



CAD Validation Report Manual

How to Read the Report

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1. Prerequisites to Browse Reports

1.1. System Requirements

Below are the supported environments to browse 3D HTML reports exported from “CAD Validation” Component.

OS	Windows 8.1 (32bit/64bit) Windows 10 (32bit/64bit)
Browser	Internet Explorer 11

Please note that it also requires Adobe Acrobat Reader by Adobe Systems Incorporated to browse 3D PDF reports.

Supported versions	Adobe Acrobat Reader DC or later
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1.2. Other Requirements

- **To Enable ActiveX Controls in Internet Explorer**

It utilizes Active X Controls to browse 3D HTML reports, so please ensure to enable ActiveX Controls from [Tools] > [Internet options] > [Security] tab.

- **To Browse Using Internet Connection (First Time Only)**

When browsing a 3D HTML report which is exported from this version of ASFALIS for the first time in that environment, please ensure to browse using Internet connection to set up ActiveX Control “FlgControlGV”. The setup will run automatically, and you will be asked to run as a user with Administrator roles in User Account Control dialog.

When in an environment without Internet connection, you can still set up ActiveX Control by running “RegisterFlgControlGV.bat” (add-on application for viewing 3D reports) as Administrator if it is included in the subfolder (with the same name as the exported report) of the exported 3D HTML validation report. (This is an optional component, and it means that the report does not include it when it does not exist in that subfolder.)

Once completed, you can view 3D HTML reports without Internet connection as well.

2. Validation Report File (3D HTML)

Exported validation reports have the following three tabs to easily view the CAD Validation results according to your needs.

- 2.1, “[Information] Tab”
- 2.2, “[Overview] Tab”
- 2.3, “[Detail] Tab”
- 2.4, “[Help] Tab”

2.1. [Information] Tab

You can check the followings in [Information] tab.

- Information on two files used for CAD Validation
- Information on CAD Validation process
- Settings used for CAD Validation


Validation Report

Information

Overview

Detail

Help



CAD Information

	First CAD Model	Second CAD Model
File Path	\\monster\TestModel\CadValidator\demo\V5_Assy_Conrod\originalRod_Assy_2.CATProduct	\\monster\TestModel\CadValidator\demo\V5_Assy_Conrod\mod3Rod_Assy_2.CATProduct
File Size	2 MB	2.1 MB
CAD Version	CATIA Version 5-6 Release 2014	CATIA Version 5-6 Release 2014
Executed CAD Version		

Execution Property

Processing Date	2019-10-03T04:43:51+09:00
Processing Time	36 sec.
Validated with Version	EX8.2
Length Unit	Millimeter
Number of Display Digit	6

Validation Settings

How to find the part to pair with	Auto
Unit system	millimeter
Direction of geometry comparison	Bi-directional
Min. distance to detect as difference	0.005000 mm
Max. distance to measure	10.000000 mm
Interval for point comparison	Auto (0.096000 mm)
Max. length to recognize as Chamfer	10.000000 mm
Max. radius to recognize as Fillet	10.000000 mm
Max. diameter to recognize as Round Hole	100.000000 mm
Max. deviation to recognize as Analytic Curve	0.010000 mm
Min. normal angle deviation to detect as difference	1.00000 degree
Max. normal angle deviation to detect as difference	40.00000 degree
Whether to ignore face flip	0
Min. distance to detect as difference (Exact - Tessellated)	0.100000 mm
Max. distance to measure (Exact - Tessellated)	1.000000 mm

2.2. [Overview] Tab

Overview tab allows you to confirm the total number of detected differences. In the list, the number of displayed items can be changed including displaying all the items, and it is possible to search and sort them as well. Differences can be confirmed closely in Detail tab by clicking the part name / assembly name.

- A. Total number of detected differences and non-differences per part/assembly
- B. Hyperlink to the details of that part/assembly
- C. Drop-down list to control the maximum number of parts/assemblies to display

Validation Report Information Overview Detail Help

Part

Show 10 entries

Search:

Component name		Face Geometry	Isolated Curve Geometry	Free Edge Geometry	Isolated Points	Exact - Tessellated Geometry	Exact - Tessellated Polyline Geometry	Exact - Tessellated Point Geometry	Note	Datum															
First Model	Second Model	Result	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	Same	Diff	Rem	Add	Same	Diff	Rem	Add
Bolt	Bolt	Same																							
CONROD-2	CONROD-2	Diff		4		4												8	2			2	1		
Nut	Nut	Same																							
Pin	Pin	Same																							
Piston	Piston	Diff		2																					
Rod(L)	Rod(L)	Same																							

Showing 1 to 6 of 6 entries

Assembly

Show 10 entries

Search:

Component name		Note	Datum	GD&T	Surface Finish	Dimension	Model View	System																		
First Model	Second Model	Result	Same	Diff	Rem	Add	Same	Diff	Rem	Add	Same	Diff	Rem	Add	Same	Diff	Rem	Add	Same	Diff	Rem	Add	Same	Diff	Rem	Add
Rod_Assy_2	Rod_Assy_2	Diff					1	1			4	1			1	1			4							

Showing 1 to 1 of 1 entries

- D. Search box to filter by part/assembly names, result category (Diff/First Model/Second Model) or the number of detected differences/non-differences

Validation Report Information Overview Detail Help

Part

Show 10 entries

Search:

Component name		Face Geometry	Isolated Curve Geometry	Free Edge Geometry	Isolated Points	Exact - Tessellated Geometry	Exact - Tessellated Polyline Geometry	Exact - Tessellated Point Geometry	Note	Datum	GD&T	Surface Finish																	
First Model	Second Model	Result	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	Same	Diff	Rem	Add	Same	Diff	Rem	Add	Same	Diff	Rem	Add
Bolt	Bolt	Same																											
CONROD-2	CONROD-2	Diff		4		4												8	2			2	1		4	1		5	1
Nut	Nut	Same																											
Pin	Pin	Same																											
Piston	Piston	Diff		2																									
Rod(L)	Rod(L)	Same																											

Showing 1 to 6 of 6 entries

After Searching

Part

Show 10 entries

Search: conrod

Component name		Face Geometry	Isolated Curve Geometry	Free Edge Geometry	Isolated Points	Exact - Tessellated Geometry	Exact - Tessellated Polyline Geometry	Exact - Tessellated Point Geometry	Note	Datum	GD&T	Surface Finish																	
First Model	Second Model	Result	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	OK	NG	Diff	Same	Diff	Rem	Add	Same	Diff	Rem	Add	Same	Diff	Rem	Add
CONROD-2	CONROD-2	Diff		4		4												8	2			2	1		4	1		5	1

Showing 1 to 1 of 1 entries (filtered from 6 total entries)

2.3. [Detail] Tab

In [Detail] tab, you can check the details of the validation results using "3D View", Assembly Tree, and Detail List.

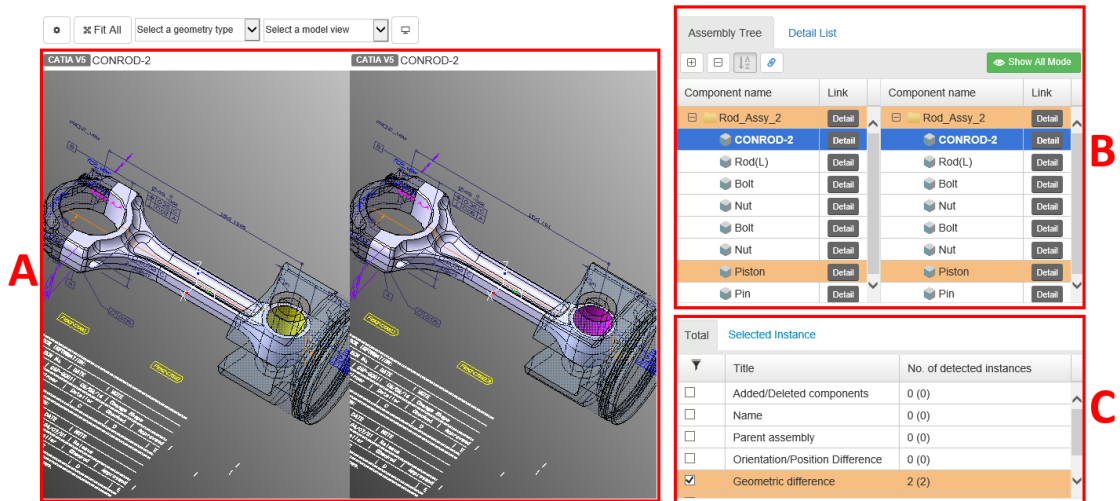
Please refer to [To Check Detailed Result](#) for more details about the procedures.

What you would like to check (Examples)	How to operate
Check the summary of PMI and attribute differences	In [Overview] tab, confirm the number of differences in the list, and then move to the preferred part / assembly
Check the differences related to PMI displayed on "3D View"	Specify PMI on "3D View" window to move to its PMI differences
Check PMI and attribute differences in detail	In [Detail List] tab, click [+] icon next to each element
Check geometry differences in detail	In [Detail List] tab, click [+] icon next to each difference
Check the overview of geometry differences	[3D View] > [Select a geometry type]
Do not fit when checking the detail differences	[3D View] > [Setting] icon > disable [Fit to Selected Element]
Check PMI differences per model view	[3D view]-[Select a model view]
Check differences by overlaying the views	[3D View] > [Setting] icon > enable [Display on Single View]
Check surrounding geometry differences as well when checking geometry differences in detail	[3D View] > [Setting] icon > disable [Show Only Neighboring Faces]
Check the differences of assembly structure	[Assembly Tree]

2.3.1. Descriptions

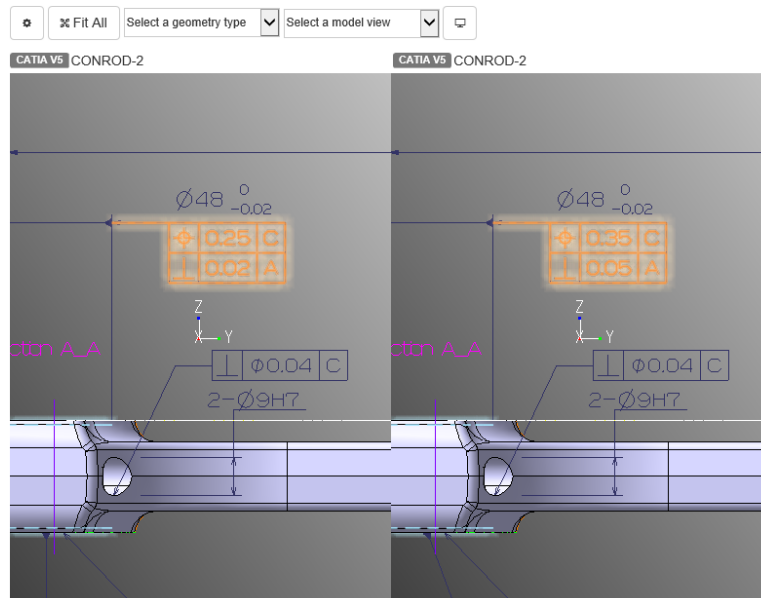
[Detail] Tab

- A. "3D View"
- B. [Assembly Tree] tab / [Detail List] tab
- C. [Total] tab / [Selected Instance] tab



3D View

You can check the detected differences visually in “3D View”.



