What's New in MBD for ANSYS 18

FunctionBay, Inc.

MBD for ANSYS
Multi-Body Dynamics

FunctionBay

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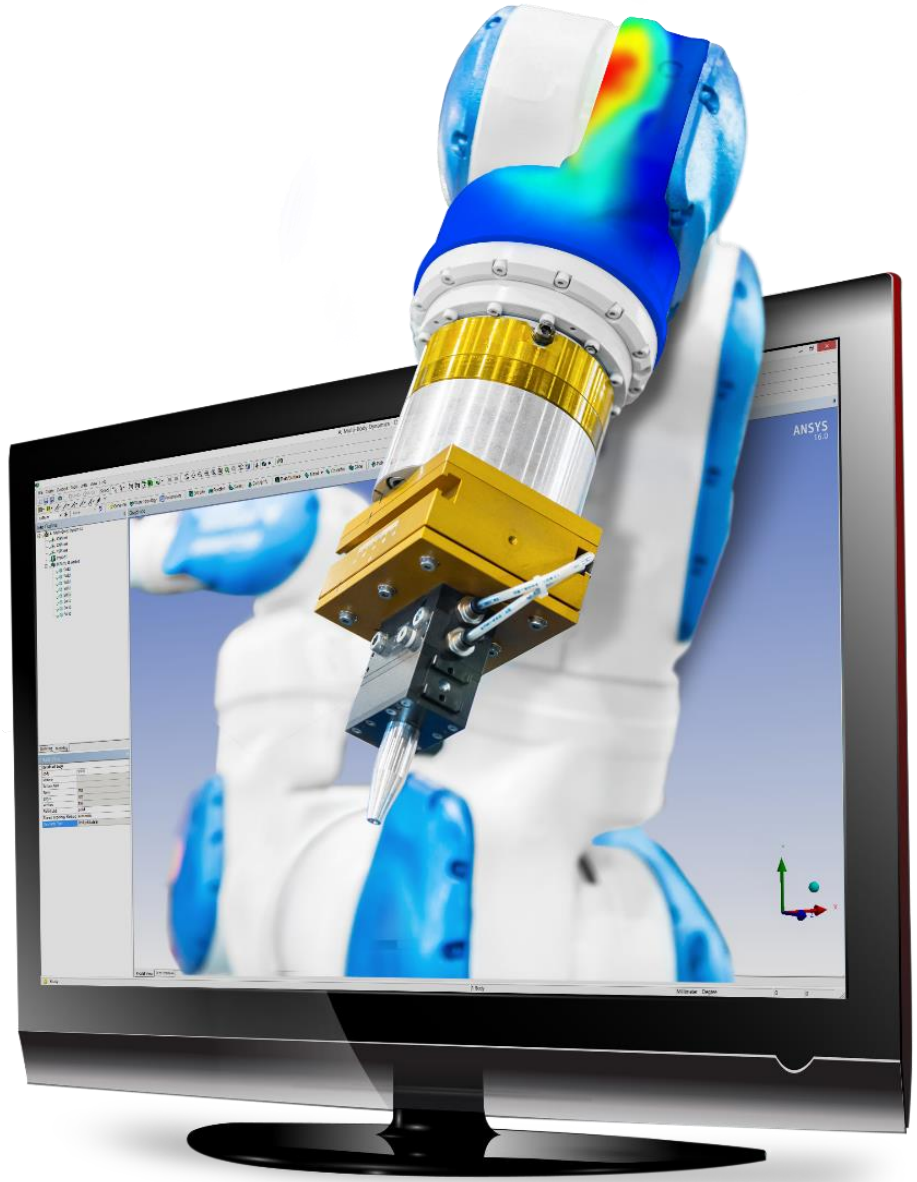
MBD for ANSYS

