Shaded view applied to interference parts surrounding.
C) Transparent: Transparent view applied to interference parts surrounding.
☐ **Single Color:** View the interference parts by a single color.
☐ **Auto Reveal:** Depending on the camera angle, auto-hide other models that block interference parts.

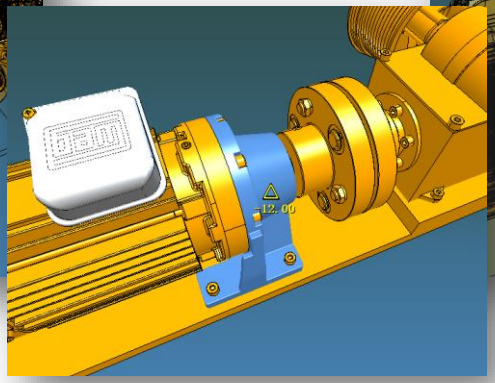


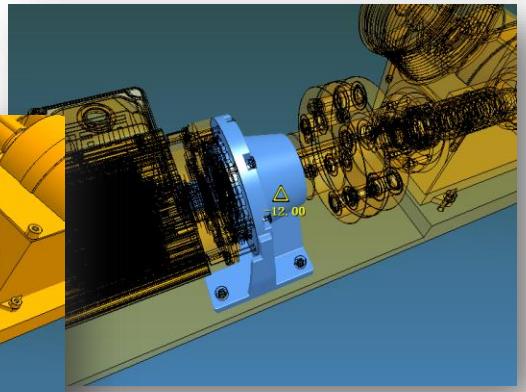

A) Wire Style



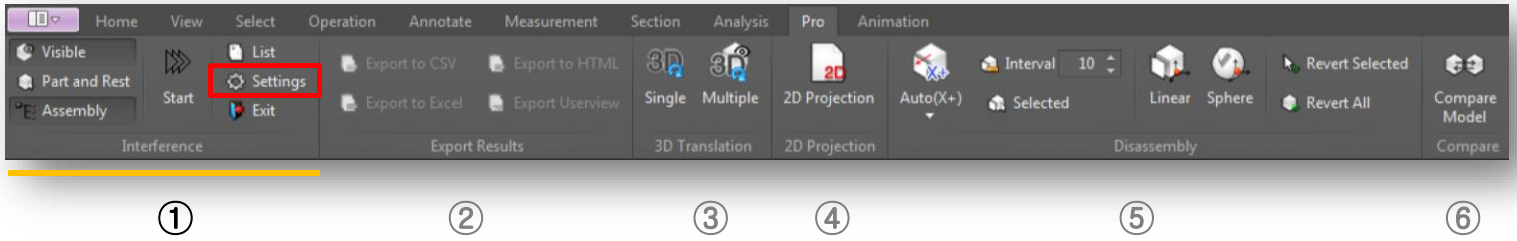
B) Shading Style



C) Transparent Style

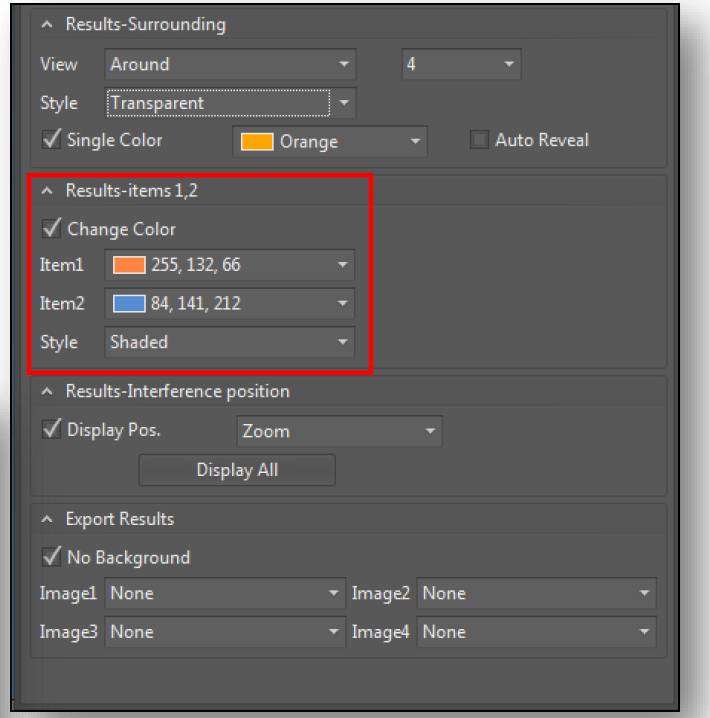


# 11. Pro Tab > Interference

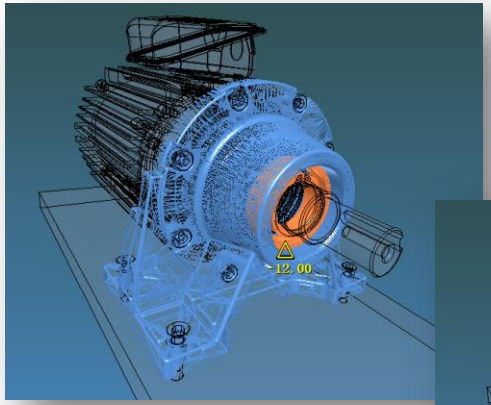



## Interference Panel

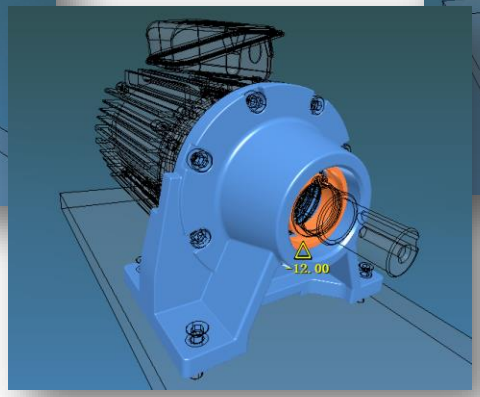
**C) Results-Items 1,2:** Sets the interference result's model view preference.
☐ Change color: For the interference parts, change to the color selected in "Item 1/2" instead of the original color.
☐ Style: View Style for Interference parts.
**A) Wire:** Wire view. **B) Shaded:** Shaded view. **C) Transparent:** Transparent view.



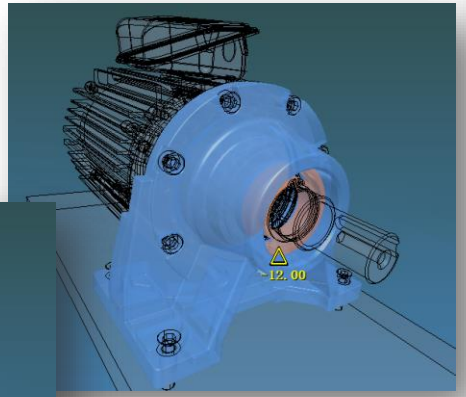

A) Wire Style



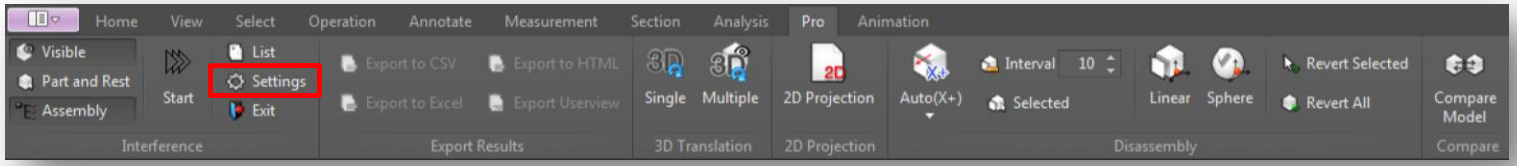
B) Shading Style



C) Transparent Style



# 11. Pro Tab > Interference




## Interference Panel

**D) Results-Interference Position**

☐ Display Pos.: viewing area for interference location.

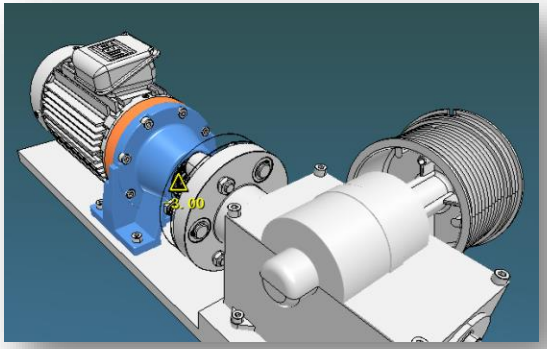
A) **All:** Shows interfered parts location and result.

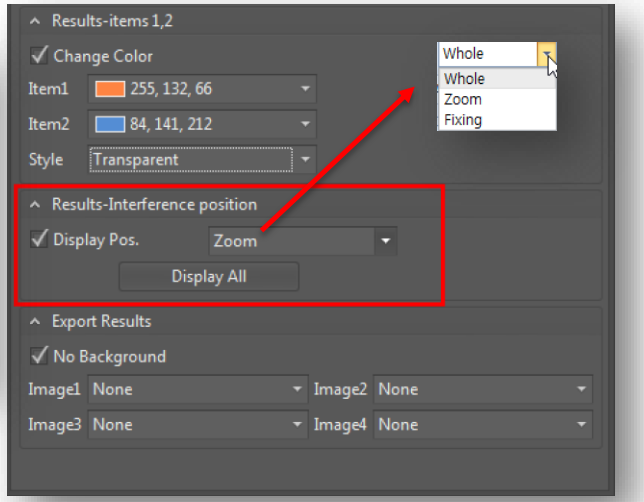
B) **Zoom:** Zoom in to show the interference parts.

C) **Fixed:** Shows the result of interference as user defined screen size.

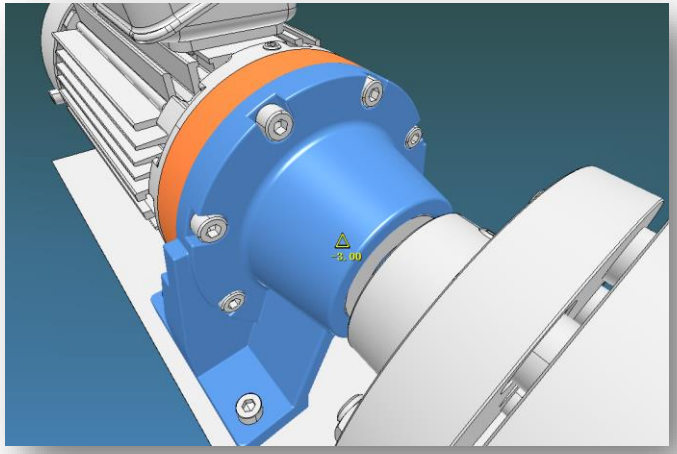
Display All: Shows all interference parts locations.

**A) All**

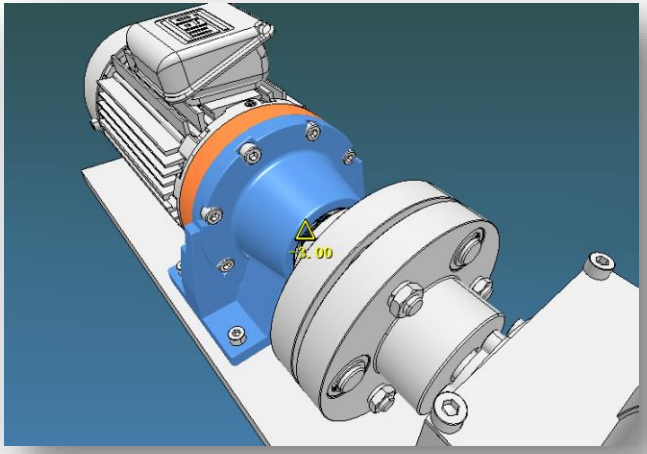




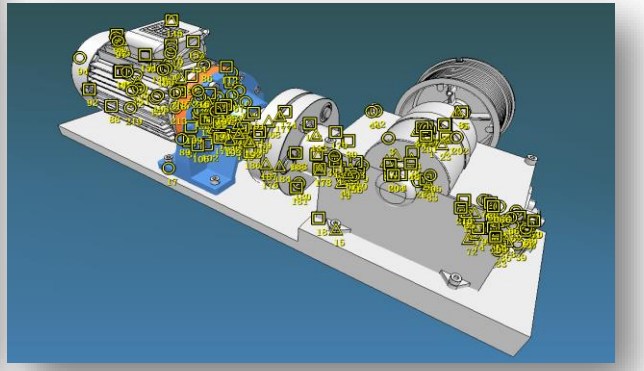

**B) Zoom**



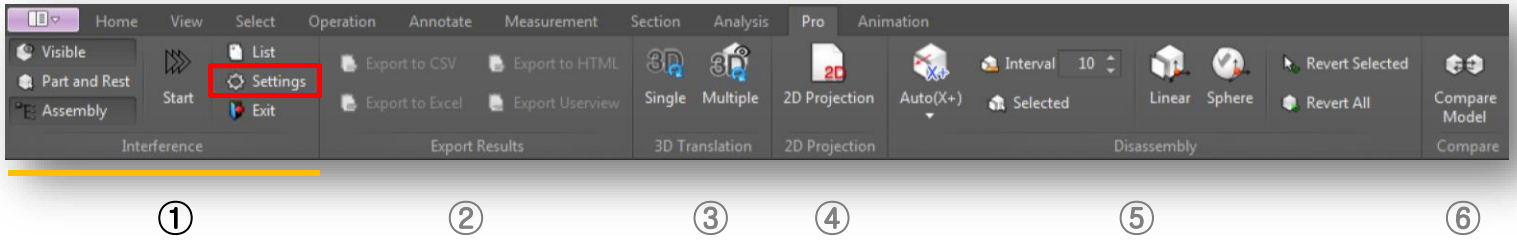
**C) Fixed**



**Display All**

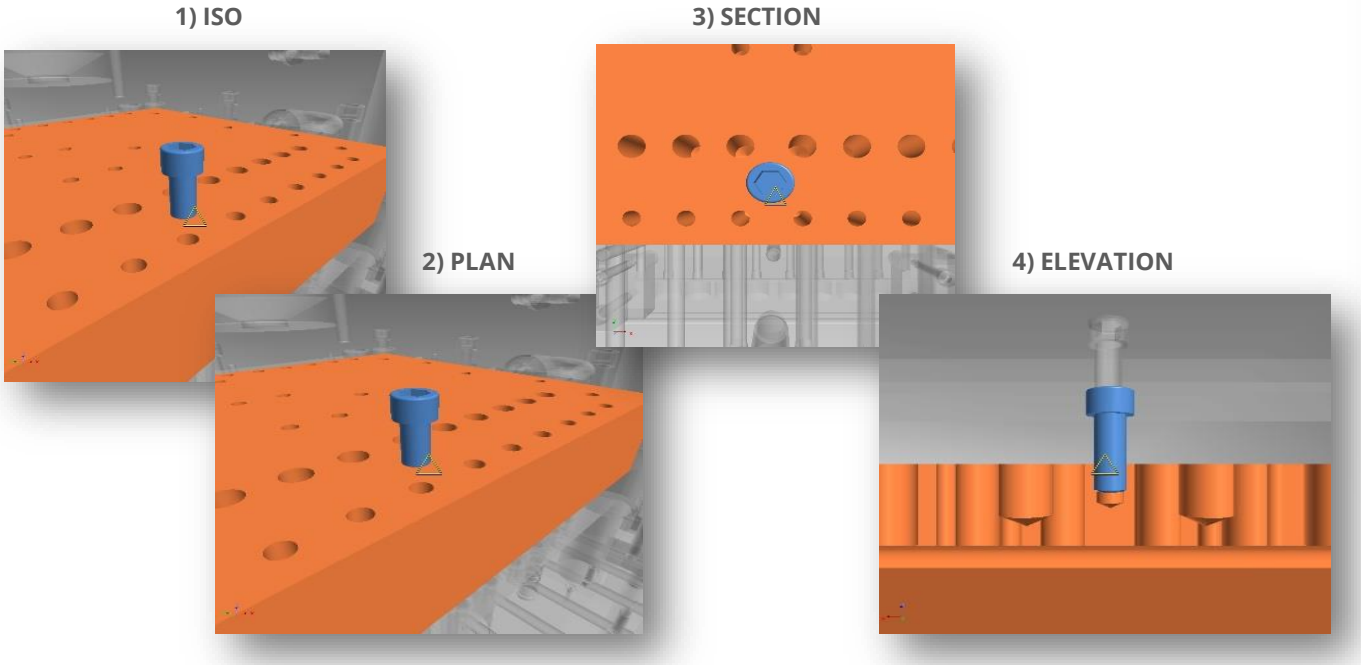


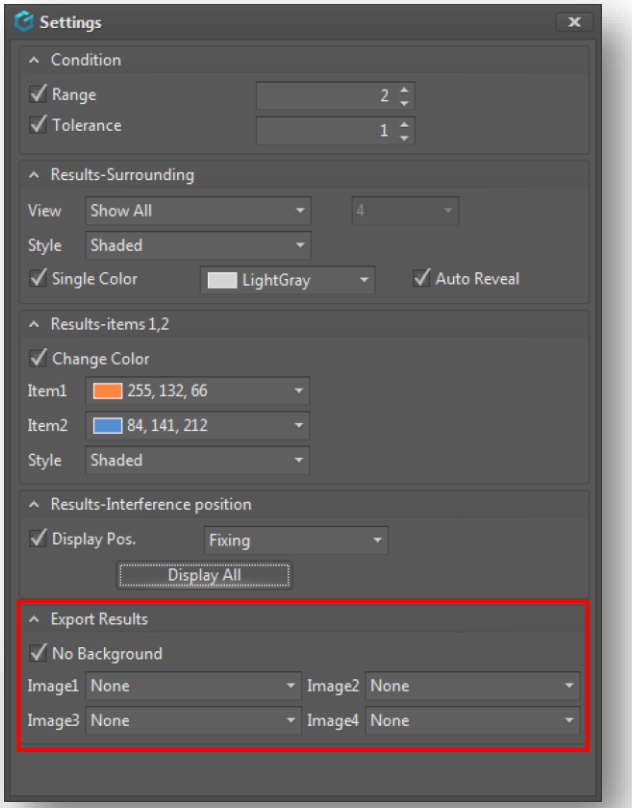
# 11. Pro Tab > Interference



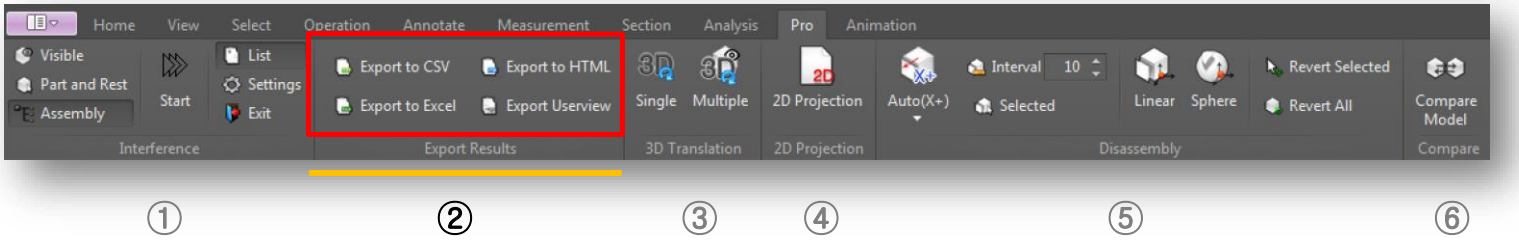

## Interference Panel

**E) Export:** Outputs various image information about interference result by option.
-Generated images can be used in exported (.html/.csv/.xls) documents.
-☐ No Background: Removes the viewer's default background color when creating an image.
■ Images 1,2,3,4: ISO, PLAN, SECTION, ELEVATION viewer selection.