Basic view operations are as follows. Left View and Right View are synchronized to each other as you manipulate the model in either view.

- Pan: Right-click anywhere in “3D View” and drag to move the model
- Zoom in / out: Middle-click (or hold down the mouse wheel) anywhere in “3D View” and drag to zoom in / out
- Rotate: Left-click anywhere in “3D View” and drag to rotate the model
- Select: Left-click an element to select elements
- Deselect: Left-click anywhere except the selected element to deselect the selected element
- Fix the rotation center: Right-click while holding down [Ctrl] key to fix the rotation center at the clicked point
- Release the rotation center: Right-click at a blank space in “3D View” while holding down

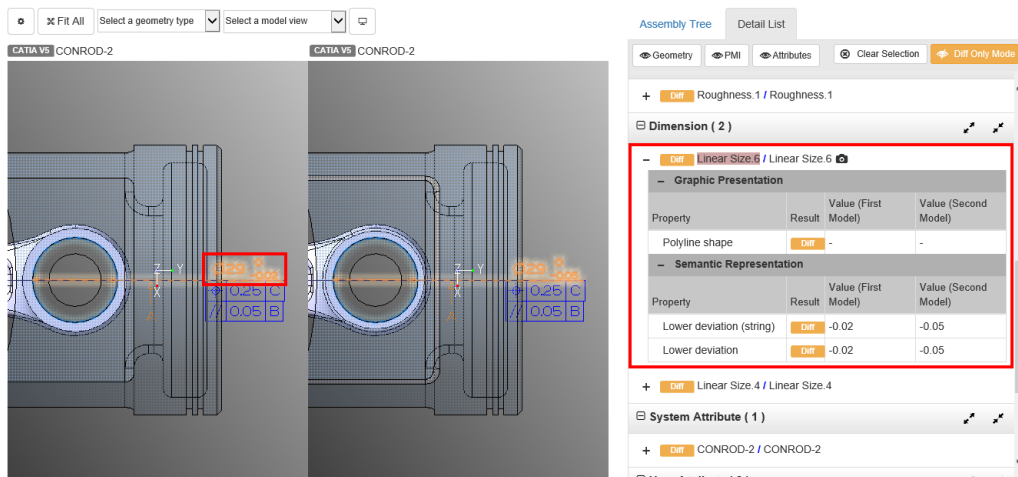
[Ctrl] key to release the rotation center

Selecting Elements in “3D View”

Select a PMI in “3D View”.

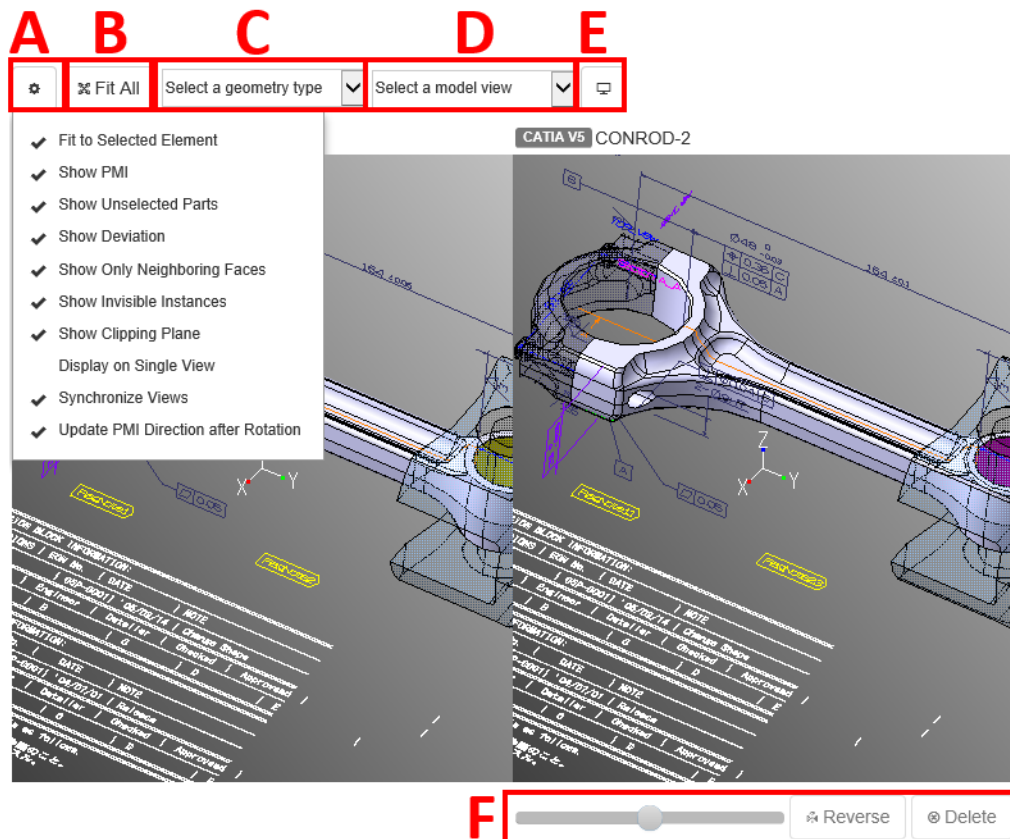
The selected PMI will be highlighted in “3D View”, and the corresponding element will be displayed in [Detail List] tab. (The detail list will be scrolled to display the selected PMI when [Detail List] tab is selected.)

Please note that you can select PMIs which belong to assembly only (PMIs which belong to child assemblies and child parts are not selectable) in “3D View”, even though, PMIs which belong to child assemblies and child parts will also be displayed in “3D View” when viewing an assembly in “3D View”.



[Tools for View Operation]

These are the tools to optimize the view for efficient view operation.



A. [Function ()] button

- Fit to Selected Element
Specify whether to fit the view to the element selected in “3D View” or [Element] list.
 - Enabled: Fit the View to the selected element
 - Disabled: Don’t fit the View
- Show PMI
Specify whether to show all PMIs.
 - Enabled: Show all PMIs
 - Disabled: Show the PMI selected in “3D View” / “Detail List” only
- Show Unselected Parts
Specify whether to show all parts including unselected parts.
 - Enabled: Show all parts including unselected parts This is useful to check where in the entire model the selected part is.
 - Disabled: Show the part selected in “3D View” / “Detail List” only
- Show Deviation
Specify whether to show all parts including unselected parts.
 - Enabled: Show all parts including unselected parts
This is useful to check where in the entire model the selected part is.
 - Disabled: Show the part selected in “3D View” / “Detail List” only

- Show Only Neighboring Faces

Specify whether to show adjacent faces only (hide all the rest). This is effective on differences on geometry only.

- Enabled: Show adjacent faces only
This is useful to check the deviation in detail.
- Disabled: Show all faces

Enable to show a section at the specified face. You can move the section forward / backward using the slider beneath the “3D View”. This is useful to check the geometry behind the other model when in Overlay mode.

- Show Invisible Instances

Enable to show the hidden instances. Hidden Instances are not shown by default.

- Show Clipping Plane

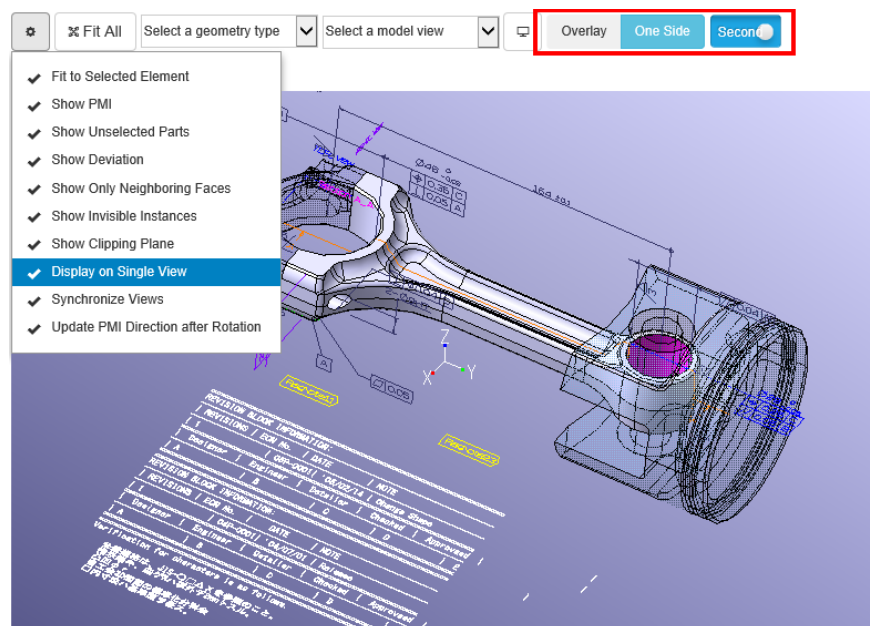
Specify whether to show a section at the specified face.

- Enabled: Show a section at the specified face
You can move the section forward / backward using the slider beneath the “3D View.”
This is useful to check the geometry on both models when in Overlay mode.
- Disabled: Don't show a section

- Display on Single View

Specify whether to show model(s) in single view.

- Enabled: Show model(s) in single view
You can select either;
 - Overlay both the first and the second models
 - Show either the first or the second model only, and toggle them



- Synchronize Views

Enable to synchronize Left View and Right View as you manipulate the model in either

view.

- Update PMI Direction after Rotation

Enable to auto-update the orientation of PMI in view operation to keep them front-sided while manipulating the model in the view. It is recommended to disable this option when checking the differences on polyline PMI.

B. [Fit All] button

Click this button to fit the model to view. (The model size will be adjusted automatically for your window size.) Please note that PMIs may go out of “3D View”.

C. [Select a geometry type] drop-down list

Select a geometry type from “Select a geometry type” drop-down list to display all the detected differences on the assembly model per geometry type

D. [Select a model view] drop-down list

Select a Model View to filter the PMI to display.

Only PMIs related to the selected Model View will be displayed in “3D View” and Detail List. Select [Exit Model View Mode] from the drop-down list to exit Model View mode and display all PMIs in “3D View” and Detail List.

E. [Change View Orientation] button

Click this button and select a view direction (Front / Back / Left / Right / Top / Bottom / Isometric)

F. Tools to adjust the section

- Slide bar

Use the slide bar to move the section forward (move the slider to the left) / backward (move the slider to the right) along its axis.

- [Reverse] button

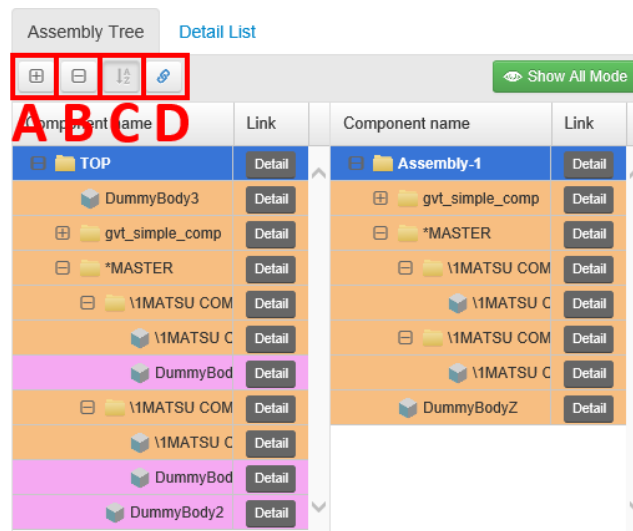
Click this button to switch the side to show (show the other side of the section).

