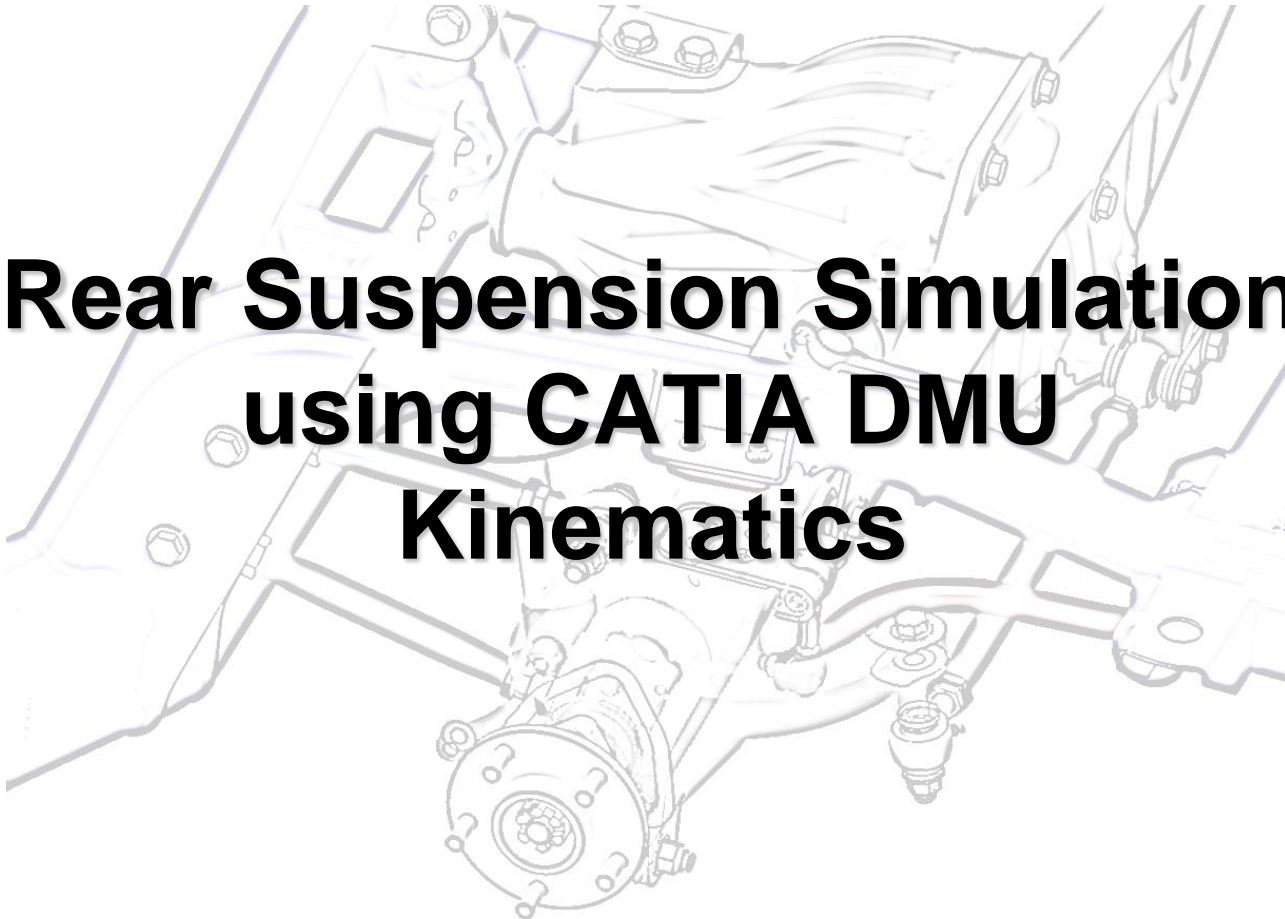
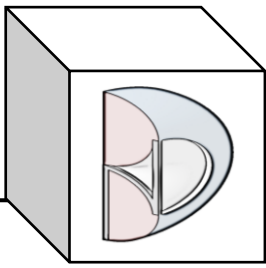


# BND TechSource

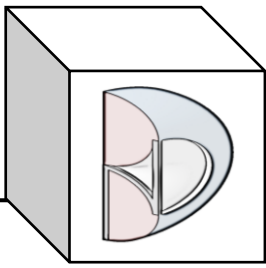


## **Rear Suspension Simulation using CATIA DMU Kinematics**





- The following licenses are required to create this DMU Kinematic simulation:
  - Digital Mockup Kinematics
  - Mechanical Part Design
  - Generative Shape Design
  - Assembly Design

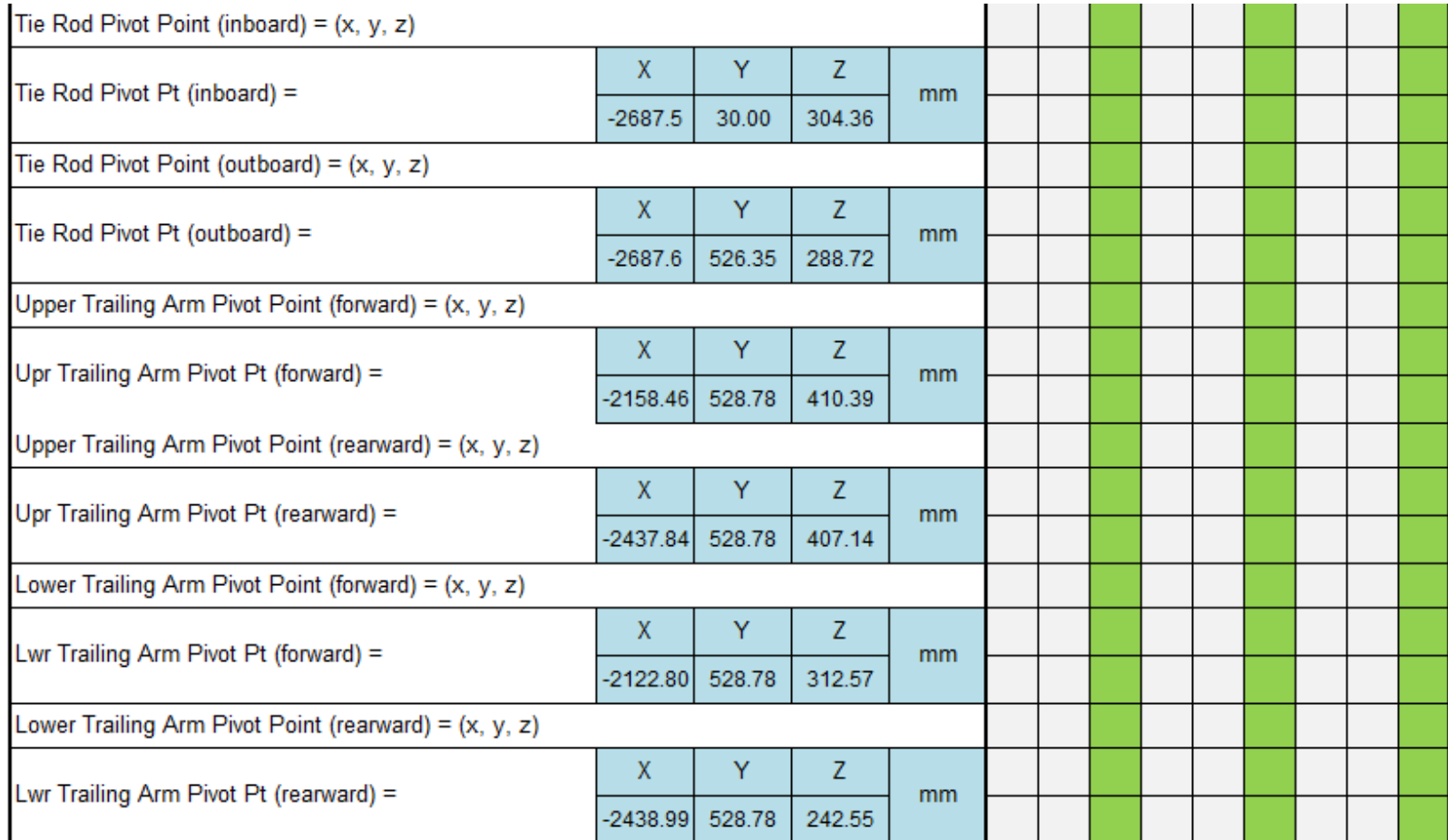


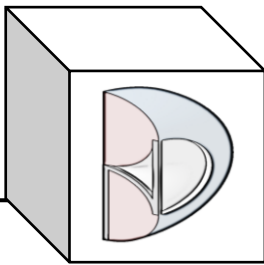
- To create this DMU Kinematic simulation, we must begin with several known parameters.
- Known:
  - All suspension “hard points”.
    - Pivot points and lines
    - Angles of axes and planes
  - Min/Max Command values
    - Driveshaft rotation (-720deg, 720deg)
    - Shock down/up (-49.5mm, 35.5mm)