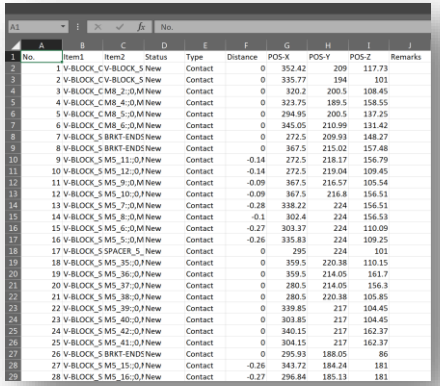
# 11. Pro Tab > Export Results



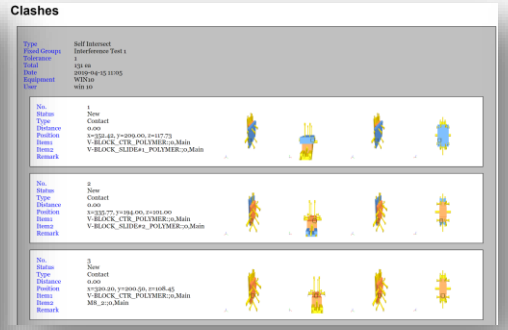

## Export Results Panel

1) **Export to CSV:** Save the interference test result as a ".csv" file.
2) **Export to HTML:** Saves interference check results as ".html" file.
3) **Export to Excel:** Saves interference test result as ".xlsx" file.
4) **Export Userview:** Outputs interference test snapshots to userview window.

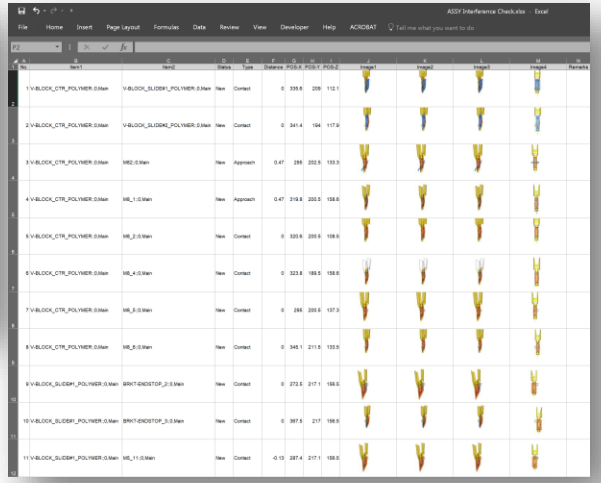
### 1) CSV File



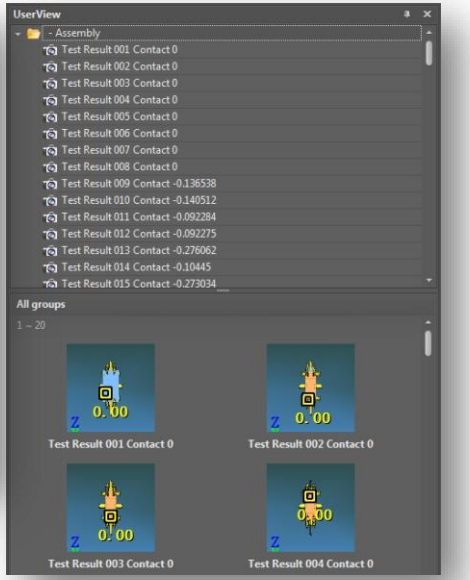
### 2)Html File



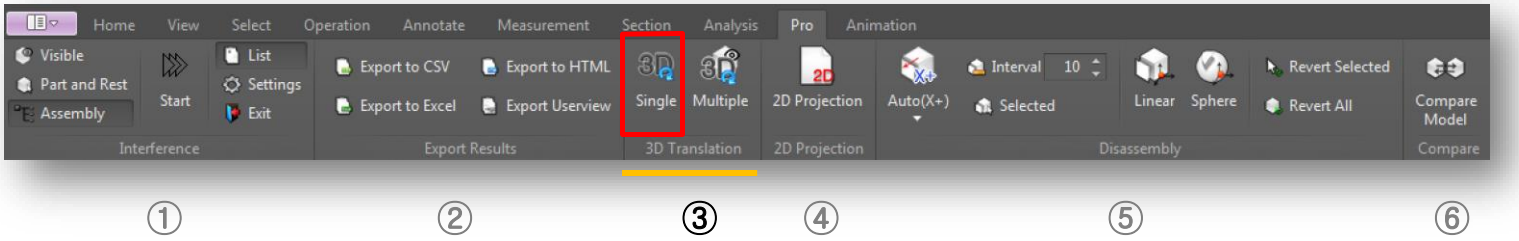

### 3) Excel File



### 4) Userview

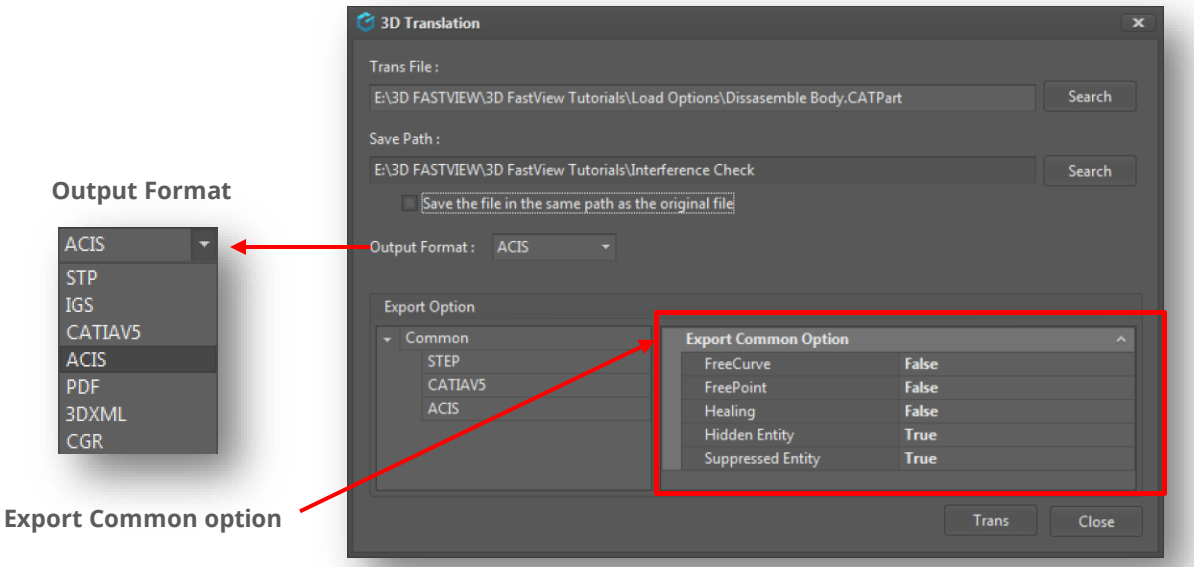


# 11. Pro Tab > 3D Translation

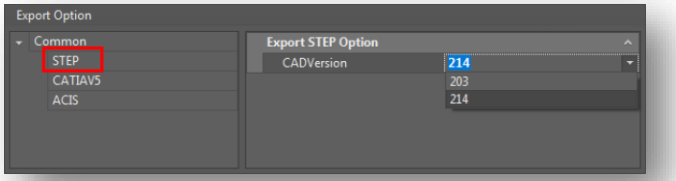



## 3D Translation Panel

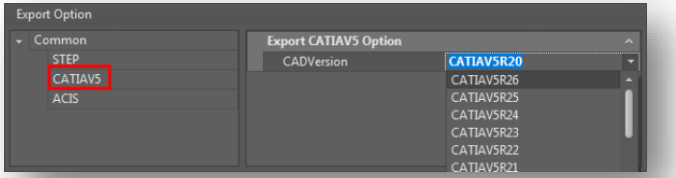
**Single:** Converts, exports or outputs a single 3D file format into STP, IGS, CATIAV5, ACIS, PDF, 3DXML and CGR.
1) **Trans File:** Select the file to convert.
2) **Save Path:** Select the save path of the converted file.
- Optional: Save the conversion file in the same path as the original file.
3) **Export Common Options:** Sets as true/false 3D file common attributes like Free Curve, Free Point, Healing, Hidden Entity and Suppressed Entity.



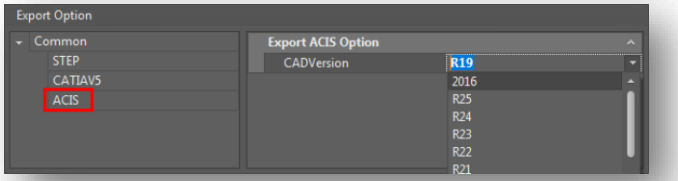

Export STEP file format versions supported



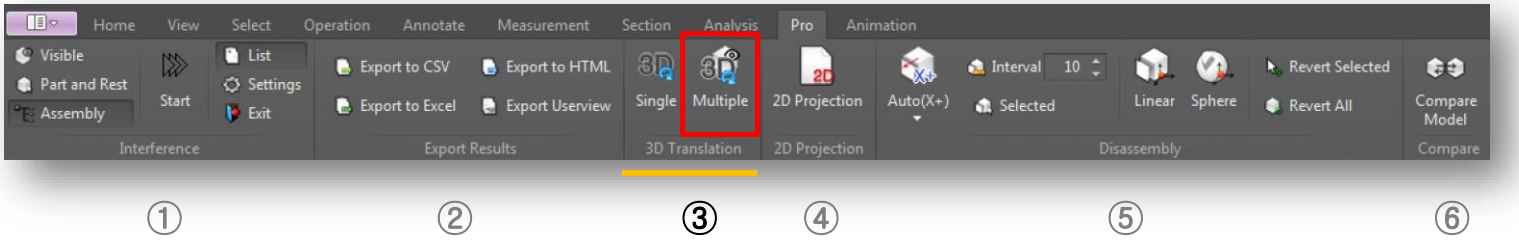

Export CATIAV5 file format versions supported




Export ACIS file format versions supported

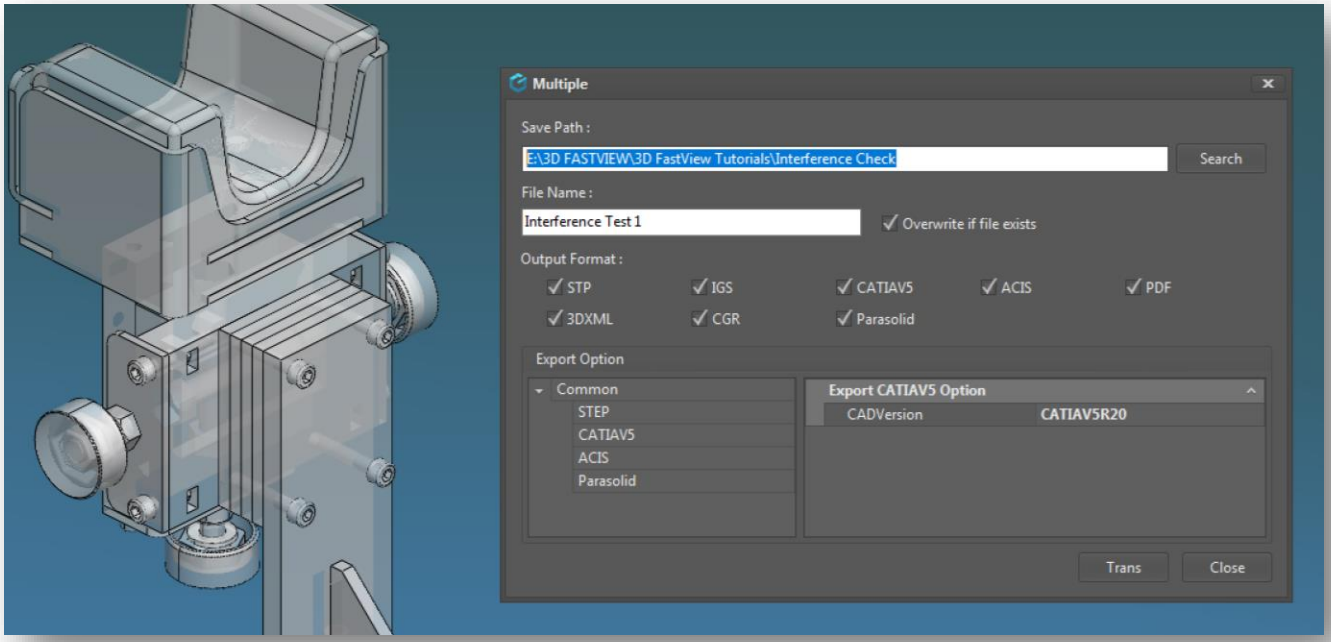


# 11. Pro Tab > 3D Translation




## 3D Translation Panel

**Multiple:** Batch conversion into various formats for current model displayed on the screen.
(Only for CAD formats opened in ACIS mode (= B-rep Mode) can be converted)
- Storage path: defaults to open file path
- Target file name : Auto-fill original file name
Options : As same as “Single” option (see previous page).




** Matters that require attention

1. Upon opening the assembly CAD file

1-1) Deletion, rotation, and movement can only be per **Part.**

Tip) Tree structure :
Assembly > **Part** > Body > Face

1-2) Component Color: It applied as color values that exist in each original cad file

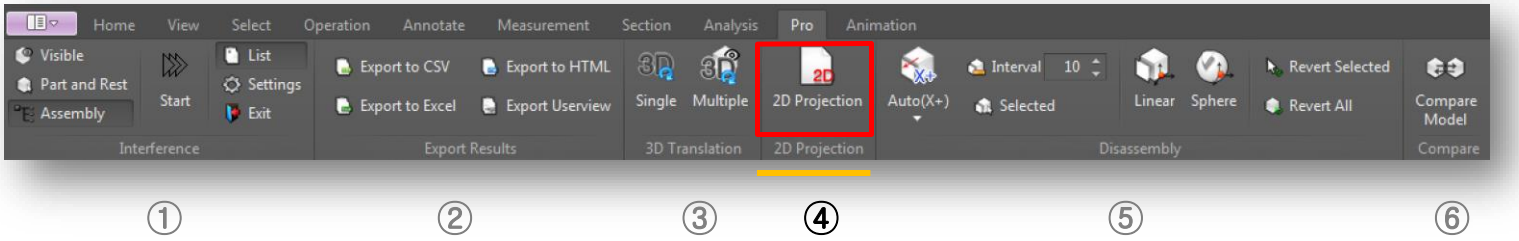
2. Upon opening a single CAD file

2-1) Can be converted by applying body color changed In VIZDesign

2-2) Deletion, rotation, and movement can only be per **Body.**

Tip) Tree structure :
Assembly > Part **>** **Body** > Face

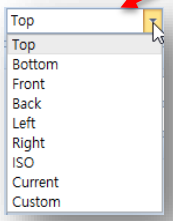
# 11. Pro Tab > 2D Projection

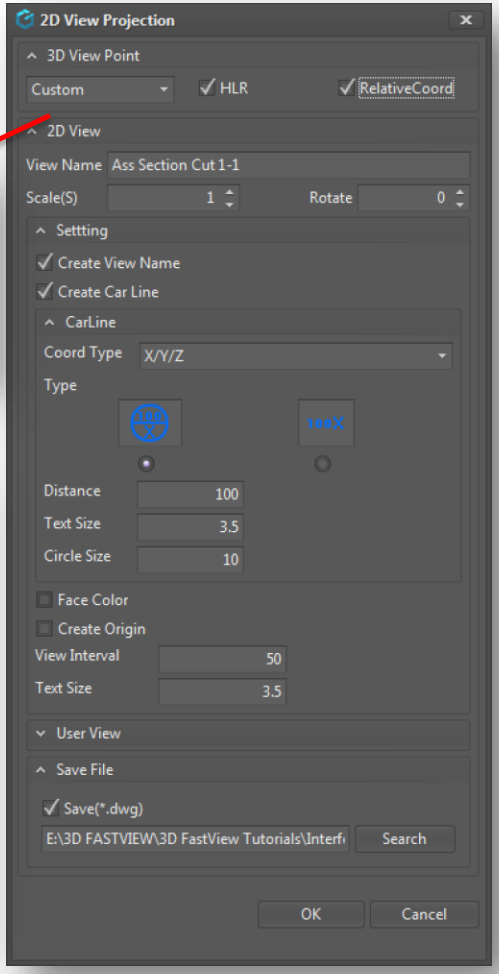



## 2D Projection Panel

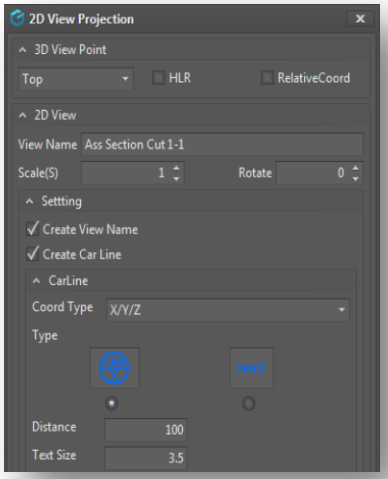
**2D Projection:** Outputs 3D geometry as a 2D CAD file.
1) **3D Viewpoint:** Supports eight projection viewpoints plus one custom view option.
☐ HLR: Hidden Line Remove
**2) 2D View:** Users can select options for 2D projection.
A) Settings: Creates view name, car line, origin. Applies face color, view interval and text size.
**3) User View:** Activate when 3D viewpoint is selected in "Custom" option.
**4) File Save:** Specifies path and dwg file name.
A) Save file (Saves & Opens as dwg file).