- [Delete] button

Click this button to release the section view, and go back to normal view mode.

2.3.2. [Assembly Tree] Tab

You can check the differences on the assembly structure here.



Each instance will be classified into following three types;

- No highlighting (White): Is the same between left model and right model
- Highlighted in orange: Is different between left model and right model
- Highlighted in pink: Exists in either (left or right) model only
- Blue : Currently selected instance on "3D View" or Summary List.

And the instance will be highlighted in blue when it is selected in “3D View” or Summary list.

A. [Expand All]

Click this to expand the whole assembly model (display all instances).

B. [Collapse All]

Click this to collapse the whole assembly model (display the top assembly only).

C. [Sort Alphabetically]

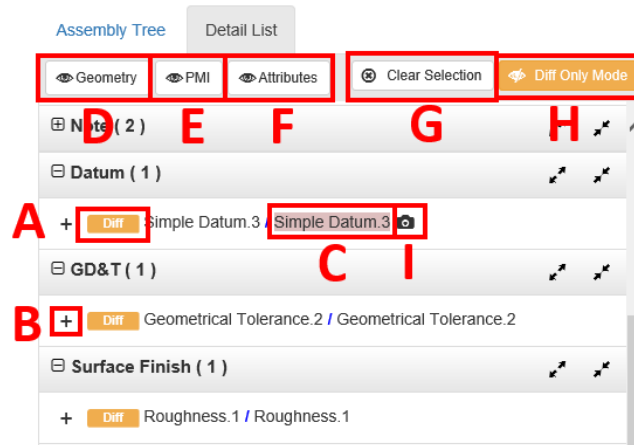
Enable to sort the assembly tree alphabetically (A to Z). It is disabled by default, and displayed as in the CAD systems.

D. [Synchronize assembly trees]

Enable to synchronize the assembly tree (left / right) to the other as you scroll, expand or collapse in either tree.

2.3.3. [Detail List] Tab

You can check the details of each difference.



A. Validation result label

A label will be displayed for each item in [Detail List] tab.
(The following list is available in [Help] page as well.)

Label	Description
Same	The element / value is identical between the first and second model
Diff	The element / value is different between the first and second model
Rem	The element / value is removed
Add	The element / value is added
Ref	For your reference, the validation was not performed on this particular element
OK	“OK” flag has been set by a user for the detected difference
Reject	“Reject” flag has been set by a user for the detected difference

B. [+] icon

Click this icon to view the property of corresponding element and the values of first and second models.

For example,

- Datum

Diff

Simple Datum.3 / Simple Datum.3

Graphic Presentation

Property	Result	Value (First Model)	Value (Second Model)
Polyline shape	Diff	-	-
Bounding box	Diff	27.6693 5.18786 -39.6752	27.6692 7.73922 -44.6952
		27.6693 12.1878 -12.9995	27.6693 22.597 -12.6534

Presentation Placeholder

Property	Result	Value (First Model)	Value (Second Model)
Position	Diff	27.6694 8.68775 -36.1752	27.6694 19.0969 -41.1953

◦ Dimension

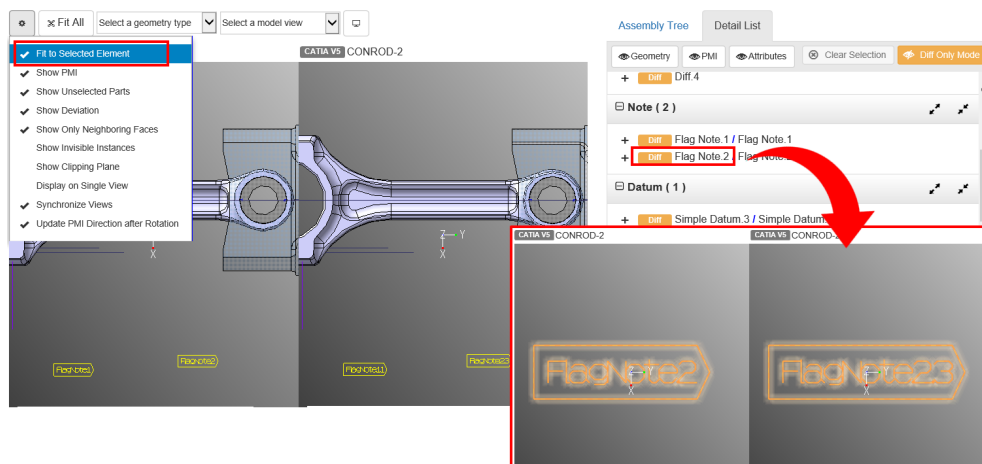
Diff Linear Size.4 / Linear Size.4

Graphic Presentation			
Property	Result	Value (First Model)	Value (Second Model)
Polyline shape	Diff	-	-
Semantic Representation			
Property	Result	Value (First Model)	Value (Second Model)
Upper deviation	Diff	0.05	0.1
Lower deviation	Diff	-0.05	-0.1
Upper/lower deviation (string)	Diff	#{plus-minus}0.05	#{plus-minus}0.1

C. Selecting elements

Click the name of each element (PMI, geometry or Model View) to select them.

Regarding the differences on PMI or geometry, the selected element will be highlighted in the Detail List. And “3D View” will fit to the selected element when in [Fit to Selected Element] mode.



D. [Geometry]

Enable to show the result on geometry validation.

E. [PMI]

Enable to show the result on PMI validation.

F. [Attributes]

Enable to show the result on attribute validation.

G. [Clear Selection] button

Click this button to deselect the selected element. This will also

- Stop highlighting the selected element in “3D View”
- Stop showing the selected element only in “3D View” (*1)
- Stop filtering the PMI to display in “3D View” by the selected model view (*1)

H. [Diff Only Mode] / [Show All Mode] button

Click this button to set whether to filter elements to show in [Detail List] tab to those with differences only. This button shows the current mode you are in.

Assembly Tree Detail List

Geometry PMI Attributes Clear Selection Diff Only Mode

+ Diff Roughness.1 / Roughness.1

Dimension (2)

- Diff Linear Size.6 / Linear Size.6

Graphic Presentation			
Property	Result	Value (First Model)	Value (Second Model)
Polyline shape	Diff	-	-

Semantic Representation			
Property	Result	Value (First Model)	Value (Second Model)
Lower deviation (string)	Diff	-0.02	-0.05
Lower deviation	Diff	-0.02	-0.05

- Diff Linear Size.4 / Linear Size.4

Graphic Presentation			
Property	Result	Value (First Model)	Value (Second Model)
Polyline shape	Diff	-	-

Semantic Representation			
Property	Result	Value (First Model)	Value (Second Model)
Upper deviation	Diff	0.05	0.1
Lower deviation	Diff	-0.05	-0.1
Inner/outer deviation	Diff	#nlvc_minvc10.05	#nlvc_minvc10.1

Assembly Tree Detail List

Geometry PMI Attributes Clear Selection Show All Mode

+ Same Roughness.6 / Roughness.6

Dimension (7)

- Diff Linear Size.6 / Linear Size.6

General Attribute			
Property	Result	Value (First Model)	Value (Second Model)
Name	Same	Linear Size.6	Linear Size.6
Layer number	Same	101	101
Visibility	Same	ON	ON
Pickable flag	Same	ON	ON

Graphic Presentation			
Property	Result	Value (First Model)	Value (Second Model)
Polyline shape	Diff	-	-
Bounding box	Same	-7.1371 149.5 15 0.557468 234.981 15	-7.1371 149.5 15 0.557468 234.981 15

Related Element			
Property	Result	Value (First Model)	Value (Second Model)
Related elements	Same	Edge.402 Edge.403	Edge.435 Edge.436

Semantic Representation			
Property	Result	Value (First Model)	Value (Second Model)

I. Icon to apply the model view

Click this icon to apply Model View(s) which the selected PMI belongs to. When there are multiple Model Views available, click several times to apply them in turn.

Left-click while holding down [Ctrl] key, or keep clicking the icon to exit the Model View mode.

[Total] tab

This table shows the summary of the validation result. Check off the element types to ignore the detected differences on that element type, and the [Assembly Tree] tab will be updated.

Total	Selected Instance	
▼	Title	No. of detected instances (parts)
<input checked="" type="checkbox"/>	Added/Deleted components	3 (2)
<input checked="" type="checkbox"/>	Name	2 (2)
<input type="checkbox"/>	Parent assembly	0 (0)
<input type="checkbox"/>	Orientation/Position Difference	0 (0)
<input checked="" type="checkbox"/>	Geometric difference	5 (4)
<input type="checkbox"/>	PMI difference	0 (0)
<input checked="" type="checkbox"/>	Attribute difference	10 (8)



[No. of detected instances (parts)] column shows the total number of instances which difference(s) have been detected on. The figure in the brackets shows that per component.

- [Added/Deleted components]

Shows the total number of instances (components) which does not have a pair in the other model.

- [Name]

[Parent assembly]

- Shows the total number of paired instances (components) that belong to an assembly which does not have a pair in the other model.

- Shows the total number of paired instances (components) which do not match to each other on the instance path matrix.

- Shows the total number of paired instances (components) which do not match to each other on the geometry.

- Shows the total number of paired instances (components) which do not match to each other on the PMI (graphic / semantic).

- Shows the total number of paired instances (components) which do not match to each other on the attribute value.

[Selected Instance] tab

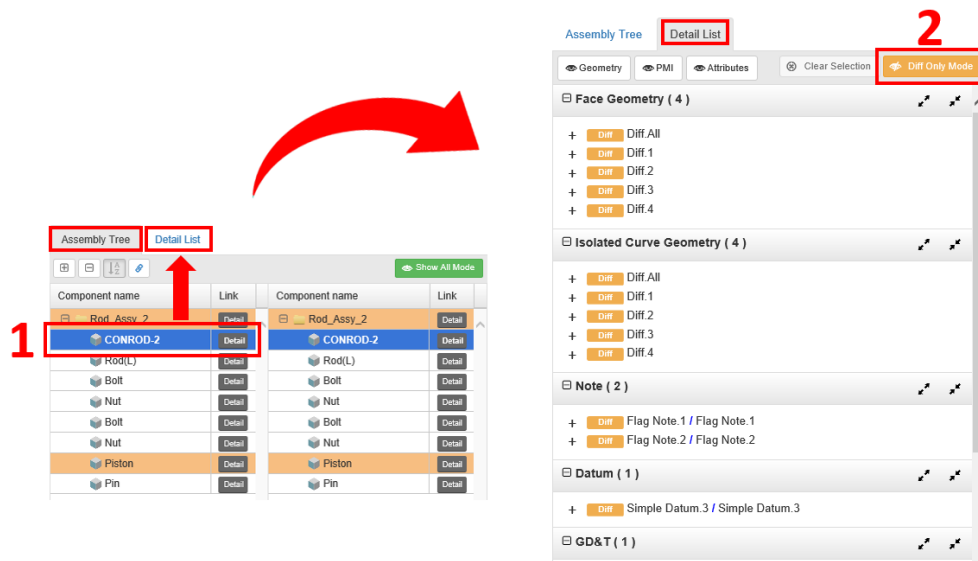
This table shows whether any differences have been detected on the selected instance (component) per element type (Name, Parent assembly, Orientation/Position Difference, Geometric difference, PMI difference, and Attribute difference). Check off the element types to ignore the detected differences on that element type, and the [Assembly Tree] tab will be updated.