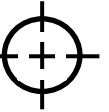
Vehicle Suspension Hardpoints									
Rear Suspension									
Scrub (Pivot) Radius =			162.3 mm						
Kingpin Inclination Angle =			-7.1 deg						
Caster Angle =			1.2 deg						
Mechanical (or caster) trail (if applicable) =			6.83 mm						
Toe Angle =		-0.01 deg	+/- 0.10 deg						
Camber Angle =		-0.18 deg	+/- 0.5 deg						
Knuckle Attachment Points relative to Suspension Analysis Axis									
Various links and arms depend upon the Rear Suspension configuration. (i.e. Dependent vs. Semi-Independent vs. Independent Suspension)									
Configuration:	GM 5-link Independent Rear Suspension (axle half-shaft acts as 5th link)								
List each Knuckle Attachment Point relative to Susp Analysis Axis = (x, y, z)									
Camber Strut Pivot Point (inboard) = (x, y, z)									
Camber Strut Pivot Pt (inboard) =		X	Y	Z	mm				
		-2486.13	153.90	201.63					
Camber Strut Pivot Point (outboard) = (x, y, z)									
Camber Strut Pivot Pt (outboard) =		X	Y	Z	mm				
		-2486.14	603.67	187.51					







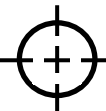
# BND TechSource

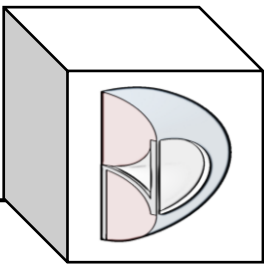


U-Joint Pivot Point (inboard) = (x, y, z)																			
U-Joint Pivot Pt (inboard) =	X	Y	Z	mm															
	-2488.90	197.89	339.18																
U-Joint Pivot Point (outboard) = (x, y, z)																			
U-Joint Pivot Pt (outboard) =	X	Y	Z	mm															
	-2488.91	620.91	325.90																
Knuckle/Brakes																			
Hub Dimensions:	(i.e. hub dia/thickness, pilot dia, hub face to knuckle, stud size/circle dia, etc.)																		
	See CAD Data																		
Brake Rotor Dimensions:																			
Rotor Thickness =				26.0 mm															
Rotor Diameter =				305.0 mm															
Inner Face of Hub to Inner Rotor Surface =				42.0 mm															
Inner Hub Diameter =				182.0 mm															
Outer Hub Diameter =				202.0 mm															
Center Hole Diameter =				70.0 mm															
Brake Caliper to Wheel (min clearance) =				41.2 mm															
Brake Drum Dimensions (if drum brakes) (i.e. drum dia/depth, ctr hole dia, inner hub face to inner drum surf, etc.)				n/a															



BND TechSource

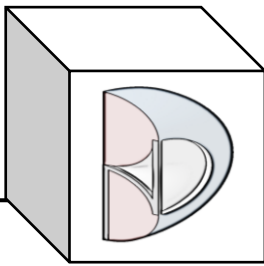
BND TechSource



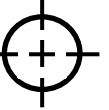
# BND TechSource



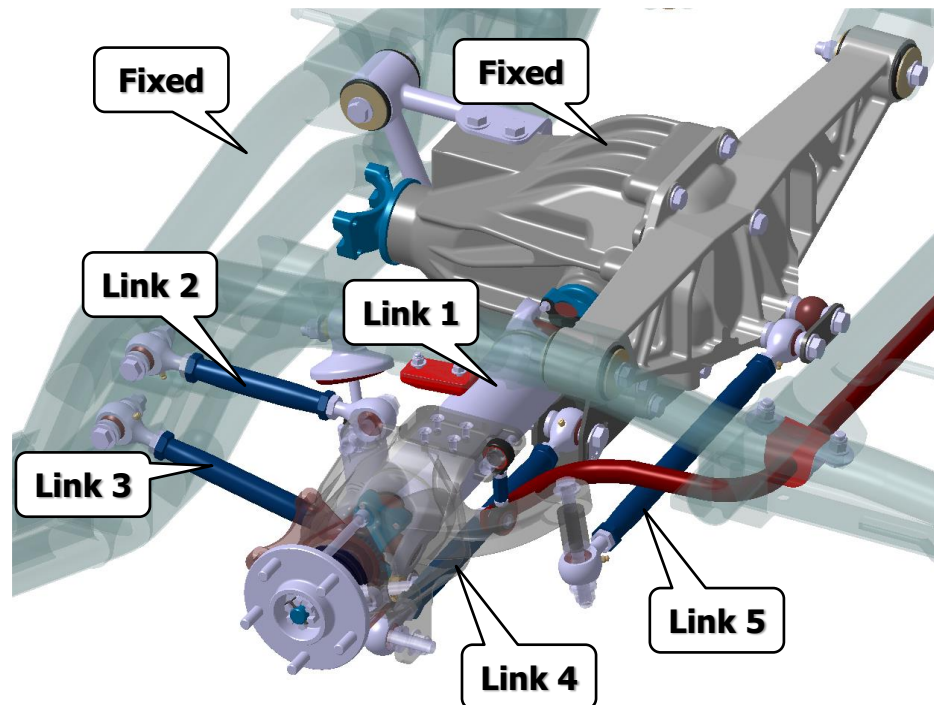
## **Step 1: Understand the suspension system**

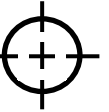
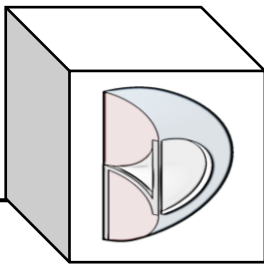


# BND TechSource



- Begin with the completed Rear Suspension Assembly.
- This will help to understand all the pivot and links within this 5-link system.





2) The Input Yoke will rotate with a **gear (with command)** reduction ratio to the Output Yoke

1) The Differential and all its immovable attached parts would be the **Fixed part** in this simulation

3) The Inner U-joint will **rotate (pivot)** within the Output Yoke

4) The Halfshaft will **rotate (pivot)** about the Inner U-joint

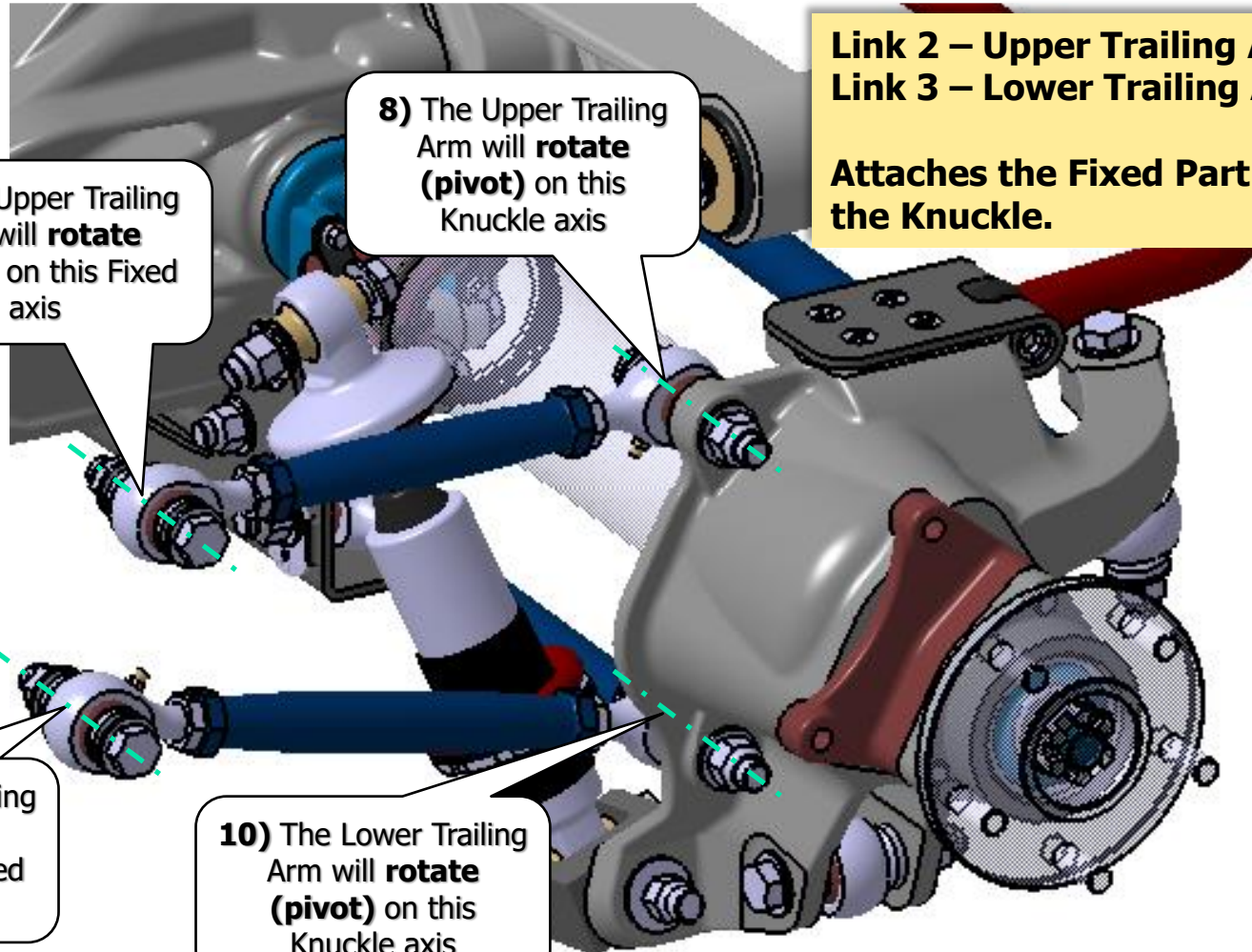
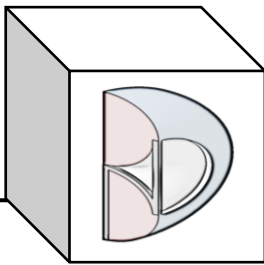
5) The Halfshaft will **rotate (pivot)** about the Outer U-joint