### 1) 3D Viewpoint

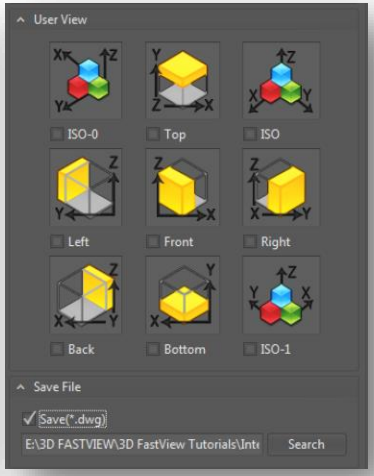


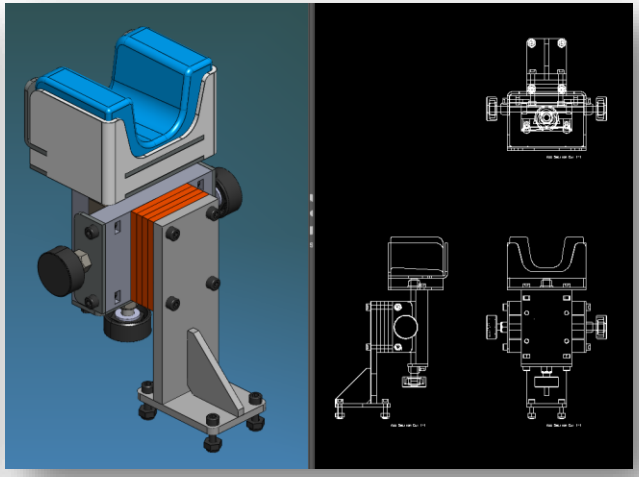

### 2) 2D Set view options



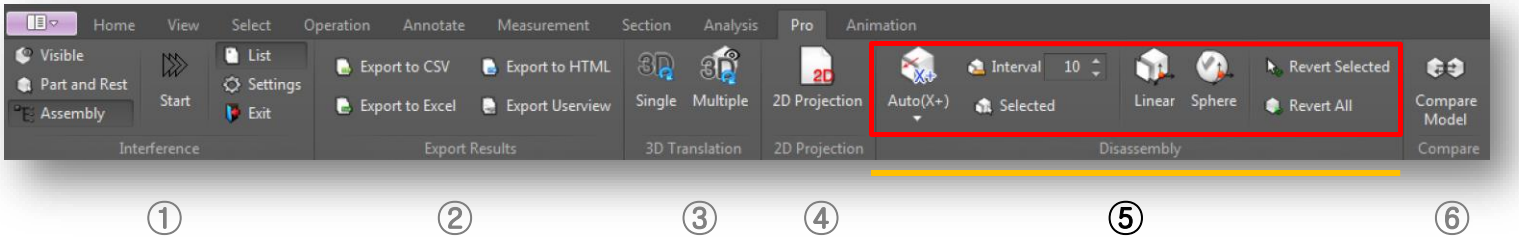

### 3) Custom User View




### 2D View Direct projection and open



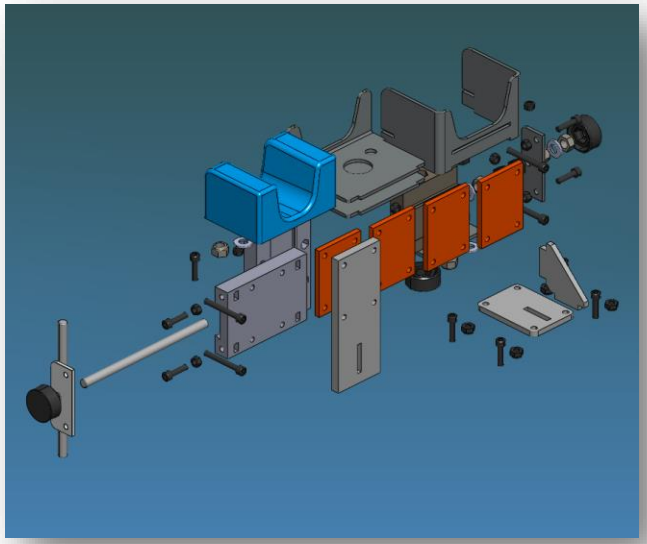
# 11. Pro Tab > 2D Projection



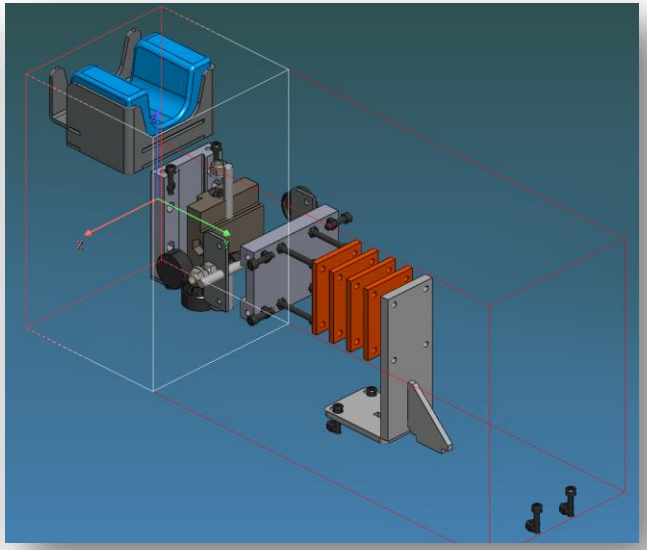

## Disassembly Panel

1) **Auto:** Auto disassembly in X + .X-, Y +, Y-, Z +, Z- & XYZ directions.
- **Interval:** Sets distance between objects (automatic interference avoidance between parts).
- **Selected:** Applies disassembly only to the selected part.
2) **Linear:** Explodes the model in linear direction according to auto axis selected.
3) **Spherical:** Explodes the model in spherical direction according to auto axis selected.
4) **Revert Selected / Revert All:** Restores original view state of selected part or entire model.

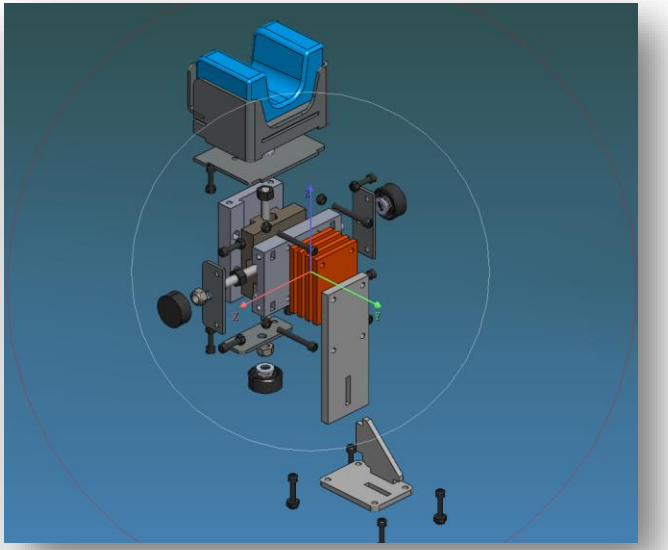
### 1) Automatic Explosion Axis



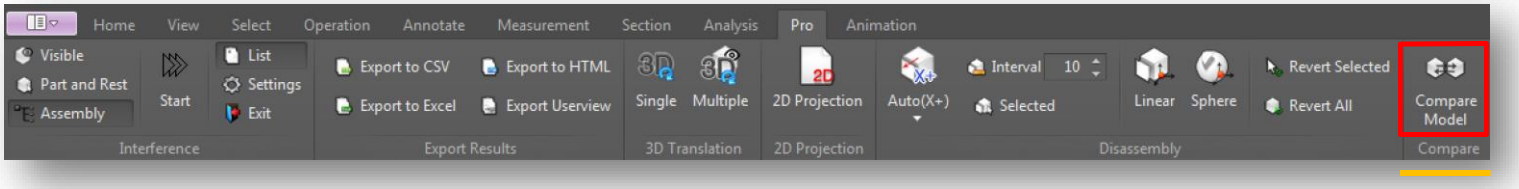
### 2) Linear Explosion



### 3) Spherical Explosion

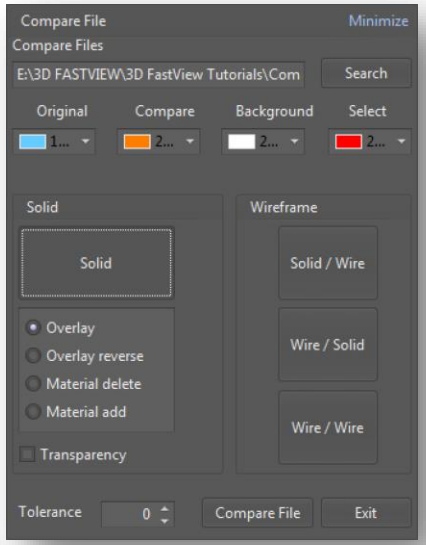


# 11. Pro Tab > Compare



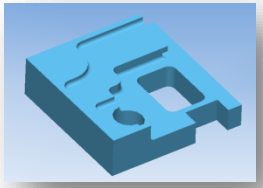

## Compare Panel

1) Compare Files: Browses the comparison target file to compare with the original model
2) Solid: Solid state representation from selected options.
A) Overlay: Overlays original on top of comparison model.
B) Overlay Reverse: Overlaps the compared model over the original one to see the shape difference in color.
C) Material Delete: Highlights the features not in the model to be compared (background setting color).
D) Material Add: Highlights the feature that exists only in the comparison model (background setting color).
- Options: Transparency

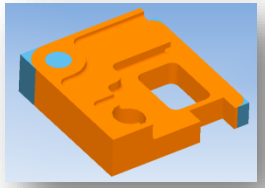



### 1) Comparison of solid vs. solid shapes

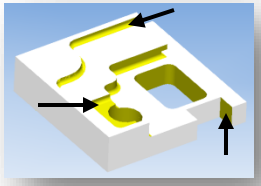
A) Overlay



B) Overlay Inversion

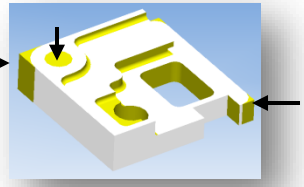


C) Delete creative



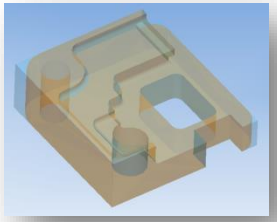
Material delete

D) Add creative



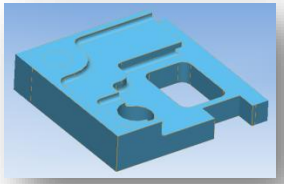
Material Add

- Options: Transparency

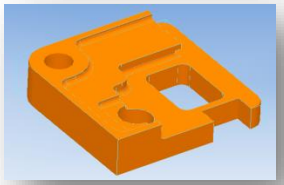


### 2) Wireframe

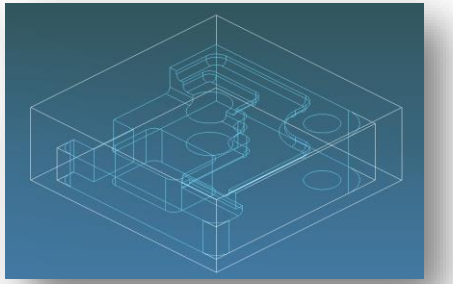
A) Solid vs Wire



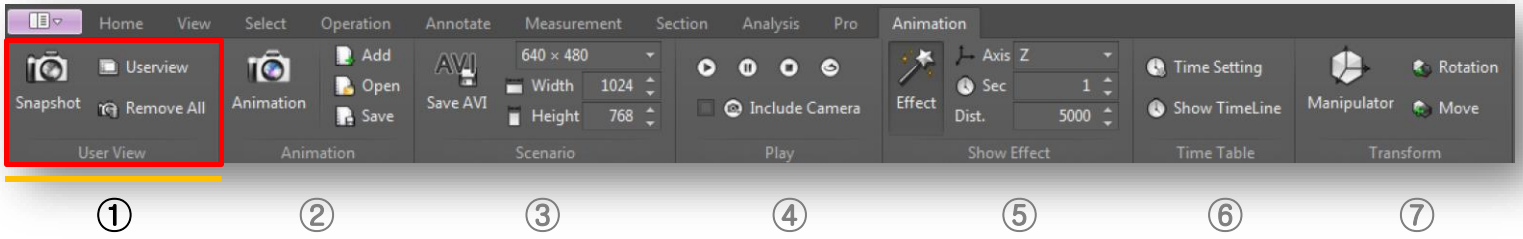
B) Solid vs Wire



C) Wire vs Wire

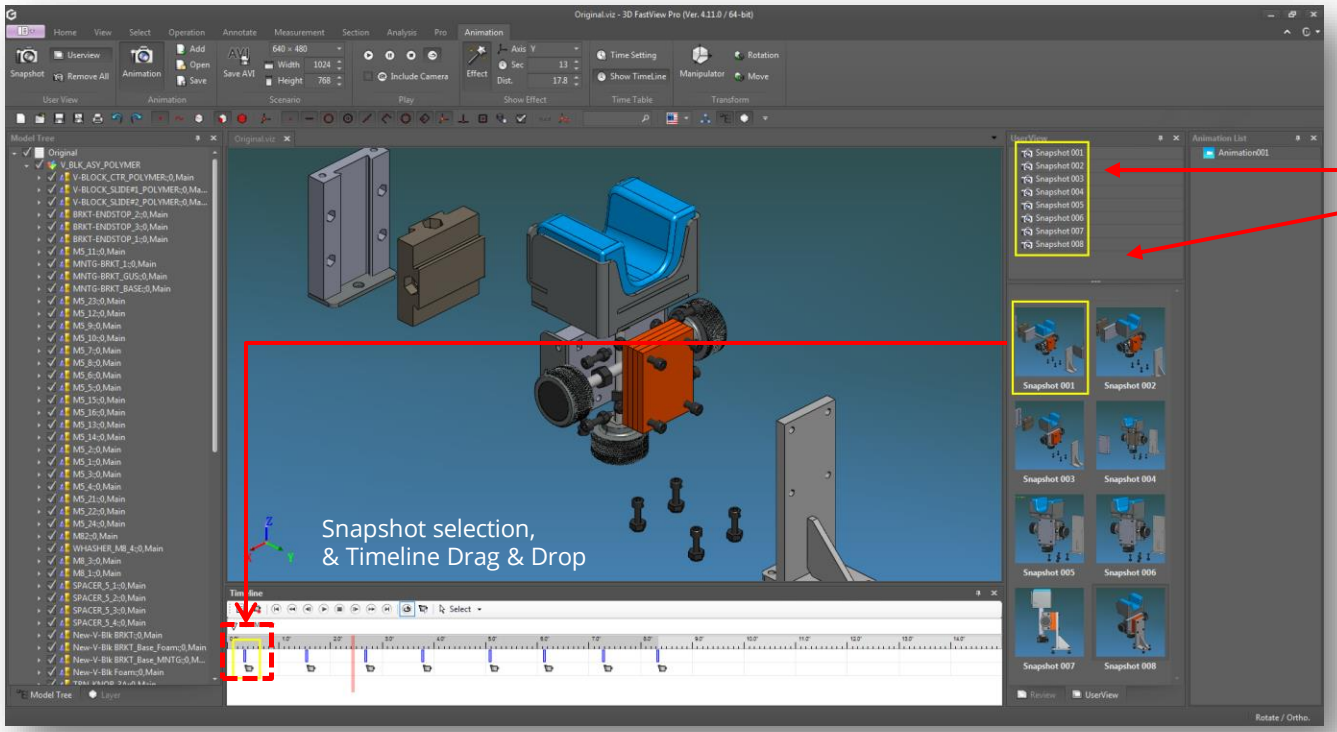


# 12. Animation Tab > User View




## User View Panel

1) **Snapshot:** Saves the snapshot (Q) of the view state at a specific point in time and use it as a key value at a certain point in the animation.
2) **Userview:** Opens/closes the userview window on screen.
3) **Remove All:** Removes or deletes all screenshots stored in userview window.

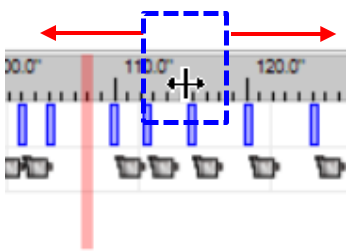



1) Save Snapshot (Q)

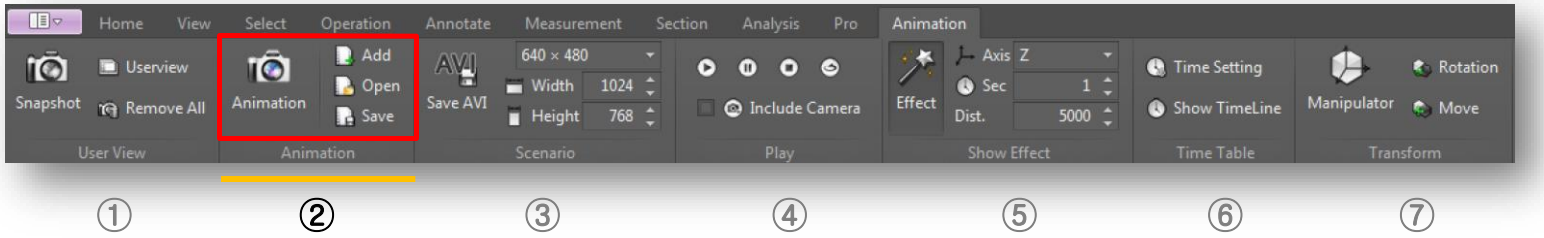
2) View snapshot image
- Select user view - View selected snapshot
- Click on empty space - view full snapshot

3) Insert Animation scene key
- Snapshot selection, Timeline Drag & Drop

※ Quick Moving Timeline
-Mouse 2 button click state, left / right movement



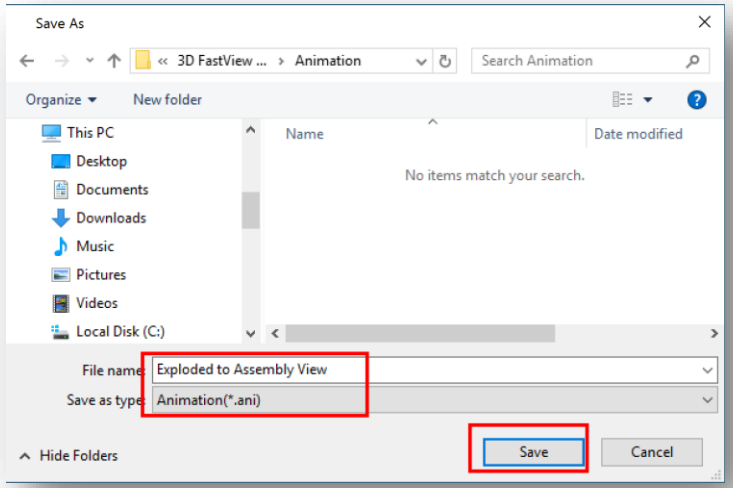
# 12. Animation Tab > Animation

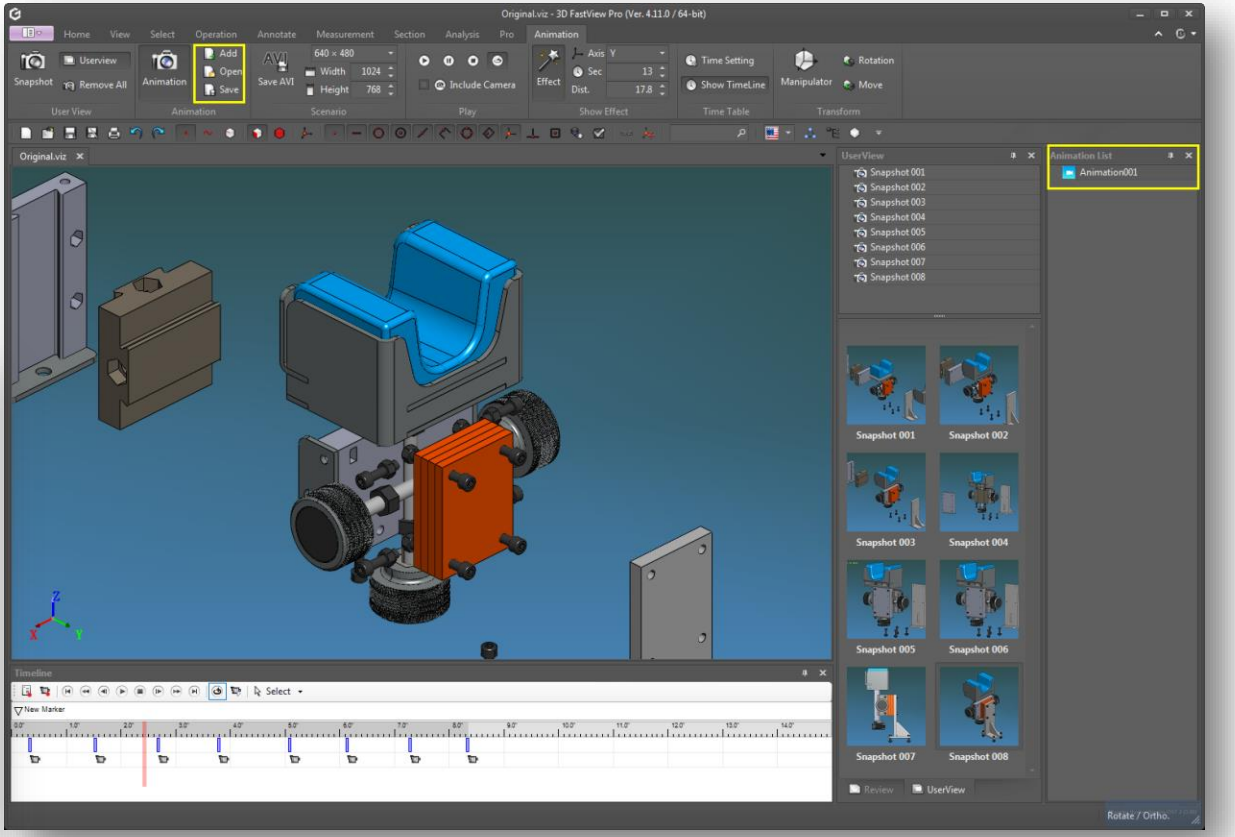



## Animation Panel

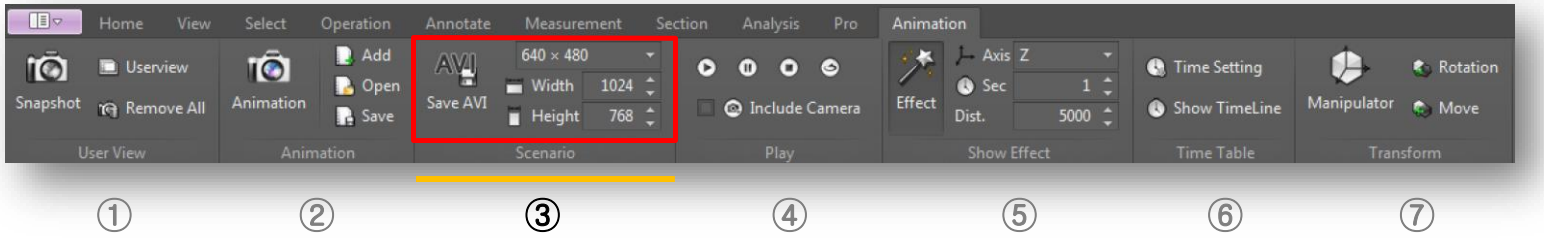
1) **Animation:** Manages animation list panel on screen.
2) **Add:** Adds a new animation item on list panel.
3) **Open:** Imports saved animation file.
4) **Save:** Saves animation list created as * .ani format.