Total		Selected Instance
▼	Title	Differences found
<input checked="" type="checkbox"/>	Name	None (\1MATSU COMBI / \1MATSU COMBI)
<input type="checkbox"/>	Parent assembly	None (\1MATSU COMBI / \1MATSU COMBI)
<input type="checkbox"/>	Orientation/Position Difference	None (1 5.35325e-18 5.55112e-17 -15 -5.35325e-18 5.55112e-17 -15 -5.35325e-18 5.55112e-17)
<input checked="" type="checkbox"/>	Geometric difference	Yes
<input type="checkbox"/>	PMI difference	None
<input checked="" type="checkbox"/>	Attribute difference	Yes

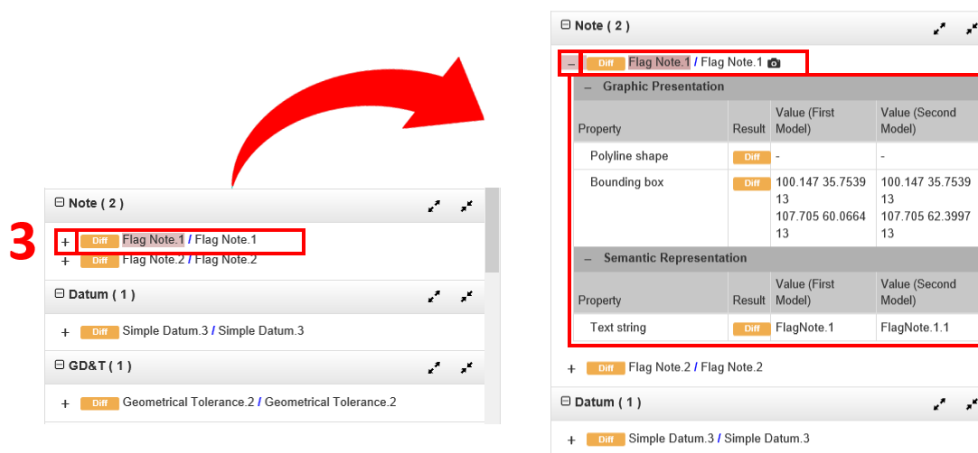
2.3.4. To Check Detailed Result

1. Select a part in [Assembly Tree] tab, and then click [Detail List] tab to check the details of detected differences on the selected part on system attribute, user attribute, PMI, B-rep attribute (such as color, transparency and display attribute) and geometry.
2. Click [Show All Mode] button to switch to [Diff Only Mode] and display elements with

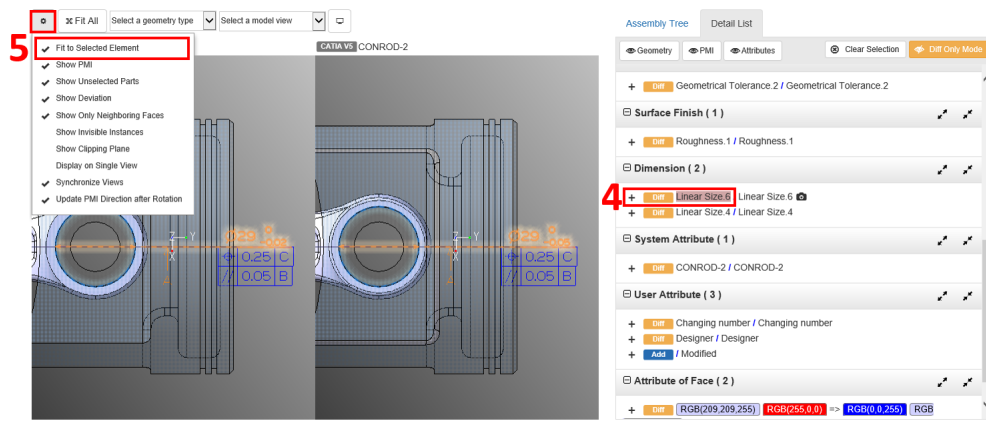
differences only.



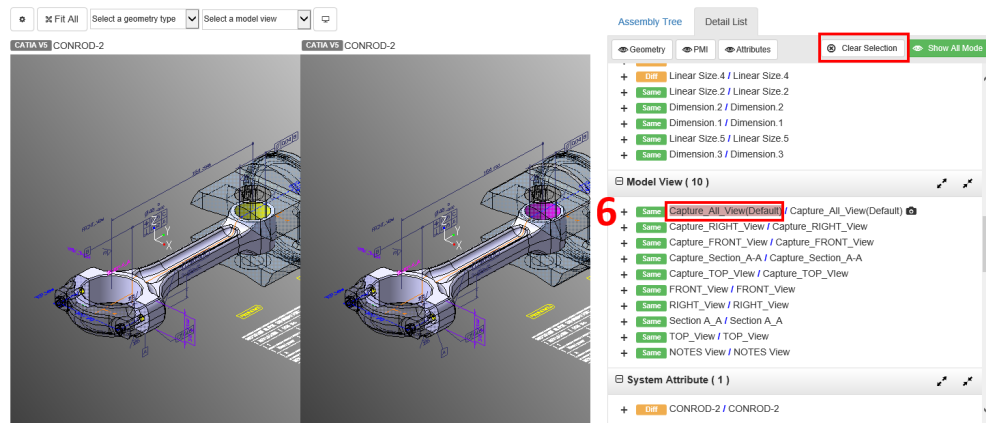
- Click [+] icon in the list to expand and view the details. The result will be displayed in table format.



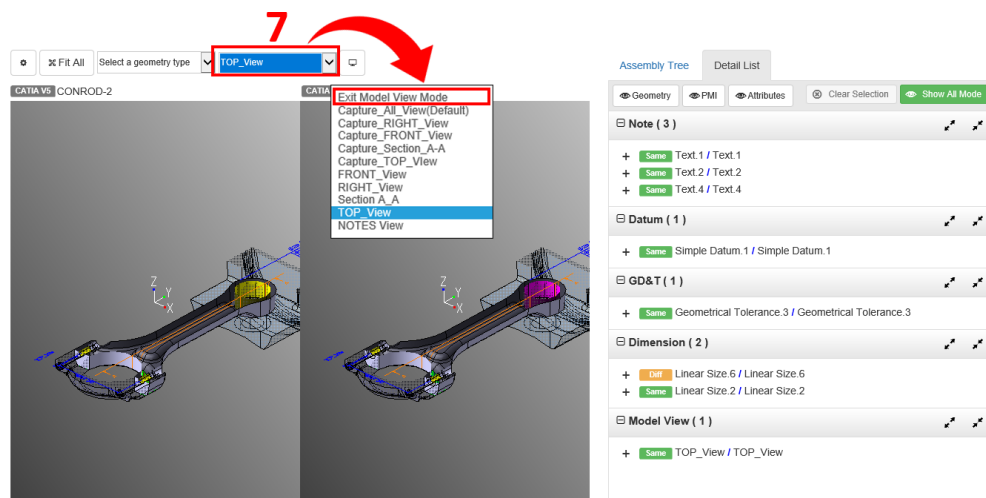
- Regarding the differences on PMI, B-rep attribute and geometry, you can also check the differences visually in “3D View”. Click an element in [Detail List] tab, and the selected element will be highlighted and zoomed to fit in “3D View”.
- Disable [Fit to Selected Element] from the function button (⚙️ at the left end) to stop fitting to the selected element. This is effective when you wish to view the selected element from the distance including surroundings.



- Click an element in “Model View” list in [Detail List] tab to view the model from the defined viewpoint with related PMIs only. Click [Clear Selection] button above “3D View” to release the selection and go back to standard view mode.



- Select a defined Model View from [Select a model view] drop-down list to check the differences on PMI per Model View. [Detail List] tab will also be updated to display related PMIs only. This is useful when you wish to check specific (related to Model View) PMIs only. Select [Exit Model View Mode] from the drop-down list to go back to standard view mode



- Select “Diff.All” at the top of each element type, such as “Face”, “Isolated curve” etc., to view the differences on geometry. All the differences on the selected geometry type will be displayed in a color map for entire part. Select any difference, such as “Diff.1” or “Diff.2”, to

fit to each difference and view in detail.

In the color map, the gradation shows the amount of the difference between the first and the second models; the stronger the color is, the larger the difference is.

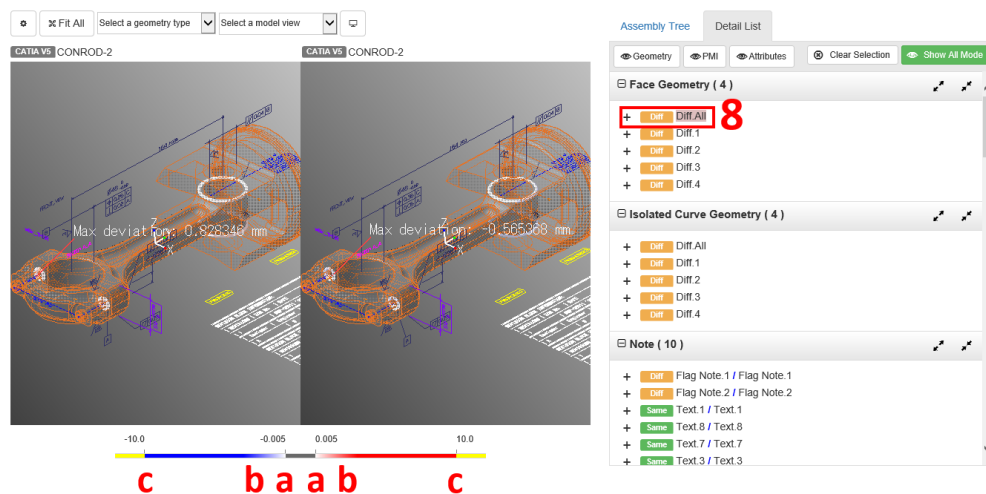
For the face geometry, the color map also shows the direction as follows;

- Red: Convex to the other
- Blue: Concave to the other
- Yellow: Difference is larger than the max. value to detect (Common for both directions)


For Isolated Curve Geometry, Free Edge Geometry, Face Normal Direction, and Exact - Tessellated Geometry, red for both directions, and the stronger the color is, the larger the difference is.