7) The Hub Assy will **rotate** within the Knuckle Assy

6) The Outer U-joint will **rotate (pivot)** within the Hub Assy

**Link 1 – Halfshaft Assy:**  
**Rotates and attaches Fixed Part to the Knuckle.**





**Link 2 – Upper Trailing Arm:  
Link 3 – Lower Trailing Arm:**

**Attaches the Fixed Part to  
the Knuckle.**

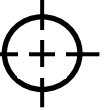
**8) The Upper Trailing  
Arm will **rotate**  
(pivot) on this  
Knuckle axis**

**9) The Upper Trailing  
Arm will **rotate**  
(pivot) on this Fixed  
axis**

**10) The Lower Trailing  
Arm will **rotate**  
(pivot) on this  
Knuckle axis**

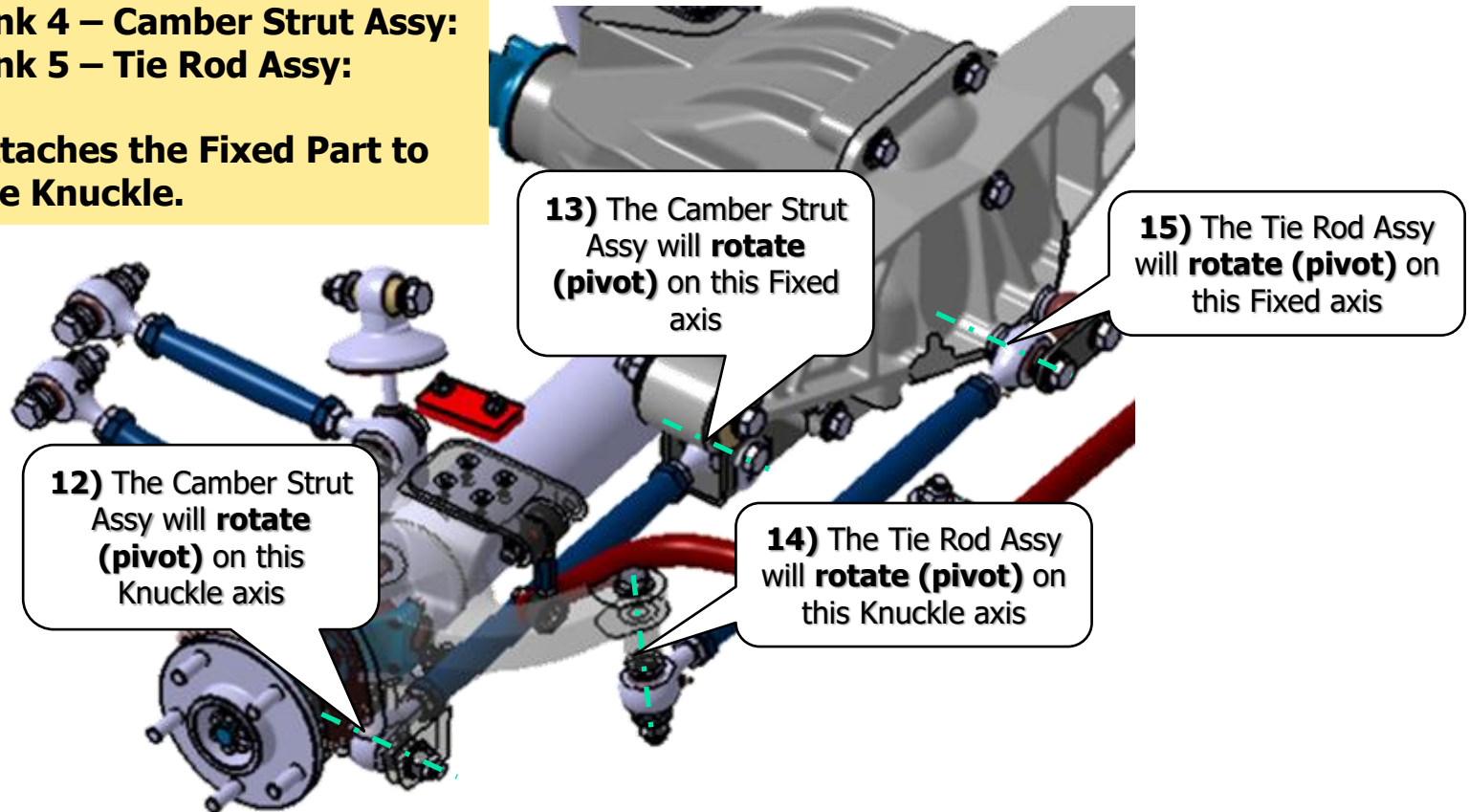
**11) The Lower Trailing  
Arm will **rotate**  
(pivot) on this Fixed  
axis**

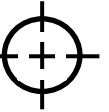
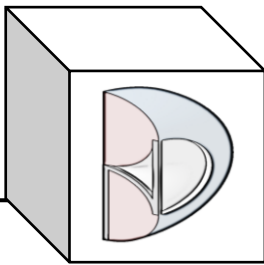




**Link 4 – Camber Strut Assy:  
Link 5 – Tie Rod Assy:**

**Attaches the Fixed Part to  
the Knuckle.**





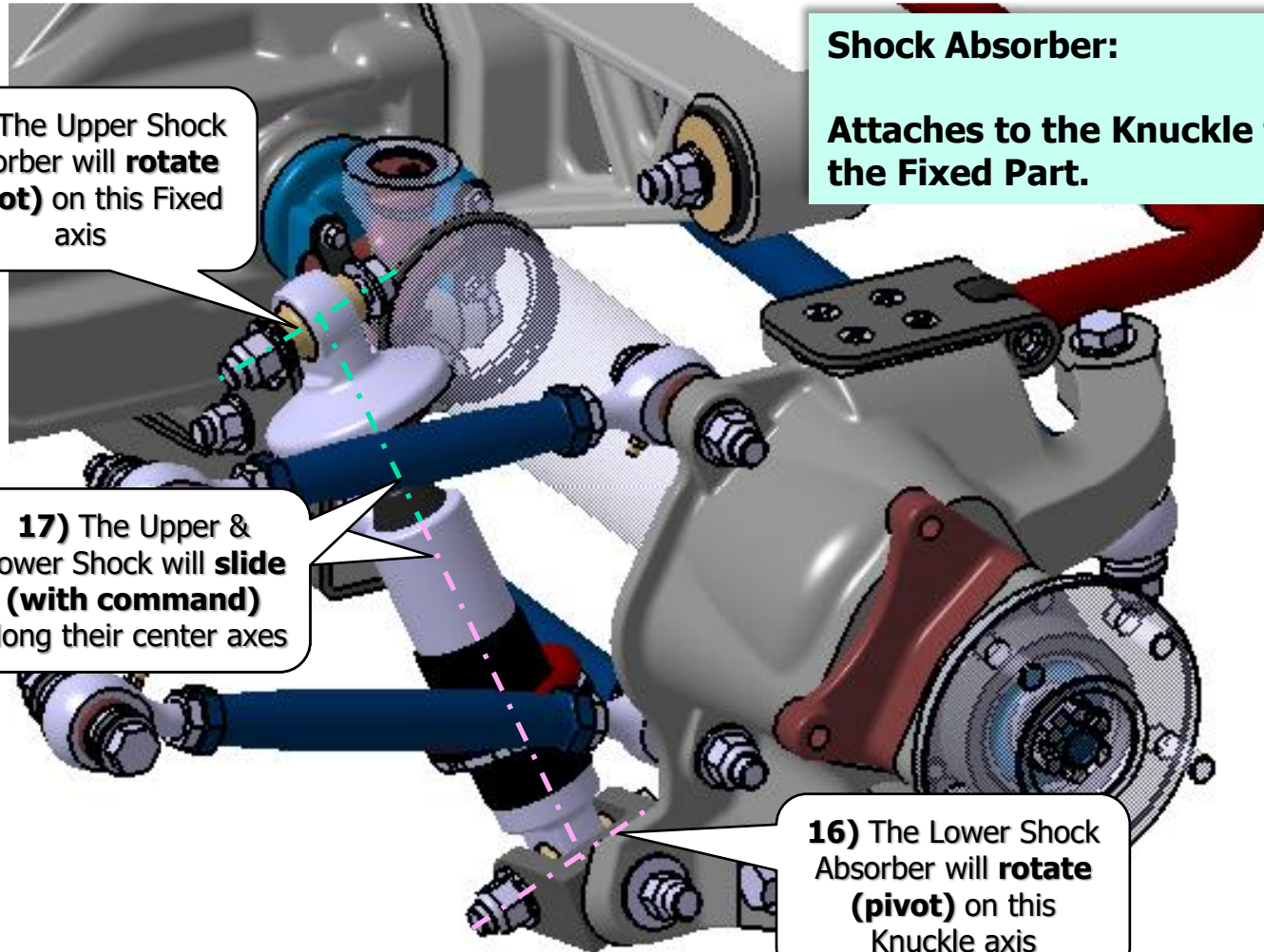
**18)** The Upper Shock Absorber will **rotate (pivot)** on this Fixed axis

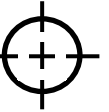
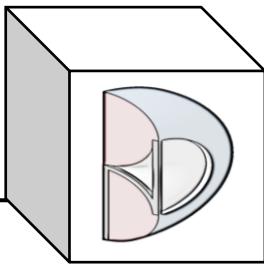
**17)** The Upper & Lower Shock will **slide (with command)** along their center axes