### Save Animation file (*.ani)



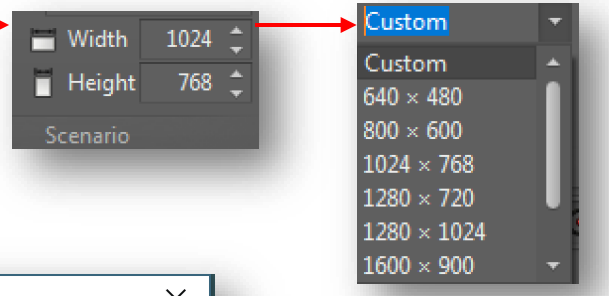



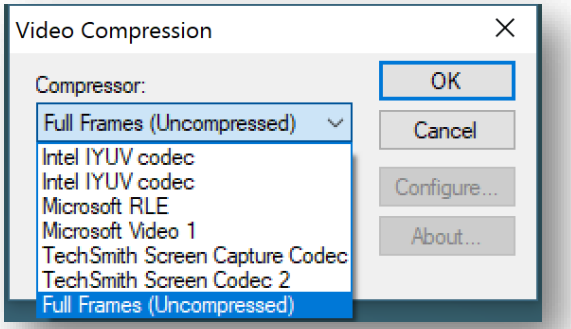
# 12. Animation Tab > Scenario

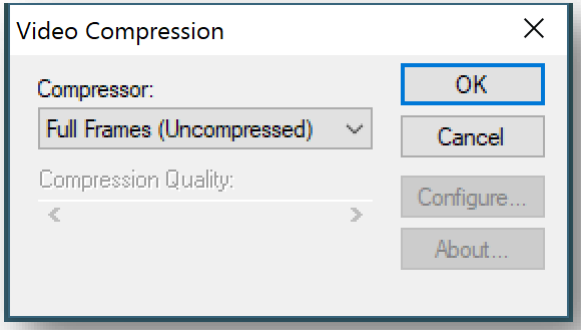



## Scenario Panel

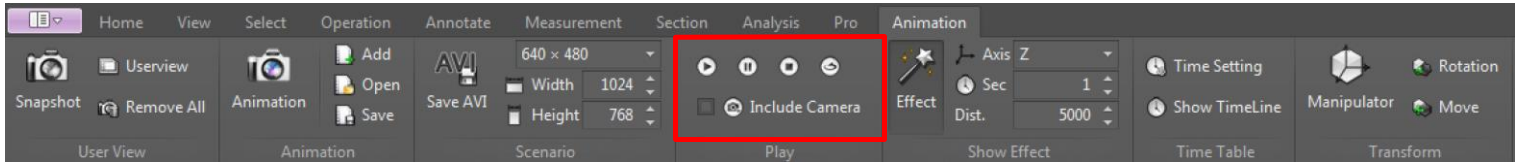
1) **Save AVI:** Exports animation to movie file [Format: * .AVI].
2) Horizontal / Vertical: Sets resolution and size when making movie.
- "Custom size" setting and standard list selection list
3) Recommended codec : Xvid MPEG-4 CODEC (https://www.xvid.com/download)



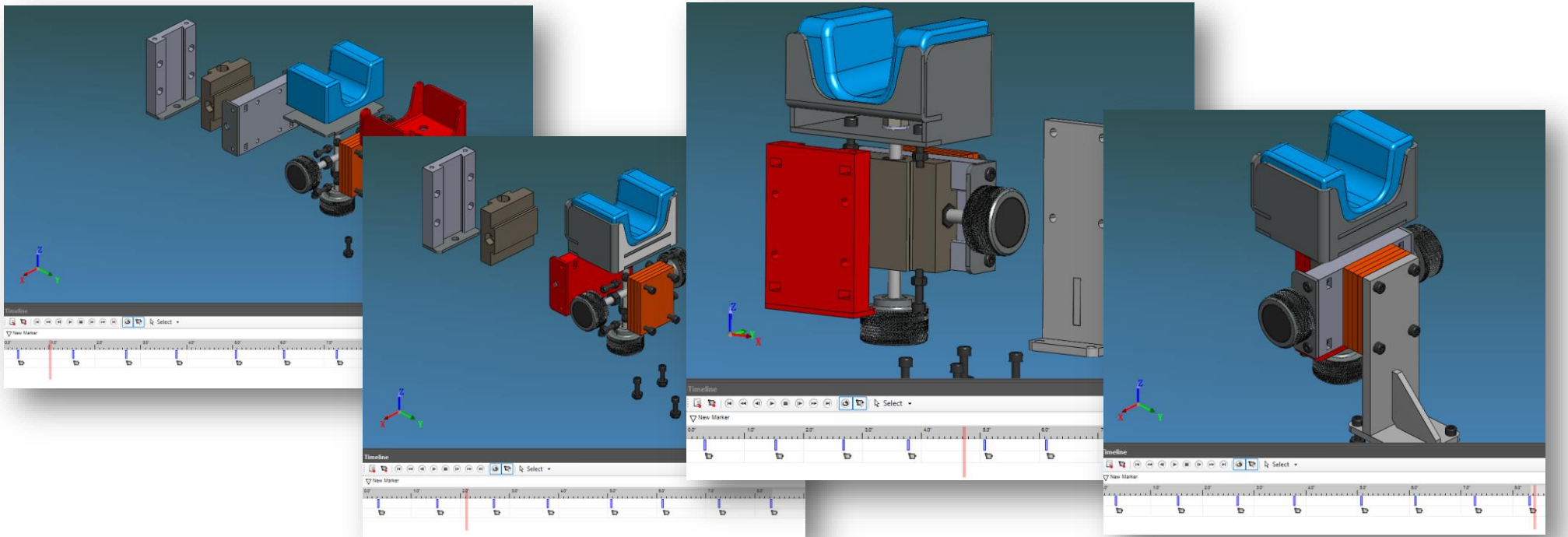



# 12. Animation Tab > Play

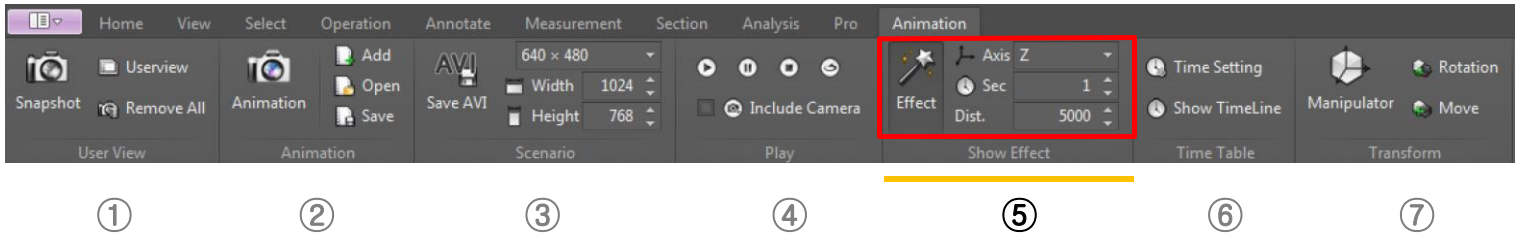



**Play Panel**

1) Start: Plays current animation.
2) Pause: Pauses animation playback.
3) Stop: Stops animation playback.
4) Repeat: Turns the animation repeat play mode On/Off. Automatically play back from the beginning after playing the animation to the last time.
5) Included Camera: To turn camera play mode On/Off. Sets camera view and zoom function when playing animation.



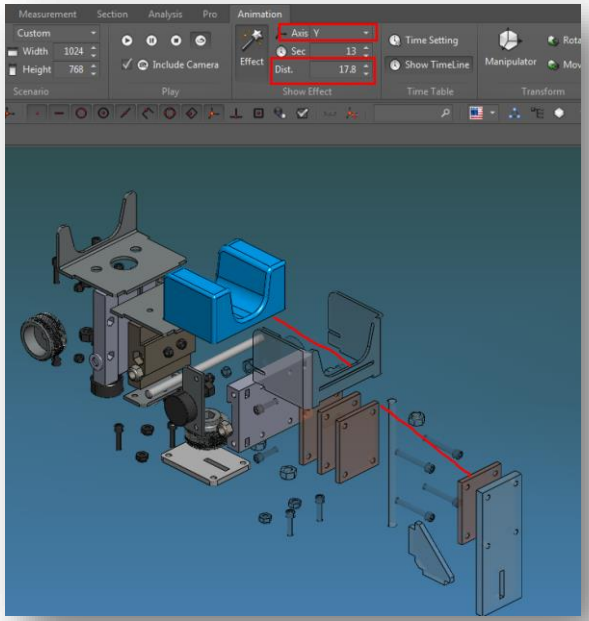
# 12. Animation Tab > Show Effect

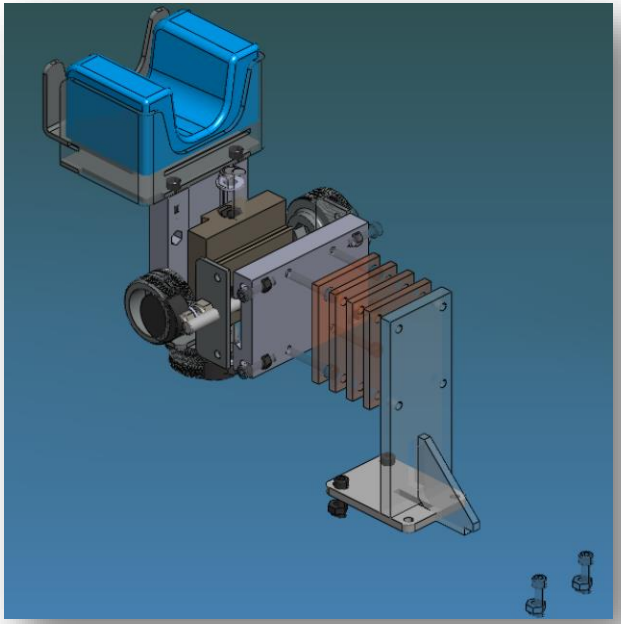


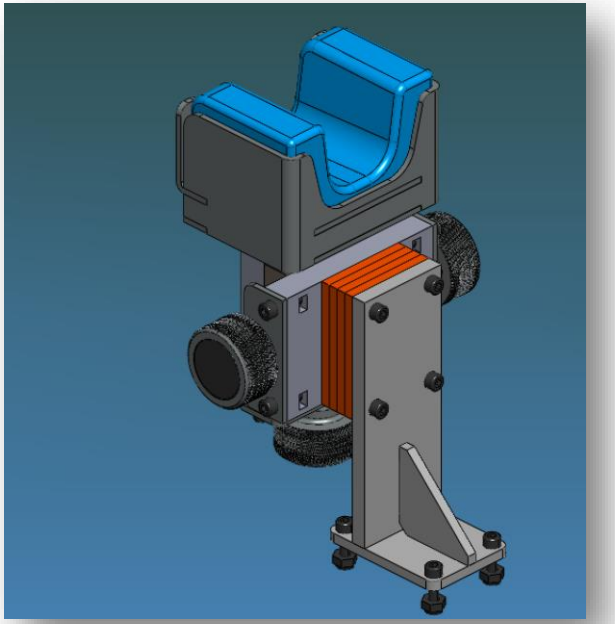

**Show Effect Panel**

1) Effect: Sets whether to apply the effect. Applies effects to model when animating.
2) Axis: Sets whether to apply the effect in the X/Y/Z direction.
3) Sec: Sets the time at which the effect will be executed.
4) Dist: Sets the distance to which the effect is applied.

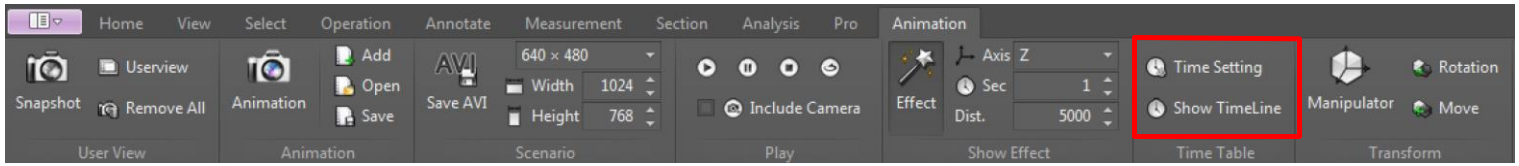
**Example) Set the effect so that it gradually appears at a distance of 5000 from Z axis direction from 1 second before the model is seen**





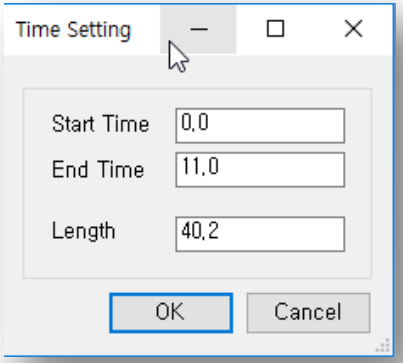


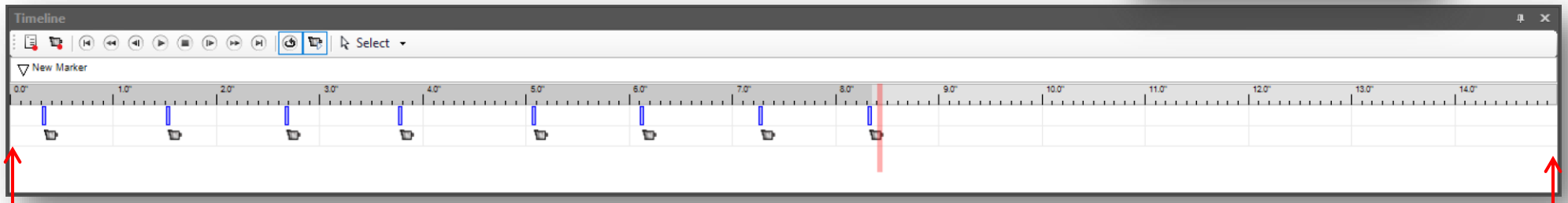
# 12. Animation Tab > Time Table




**Time Table Panel**

**Time Setting:** Sets animation time at time setting dialog box.
1) **Start time:** Sets the timeline start time.
2) **End Time:** Sets the end time of the timeline.
3) **Length:** Sets the playback length of the animation.

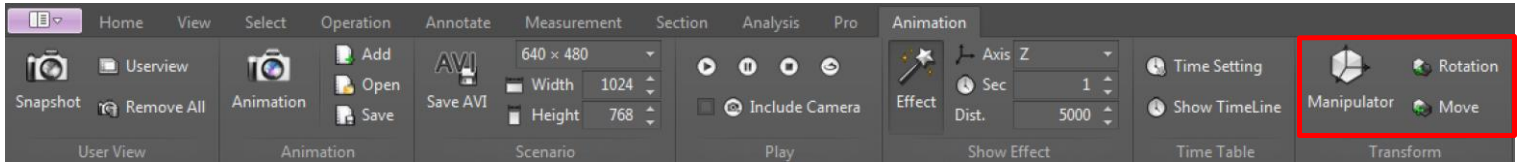



**Start Time**

**End Time**

# 12. Animation Tab > Transform



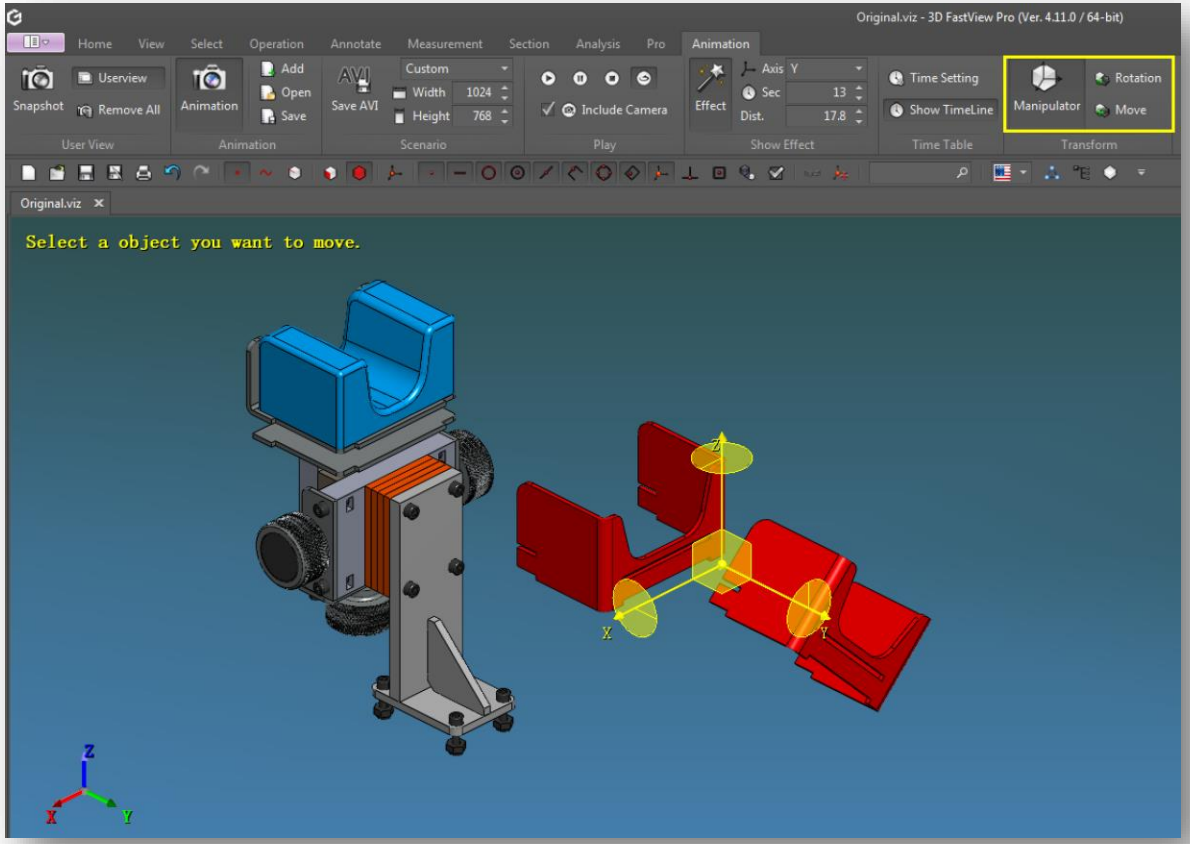

① ② ③ ④ ⑤ ⑥ ⑦

### Transform Panel

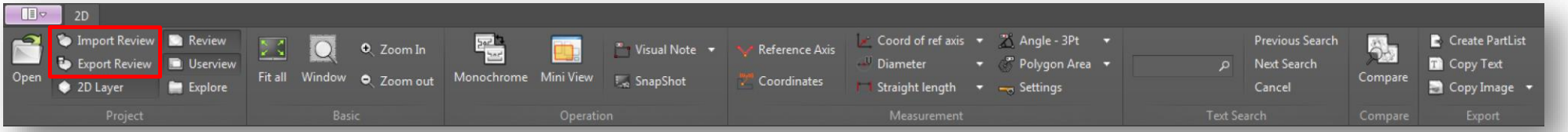
**1) Manipulator:** Moves and rotates a selected part by X/Y/Z axis using the manipulator tool.