Multi-Body Dynamics

Multi-Body Dynamics for ANSYS is…

Multi-Body Dynamics software
Tightly integrated into
ANSYS® Workbench™

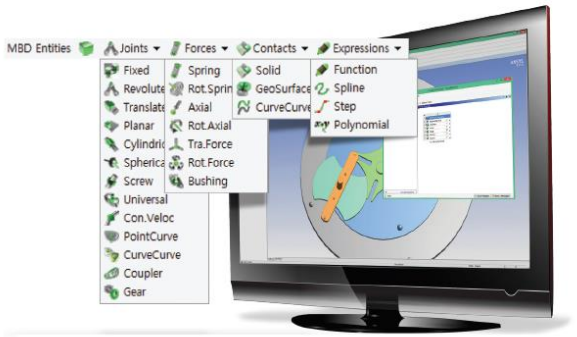


MBD for ANSYS (Multi-Body Dynamics for ANSYS)
is an add-on module for ANSYS

4 Advantages of MBD for ANSYS

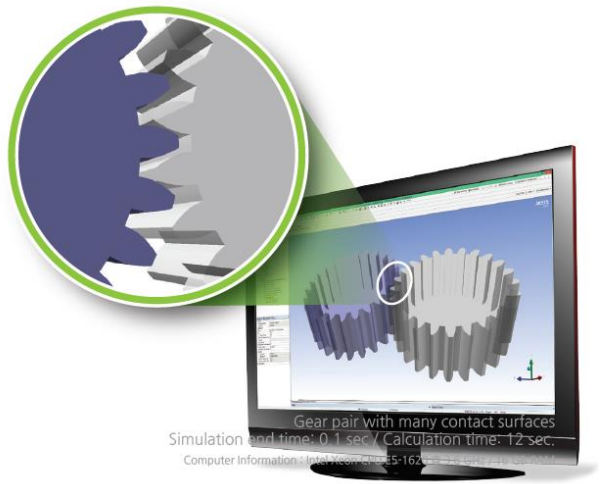
1 User-friendly interface integrated with the ANSYS Workbench environment

- An add-on module for ANSYS Workbench that can be installed easily
- A convenient, innovative modeling environment optimized for Multi-Body Dynamics analysis
- Pre-processing, solving, and post-processing possible within the ANSYS Workbench environment



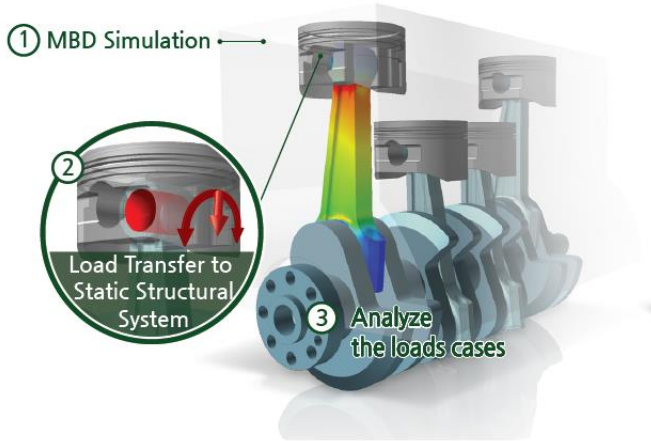
2 Fast and robust solver

- Developed by an experienced FunctionBay team.
- Fast simulations using rigid bodies (Transient analysis)
- High performance contact algorithms



3 Convenient, Automated Load Transfer

- Apply the Multi-Body Dynamics analysis results as the load conditions for a structural analysis model.
- Easily convert the analysis results into the load conditions for a structural analysis model with Load Transfer.