**Shock Absorber:**

**Attaches to the Knuckle to the Fixed Part.**

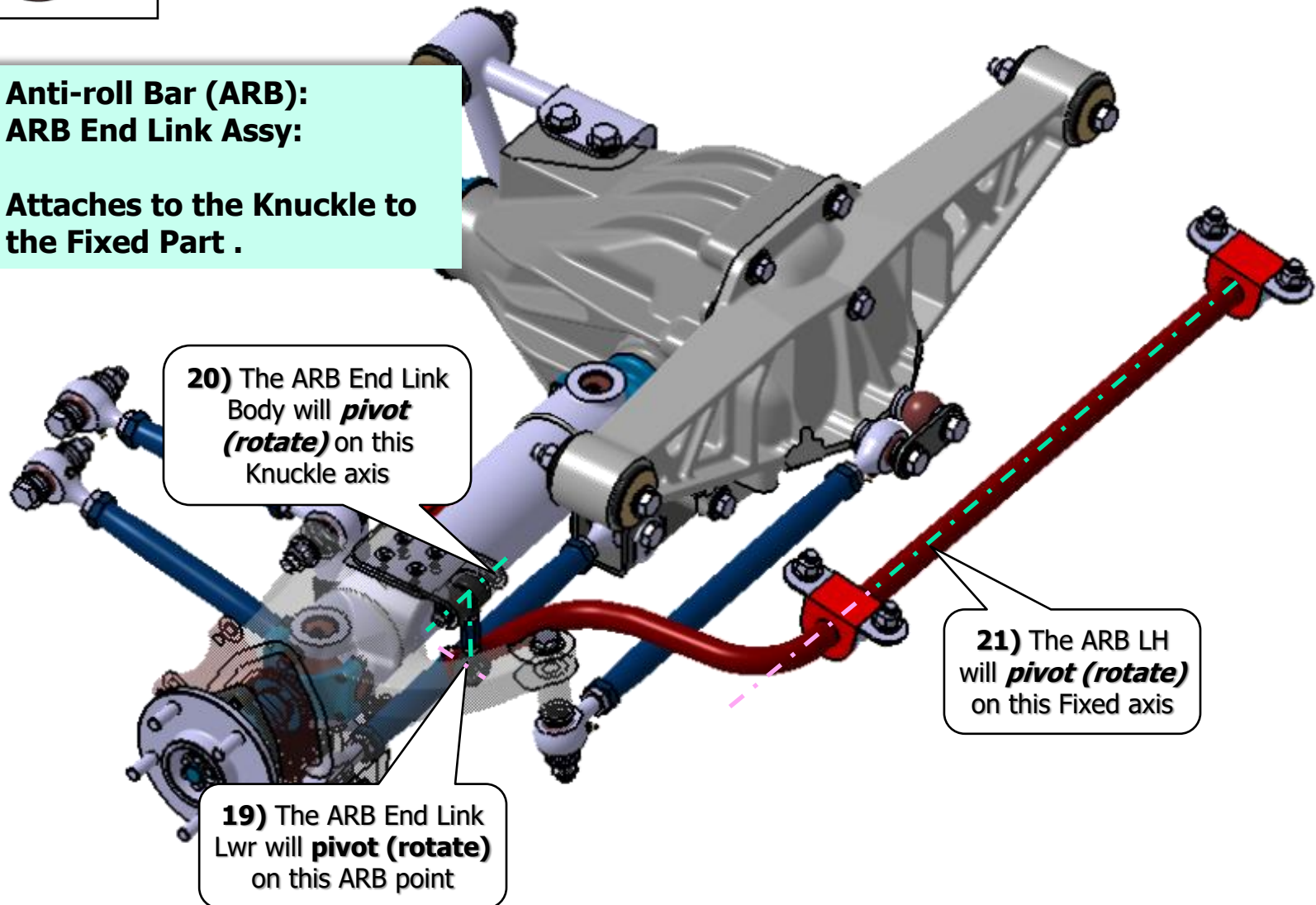
**16)** The Lower Shock Absorber will **rotate (pivot)** on this Knuckle axis





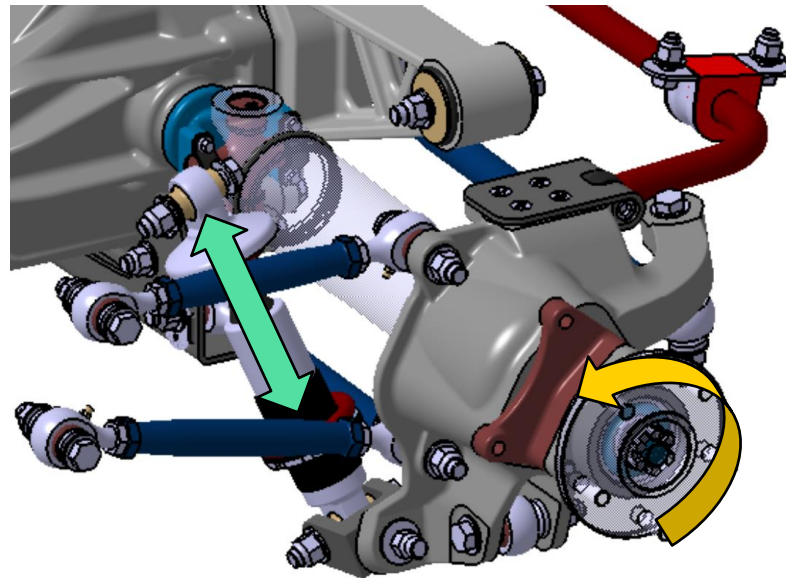
## Anti-roll Bar (ARB): ARB End Link Assy:

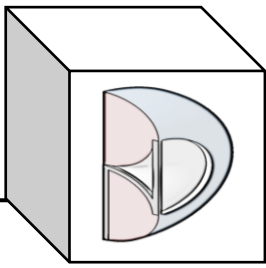
Attaches to the Knuckle to  
the Fixed Part .





- Understand which joints need commands.
  - Min/Max Command values
    - Driveshaft rotation (-720deg, 720deg)
    - Shock down/up (-49.5mm, 35.5mm)



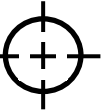


# BND TechSource

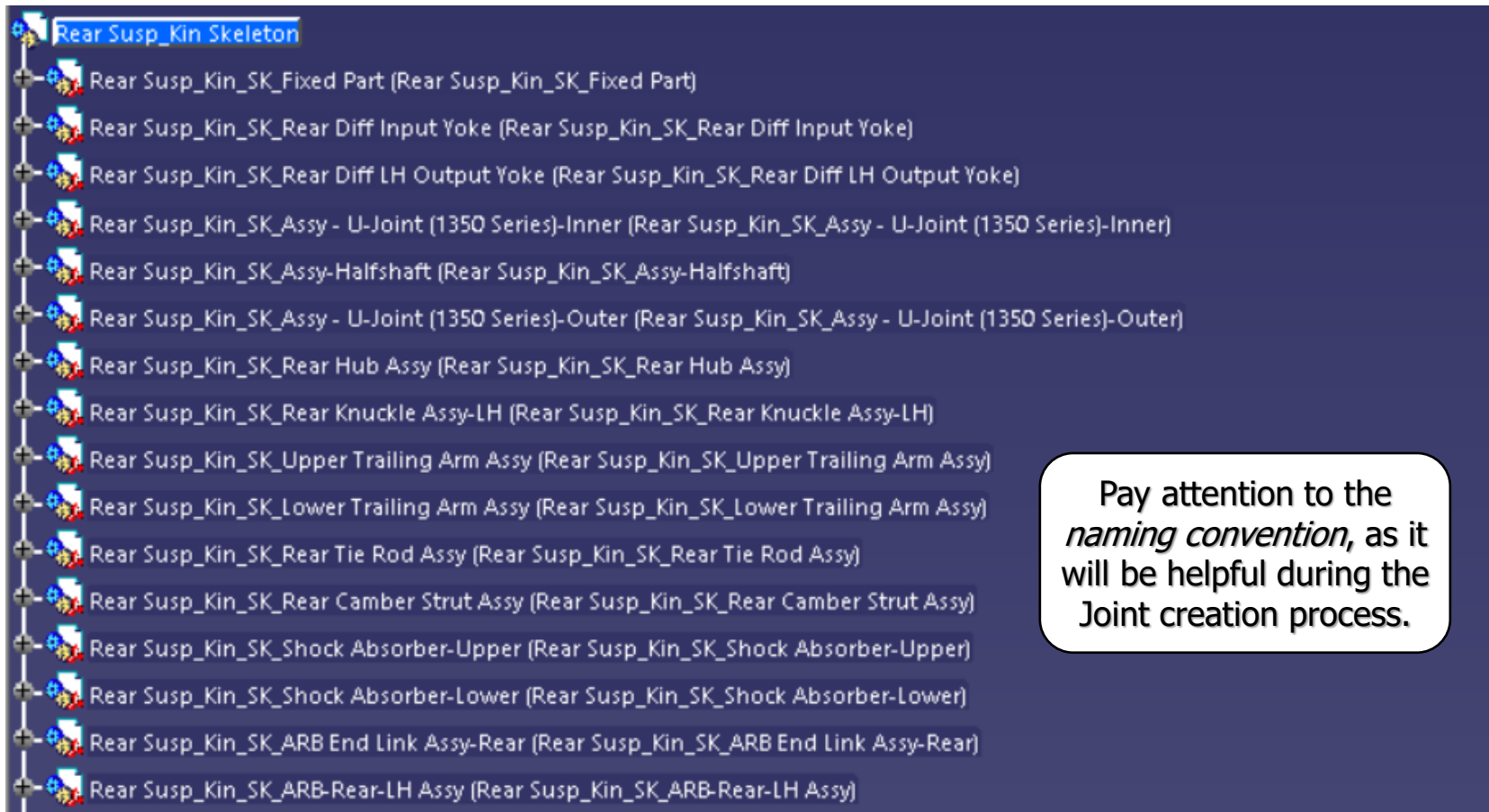


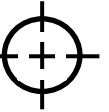
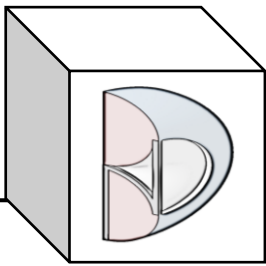
## **Step 2: Create a kinematic skeleton structure**