2) **Rotation:** Rotates a selected part by X/Y/Z axis, the selected part or component can be copied.

3) **Move:** Moves selected part relative to X/Y/Z axis, the selected part or component can be copied.



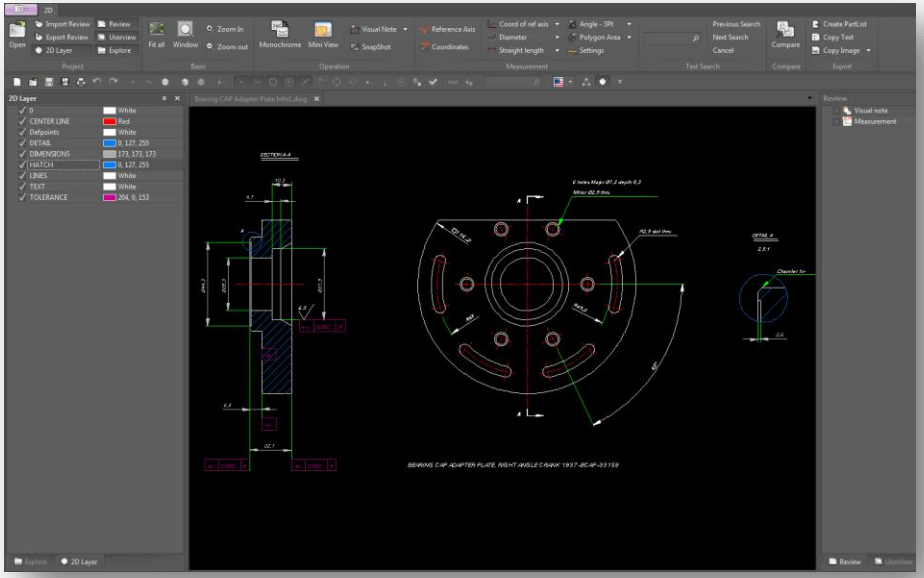
# 13. 2D Tab > Project



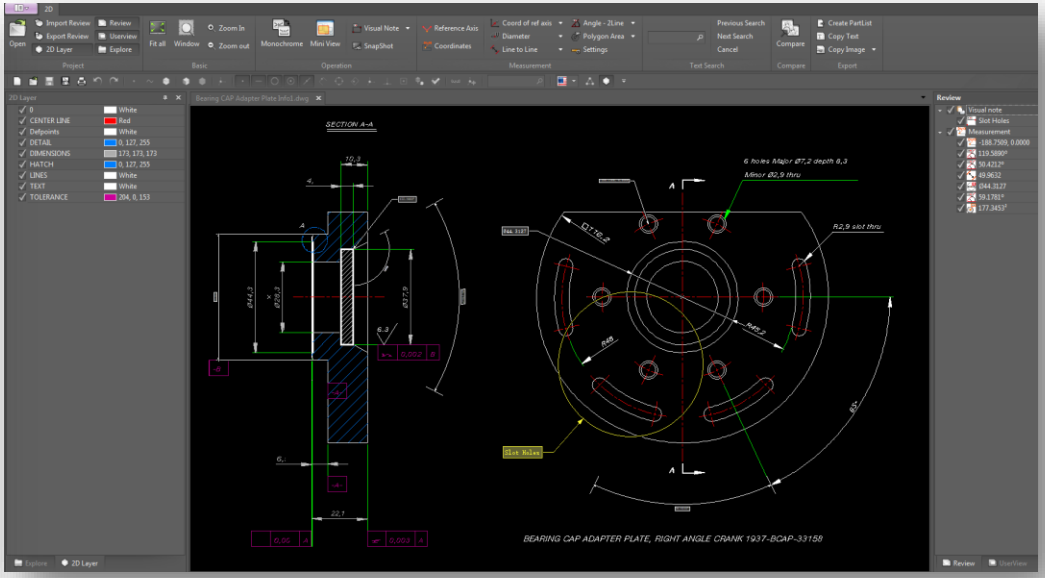

**Project Panel**

1) **Import Review:** Loads a review information (*.CVR) file. When using review information, the model 2D drawing must be open.
2) **Export Review:** Exports a review information (*.CVR) file. Is recommendable to save the review file as same name as 2D drawing.

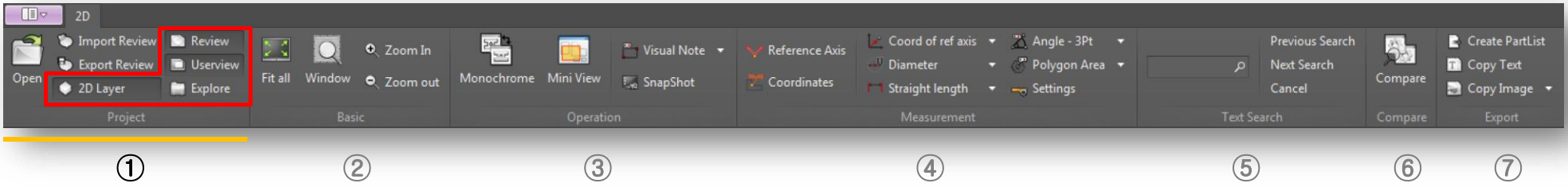
**Before Exporting Review Information**



**After Exporting Review Information**



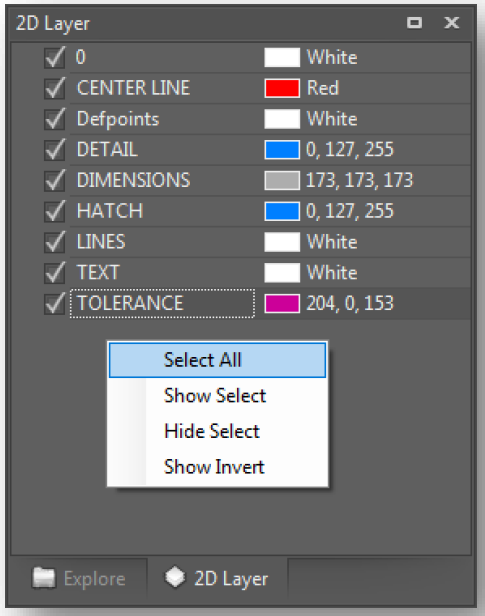
# 13. 2D Tab > Project




## Project Panel

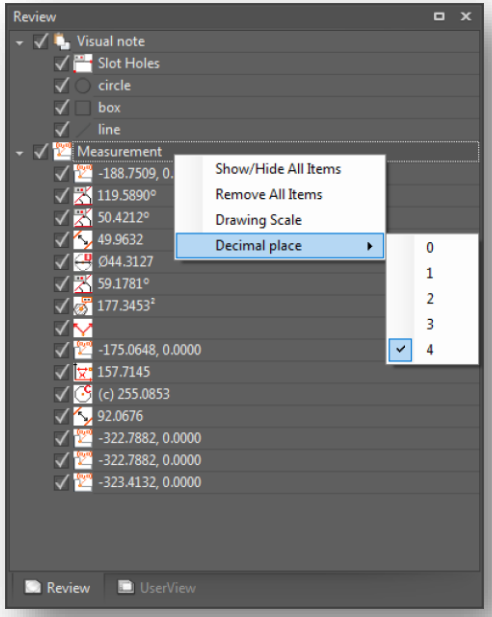
3) **2D Layer:** Panel that shows all 2D drawing layers available.
4) **Review:** Panel that shows annotation and measurement info.
5) **Userview:** Panel that shows all snapshots created on the screen.
6) **Explore:** Panel that shows local files and folders to quick access them.

### 3) 2D Layer Panel



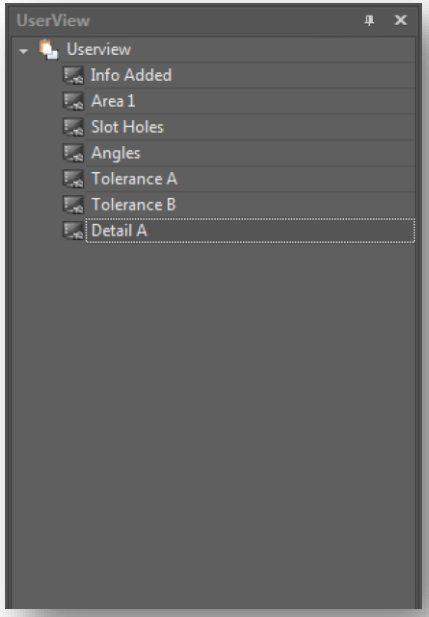

**Tip**
Right-click a layer on the list to pop up the context menu

### 4) Review Panel



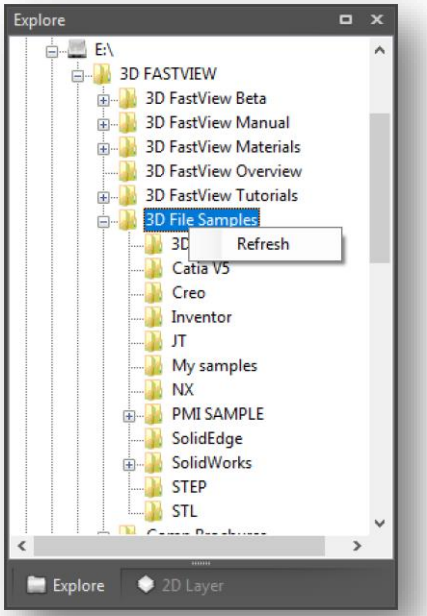

**Tip**
Right-click the top of measurement or visual note to pop up the context menu.

### 5) Userview Panel

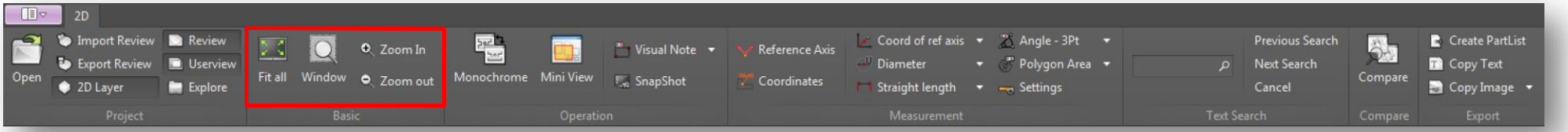



**Tip**
Place the right location on the screen where you want to take the snapshot.

### 6) Explorer Panel



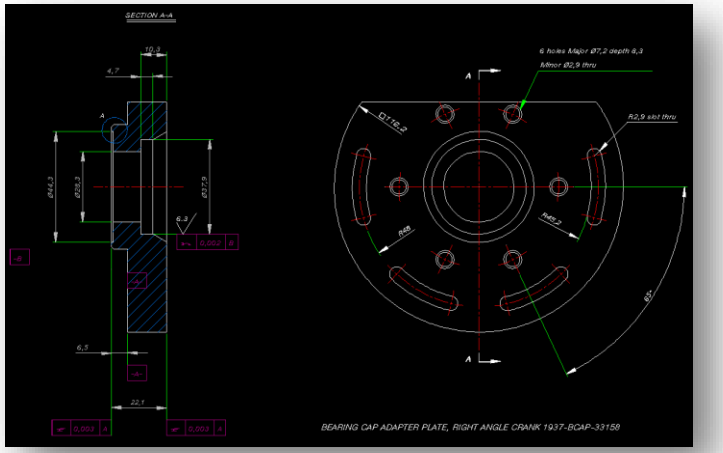
# 13. 2D Tab > Basic



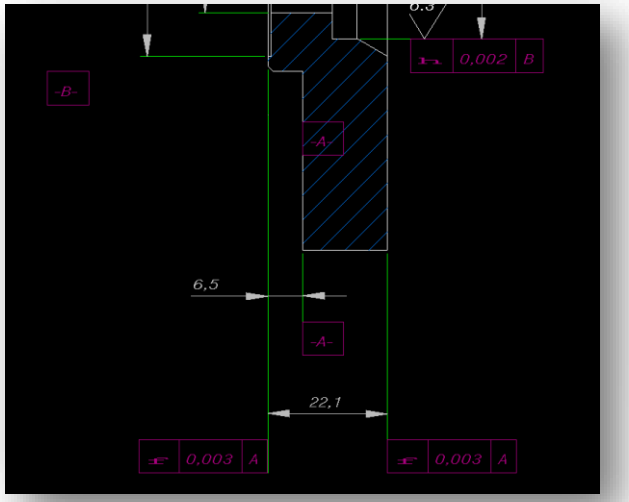

**Basic Panel**

1) **Fit All:** Fits the whole drawing visualization on screen.
2) **Window:** Window selection to view specific area of the drawing.
3) **Zoom In:** Enlarges the drawing visualization on the screen.
4) **Zoom Out:** Reduces the drawing visualization on the screen.

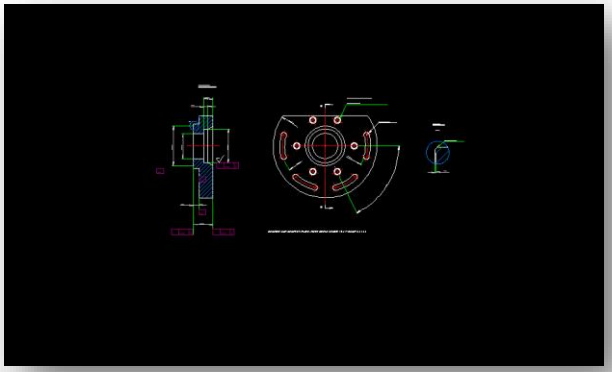
### 1) Fit All



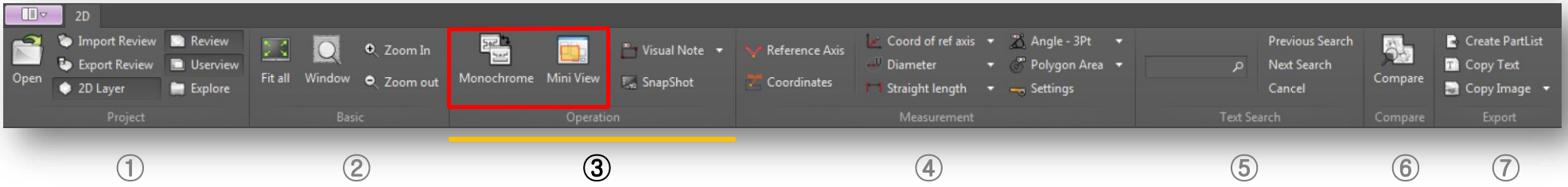

### 2~3) Window & Zoom In




### 4) Zoom Out



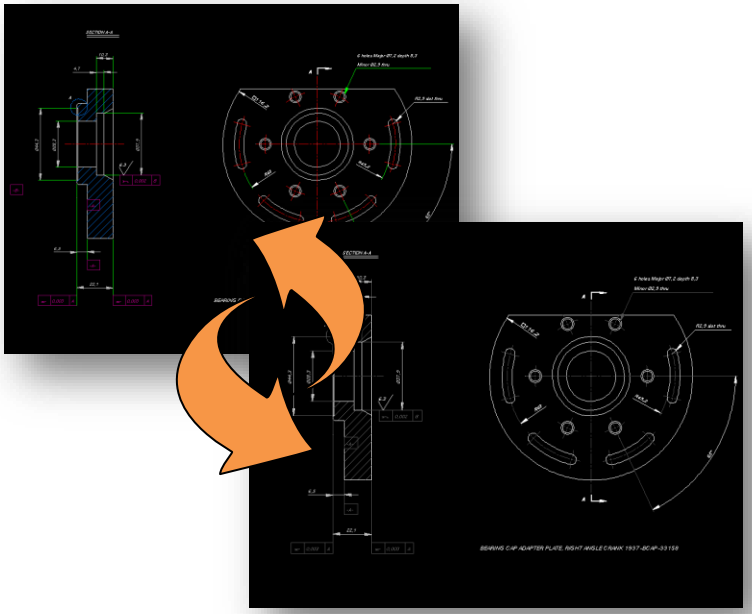
# 13. 2D Tab > Operation



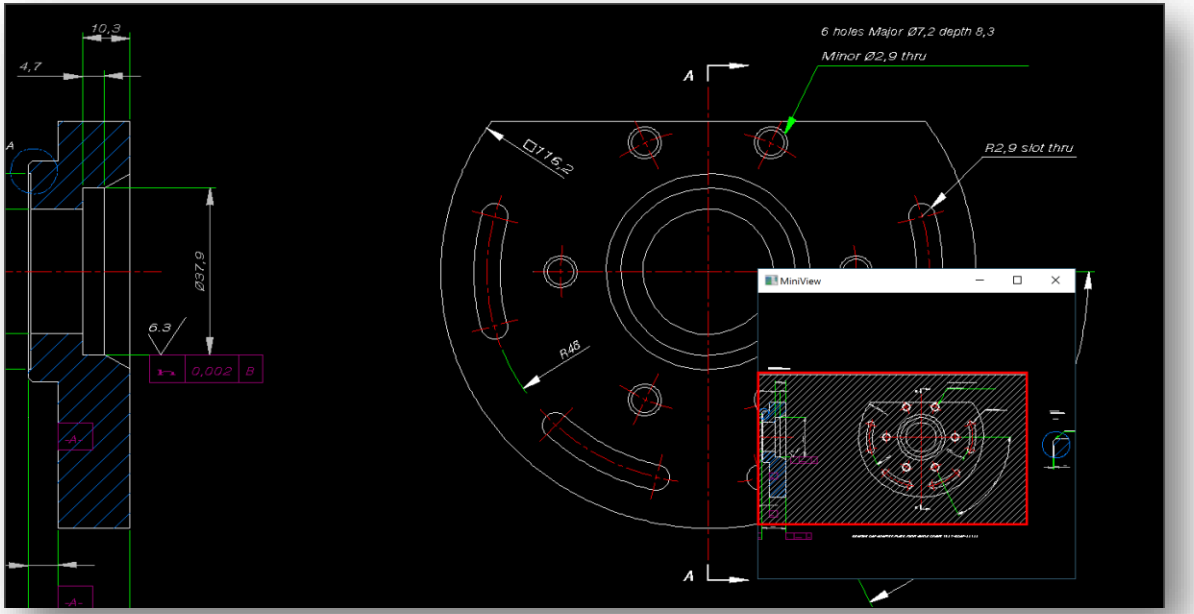

**Operation Panel**

1) **Monochrome:** Changes all lines in the drawing to white (black and white) :: Re-apply to switch to original color.
2) **Mini View:** Allows you to view the entire drawing in a separate window, allowing you to move to the desired point.
A) Mini-view window showing the whole drawing.
B) If you select a region with the mouse in the mini view, the selected region is visible.
C) Both the mini view window and the visualization window can be zoomed by using the mouse to move the visualization area andscroll.