4 Scalability to Multi-Body Dynamics applications

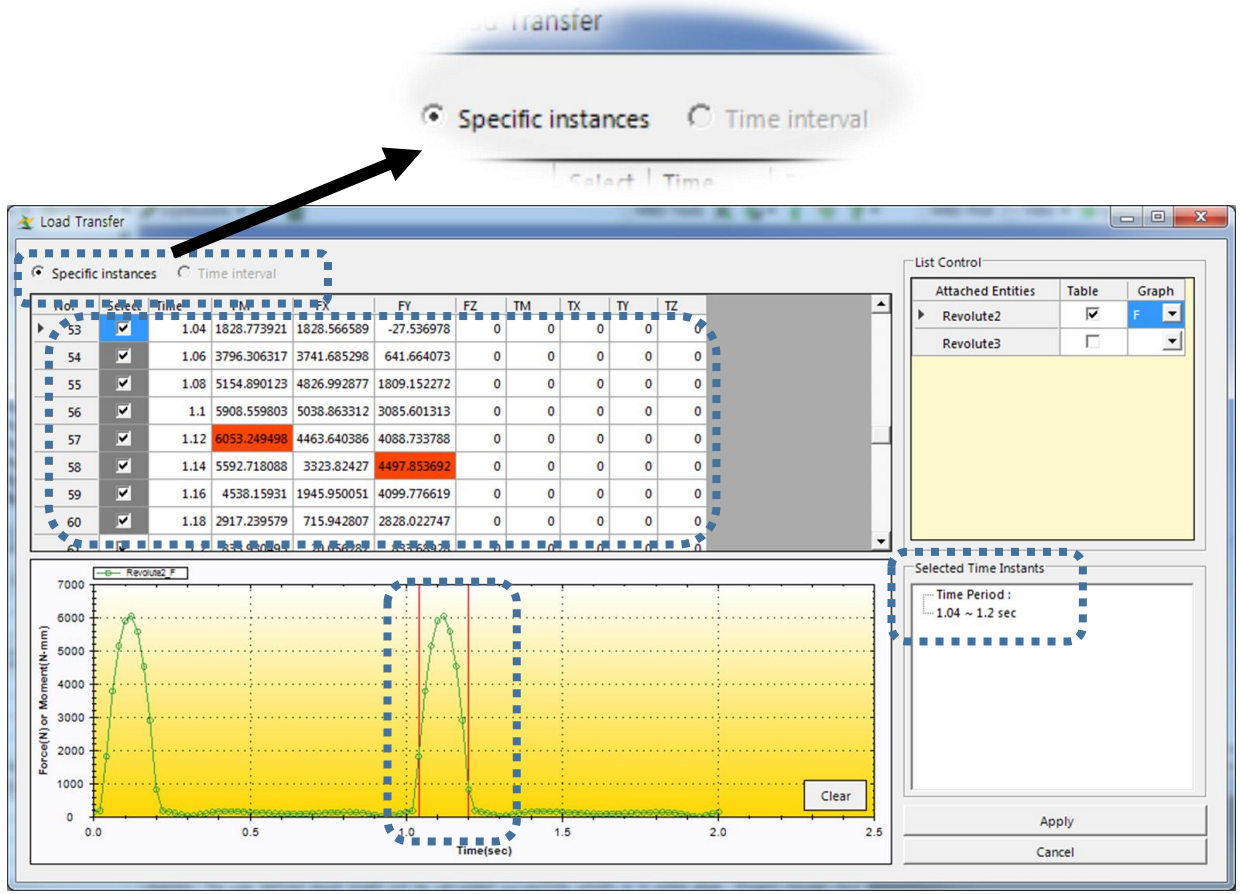
- Convert MBD for ANSYS models into RecurDyn models, to access additional functionality in RecurDyn/Professional.
- You can simulate a complex system with coupled vibrations or other complex applications such as mechatronics or coupled analysis with a fluid.

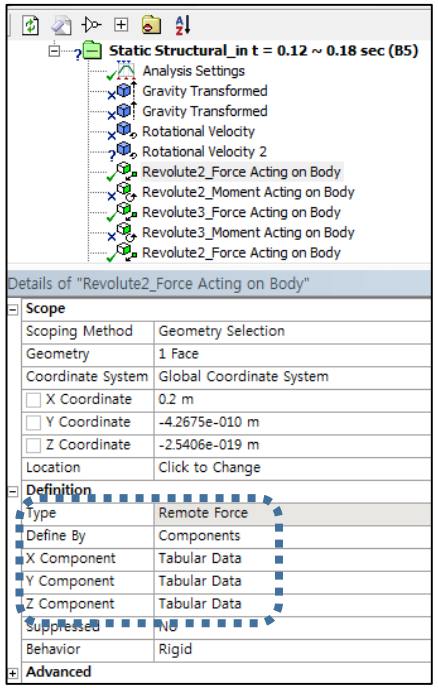
Expandable Areas	Multi Flexible Body Dynamics Controllers, sensors, belts, bearings, tracks/optimization Co-simulation with a computational fluid dynamics using particle dynamics (Particleworks)

Load Transfer for ‘Time interval’

- When doing Load Transfer, load conditions over time can be transferred using ‘Time interval’ option.

- Users can conduct static analysis at the several time instants conveniently.





t = 1.04s ~ 1.2s

Tabular Data

	Steps	Time [s]	X [N]	Y [N]	Z [N]
1	1	0.	= 1700.9	= -671.94	= 0.
2	1	1.04	1700.9	-671.94	0.
3	2	1.06	3529.	-1399.4	0.
4	3	1.08	4791.9	-1900.1	0.
5	4	1.1	5493.4	-2175.7	0.
6	5	1.12	5629.5	-2225.	0.
7	6	1.14	5203.6	-2049.6	0.
8	7	1.16	4226.1	-1653.8	0.
9	8	1.18	2722.5	-1048.1	0.
10	9	1.2	788.62	-271.15	0.