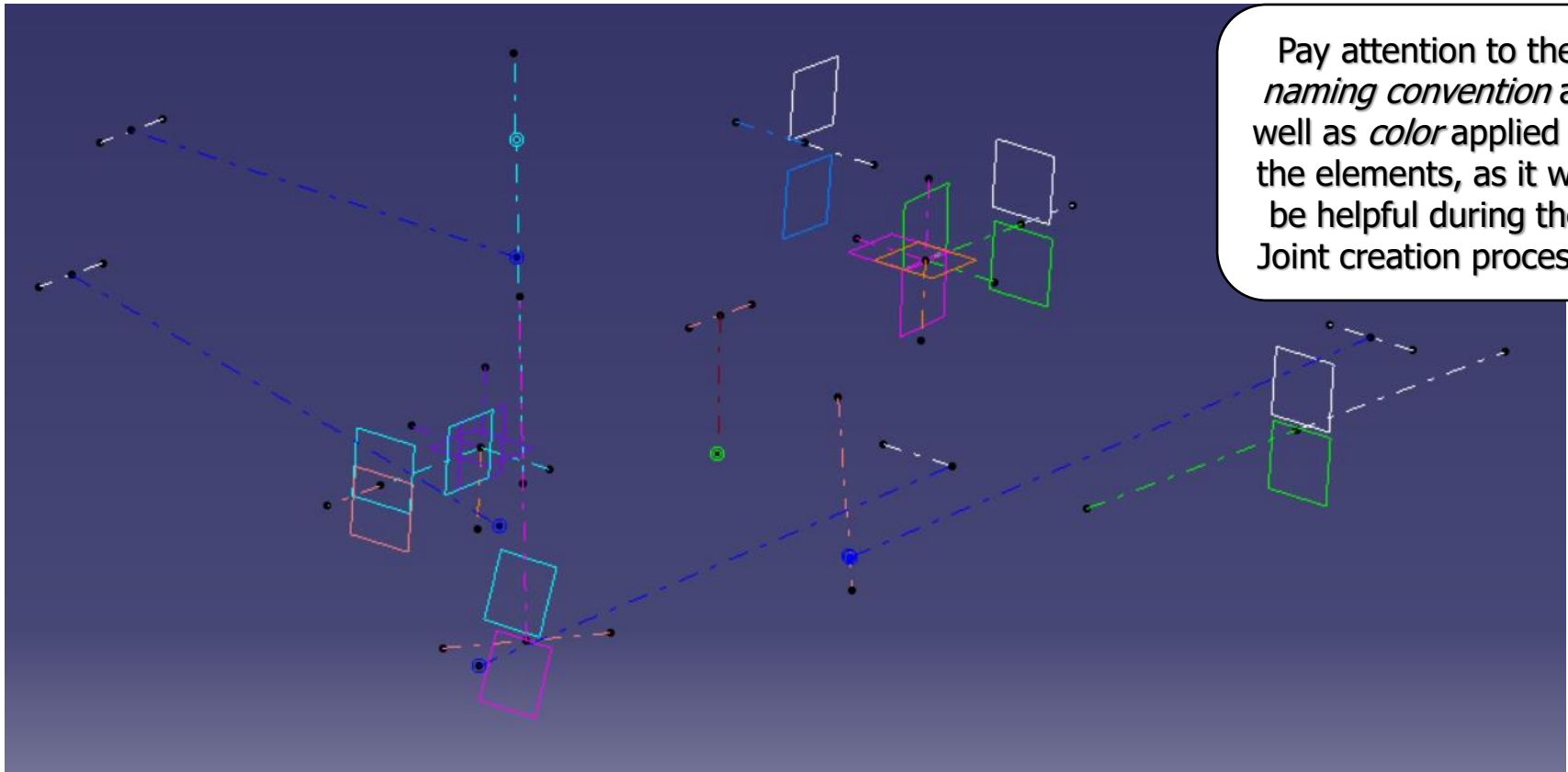


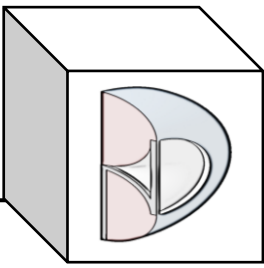
- Create a Skeleton Product and all Parts required for the kinematic simulation.





- Create all points, lines, & planes inside each part within the kinematic structure.





# BND TechSource

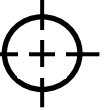


## **Step 3: Create the kinematic Joints**





# BND TechSource



- Create the Fixed Part and name the Mechanism.

The screenshot displays the ENOVIA V5 VPM software interface. The left-hand tree view shows a list of components under 'Rear Susp\_Kin\_Sk\_Skeleton'. The 'Rear Susp\_Kin\_SK\_Fixed Part' is highlighted with a red box. A callout bubble labeled '5) Pick the Fixed Part' points to this item. The main workspace shows a 3D model of a mechanical assembly. A callout bubble labeled '1) Pick the Fixed part icon' points to the 'Fixed Part' icon in the right-hand toolbar. Another callout bubble labeled '3) Give the New Mechanism a name' points to the 'Mechanism name' field in the 'Mechanism Creation' dialog box, which contains the text 'Mechanism.1'. A callout bubble labeled '4) Pick OK' points to the 'OK' button in the 'Mechanism Creation' dialog box. A callout bubble labeled '2) Pick New Mechanism' points to the 'New Mechanism' button in the 'New Fixed Part' dialog box, which also contains the text 'Mechanism.1'. The 'New Fixed Part' dialog box is open, showing the 'Mechanism' field with 'Mechanism.1' and the 'New Mechanism' button. The 'Mechanism Creation' dialog box is also open, showing the 'Mechanism name' field with 'Mechanism.1' and the 'OK' button. The 'Mechanism Creation' dialog box has a question mark icon in the top right corner. The 'New Fixed Part' dialog box has a question mark icon in the top right corner. The 'Mechanism Creation' dialog box is positioned above the 'New Fixed Part' dialog box. The 'Mechanism Creation' dialog box is also open, showing the 'Mechanism name' field with 'Mechanism.1' and the 'OK' button. The 'New Fixed Part' dialog box is also open, showing the 'Mechanism' field with 'Mechanism.1' and the 'New Mechanism' button. The 'Mechanism Creation' dialog box is positioned above the 'New Fixed Part' dialog box.

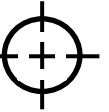
5) Pick the Fixed Part

1) Pick the Fixed part icon

3) Give the New Mechanism a name

4) Pick OK

2) Pick New Mechanism



- Create a Gear Joint between the Diff Input Yoke and the Diff LH Output Yoke.

**1) Pick the Gear icon**

**2) Pick Create Revolute Joint 2**

**3) Pick Line 1 Fixed geometry**

**3) Or Pick Line 1 from tree**

**4) Pick Line 2 Diff Input Yoke geometry**

**4) Or Pick Line 2 from tree**

**5) Pick Plane 1 Fixed geometry**

**5) Or Pick Plane 1 from tree**

**6) Pick Plane 2 Diff Input Yoke geometry**

**6) Or Pick Plane 2 from tree**

**7) Pick OK**

**Joint Creation: Gear**

Mechanism: Mechanism.1

Joint name: Gear.1

Current selection

Create... Revolute Joint 2: Create...

Define... Rotation directions: Same ☐ Opposite ☐

Revolute 1

Angle driven for revolute 2 ☐

OK Cancel

**Joint Creation: Revolute**

Mechanism: Mechanism.1

Joint name: Revolute.1

Current selection:

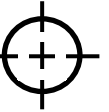
Line 1: Rear Susp\_Kin\_SK\_Re Line 2: Rear Susp\_Kin\_SK\_Fo

Plane 1: Rear Susp\_Kin\_SK\_Fo Plane 2: Rear Susp\_Kin\_SK\_Re Null Offset ☐ Offset ☐ Unset ☐

Plane 3: - Plane 4: - ☐ Centered ☐

☐ Angle driven

OK Cancel



- Create a Gear Joint between the Diff Input Yoke and the Diff LH Output Yoke.