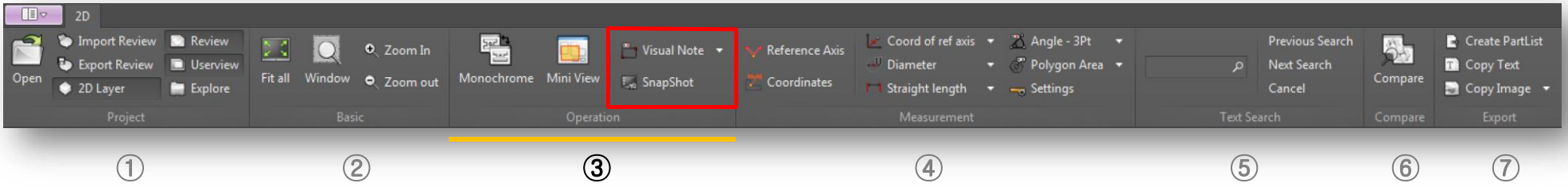
### 1) Monochrome view



### 2) Mini-view window



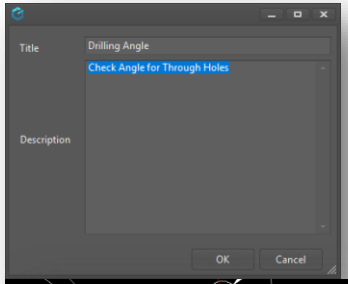
# 13. 2D Tab > Operation

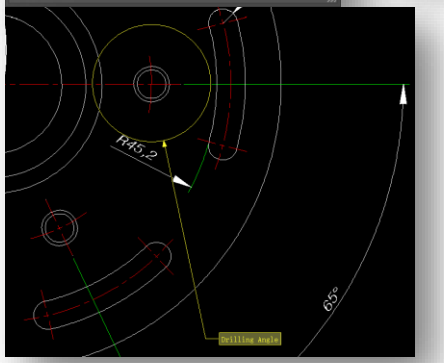



## Operation Panel

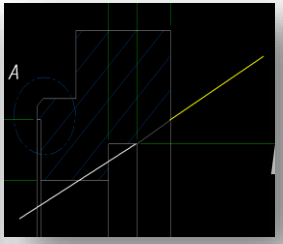
3) **Visual Note:** You can create notes in the drawing location you want. You can see the property values in the list of reviews.
-Line: Creates a straight line by clicking start and end point on the drawing.
-Rectangle: Creates a rectangle by clicking start and end point of the drawing.
-Circle: Creates a circle by clicking start and end point on the drawing.
4) **Snapshot:** Saves current screen view in userview panel.

### 1) Visual note

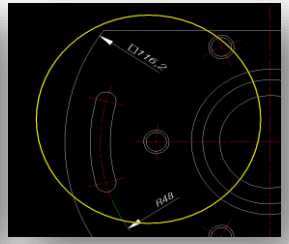


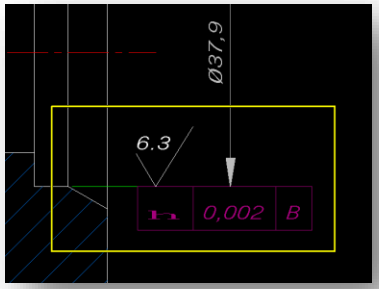

### Line



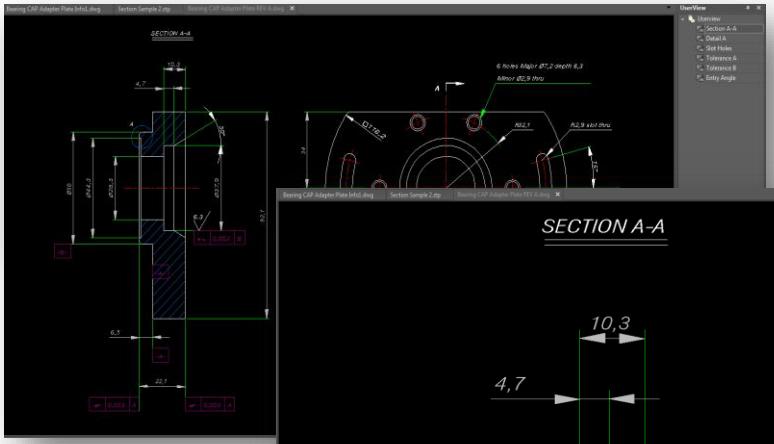

### Circle



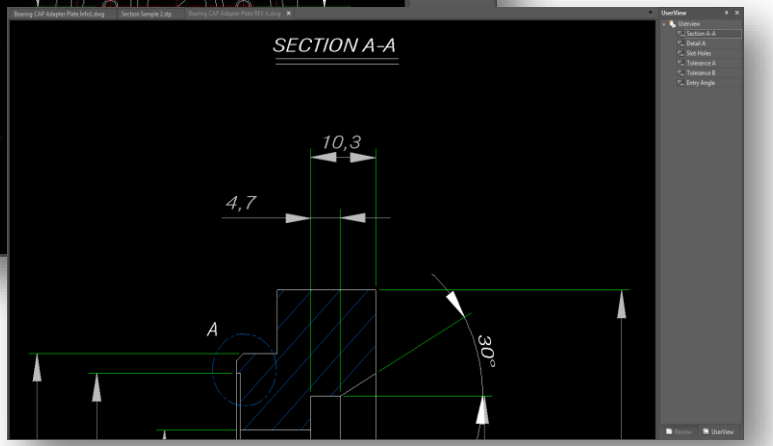

### Rectangle



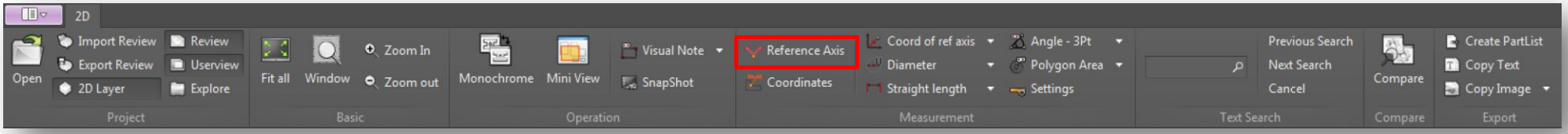

### Before Snapshot



### After Snapshot



# 13. 2D Tab > Measurement

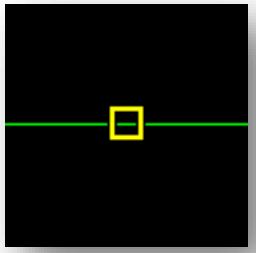



## Measurement Panel

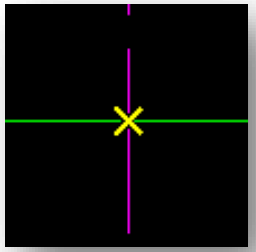
1) **Reference Axis:** Sets additional reference axes at any point in the drawing.

□ **Measure (1)**

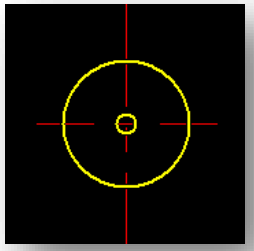
** Cursor snap marker when measuring



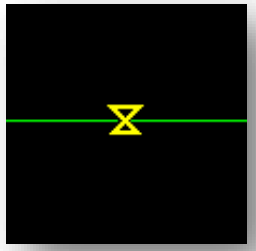
In case of line



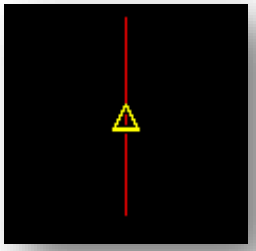
In case of intersection



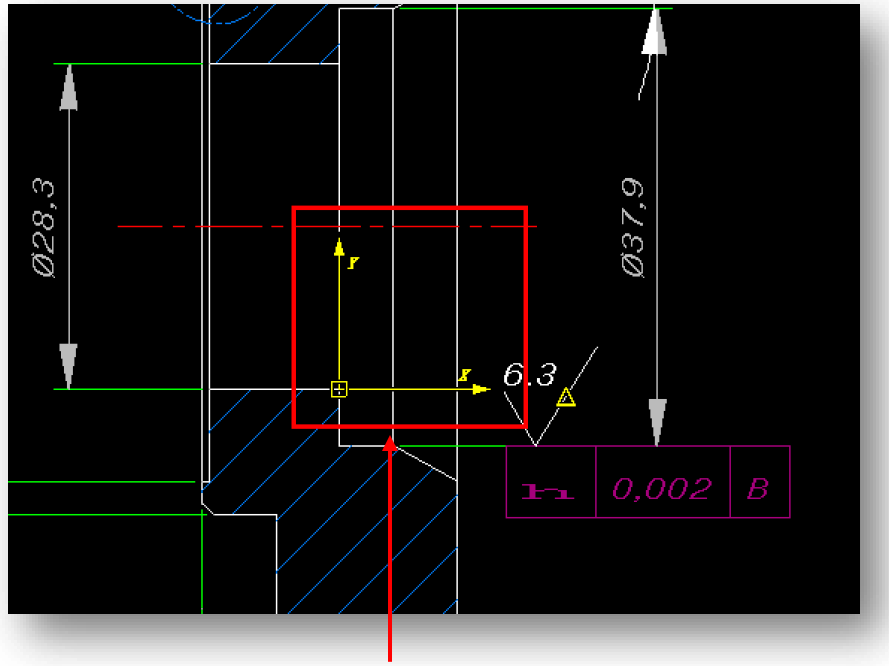
When the cursor is over the circle, Circle center mark



Distance between line and line for measurement

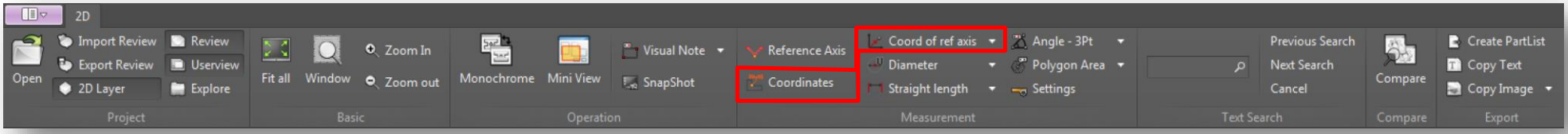


When selecting the straight line center point




**Create Reference Axis**

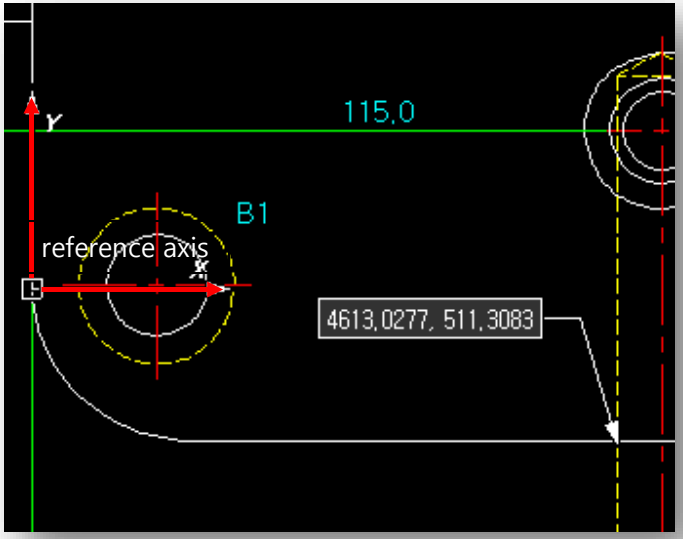
# 13. 2D Tab > Measurement



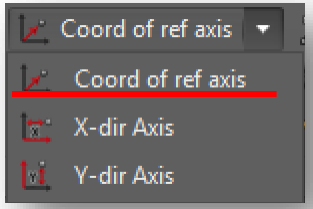

**Measurement Panel**

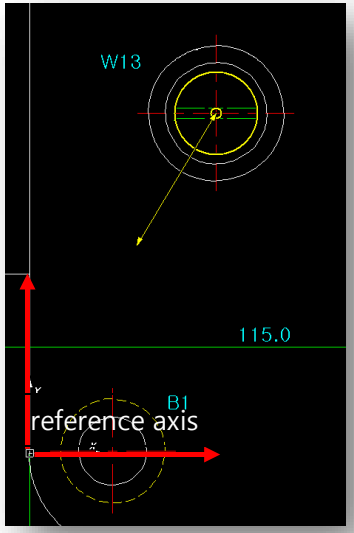
2) **Coordinates:** Measures a point coordinates. Select a point to be the axis origin, then align the arrow axis as you need.
3) **Coord of ref axis:** Measures the length from reference axis origin. Select snap point from the drawing and then pick the end the arrow to the reference axis to select the origin.

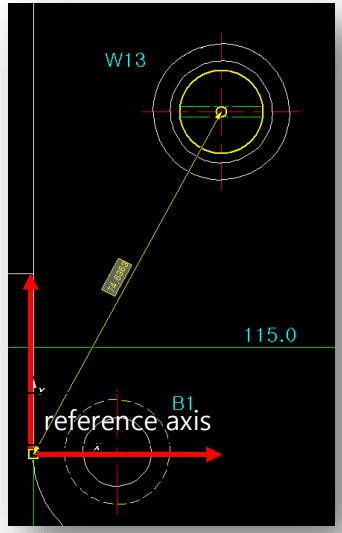
### 1) Coordinates



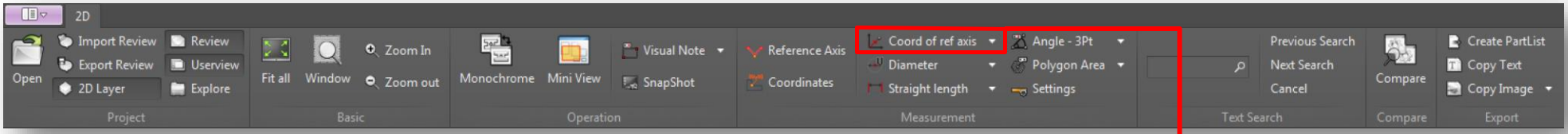

### 2) Coord of Ref axis

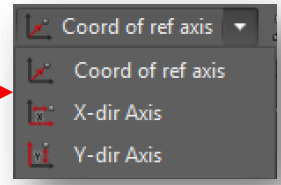


# 13. 2D Tab > Measurement

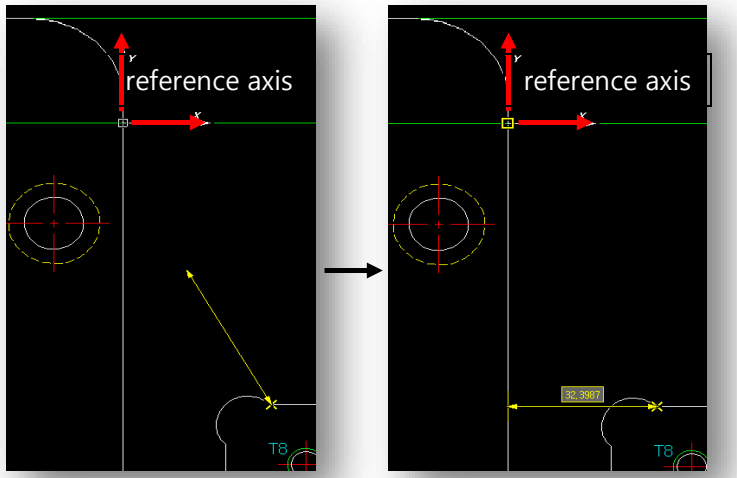


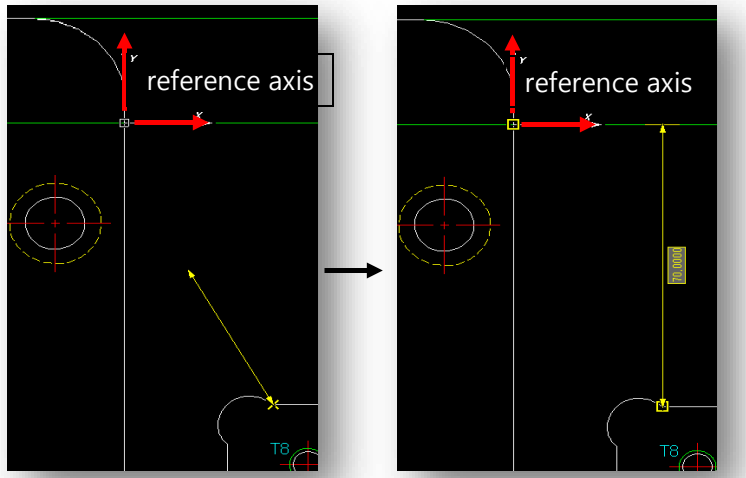

**Measurement Panel**

**X-dir Axis:** Measures the X-axis length from the reference axis.
A) If you move the cursor to the part you want to measure and then select it.
B) If you select the reference axis origin, the X axis length value from the reference axis is generated.
**Y-dir Axis:** Measures the length of the Y axis from the reference axis.
A) If you move the cursor to the part you want to measure and then select it.
B) If you select the reference axis origin, the Y axis length value from the reference axis is generated.

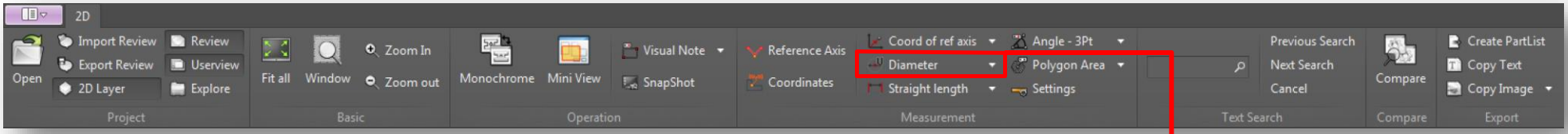
### 1) X direction length based on reference axis




### 2) Y direction length with reference axis

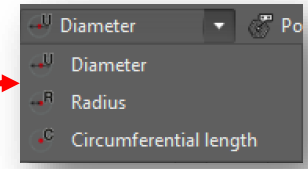


# 13. 2D Tab > Measurement

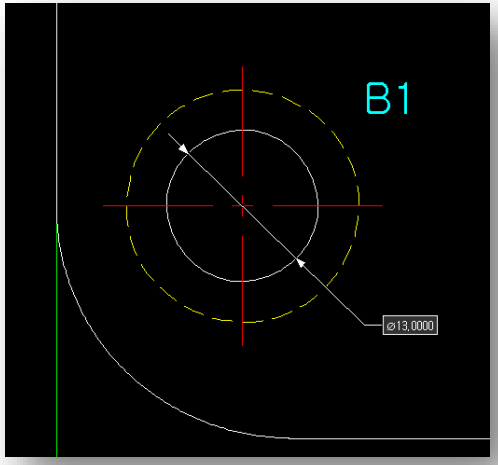



**Measurement Panel**

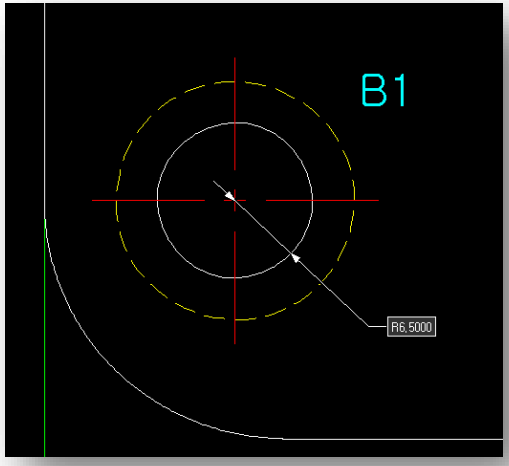
4) **Diameter:** Measures diameter of a circle.
A) Move the cursor to the circle you want to measure and select it to measure the diameter.
5) **Radius:** Measures radius of circle.
A) Move the cursor to the circle you want to measure and select it to measure the radius.
6) **Circumferential Length:** Measures circle circumference.
A) Move the cursor to the circle you want to measure and make a selection to measure the circumference of the circle.