Use Reference Marker for Rotational Force and Translational Force

- The user can select an option to use a reference marker for rotational forces and translational forces.
- The user now can define the force relative to the arbitrary orientation.
- If the reference body is used, the force can be applied relative to the changing orientation over time.

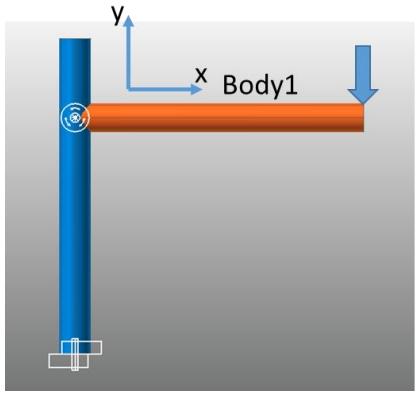
Details of "TraForce1"

Definition	
Connection Type	Body-Body
Coordinate System	No
Base Body Information	
Scoping Method	Geometry Selection
Scope	
Body	
Action Body Information	
Scoping Method	Geometry Selection
Scope	
Body	
Origin	
Origin	Click to Change
Origin X	
Origin Y	
Origin Z	
Force	
FX Function Exp	
FY Function Exp	
FZ Function Exp	
Reference Marker	
Use Reference Marker	No

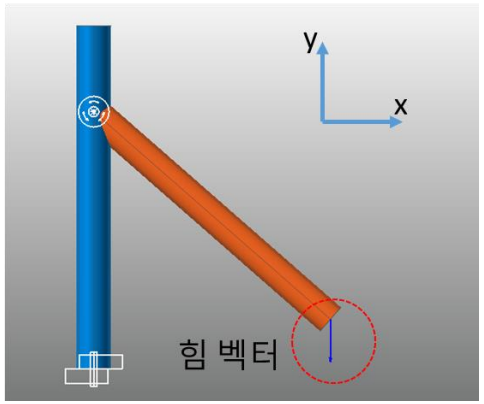
Details of "Result for Force_1"

Select a Force	
Force	
Select a Result Type	
Component	
Reference Marker	
Use Reference Marker	Yes
Reference Body	Ground
Name	Ground
Origin	
X	
Y	
Z	
X Axis	
X	
Y	
Z	
Z Axis	
X	
Y	
Z	
Select Result Summary Value	
Min Over Time	