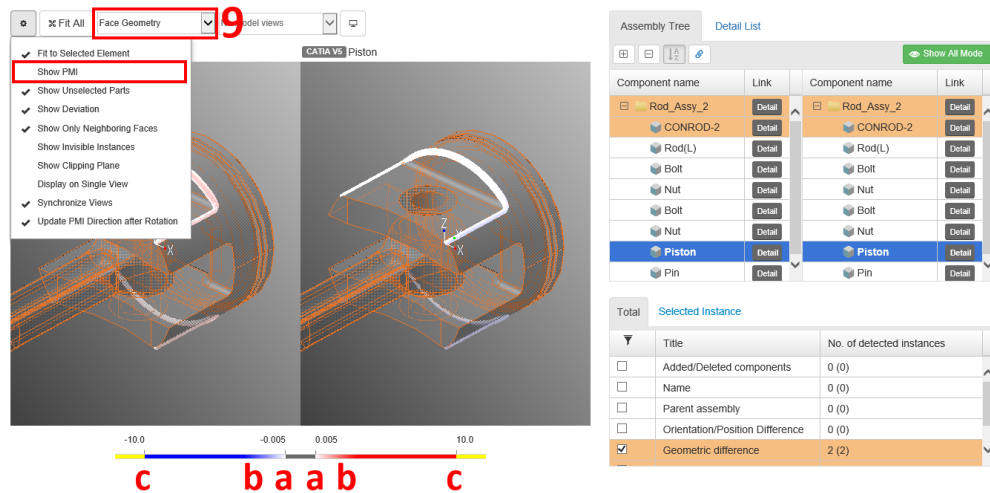
The color bar shows the followings;


1. Min. distance to detect as the difference
2. Largest difference for color gradation
(Differences larger than this value will be displayed in the same darkness.)
3. Max. distance to detect as the difference




9. Select a geometry type from “Select a geometry type” drop-down list to display all the detected differences on the assembly model per geometry type.
Parts that do not have a pair in the other model will be highlighted in yellow.

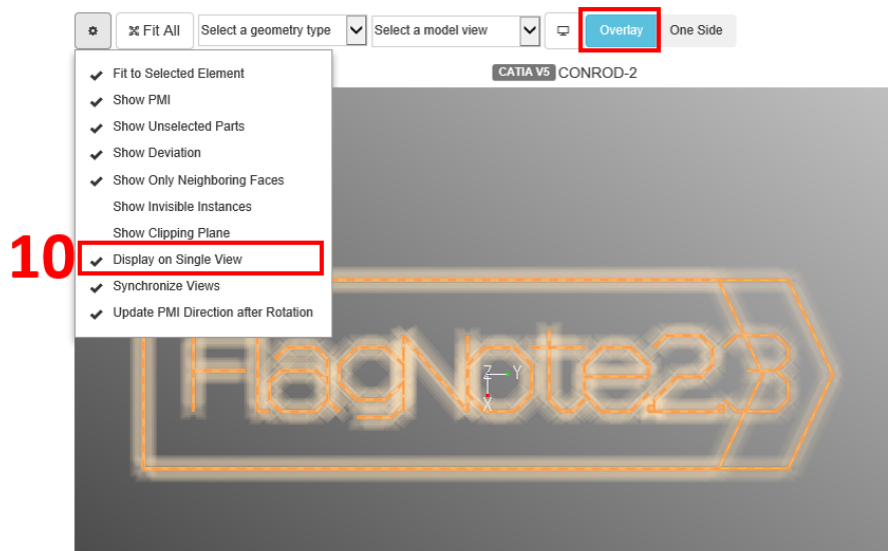
Enable/disable [Show PMI] from the function button ( at the left end) in combination to show/hide PMIs. Only the PMI selected in “3D View”/“Detail List” will be shown when disabled, which is useful when you wish to check the difference on geometry, or selected PMI.



10. Enable [Display on Single View] from the function button ( at the left end), and select [Overlay] to overlay the first and the second models to visually check the differences. Or select [One Side], and toggle [First] / [Second] to show the first and the second model alternately.

Also adjust the following display settings from the function button ( at the left end) as appropriate.

- [Show Unselected Parts]
Disable to hide unselected parts (show the part which the selected geometry or PMI belongs to, only). This is useful when there are other parts that overlap the selected element in the front.
- [Show Deviation]
Disable to disable color map display. This is effective when you are in “Geometry Diff” mode, and useful when checking differences on faces, e.g., with/without fillets.
- [Show Only Neighboring Faces]
Enable to show adjacent faces only (hide all the rest). This is effective on differences on geometry only. This is useful to check the deviation in detail.
- [Show Clipping Panel]
Enable to show a section at the specified face. You can move the section forward/backward using the slider beneath the “3D View”. This is useful to check the geometry behind the other model when in Overlay mode.



2.4. [Help] Tab

[Help] tab shows the basic instructions and descriptions on 3D HTML reports.

Validation Report
Information
Overview
Detail
Help
ELYSIUM

How To View Reports

- 3D models are not displayed at first. Enable ActiveX "FLG Control" in order to make them show up.
- View the list of components in the "Overview" tab. View assembly structure in the "Assembly tree" inner tab which can be accessed from the "Detail" tab. In order to view comparison results in more detail, click a component in either view.

How To Operate 3D View

Motion	Operation
Pan	Right-click and drag
Zoom in/out	Scroll the mouse wheel, or middle-click and drag
Rotate	Left-click and drag
Select	Left-click a highlighted element (*1)
Deselect	Left-click an empty space in the view, or click [Clear Selection] button at the top
Fix Rotation Center	Right-click an element while holding down [Ctrl] key.
Release Rotation Center	Right-click an empty space in the view while holding down [Ctrl] key.

- First and second model's views are synchronized to each other.
- (*1) The View will fit to the selected element, and the list will scroll to the selected element if displayed in [Element List] tab.

Description of Labels

Label	Description
Same	The element/value is identical between the first and second model
Diff	The element/value is different between the first and second model
Rem	The element/value is removed
Add	The element/value is added
Ref	This is just for your reference, the validation was not performed on this element
OK	"OK" flag has been set by a user for the detected difference
Reject	"Reject" flag has been set by a user for the detected difference

Special Property Values

Value	Description
empty	Unused item
unknown	Undefined item
(No name)	A dummy name is inserted since the original name was blank
<i>Italic text</i>	Element types which were excluded when comparing, or are not supported in comparison
+	Line break symbol (in "String" properties)

Requirements

- Internet Explorer 11
- ActiveX control enabled

3. Validation Report File (3D PDF)

Exported validation reports consist of following pages to easily view the Geometry Validation results according to your needs.

- [3.1, “\[Detail\] Page”](#)
- [3.2, “\[Summary\] Page”](#)
- [3.3, “\[Information\] Page”](#)
- [3.4, “\[Help\] Page”](#)



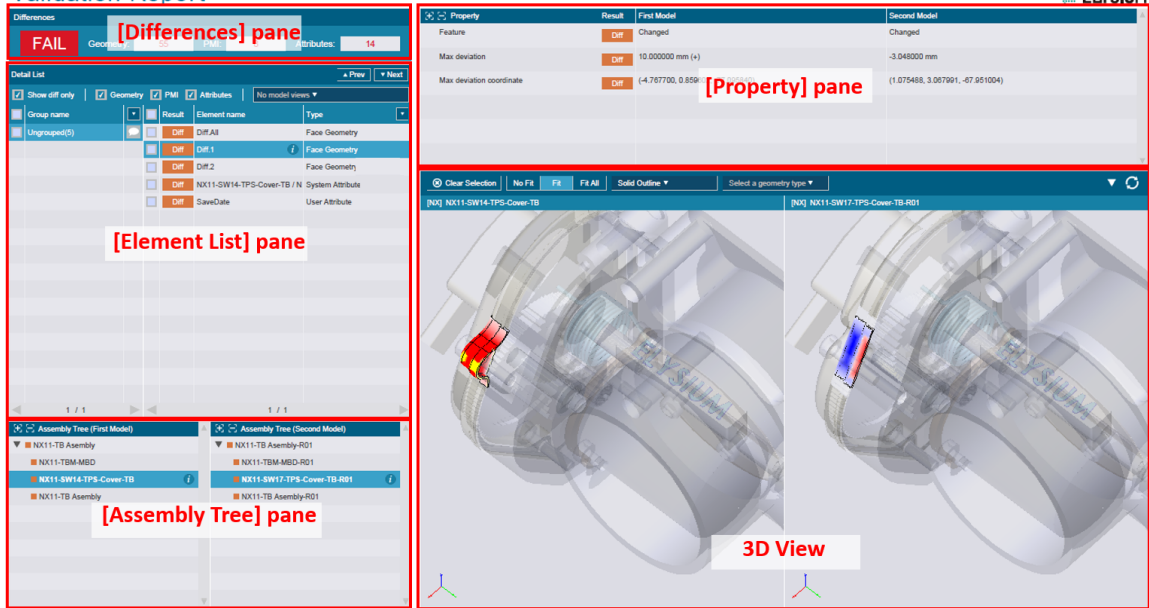
Apart from the regular Validation Report (3D PDF format), you can also create a Validation Report (3D PDF format) which can be viewed smoothly by simplifying the appearance. To create such a report, you need to set parameters when creating a report; therefore, please ask your system administrator. Please refer to [3.5, “Simplified-appearance Validation Report \(3D PDF format\)”](#) for details on how to operate the Simplified-appearance Validation Report.

3.1. [Detail] Page

You can check the CAD Validation result in detail in the following tables along with the 3D view;

- 3D View
- [Differences] Pane
- [Detail list] Pane
- [Assembly Tree (First Model / Second Model)] Pane
- [Property] Pane

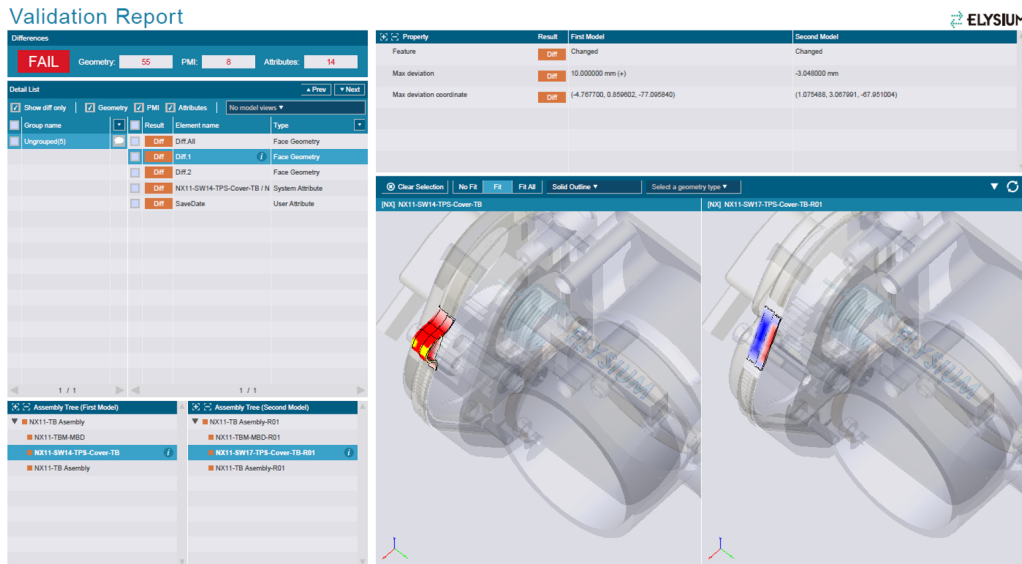
Validation Report



What you would like to check (Examples)	How to operate
Check the summary of PMI and attribute differences	In [Overview] tab, confirm the number of differences in the list, and then move to the preferred part / assembly
Check the differences related to PMI displayed on "3D View"	Specify PMI on "3D View" window to move to its PMI differences
Check PMI and attribute differences in detail	[Detail List] tab > Select preferred element > [Property] pane
Check geometry differences in detail	[Detail List] > [Geometry]
Check the overview of geometry differences	[3D View] > [Select a geometry type]
Do not fit when checking the detail differences	[3D View] > disable [Fit to Selected Element]
Check PMI differences per model view	[Detail List] > [Model view]
Check differences by overlaying the views (When output in Single View mode)	[3D View] > disable [Overlay]
Check the differences of assembly structure	[Assembly Tree]

3.1.1. 3D View

You can check the detected differences visually in “3D View”. You can also use the built-in functions of Adobe Acrobat Reader for advanced capabilities such as changing rendering mode, measuring dimensions, and so on. Please refer to the help page of Adobe Acrobat Reader available from [Help] > [Online Support].