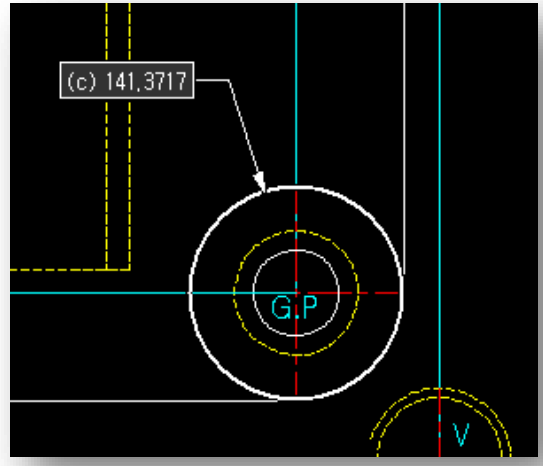

4) Diameter



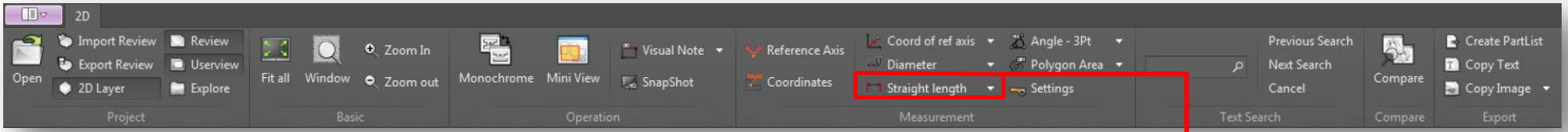

5) Radius

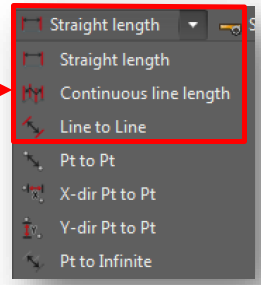



6) Circumference Length



# 13. 2D Tab > Measurement

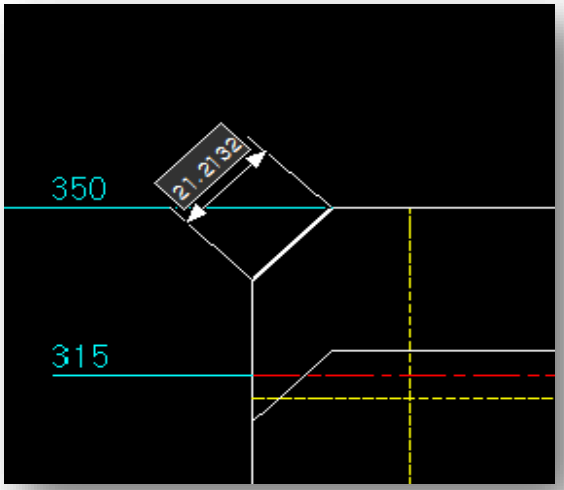


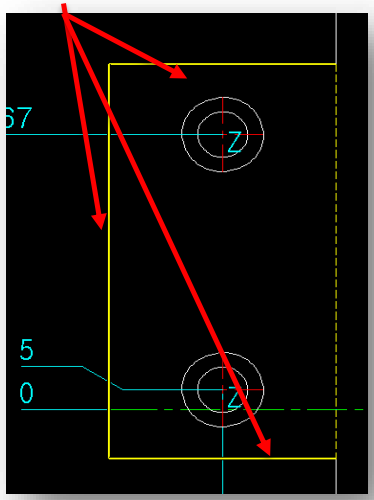

**Measurement Panel**

7) **Straight Length:** Measures the length of a straight line.
A) Move the cursor to the line you want to measure and select it to measure the length.
8) **Continuous Line Length:** Measures the length of a continuous straight line.
A) Move the cursor to the line to be measured and make a selection, right-click to measure the length of selected line.
9) **Line to Line:** Measures the distance between two parallel lines.
A) Move the cursor to the line to be measured and make a selection, select the second line to measure the distance.

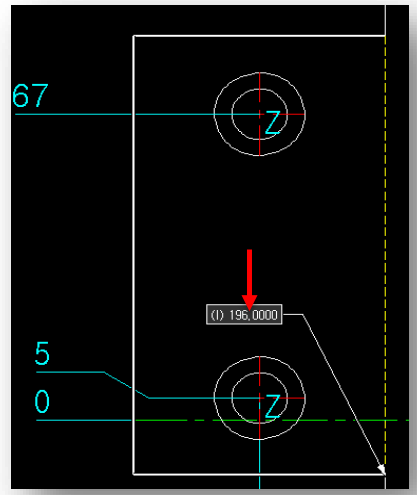
### 7) Straight length

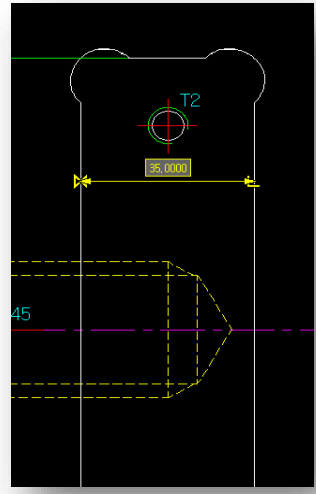



### 8) Continuous Line Length

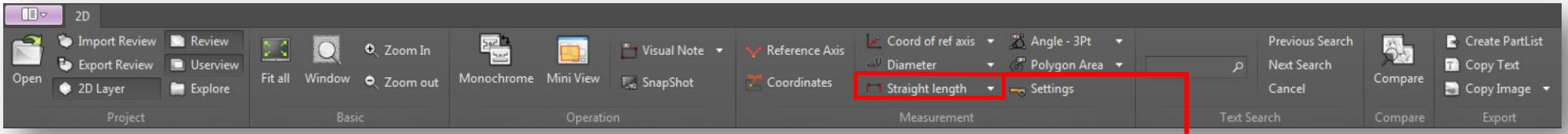



### 9) Line to Line



# 13. 2D Tab > Measurement

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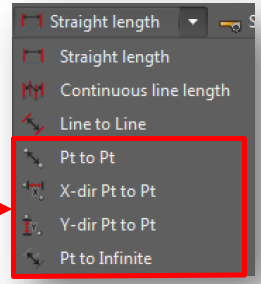
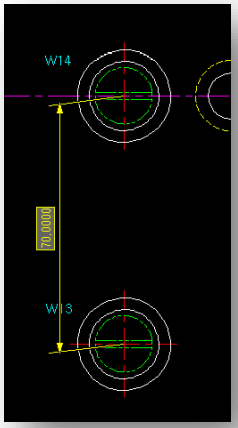
**Measurement Panel**

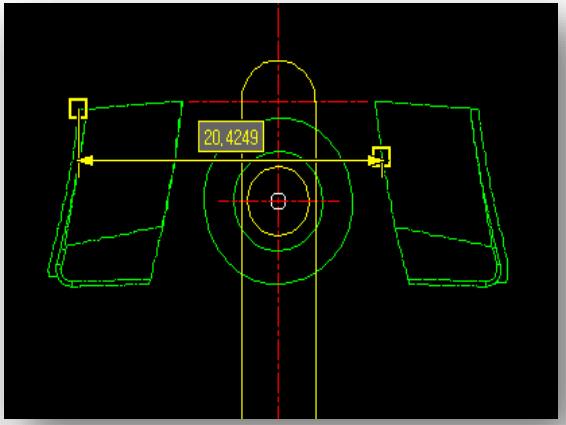
10) **Pt to Pt:** Measures the length between two selected vertices.
11) **X-dir Pt to Pt:** Measures the length in the X-axis direction between two points.
12) **Y-dir Pt to Pt:** Measures the length of the Y direction between two points.
13) **Pt to Infinite:** Measures the length between point and infinite line.



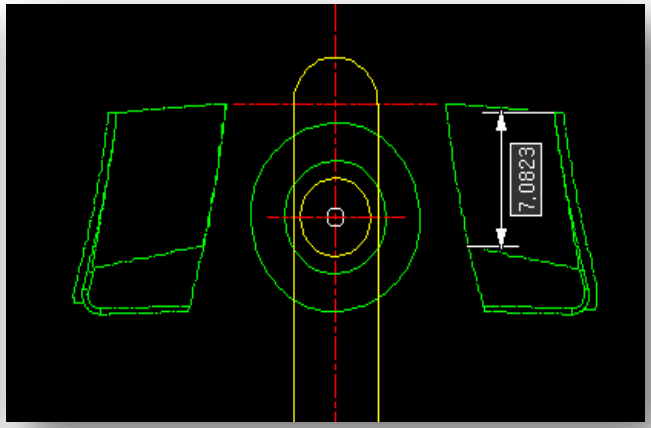

### 10) Point-Point length



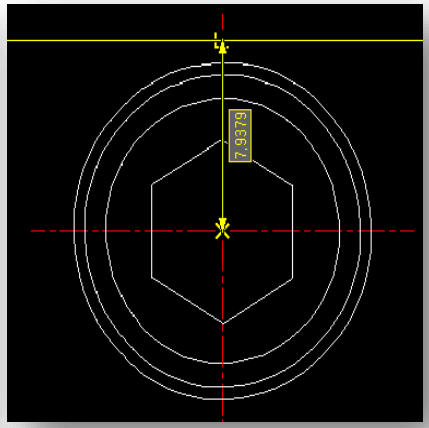

### 11) Point-to-Point X Direction Length



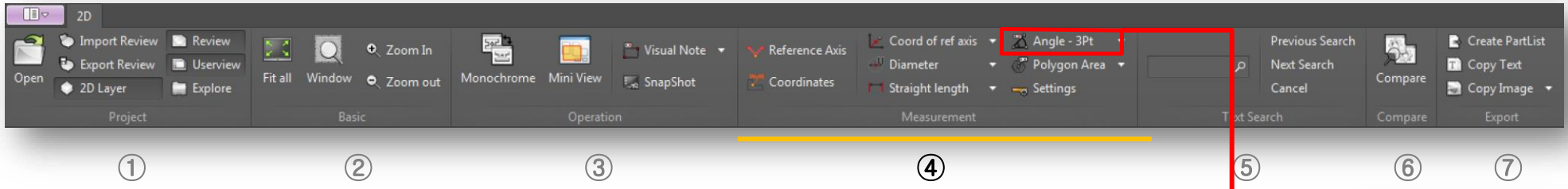

### 12) Point-to-Point X Direction Length

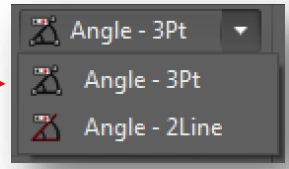



### 13) Point - Infinite Line Length



# 13. 2D Tab > Measurement

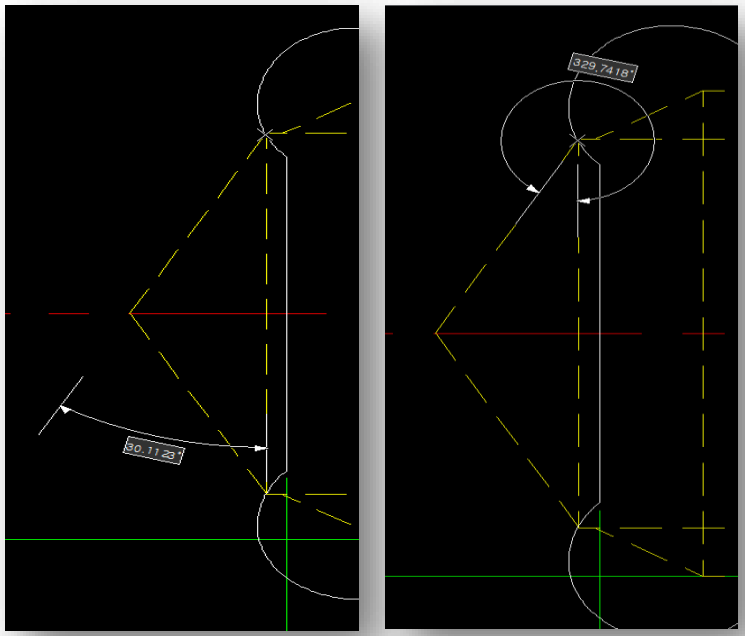


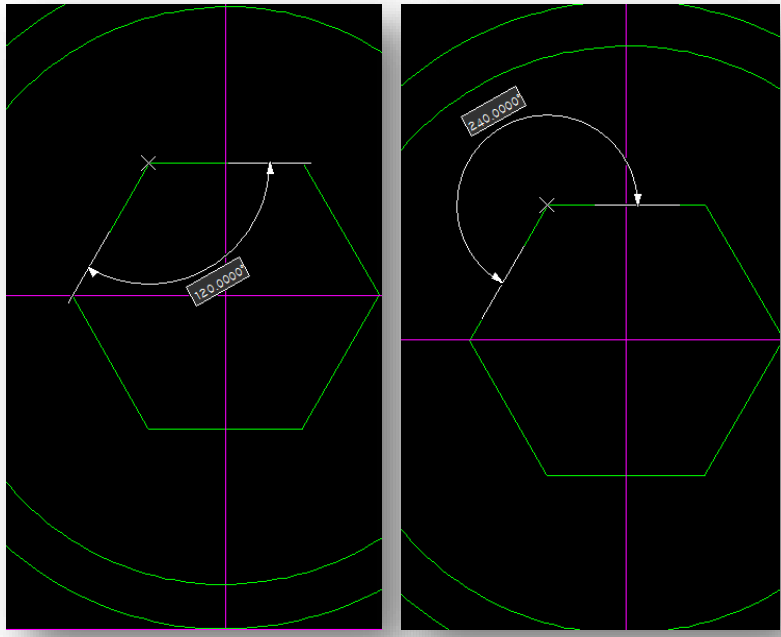

**Measurement Panel**

14) **Angle - 3Pt:** Measures the angle between three points.
15) **Angle - 2Line:** Measures the angle between two straight lines.

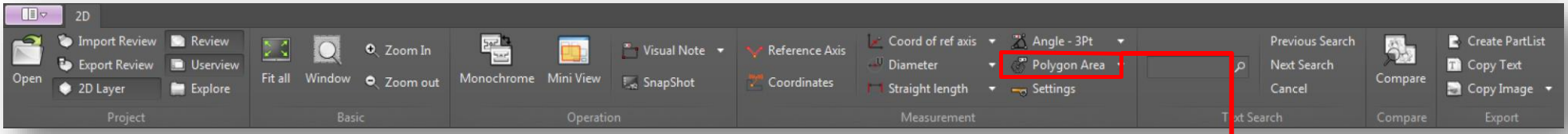
### 1) Angle – 3Pt

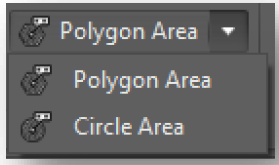



### 2) Angle – 2Line



# 13. 2D Tab > Measurement

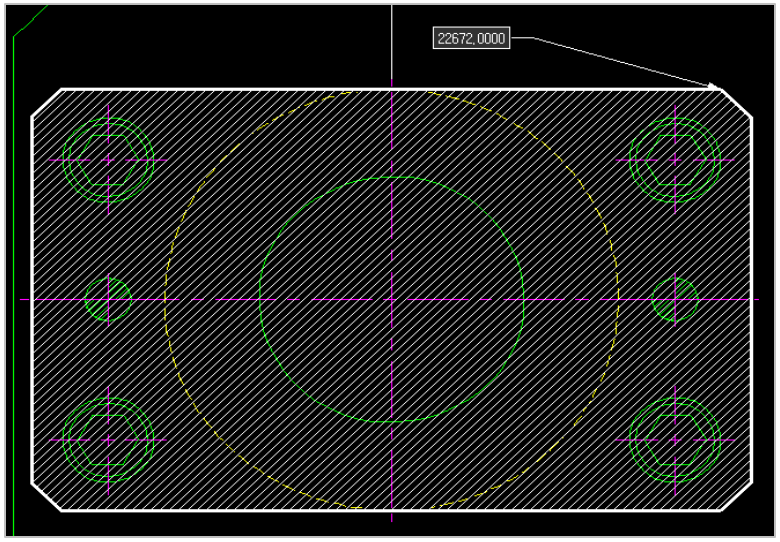


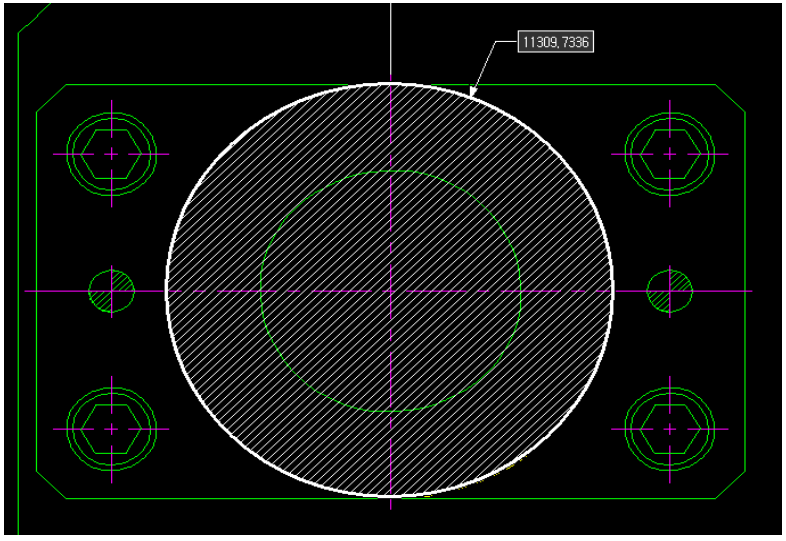

**Measurement Panel**

16) **Polygon Area:** Measures the area of a custom polygon.
A) Select the point to measure the area and click the right mouse button to measure the area.
17) **Circle Area:** Measures a circular area.
A) Select a circle to measure the area and then select it again to measure the area.