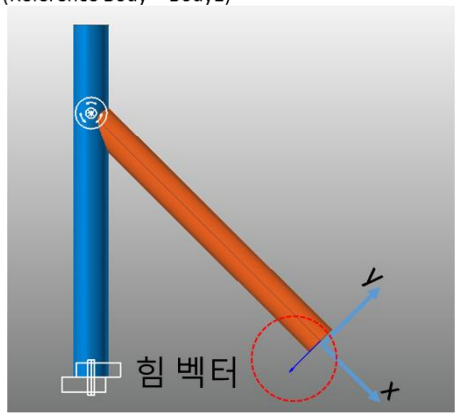
Apply force in the –y direction

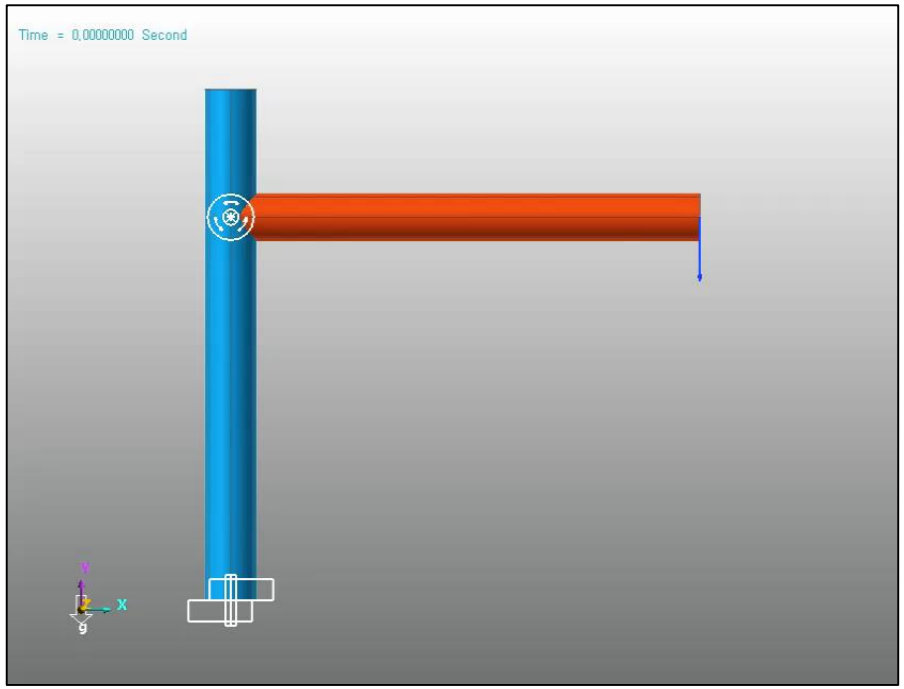


When it is relative to absolute coordinate

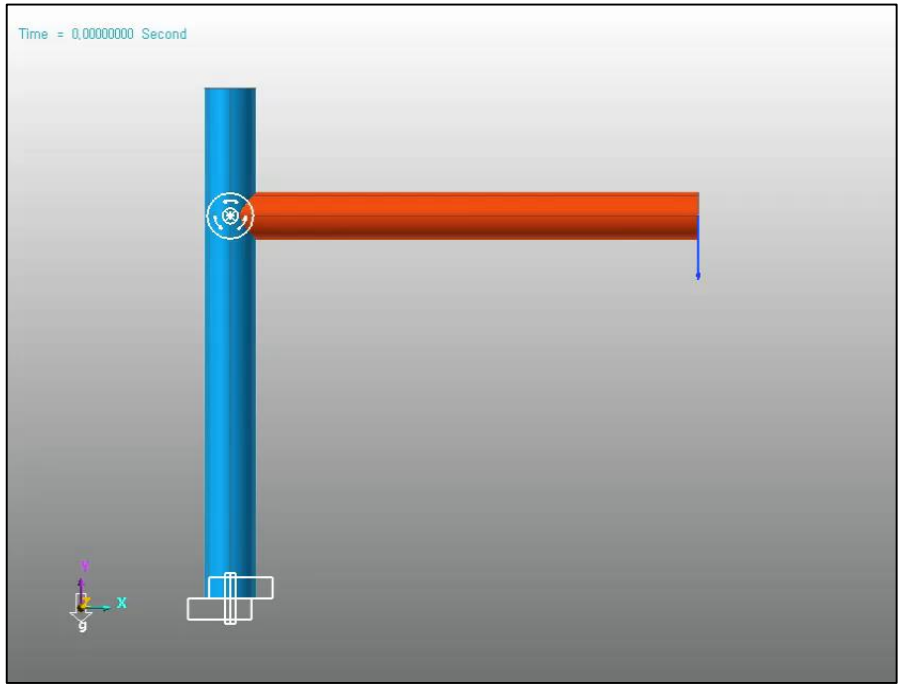


When the coordinate is attached to Body1
(Reference Body = Body1)