Basic View Operation

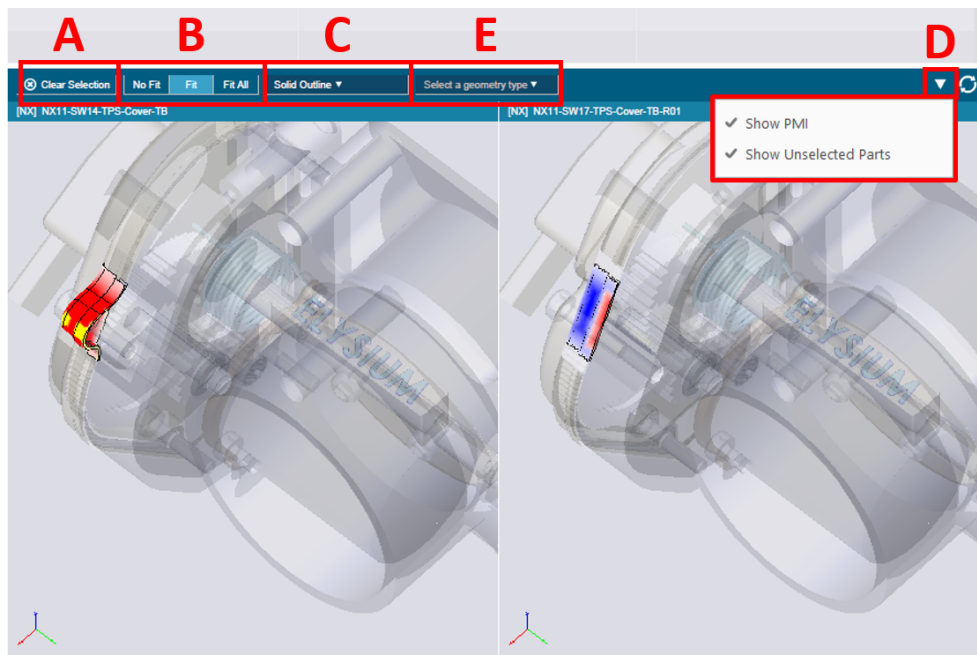
Basic view operations are as follows. Left View and Right View are synchronized to each other as you manipulate the model in either view.

- Pan: Left-click anywhere in “3D View” and drag while holding down [Ctrl] key to move the model
- Zoom in/out: Right-click anywhere in “3D View” and drag to zoom in/out
- Rotate: Left-click anywhere in “3D View” and drag to rotate the model
- Select: Left-click an element to select elements

Selecting Elements in “3D View”

Select a PMI or geometry with differences in “3D View”.

The selected element will be highlighted in “3D View” when selecting a geometry, and the view will fit to the selected element as well when selecting PMIs. Tables in [Element List] pane, [Assembly Tree (First Model / Second Model)] pane, and [Property] pane will be updated accordingly.



A. [Clear Selection] button

Click this button to clear the selection and go back to the neutral state. Tables in “Property” pane will be cleared, and the highlight in “3D View” will be removed.

B. [No Fit]/[Fit]/[Fit All] button


Toggle among the fit method for the selected element. Each time you switch, "3D View" is updated.

- [No Fit] button
Check this option to not fit the view to the selected element although selected.
- [Fit] button
Check this option to fit the view to the element selected in “3D View” or [Element List].
- [Fit All] button
Click this button to fit the view to the model including PMIs. (The model size will be adjusted automatically for your window size.)

C. [Rendering Mode]

Toggle the rendering mode of "3D View". You can select either Solid outline, Solid or Transparent.

D. [Show / Hide]

Toggle show / hide of PMI and unselected parts. You can set from () icon at the top right of "3D View". Check off the option to hide.

- [Show PMI]
Check this option to show / hide all PMIs in “3D View” window. Only the selected PMI will be shown when checked off.
- [Show Unselected Parts]
Check this option to show / hide all parts including unselected parts. Disable this option to confirm the position of the selected part, even though it may be remote,

because the entire model is displayed.

E. [Select a geometry type] pull-down list

Select a geometry type from the list to display all the detected differences on the assembly model per geometry type.

◦ Checking Detected Differences (Geometry) in “3D View”

Areas highlighted in red are convex geometry, and the areas highlighted in blue are concave geometry. As shown in the color bar, the gradation shows the degree of difference.

a. Min. distance to detect as the difference

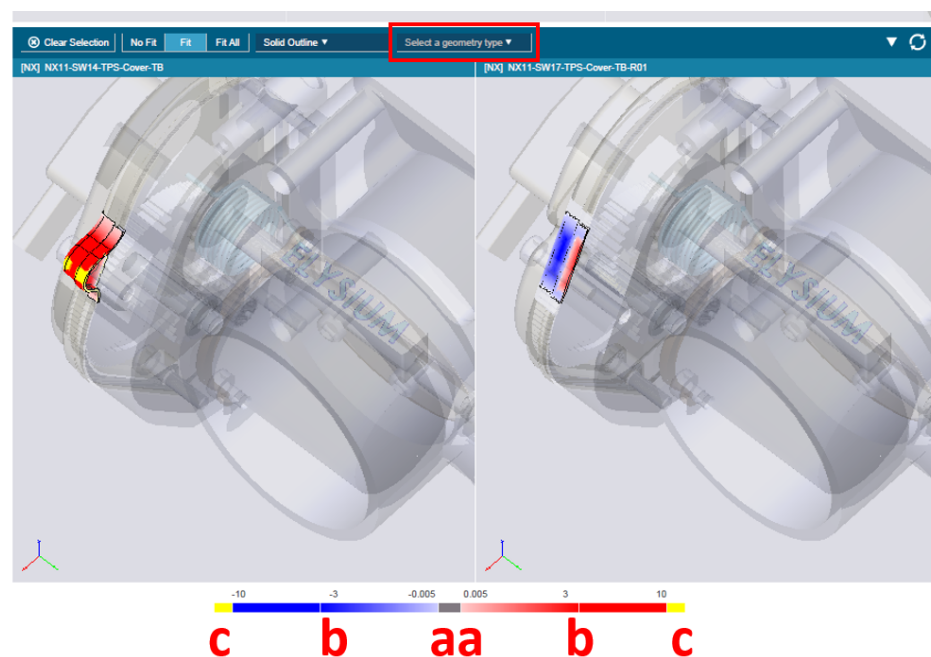
b. Largest difference for color gradation

(Differences larger than this value will be displayed in the same darkness.)

c. Max. distance to detect as the difference

▪ Differences on Face Geometry

Faces with differences will be displayed in blue when concave to the other, and in red when convex.

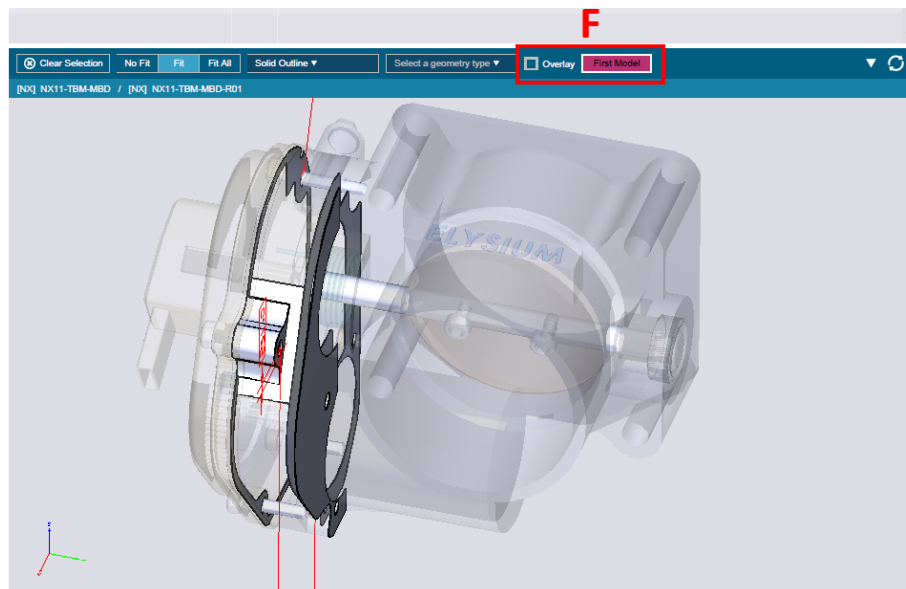


▪ Differences on Normal Direction

Differences on the normal direction will be displayed in red gradation—darker when the angle difference is larger.

◦ Checking Detected Differences in Single View Mode

Both the first and the second models will be displayed in one view. When performing validation with ASFALIS, the parameter value of CAD Validator "3DPdfReportViewType" must be set to 1.



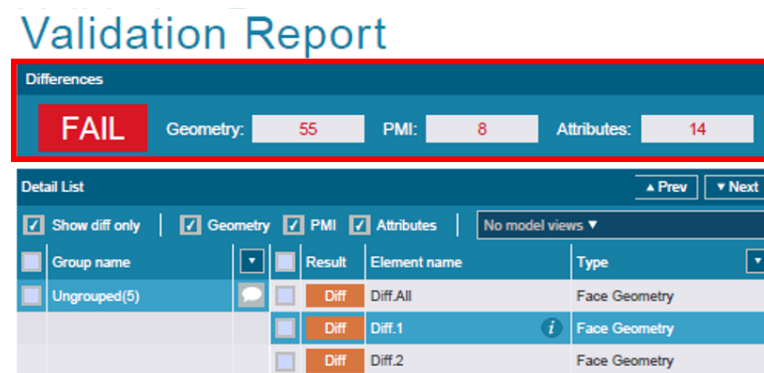
F. [Overlay] checkbox

Check this option to overlay the first and the second models to visually check the differences. Either model will be shown in “3D View” when checked off. You can toggle [First] / [Second] to show the first and the second model alternately.