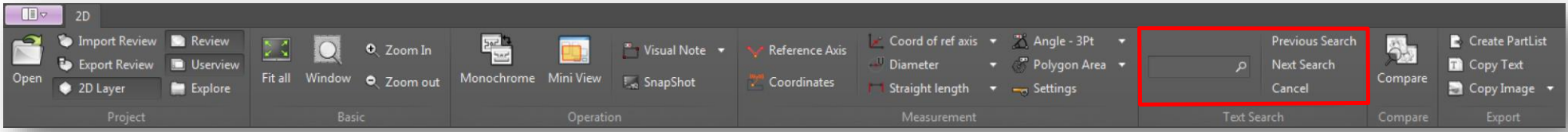
16) Polygonal Area




17) Circular Area



# 13. 2D Tab > Text Search

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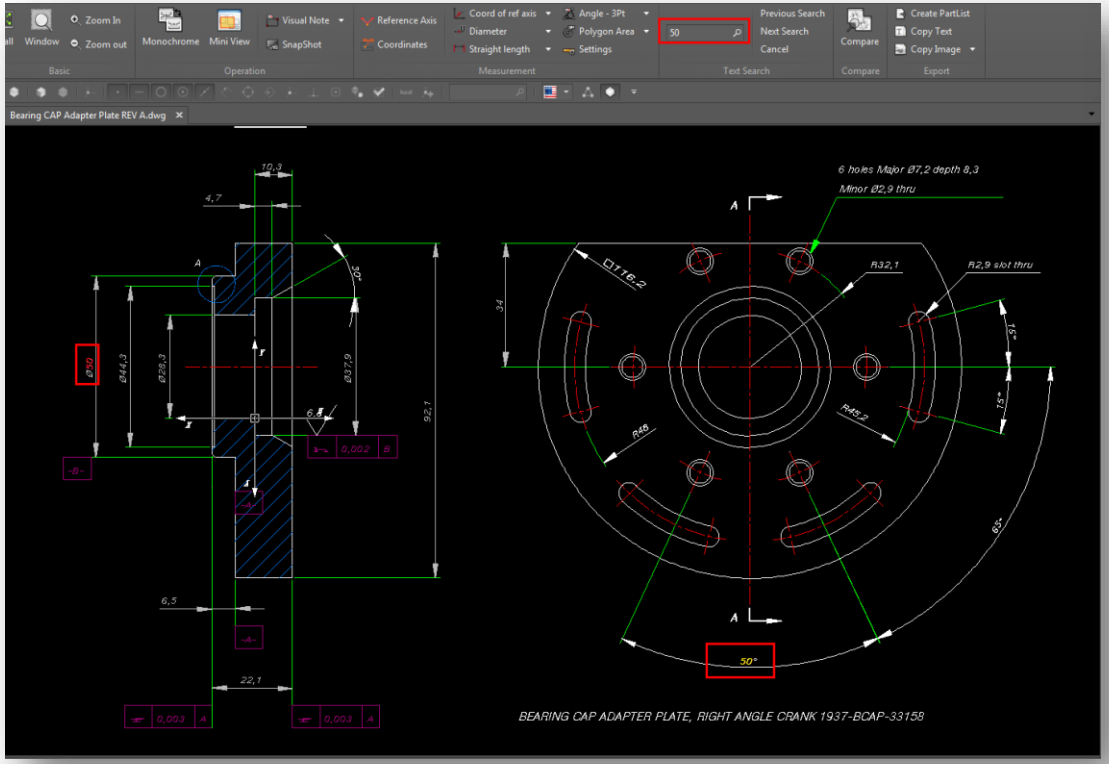
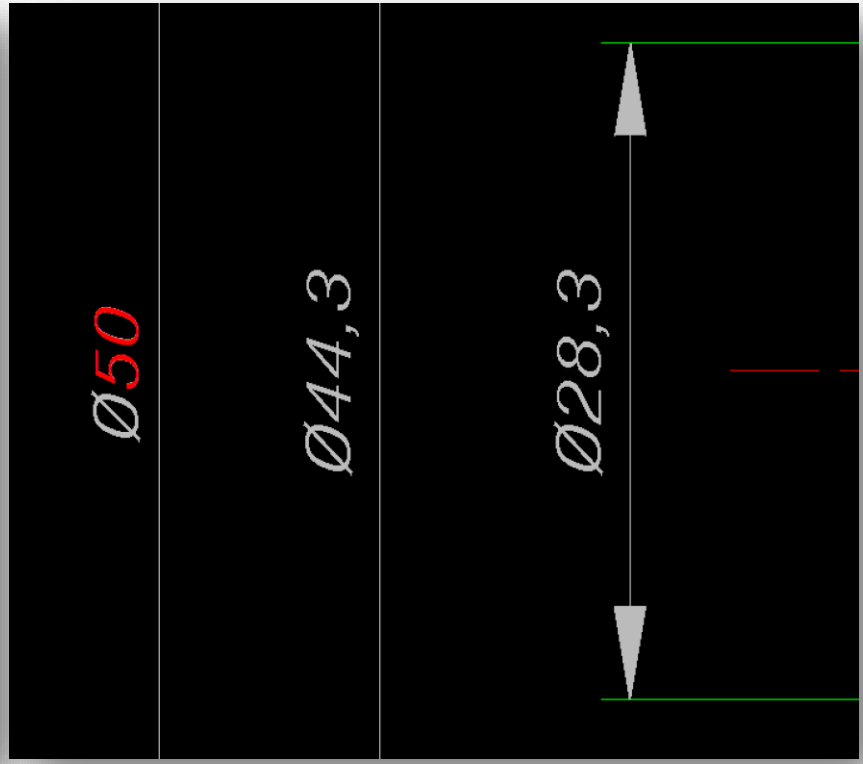
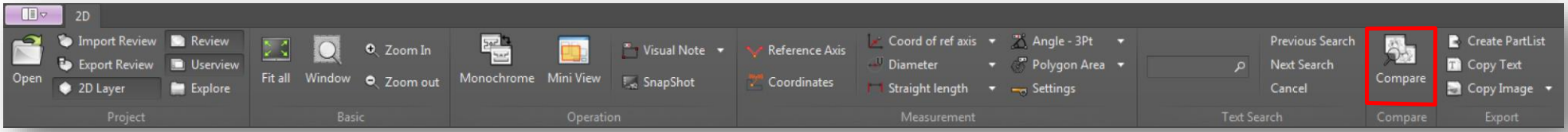
## Text Search Panel

Searches for text on current 2D drawing. The searched word will be color highlighted and the screen view will focus on it. Find previous and find next features are supported.



# 13. 2D Tab > Compare




## Compare Panel

**1) Compare Drawings:** Add, change color, compare deleted items in two drawings.

A) Compare drawings in a new window, select the drawings to be compared through "Open Comparison Drawings“ button.

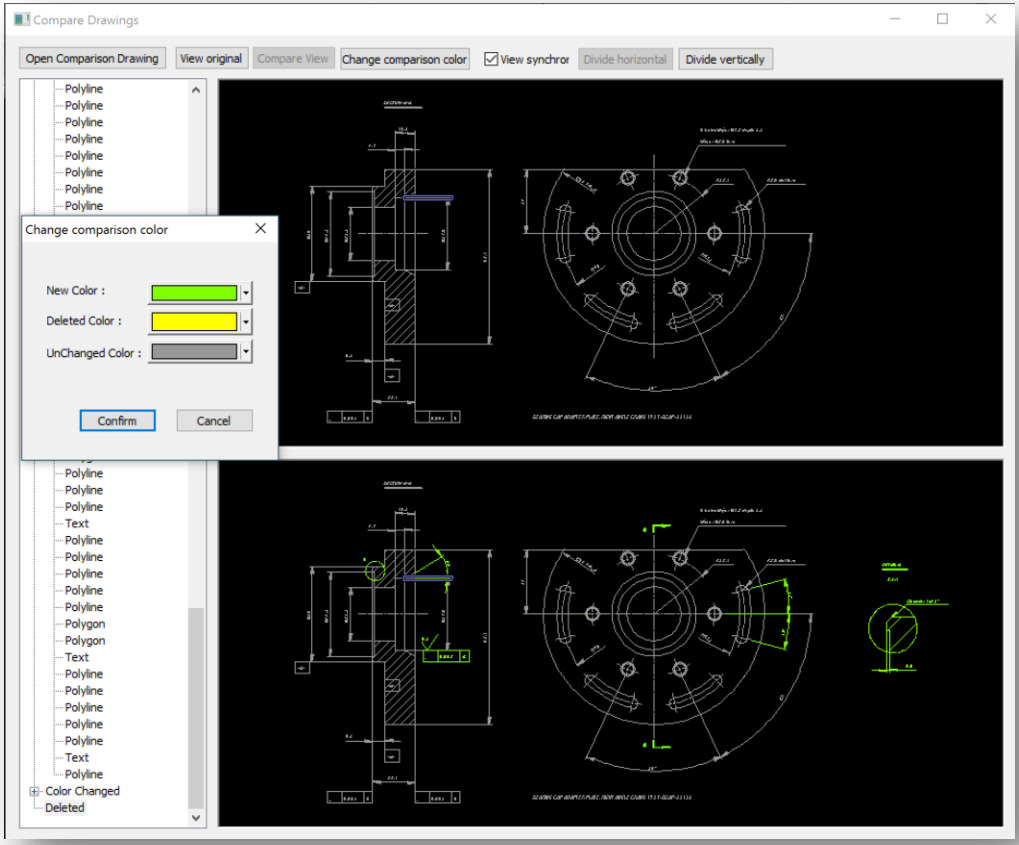
**2) View Original:** Shows both drawings as their original colors.

**3) Compare View:** Turns both drawings into compare view mode with predefined entities color.

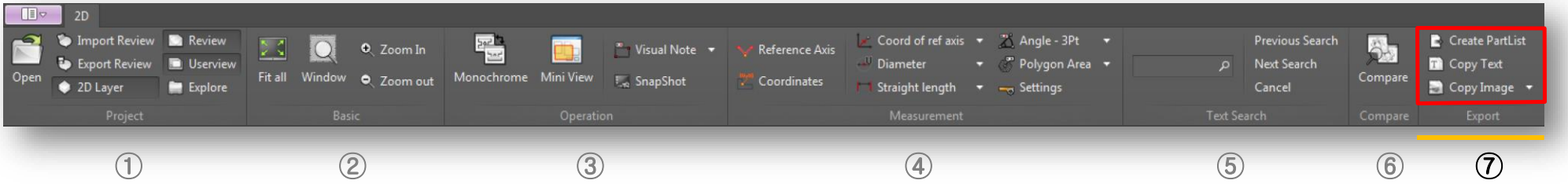
**4) Change comparison color:** Changes the color used in "Comparison view“.

**5) Synchronize view:** Uses both move and zoom in and out of both drawings by synchronizing.

**6) Divide:** Splits drawing views horizontally and vertically.



# 13. 2D Tab > Export

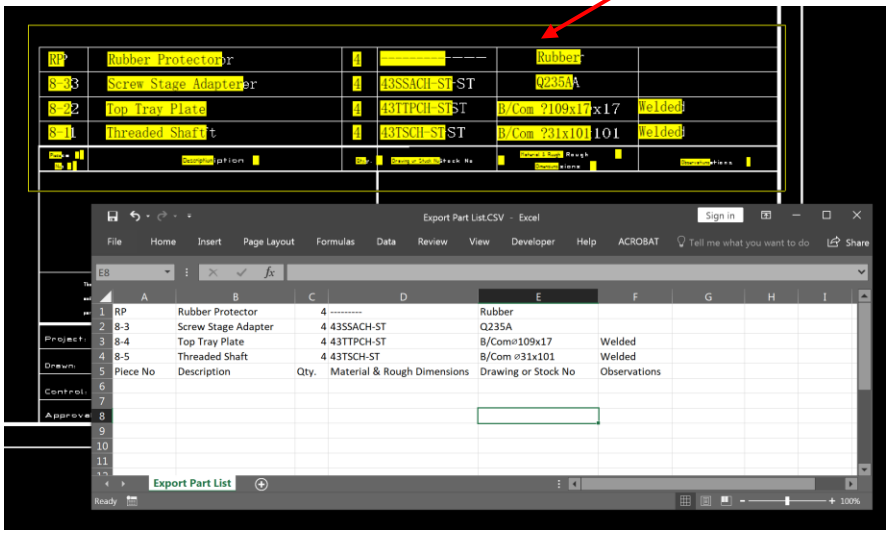



## Export Panel

1) **Create Part List:** Saves the text of the selected area as a .CSV file. Select the text area [Ctrl + Left mouse button], then save as * .CSV file by clicking the icon of part list creation icon.
2) **Copy Text:** Simply select the text area, click on "Copy Text" button, and paste (Ctrl + V) on any windows application open.
3) **Copy Image:** Copies a selected area of a drawing to an image.
4) **Copy Image White:** Copies a selected area of a drawing to an image with white background (CTRL+R).
5) **Copy Image Black:** Copies a selected area of a drawing to an image turning black color all geometry entities selected (CTRL+G).

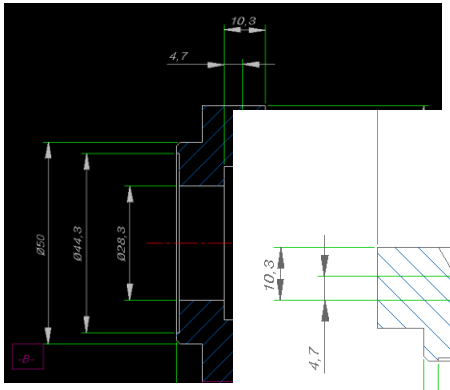
1) Select text in drawings

2) Copy text



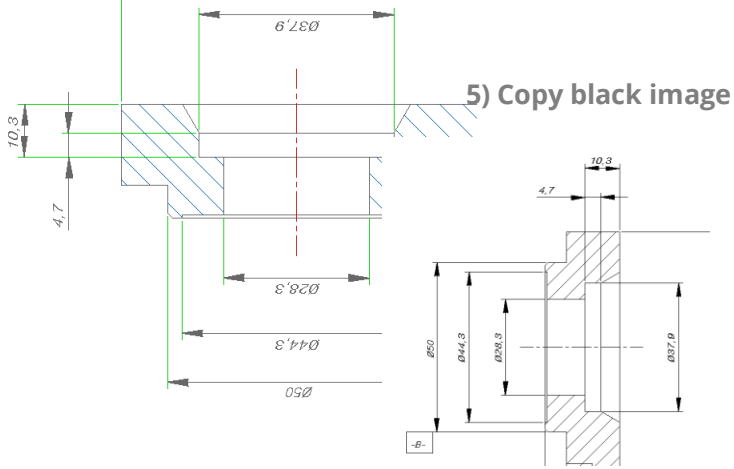

2) CSV file

3) Copy image

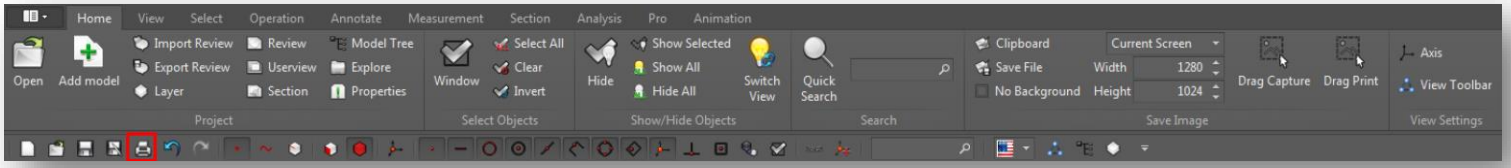


4) Copy white background image

5) Copy black image

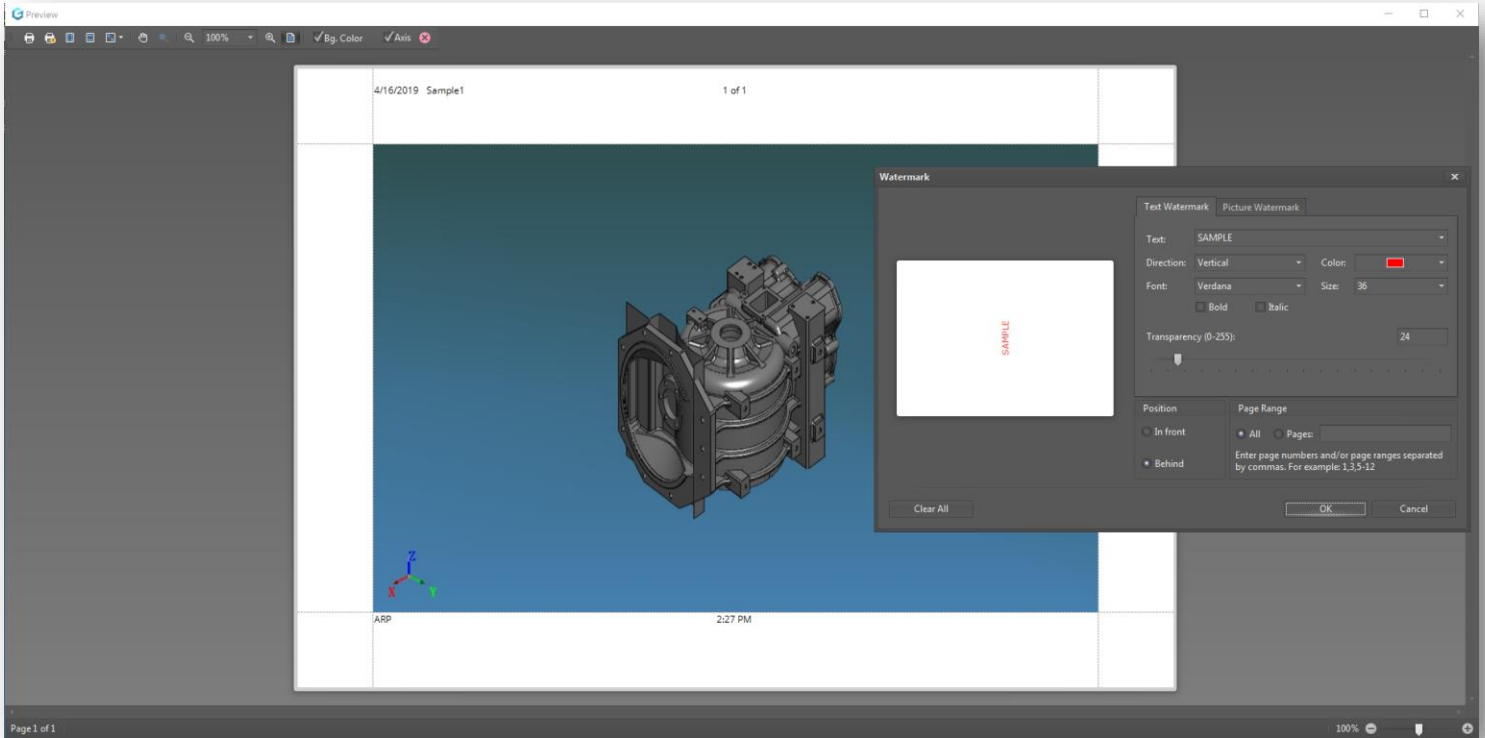


# 14. Print




## Print Window

Prints current file with several features:
-Prints with watermark (text or picture).
-Prints with Background Color.
-Prints with Axis.
-Prints with selected scale.
-Page setup supported.
-Prints with header and footer information.



Crank Shaft Pist.stp - 3D FastView Pro (Ver. 4.11.0 / 64-bit)
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Section
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Pro
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Import Review
Export Review
Layer
Review
Userview
Section
Model Tree
Explore
Properties
Project
Window
Select All
Clear
Invert
Select Objects
Hide
Show Selected
Show All
Hide All
Switch View
Show/Hide Objects
Quick Search
Search
Clipboard
Save File
No Background
Current Screen
Width
1280
Height
1024
Drag Capture
Drag Print
Save Image
Axis
View Toolbar
View Settings
Crank Shaft Pist.stp
3D
3D FastView
User Guide
Z
Y
X
3D
FastView
Rotate / Ortho.