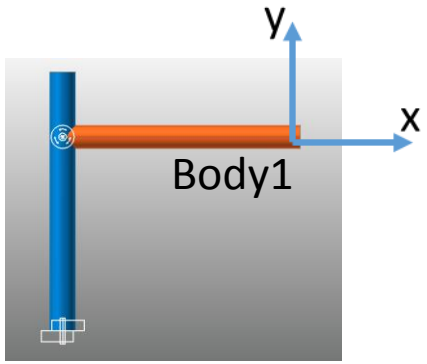




The direction of the force
-y direction of the global coordinate

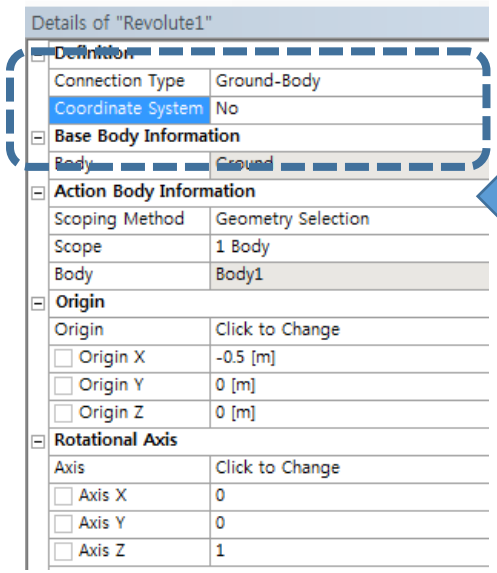


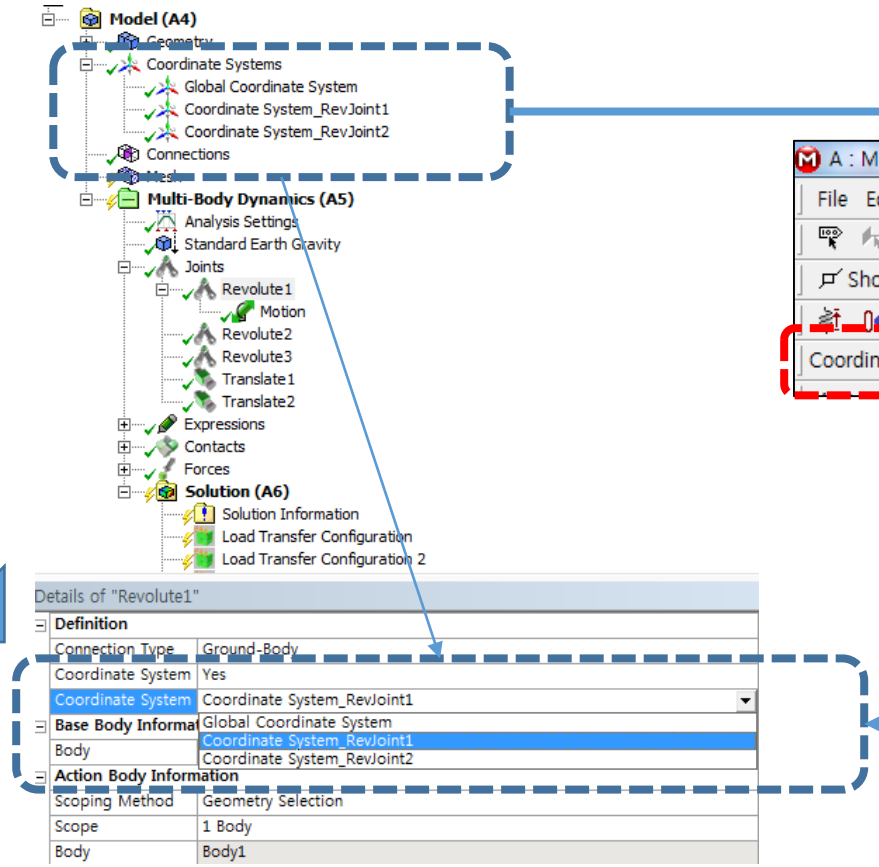
The direction of the force
-y direction attached to the body1

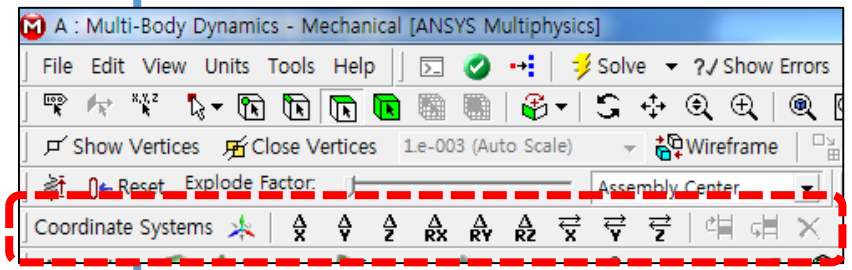


Support coordinate system for origin and orientation

- The Coordinate System field allows the user to use a custom coordinate system for defining the joint or the force.
- User can reuse the coordinate system for the same position and orientation and make use of the convenient coordinate system toolbar for transformation.