3.1.2. [Differences] Pane

This pane shows the total number of detected differences per element type (Geometry / PMI / Attribute).

[FAIL] will appear when there is a detected difference in a model; otherwise, [PASS] will appear.



3.1.3. [Detail List] Pane

This pane shows the validation result of the selected assembly / part.

Validation Report

The screenshot shows the 'Differences' section of a validation report. At the top, a 'FAIL' status is displayed. Below it, summary statistics are shown: Geometry: 55, PMI: 8, and Attributes: A 14 B. A 'Detail List' section contains several checkboxes: 'Show diff only' (checked), 'Geometry' (checked), 'PMI' (checked), and 'Attributes' (checked). To the right of these is a 'No model views' dropdown. Below the checkboxes is a table with columns: Group name, Result, Element name, and Type. The table lists several items, including 'Ungrouped(4)', 'Diff', 'Diff.1', 'Diff.2', and 'Piston'. Annotations A through F are placed on the interface: A points to the 'Prev' button, B points to the 'Next' button, C points to the 'Show diff only' checkbox, D points to the 'Geometry' checkbox, E points to the 'No model views' dropdown, and F points to the 'Diff' result in the table.

A. [Prev] button

Click this button to switch the currently displayed elements sequentially.

B. [Next] button

Click this button to switch the currently displayed elements sequentially. Moves in the opposite direction to [Prev] button.

C. [Show diff only] checkbox

Toggle whether to display only the elements with differences or all elements in the Detailed List. When enabled, only the compared element type with differences and the element with differences will appear in the Detail List.

D. [Geometry] / [PMI] / [Attribute] checkbox

Check these options to show differences on geometry, PMI, attribute respectively. This is useful to filter the result to show by category.

E. [Model view] drop-down list

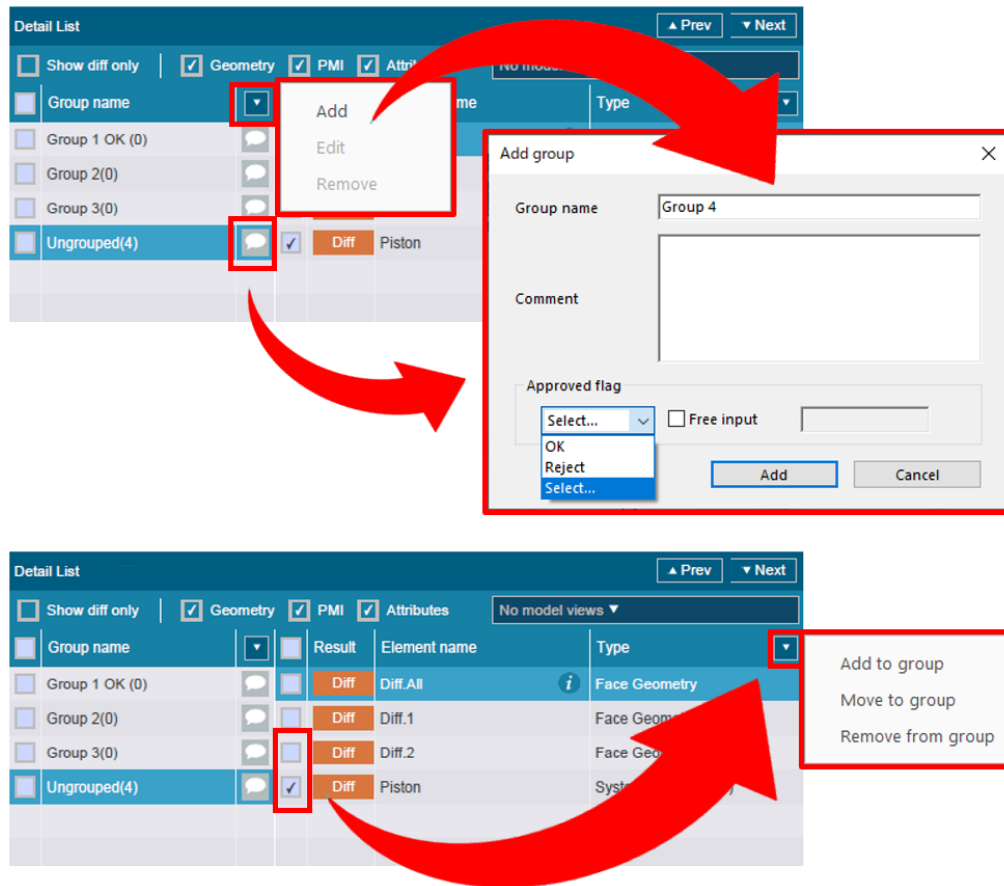
Select a Model View to filter the validation check item / result to display. Only those which are related to the selected Model View will be displayed in “3D View” and Element List. Select [Exit Model View Mode] from the drop-down list to exit Model View mode and display all in “3D View” and Element List.

F. [Group][Result][Element name][Type]



Display elements that belong to the selected component in the assembly tree. Click the column name to sort by that column.

[Grouping Elements]

Elements can be grouped. Enter a comment and save it, or flag the result (OK / Reject by default). The newly created group will still appear even if the selected assembly or parts in the assembly tree are changed. However, elements that appear in the group are related only to the selected assembly or parts.




Click the callout icon and a dialog will appear. You can select an approval flag or enter a comment.

- When creating a new group, click () icon next to group name.
- To add / move an element to a group, enable the checkbox next to the element name, then click () icon at the top right of the Detail list.
- Select [Add to group] from the group other than the default one. The element is added to the selected group as well as retained in the original group.
- Select [Move to group] to move the element to a group. Selected element will move to the selected group, and deleted from the original group.
- If there is a comment, the callout icon turns blue.
- When a flag is assigned, the assigned flag name will appear next to the group name. When setting the group's approval flag in approval state (OK by default), the group will not be recognized as a difference.

A. Labels

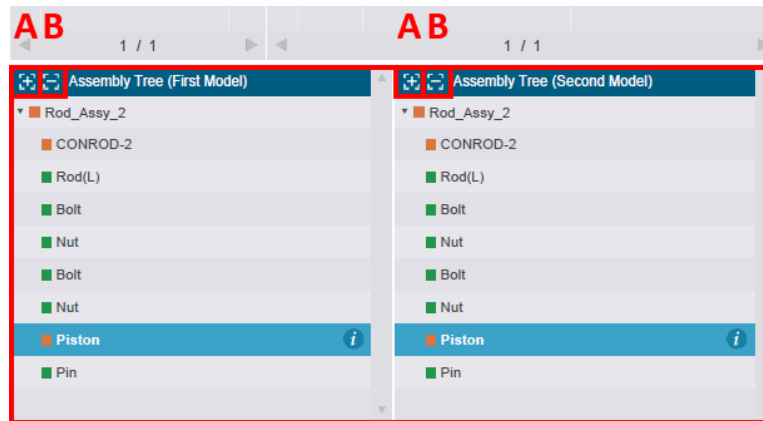
A label next (left side) to each check result in the list shows the status as follows. (The following list is available in [Help] page as well.)

Label	Description
 Same	The element/value is identical between the first and second model

Label	Description
Diff	The element/value is different between the first and second model
Rem	The element/value is removed
Add	The element/value is added
Ref	For your reference, the validation was not performed on this particular element

3.1.4. [Assembly Tree (First Model / Second Model)] Pane

This pane shows the tree structure of the first / second models. Select a part / assembly, and the [Element List] pane and “3D View” will be updated.



A. [+ (Expand)] button

Click this icon to expand the tree for the entire model. You can also expand per assembly with the triangle at the left end of each assembly.

B. [- (Collapse)] button

Click this icon to collapse the tree for the entire model. You can also collapse per assembly with the triangle at the left end of each assembly.

3.1.5. [Property] Pane

This pane shows the property values of the check result selected in the [Element List] pane or “3D View”.

AB

Property	Result	First Model	Second Model
Max deviation	Diff	0.828313 mm	-0.583349 mm
Max deviation coordinate	Diff	(-20.548553, -41.155090, 20.000000)	(30.245934, -33.878296, 20.583349)

A. [+ (Expand)] button

Click this icon to expand the entire list. You can also expand per category with the triangle at the left end of each category.

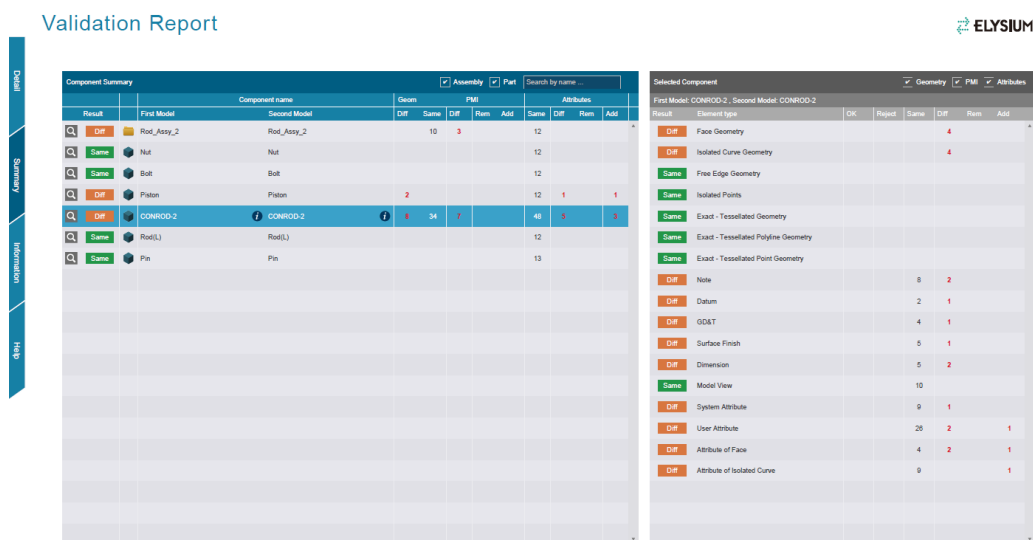
B. [- (Collapse)] button

Click this icon to collapse the entire list. You can also collapse per category with the triangle at the left end of each category.

3.2. [Summary] Page

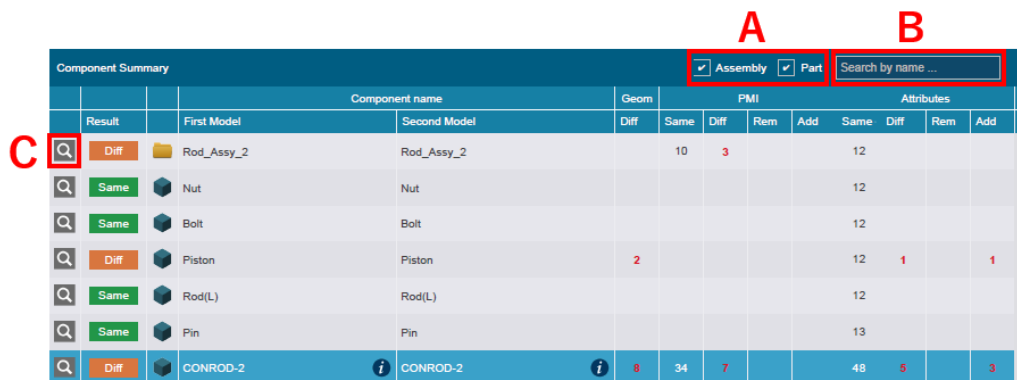
You can check the followings in this page;

- [Component Summary] pane
- [Selected Component] pane



3.2.1. [Component Summary] Pane

This pane shows the summary of the check result per part / assembly.