**11) Or Pick Line 1 from tree**

**13) Or Pick Plane 1 from tree**

**11) Pick Line 1 Fixed geometry**

**13) Pick Plane 1 Fixed geometry**

**14) Pick Plane 2 Diff Input Yoke geometry**

**9) Set Ratio to 3.54**

**10) Pick Create Revolute Joint 1**

**12) Pick Line 2 Diff LH Output Yoke geometry**

**12) Or Pick Line 2 from tree**

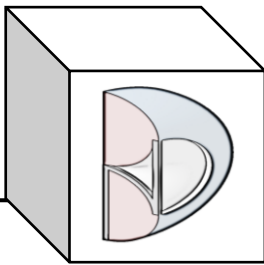
**14) Or Pick Plane 2 from tree**

**8) Select Angle driven for revolute 1**

**16) Pick OK**

**15) Pick OK**

The screenshot shows the ENOVIA V5 VPM software interface. The left pane displays a tree view with various components like 'Geometrical Set.1', 'PartBody', 'Kin Geom', and 'Rear Susp\_Kin\_SK\_Rear Diff Input Yoke'. The center pane shows a 3D model of a mechanical assembly. The right pane contains two dialog boxes: 'Creation: Gear' and 'New Mechanism'. The 'Creation: Gear' dialog has fields for 'Revolute Joint 1', 'Revolute Joint 2', 'Ratio' (set to 3.54), and 'Rotation directions'. The 'New Mechanism' dialog has fields for 'Joint name' (set to Revolute.2) and 'Current selection' (showing Line 1, Line 2, Plane 1, and Plane 2). Numbered callouts (8-16) provide step-by-step instructions for creating the gear joint.



- Set the Min/Max values for the Gear Joint.

The screenshot shows the ENOVIA V5 VPM software interface. The left sidebar displays a tree view of the assembly structure, including components like 'Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Inner' and 'Rear Susp\_Kin\_SK\_Assy-Halfshaft'. The main 3D view shows a mechanical assembly with various joints and constraints. A red box highlights the 'Gear.1' joint in the tree view, with a callout bubble indicating: **1) Double-Pick the Gear Joint**. The 'Joint Limits' dialog box is open, showing the 'Gear.1' joint selected. The '1st lower limit' is set to '-720deg' and the '1st upper limit' is set to '720deg'. Callout bubbles indicate: **2) Set Lower Limit to -720deg** and **3) Set Upper Limit to 720deg**. The 'OK' button is highlighted with a callout bubble indicating: **4) Pick OK**. A circled number '2' is in the top right corner of the software window.

**2) Set Lower Limit to -720deg**

**3) Set Upper Limit to 720deg**

**1) Double-Pick the Gear Joint**

**4) Pick OK**





- Create a Revolute Joint between the Diff LH Output Yoke and the Inner U-Joint.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. Below the menu bar is a toolbar with various icons. A red box highlights the Revolute icon in the toolbar, labeled with a circled '3'. The main workspace shows a 3D model of a mechanical assembly with various components and planes. Numbered callouts provide instructions for creating a Revolute Joint:

- 1) Pick the Revolute icon
- 2) Or Pick Line 1 from tree
- 3) Pick Line 2 Inner U-Joint geometry
- 4) Or Pick Plane 1 from tree
- 5) Or Pick Plane 2 from tree
- 6) Pick OK

The left-hand tree view shows the following structure:

- Rear Susp\_Kin\_SK\_Rear Diff Input Yoke (Rear Susp\_Kin\_SK\_Rear Diff Input Yoke)
- Rear Susp\_Kin\_SK\_Rear Diff LH Output Yoke (Rear Susp\_Kin\_SK\_Rear Diff LH Output Yoke)
- xy plane
- yz plane
- zx plane
- Axis Systems
- Geometrical Set.1
- PartBody
- Kin Geom
  - CL-Rear Axle Shaft
  - Plane-CL-Rear Axle Shaft
  - CL-U-Joint to Axle Shaft-Inner
  - Plane-CL-U-Joint to Axle Shaft-Inner
- Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Inner (Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Inner)
- xy plane
- yz plane
- zx plane
- Axis Systems
- Geometrical Set.1
- PartBody
- Kin Geom
  - U-Joint Ctr Pt
  - CL-U-Joint to Half Shaft
  - Plane-CL-U-Joint to Half Shaft
  - CL-U-Joint to Axle Shaft
  - Plane-CL-U-Joint to Axle Shaft

The 'Joint Creation: Revolute' dialog box is open, showing the following fields:

- Mechanism: Mechanism.1
- Joint name: Revolute.2
- Current selection:
  - Line 1: Rear Susp\_Kin\_SK\_Re
  - Line 2: Rear Susp\_Kin\_SK\_As
  - Plane 1: Rear Susp\_Kin\_SK\_Re
  - Plane 2: Rear Susp\_Kin\_SK\_As
  - Plane 3: -
  - Plane 4: -
- Null Offset ☐ Offset ☐ Centered ☐
- ☐ Angle driven

The OK and Cancel buttons are at the bottom right of the dialog box.



- Create a Revolute Joint between the Inner U-Joint and the Halfshaft Assy.

**1) Pick the Revolute icon**

**2) Or Pick Line 1 from tree**

**3) Or Pick Line 2 from tree**

**4) Or Pick Plane 1 from tree**

**5) Or Pick Plane 2 from tree**

**6) Pick OK**

**Joint Creation: Revolute**

Mechanism: Mechanism.1

Joint name: Revolute.3

Current selection:

Line 1: Rear Susp\_Kin\_SK\_As Line 2: Rear Susp\_Kin\_SK\_As

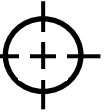
Plane 1: Rear Susp\_Kin\_SK\_As Plane 2: Rear Susp\_Kin\_SK\_As

Plane 3: - Plane 4: -

☐ Angle driven ☐ Null Offset ☐ Offset =

☐ Centered

OK Cancel



- Create a Revolute Joint between the Halfshaft Assy and the Outer U-Joint.

The screenshot shows the ENOVIA V5 VPM software interface with the Revolute Joint Creation dialog box open. The interface includes a menu bar (Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, Help) and a toolbar. The left pane displays a tree structure of the assembly, including components like 'Rear Susp\_Kin\_SK\_Assy-Halfshaft', 'Rear Susp\_Kin\_SK\_Assy-Halfshaft', 'xy plane', 'yz plane', 'zx plane', 'Axis Systems', 'Geometrical Set.1', 'PartBody', 'Kin Geom', 'CL-U-Joint to Half Shaft-Inner', 'Plane-CL-U-Joint to Half Shaft-Inner', 'CL-U-Joint to Half Shaft-Outer', 'Plane-CL-U-Joint to Half Shaft-Outer', 'Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Outer (Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Outer)', 'Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Outer', 'xy plane', 'yz plane', 'zx plane', 'Axis Systems', 'Geometrical Set.1', 'PartBody', 'Kin Geom', 'U-Joint Ctr Pt', 'CL-U-Joint to Half Shaft', 'Plane-CL-U-Joint to Half Shaft', 'CL-U-Joint to Axle Shaft', and 'Plane-CL-U-Joint to Axle Shaft'. The right pane shows a 3D model of the assembly. The Revolute Joint Creation dialog box is open, showing the 'Mechanism: Mechanism.1' and 'Joint name: Revolute.4'. The 'Current selection' section shows 'Line 1: Rear Susp\_Kin\_SK\_Assy', 'Line 2: Rear Susp\_Kin\_SK\_Assy', 'Plane 1: Rear Susp\_Kin\_SK\_Assy', and 'Plane 2: Rear Susp\_Kin\_SK\_Assy'. The 'Angle driven' checkbox is unchecked. The 'OK' button is highlighted.

1) Pick the Revolute icon

2) Or Pick Line 1 from tree

3) Or Pick Line 2 from tree

4) Or Pick Plane 1 from tree

5) Or Pick Plane 2 from tree

6) Pick OK



- Create a Revolute Joint between the Outer U-Joint and the Hub Assy.

**1) Pick the Revolute icon**

**2) Or Pick Line 1 from tree**

**4) Or Pick Plane 1 from tree**

**2) Pick Line 1 Outer U-Joint geometry**

**3) Or Pick Line 2 from tree**

**5) Or Pick Plane 2 from tree**

**3) Pick Line 2 Hub Assy geometry**

**5) Pick Plane 2 Hub Assy geometry**

**6) Pick OK**

Joint Creation: Revolute

Mechanism: Mechanism.1

Joint name: Revolute.5

Current selection:

Line 1: Rear Susp\_Kin\_SK\_As Line 2: Rear Susp\_Kin\_SK\_Re

Plane 1: Rear Susp\_Kin\_SK\_As Plane 2: Rear Susp\_Kin\_SK\_Re

Plane 3: - Plane 4: -

☐ Angle driven

☒ Null Offset ☐ Offset =

☐ Centered





- Create a Revolute Joint between the Hub Assy and the Knuckle Assy.

**1) Pick the Revolute icon**

**2) Or Pick Line 1 from tree**

**2) Pick Line 1 Hub Assy geometry**

**4) Or Pick Plane 1 from tree**

**4) Pick Plane 1 Hub Assy geometry**

**3) Or Pick Line 2 from tree**

**3) Pick Line 2 Knuckle Assy geometry**

**5) Or Pick Plane 2 from tree**

**5) Pick Plane 2 Knuckle Assy geometry**

**6) Pick OK**

Joint Creation: Revolute

Mechanism: Mechanism.1

Joint name: Revolute.6

Current selection:

Line 1: Rear Susp\_Kin\_SK\_Re Line 2: Rear Susp\_Kin\_SK\_Re

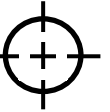
Plane 1: Rear Susp\_Kin\_SK\_Re Plane 2: Rear Susp\_Kin\_SK\_Re

Plane 3: - Plane 4: -

☐ Null Offset ☐ Offset =

☐ Angle driven

OK Cancel



- Create a Spherical Joint between the Knuckle and the Upper Trailing Arm.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. The toolbar contains various icons, with the Spherical Joint icon highlighted by a red box and labeled '1) Pick the Spherical icon'. The left-hand tree view shows a hierarchical structure of components, with 'Point-Upper Trailing Arm to Knuckle' highlighted and labeled '2) Or Pick Point 1 from tree'. The main workspace shows a 3D model of a mechanical assembly with various components and joints. A callout '2) Pick Point 1 Knuckle geometry' points to a specific point on the knuckle. Another callout '3) Pick Point 2 Upper Trailing Arm geometry' points to a specific point on the upper trailing arm. A third callout '3) Or Pick Point 2 from tree' points to the same point in the tree view. The bottom of the screen shows the 'Joint Creation: Spherical' dialog box, which is labeled '4) Pick OK'. The dialog box contains fields for Mechanism (Mechanism.1), Joint name (Spherical.7), and Current selection (Point 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Point-Upper Trailing Arm to Knuc, Point 2: Rear Susp\_Kin\_SK\_Upper Trailing Arm Assy/P...-Upper Trailing Arm to Knuc). The OK button is highlighted.