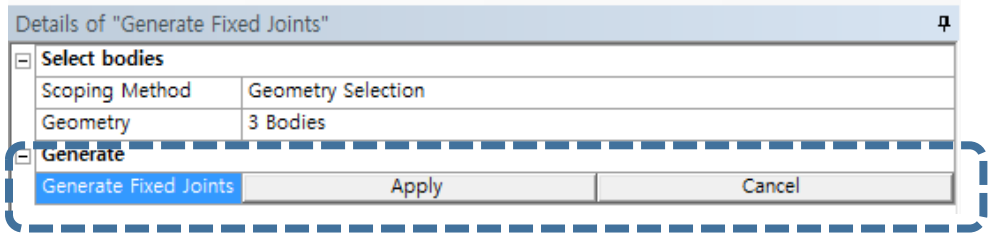


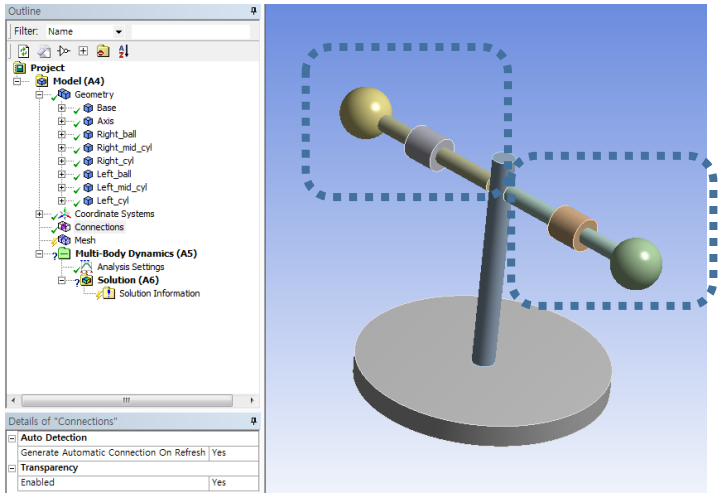


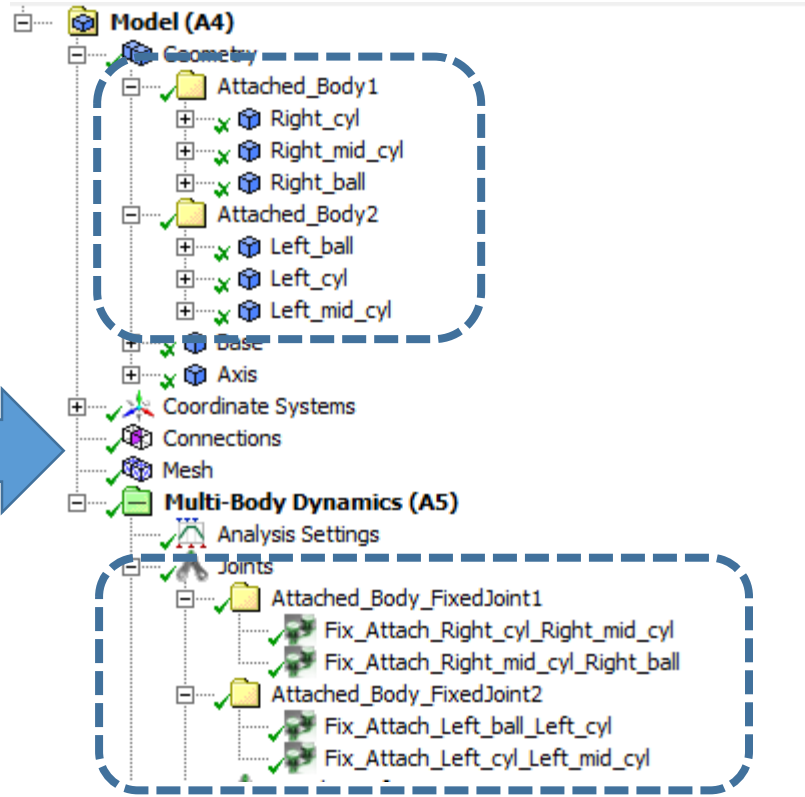
Coordinate system toolbar helps to define the position and the orientation easily.

Group Geometry with Fixed joints

- This tool can be used to automatically create fixed joints between any number of selected bodies.
- Some of the imported geometry may become multiple bodies even when the original solids were grouped into a single body. There is a need to regroup the bodies into a single merged body. This tool automates the grouping process and reduces the model preparation time.