A. [Assembly] / [Part] checkbox

Check these options to show summary on assembly / part respectively.

B. [Search by name] box

Input a search word to filter the summary list by assembly / part name.

C. Link to the selected assembly / part in [Detail] page

Click this icon to jump to [Detail] page with the selected part / assembly shown in [Element List] pane and “3D View”.

3.2.2. [Selected Component] Pane

This pane shows the detailed summary of the selected assembly / part.

A. [Geometry] / [PMI] / [Attribute] checkbox

Check these options to show differences on geometry, PMI, attribute respectively. This is useful to filter the result to show by category.

A

Selected Component							
First Model: CONROD-2 , Second Model: CONROD-2							
		<input checked="" type="checkbox"/> Geometry	<input checked="" type="checkbox"/> PMI	<input checked="" type="checkbox"/> Attributes			
Result	Element type	OK	Reject	Same	Diff	Rem	Add
Diff	Face Geometry				4		
Diff	Isolated Curve Geometry				4		
Same	Free Edge Geometry						
Same	Isolated Points						
Same	Exact - Tessellated Geometry						
Same	Exact - Tessellated Polyline Geometry						
Same	Exact - Tessellated Point Geometry						
Diff	Note			8	2		
Diff	Datum			2	1		
Diff	GD&T			4	1		
Diff	Surface Finish			5	1		
Diff	Dimension			5	2		
Same	Model View			10			
Diff	System Attribute			9	1		

3.3. [Information] Page

You can check the followings in this page;

- [CAD Information] pane
This pane shows the information of the first and the second models.
- [Execution Property] pane
This pane shows the information of the process execution.
- [Validation Settings] pane
This pane shows the validation settings.

Validation Report

CAD Information	
	First CAD Model
File Path	\\monstar\TestModel\CadValidator\demo\VP_Assy_Conrod\originalRod_Assy_2_CATProduct
File Size	2 MB
CAD Version	CATIA Version 5-6 Release 2014
Executed CAD Version	CATIA Version 5-6 Release 2014

Execution Property	
Processing Date	2019-05-08T18:12:14+09:00
Processing Time	36.1 sec.
Validated with Version	EXB.1
Length Unit	Millimeter
Number of Display Digit	6

Validation Settings	
How to find the part to pair with	Auto
Unit system	millimeter
Direction of geometry comparison	Bi-directional
Min. distance to detect as difference	0.005000 mm
Max. distance to measure	10.000000 mm
Interval for point comparison	Auto (0.049000 mm)
Max. length to recognize as Chamfer	10.000000 mm
Max. radius to recognize as Fillet	10.000000 mm
Max. diameter to recognize as Round Hole	100.000000 mm
Max. deviation to recognize as Analytic Curve	0.010000 mm
Min. normal angle deviation to detect as difference	1.000000 degree
Max. normal angle deviation to detect as difference	40.000000 degree
Whether to ignore face flip	0
Min. distance to detect as difference (Exact - Tessellated)	0.100000 mm
Max. distance to measure (Exact - Tessellated)	1.000000 mm

3.4. [Help] Page

[Help] page shows the basic instructions and descriptions on 3D PDF reports.

Validation Report

ELYSIUM

How to Use

- View the sum of the Geometry, PMI and Attributes differences at the top left corner, "Detail" tab.
- To view the more detailed information, please select an element in the "Element List" of the "Detail" tab. The selected element will display in the 3D view on the bottom right. The detail property of the element is displayed in "Property" table at the upper right.
- Change the 3D view of the part/assembly through "Assembly Tree" in the "Detail" tab or in the "Summary" tab.
- View the list of part and assembly in the "Summary" tab.
- View the assembly structure in the "Assembly Tree" in the "Detail" tab.
- When selecting a particular group for viewing, click in the group list to insert/modify comments. In addition, it can set "OK" status flag when its OK or "Reject" status when there is a problem.
- Represents the total number of elements with and label in the model.

How to Operate 3D View

Icon	Action	Description
	Left-click anywhere in 3D View and drag while holding down [Ctrl] key to move the model	
	Right-click anywhere in 3D View and drag to zoom in/out	
	Left-click anywhere in 3D View and drag to rotate the model	
	Left-click an element to select	
	Left-click at an empty space in "3D View" to cancel highlighting the selected element	

Description of Labels

Label	Description
	The element/value is identical between the first and second model
	The element/value is different between the first and second model
	The element/value is removed
	The element/value is added
	For your reference, the validation was not performed on this particular element

Special property values

Value	Description
empty	Unused value
unknown	Undefined value

3.5. Simplified-appearance Validation Report (3D PDF format)

This report improves viewing performance by simplifying some elements included in a regular

Validation Report (3D PDF format). Basic operation is the same as the regular Validation Report (3D PDF format), except for the following points:

- To switch the selected element, either click the element with the mouse, or press Up and Down arrow keys.
- In Detail list, there aren't any checkboxes to use when selecting multiple elements. To select multiple elements, either hold Ctrl key while clicking to select the elements, or press Shift key + Up and Down arrow keys.

Validation Report

The screenshot displays the Elysium CAD Validation Report interface. The top status bar shows a **FAIL** result with 55 Geometry, 8 PMI, and 14 Attributes differences. The 'Detail List' on the left shows a list of differences, including Face Geometry, Isolated Curve Geometry, and GD&T. The right side features a 'Property' table comparing values for the first and second models, and two 3D model views side-by-side for comparison.

Property	Value (First Model)	Value (Second Model)
[Diff] Max deviation	10.000000 mm (+)	6.349843 mm
[Diff] Max deviation coordinate		

Assembly Tree (First Model):

- NX11-TB Assembly
 - NX11-TBM-MBD
 - NX11-SW14-TPS-Cover-TB
 - NX11-TB Assembly

Assembly Tree (Second Model):

- NX11-TB Assembly-RD1
 - NX11-TBM-MBD-RD1
 - NX11-SW17-TPS-Cover-TB-RD1
 - NX11-TB Assembly-RD1

4. Troubleshooting

4.1. 3D HTML Report

Q1: Cannot open 3D HTML reports

Please confirm that the current environment meets the system and other requirements. Enable ActiveX Controls from [Tools] > [Internet options] > [Security] tab in the environment with an Internet connection. Set the security level of Internet to “Medium-high” or lower, and then click [Custom level] button to confirm that ActiveX Controls are enabled.

Q2: An error occurred while viewing 3D HTML reports

Please restart “Internet Explorer” and then re-open the report.

Q3: 3D HTML reports stopped responding while viewing

Please note that it may take long to complete the following processes;

- To show all parts and assemblies in [Overview] tab when the model is a large assembly model
- To expand the entire assembly Tree in [Detail] tab > [Assembly] tab
- To select a part/assembly on which many differences have been detected
- To show all elements in [Element List] tab with [Diff Only Mode] button

When the process abends during other operations, please terminate Internet Explorer and re-open the report.

Q4: To view 3D HTML reports in other languages

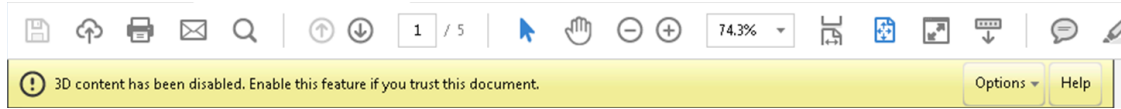
Please export the report from the computer with preferred-language OS. Japanese and English are supported with the latest version.

Q5: Fails to auto-register ActiveX Control

When opening a 3D HTML report, you may see a message to prompt registration of ActiveX Control. In case it fails due to an environment-dependent issue, try launching “Internet Explorer” as an administrator, and registering ActiveX Control again.

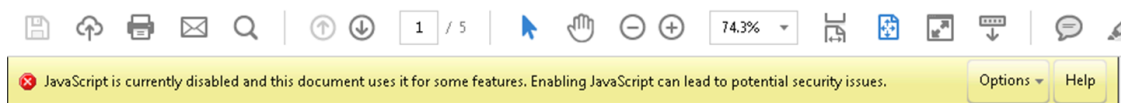
4.2. 3D PDF Report

Q1: Yellow bar is displayed when opening 3D PDF reports



3D PDF utilizes 3D contents when drawing the model in the report, and you may see a yellow bar at the top with the message “3D content has been disabled. Enable this feature if you trust this document.”

Enable playing the 3D content in that document from [Options] button, or enable permanently by checking “Enable playing of 3D content” checkbox from [Edit] > [Preferences] > [3D & Multimedia].



3D PDF also utilizes JavaScript for element selection and view synchronization, and you may see a yellow bar at the top with the message “JavaScript is currently disabled ...”


Enable JavaScript in that document from [Options] button, or enable permanently by checking “Enable Acrobat JavaScript” checkbox from [Edit] > [Preferences] > [JavaScript].

Q2: Views are not synchronized to each other in 3D PDF report

The model has not been loaded yet when a yellow bar “3D content has been disabled. Enable this feature if you trust this document.” is displayed.

Please click anywhere in the view to activate the view operation after enabling 3D content.

Q3: Cannot open or update 3D PDF report with a large model

This is due to a memory shortage while drawing a large model in “3D View”. Please reopen the report, and click Safe Mode icon () at the left bottom of [Detail] page to enable safe mode. Please note that, in safe mode, the selected element will not be highlighted in “3D View” to reduce the memory consumption by Acrobat Reader.

Q4: “3D View” is frozen and/or [Differences] / [Element List] / [Assembly Tree] panes are blank when opening 3D PDF Report

It may not be supported by PDF viewers other than the one provided by Acrobat to operate 3D models and fields. Also, you may fail to open large files with Adobe Reader XI or older. Please use the latest version of Adobe Acrobat Reader.

Q5: The corresponding element in the other view is not highlighted in red when selecting a PMI in 3D PDF report

The selected element will not be highlighted in red in the other view when opening 3D PDF report with Adobe Reader XI or older. Please use the latest version of Adobe Acrobat Reader.

Q6: Can enable exclusive show for few elements only when viewing differences on B-rep attributes in 3D PDF reports

Please note that we restrict the elements to show in exclusive show mode to maximum five when fitting to B-rep attributes such as face attribute, isolated curve attribute or isolated point attribute. This is a workaround for a model-dependent issue that the 3D PDF report stops functioning properly when displaying many elements in exclusive show mode. This occurs due to a high load on the memory consumption of Acrobat Reader (it increases the memory consumption to show more elements).

Q7: “Same” elements are not shown in [Element List] pane when viewing differences on B-rep attributes in 3D PDF reports

Please note that we restrict the validation result to show in “3D View” to “Difference” only. (“Same” will not be displayed.) This is for the same reason as the known issue stated above.

Q8: To view 3D PDF reports in other languages

Please export the report from the computer with preferred-language OS.
Japanese and English are supported with the latest version.

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