8

1) Pick the Spherical icon

2) Pick Point 1 Knuckle geometry

3) Pick Point 2 Upper Trailing Arm geometry

2) Or Pick Point 1 from tree

3) Or Pick Point 2 from tree

4) Pick OK

Joint Creation: Spherical

Mechanism: Mechanism.1

Joint name: Spherical.7

Current selection:

Point 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Point-Upper Trailing Arm to Knuc

Point 2: Rear Susp\_Kin\_SK\_Upper Trailing Arm Assy/P...-Upper Trailing Arm to Knuc

OK Cancel



# BND TechSource



- To avoid binding in the mechanism\*, create a Universal Joint between the Upper Trailing Arm and the Fixed Part.

The screenshot displays the ENOVIA V5 VPM software interface with a 3D model of a rear suspension assembly. The left-hand tree view lists various components, including 'CL-Rear Axle Shaft', 'Plane-CL-Rear Axle Shaft', 'Line-Rear Camber Strut\_Spin Axis 1', 'Line-Tie Rod to Diff', 'Line-Upper Trailing Arm to Frame', 'Line-Lower Trailing Arm to Frame', 'Shock Mnt Ctr Pt', 'ARB Center', 'Plane.ARB-Rear (Center Bar)-LH', 'Kin\_SK\_Rear Diff Input Yoke (Rear Susp\_Kin\_SK\_Rear Diff Input Yoke)', 'Kin\_SK\_Rear Diff LH Output Yoke (Rear Susp\_Kin\_SK\_Rear Diff LH Output Yoke)', 'Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series) (Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series) Inner)', 'Rear Susp\_Kin\_SK\_Assy-Halfshaft (Rear Susp\_Kin\_SK\_Assy-Halfshaft)', 'Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Outer (Rear Susp\_Kin\_SK\_Assy - U-Joint (1350 Series)-Outer)', 'Rear Susp\_Kin\_SK\_Rear Hub Assy (Rear Susp\_Kin\_SK\_Rear Hub Assy)', 'Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH (Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH)', 'Rear Susp\_Kin\_SK\_Upper Trailing Arm Assy (Rear Susp\_Kin\_SK\_Upper Trailing Arm Assy)', 'Rear Susp\_Kin\_SK\_Upper Trailing Arm (Rear Susp\_Kin\_SK\_Upper Trailing Arm)', 'xy plane', 'yz plane', 'zx plane', 'Axis Systems', 'Geometrical Set.1', 'PartBody', 'Kin\_Geom', 'CL-Upper Trailing Arm', 'Point-Upper Trailing Arm to Knuckle', and 'Line-Upper Trailing Arm to Frame'. The 'CL-Upper Trailing Arm' is highlighted in orange. A red box highlights the 'U-Joint' icon in the top toolbar. A yellow dialog box titled 'Joint Creation: U Joint' is open, showing the 'Mechanism: Mechanism.1' and 'Joint name: U Joint.8'. The 'Current selection:' section shows 'Spin 1: Rear Susp\_Kin\_SK\_Fixed Part/Line-Upper Trailing Arm to Frame' and 'Spin 2: Rear Susp\_Kin\_SK\_Upper Trailing Arm Assy/Upper Trailing Arm'. The 'Cross-pin axis direction' section has 'Normal to spin 1' selected. The 'OK' button is highlighted in green.

**1) Pick the U-Joint icon**

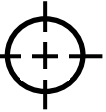
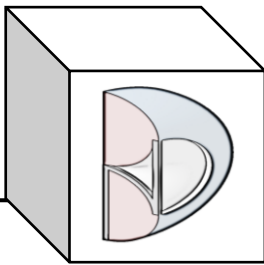
**2) Or Pick Spin 1 from tree**

**2) Pick Spin 1 Fixed Part geometry**

**3) Pick Spin 2 Upper Trailing Arm geometry**

**3) Or Pick Spin 2 from tree**

**4) Pick OK**



- Create a Spherical Joint between the Knuckle and the Lower Trailing Arm.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. The left-hand tree view shows a hierarchical structure of the assembly, with 'Point-Lower Trailing Arm to Knuckle' highlighted. The main 3D workspace shows a mechanical assembly with various components and axes. A red box highlights the 'Spherical' joint icon in the top toolbar. Four numbered callouts provide instructions: 1) Pick the Spherical icon, 2) Or Pick Point 1 from tree, 2) Pick Point 1 Knuckle geometry, 3) Or Pick Point 2 from tree, 3) Pick Point 2 Lower Trailing Arm geometry, and 4) Pick OK. A 'Joint Creation: Spherical' dialog box is open at the bottom, showing 'Mechanism: Mechanism.1', 'Joint name: Spherical.9', and the current selection for Point 1 and Point 2. The 'OK' button is highlighted.

1) Pick the Spherical icon

2) Or Pick Point 1 from tree

2) Pick Point 1 Knuckle geometry

3) Or Pick Point 2 from tree

3) Pick Point 2 Lower Trailing Arm geometry

4) Pick OK

Joint Creation: Spherical

Mechanism: Mechanism.1

Joint name: Spherical.9

Current selection:

Point 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Point-Lower Trailing Arm to Knuckle

Point 2: Rear Susp\_Kin\_SK\_Lower Trailing Arm Assy/Point-Lower Trailing Arm to Knuckle

OK Cancel





- To avoid binding in the mechanism\*, create a Universal Joint between the Lower Trailing Arm and the Fixed Part.

The screenshot displays the ENOVIA V5 VPM software interface. The left-hand tree view shows a hierarchical structure of the assembly, with 'Line-Lower Trailing Arm to Frame' and 'CL-Lower Trailing Arm' highlighted. The main workspace shows a 3D model of a mechanical assembly with various components and axes. A 'Joint Creation: U Joint' dialog box is open in the bottom right corner, showing the 'Mechanism' dropdown set to 'Mechanism.1' and the 'Joint name' as 'U Joint.10'. The 'Current selection' section shows 'Spin 1: Rear Susp\_Kin\_SK\_Fixed Part/Line-Lower Trailing Arm to Frame' and 'Spin 2: Rear Susp\_Kin\_SK\_Lower Trailing Arm Assy/CL-Lower Trailing Arm'. The 'Cross-pin axis direction' section has 'Normal to spin 1' selected. The 'OK' button is highlighted.

**1) Pick the U-Joint icon**

**2) Or Pick Spin 1 from tree**

**2) Pick Spin 1 Fixed Part geometry**

**3) Pick Spin 2 Lower Trailing Arm geometry**

**3) Or Pick Spin 2 from tree**

**4) Pick OK**



- Create a Spherical Joint between the Knuckle and the Camber Strut Assy.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. The left-hand tree view shows a hierarchy of components, with 'Pivot Point-Rear Camber Strut\_Knuckle' highlighted. The main 3D workspace shows a mechanical assembly with various components and dashed lines indicating joint creation. A red box highlights the 'Spherical' joint icon in the top toolbar. A circular callout with the number '12' is in the top right corner.

**1) Pick the Spherical icon**

**2) Or Pick Point 1 from tree**

**2) Pick Point 1 Knuckle geometry**

**3) Or Pick Point 2 from tree**

**3) Pick Point 2 Camber Strut Assy geometry**

**4) Pick OK**

Joint Creation: Spherical

Mechanism: Mechanism.1

Joint name: Spherical.11

Current selection:

Point 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Pivot Point-Rear Camber Strut\_Knuckle

Point 2: Rear Susp\_Kin\_SK\_Rear Camber Strut Assy/Point-Rear Camber Strut

OK Cancel



- To avoid binding in the mechanism\*, create a Universal Joint between the Camber Strut Assy and the Fixed Part.

**1) Pick the U-Joint icon**

**2) Pick Spin 1 Fixed Part geometry**

**3) Pick Spin 2 Camber Strut Assy geometry**

**4) Pick OK**

**2) Or Pick Spin 1 from tree**

**3) Or Pick Spin 2 from tree**

Joint Creation: U Joint

Mechanism: Mechanism.1

Joint name: U Joint.12

Current selection:

Spin 1: Rear Susp\_Kin\_SK\_Fixed Part/Line-Rear Camber Strut\_Spin Axis 1

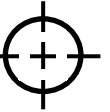
Spin 2: Rear Susp\_Kin\_SK\_Rear Camber Strut Assy/CL-Rear Camber Strut

Cross-pin axis direction

☐ Normal to spin 1 ☒ Normal to spin 2

☐ Any:

OK Cancel



- Create a Spherical Joint between the Knuckle and the Tie Rod Assy.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. The left sidebar shows a tree view of the assembly structure, with 'Point-Rear Tie Rod to Knuckle (Lower)' highlighted. The main workspace shows a 3D model of a mechanical assembly with various components and joints. A red box highlights the 'Spherical' joint icon in the top toolbar. A callout bubble points to this icon with the text '1) Pick the Spherical icon'. Another callout bubble points to a point in the tree view with the text '2) Or Pick Point 1 from tree'. A third callout bubble points to a point in the 3D model with the text '2) Pick Point 1 Knuckle geometry'. A fourth callout bubble points to another point in the 3D model with the text '3) Pick Point 2 Tie Rod Assy geometry'. A fifth callout bubble points to the 'OK' button in the 'Joint Creation: Spherical' dialog box with the text '4) Pick OK'. The dialog box shows 'Mechanism: Mechanism.1', 'Joint name: Spherical.13', and 'Current selection: Point 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Point-Rear Tie Rod to Knuckle (Lower) Point 2: Rear Susp\_Kin\_SK\_Rear Tie Rod Assy/Point-Rear Tie Rod to Knuckle (Lower)'. The dialog box also has 'OK' and 'Cancel' buttons.