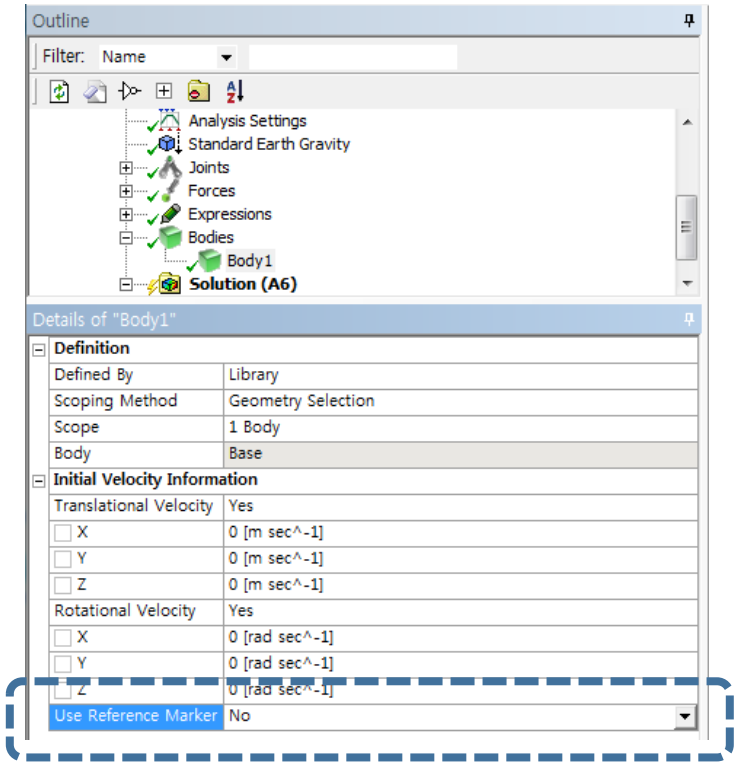


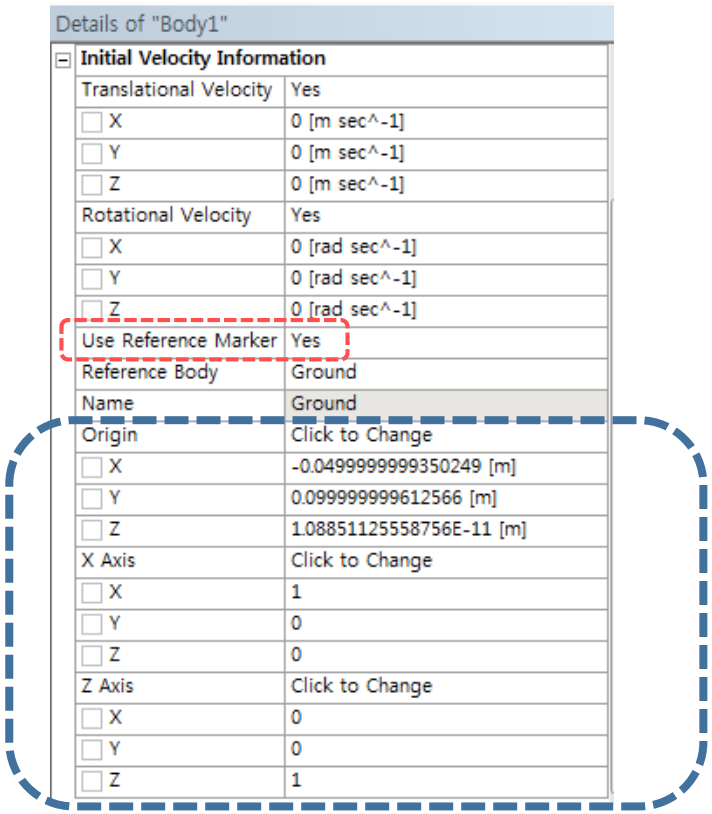




Use Reference Marker for Initial velocity of MBD Body

- The user can select an option to use a reference marker for the initial velocity of MBD Body.
- The user now can define the initial velocity relative to the arbitrary orientation.





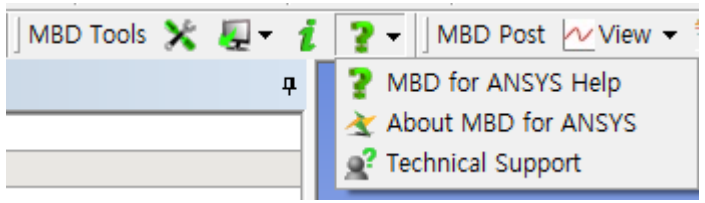
Others

- The MBD for ANSYS tutorials provide a hands-on setting for learning how to use the software within the ANSYS Workbench environment. The table below shows the areas of emphasis for each tutorial

MBD for ANSYS 17

	Post Processing	Contact Modeling	Load Transfer	Export to RecurDyn
Geneva Wheel Tutorial, Part 1	Yes	Yes		
Hoekens Mechanism Tutorial	Yes		Yes (joints, forces)	
Inverted Pendulum Tutorial	Yes			Yes
Geneva Wheel Tutorial, Part 2	Yes	Yes	Yes (contacts)	

- Technical support site can be accessed from the toolbar directly



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