1) Pick the Spherical icon

2) Or Pick Point 1 from tree

2) Pick Point 1 Knuckle geometry

3) Or Pick Point 2 from tree

3) Pick Point 2 Tie Rod Assy geometry

4) Pick OK

Joint Creation: Spherical

Mechanism: Mechanism.1

Joint name: Spherical.13

Current selection:

Point 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Point-Rear Tie Rod to Knuckle (Lower) Point 2: Rear Susp\_Kin\_SK\_Rear Tie Rod Assy/Point-Rear Tie Rod to Knuckle (Lower)

OK Cancel

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- To avoid binding in the mechanism\*, create a Universal Joint between the Tie Rod Assy and the Fixed Part.

The screenshot displays the ENOVIA V5 VPM software interface. The left-hand tree view lists various components, including 'CL-Rear Tie Rod' and 'Rear Susp\_Kin\_SK\_Rear Tie Rod Assy'. The main workspace shows a 3D model of a vehicle chassis with various components highlighted in different colors. A red box highlights the 'U-Joint' icon in the top toolbar. A callout bubble points to the 'U-Joint' icon with the text '1) Pick the U-Joint icon'. Another callout bubble points to the 'CL-Rear Tie Rod' in the tree view with the text '2) Or Pick Spin 1 from tree'. A third callout bubble points to the 'Rear Susp\_Kin\_SK\_Rear Tie Rod Assy' in the tree view with the text '3) Or Pick Spin 2 from tree'. A fourth callout bubble points to the 'Rear Susp\_Kin\_SK\_Rear Tie Rod Assy' in the main workspace with the text '3) Pick Spin 2 Tie Rod Assy geometry'. A fifth callout bubble points to the 'Rear Susp\_Kin\_SK\_Rear Tie Rod Assy' in the main workspace with the text '2) Pick Spin 1 Fixed Part geometry'. A sixth callout bubble points to the 'OK' button in the 'Joint Creation: U Joint' dialog box with the text '4) Pick OK'. The 'Joint Creation: U Joint' dialog box is open, showing the 'Mechanism' dropdown set to 'Mechanism.1', the 'Joint name' as 'U Joint.14', and the 'Current selection' for 'Spin 1' as 'Rear Susp\_Kin\_SK\_Fixed Part/Line-Tie Rod to Diff' and for 'Spin 2' as 'Rear Susp\_Kin\_SK\_Rear Tie Rod Assy'. The 'Cross-pin axis direction' is set to 'Normal to spin 2'.

1) Pick the U-Joint icon

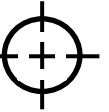
2) Or Pick Spin 1 from tree

3) Or Pick Spin 2 from tree

3) Pick Spin 2 Tie Rod Assy geometry

2) Pick Spin 1 Fixed Part geometry

4) Pick OK



- To avoid binding in the mechanism\*, create a Universal Joint between the Knuckle and the Shock Absorber-Lower.

**1) Pick the U-Joint icon**

**2) Or Pick Spin 1 from tree**

**3) Or Pick Spin 2 from tree**

**2) Pick Spin 1 Knuckle geometry**

**3) Pick Spin 2 Shock Absorber-Lower geometry**

**4) Pick OK**

Joint Creation: U Joint

Mechanism: Mechanism.1

Joint name: U Joint.15

Current selection:

Spin 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Line-Lower Shock Mnt

Spin 2: Rear Susp\_Kin\_SK\_Shock Absorber-Lower/CL-Lower Shock

Cross-pin axis direction

☐ Normal to spin 1 ☒ Normal to spin 2

☐ Any:

OK Cancel



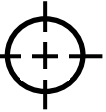
- Create a Prismatic Joint between the Lower Shock CL and the Upper Shock CL and make it *Length driven*.

The screenshot displays the SolidWorks software interface with the Prismatic Joint dialog box open. The following steps are indicated by numbered callouts:

- 1) Pick the Prismatic icon
- 2) Or Pick Line 1 from tree
- 3) Or Pick Line 2 from tree
- 2) Pick Line 1 Lower Shock geometry
- 3) Pick Line 2 Upper Shock geometry
- 4) Or Pick Plane 1 from tree
- 5) Or Pick Plane 2 from tree
- 5) Pick Plane 2 Upper Shock geometry
- 4) Pick Plane 1 Lower Shock geometry
- 6) Pick Length driven
- 7) Pick OK

The Prismatic dialog box shows the following settings:

- Joint: Prismatic
- Axis: Mechanism.1
- Length driven: ☒
- Current selection:
  - Line 1: Rear Susp\_Kin\_SK\_Shock Absorber-Lower/CL-Lower Shock
  - Line 2: Rear Susp\_Kin\_SK\_Shock Absorber-Upper/CL-Upper Shock
  - Plane 1: Rear Susp\_Kin\_SK\_Shock Absorber-Lower/Plane thru Up & Lwr Shock Mnts
  - Plane 2: Rear Susp\_Kin\_SK\_Shock Absorber-Upper/Plane thru Up & Lwr Shock Mnts



- Set the Min/Max values for the Prismatic Joint.

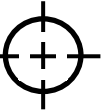
1) Double-Pick the Prismatic Joint

2) Set Lower Limit to -49.5mm

3) Set Upper Limit to 35.5mm

4) Pick OK





- Create a Spherical Joint between the Shock Absorber-Upper and the Fixed Part.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. The toolbar contains various icons, with the Spherical Joint icon highlighted by a red box and labeled "1) Pick the Spherical icon". The main workspace shows a 3D model of a mechanical assembly with various components and joints. A callout box labeled "3) Or Pick Point 2 from tree" points to the "Upper Shock Mnt Ctr Pt" in the tree. Another callout box labeled "2) Pick Point 1 Upper Shock geometry" points to a point on the upper shock geometry. A third callout box labeled "3) Pick Point 2 Fixed Part geometry" points to a point on the fixed part geometry. A fourth callout box labeled "4) Pick OK" points to the OK button in the "Joint Creation: Spherical" dialog box. The dialog box shows the Mechanism as "Mechanism.1", the Joint name as "Spherical.17", and the Current selection as "Point 1: Rear Susp\_Kin\_SK\_Shock Absorber-Upper/Upper Shock Mnt Ctr Pt" and "Point 2: Rear Susp\_Kin\_SK\_Fixed Part/Upper Shock Mnt Ctr Pt". A message box in the center states "The mechanism can be simulated" with an OK button. The tree on the left lists various components, including "Line-Upper Trailing Arm to Frame", "Line-Lower Trailing Arm to Frame", "Upper Shock Mnt Ctr Pt", "CL-Upper Shock", and "Plane thru Upr & Lwr Shock Mnts".

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1) Pick the Spherical icon

2) Pick Point 1 Upper Shock geometry

3) Pick Point 2 Fixed Part geometry

3) Or Pick Point 2 from tree

2) Or Pick Point 1 from tree

4) Pick OK

The mechanism can be simulated

Joint Creation: Spherical

Mechanism: Mechanism.1

Joint name: Spherical.17

Current selection:

Point 1: Rear Susp\_Kin\_SK\_Shock Absorber-Upper/Upper Shock Mnt Ctr Pt

Point 2: Rear Susp\_Kin\_SK\_Fixed Part/Upper Shock Mnt Ctr Pt

OK Cancel



# BND TechSource



- If 35.5mm is not upwards and -49.5mm not downwards:

**1) Double-Pick the Prismatic Command for the Lower to Upper Shock**

**2) Pick the Arrow to flip**

**3) Pick OK**

Command Edition: Command.2 (Length)

Command name: Command.2

Command value: 0mm

Reset to Zero

Law Management

Import... Discard Edit... Link... Unlink...

OK Cancel





# BND TechSource



## ■ Run Simulation with Commands.

The screenshot displays the SolidWorks interface with a mechanism model. The left sidebar shows a tree view of the assembly, including joints like Gear, Revolute, Spherical, U Joint, and Prismatic. The main workspace shows a 3D model of the mechanism with various joints and components. A 'Simulation - Mechanism.1' dialog box is open in the center, showing settings for the simulation. The dialog box has a 'Reset' button and an 'Analysis...' button. The 'Analysis...' button is highlighted with a callout. The 'Reset' button is highlighted with a callout. The 'Close' button is highlighted with a callout. The 'Simulation - Mechanism.1' dialog box is open, showing settings for the simulation. The dialog box has a 'Reset' button and an 'Analysis...' button. The 'Analysis...' button is highlighted with a callout. The 'Reset' button is highlighted with a callout. The 'Close' button is highlighted with a callout.

**1) Pick the Simulation with Commands icon**

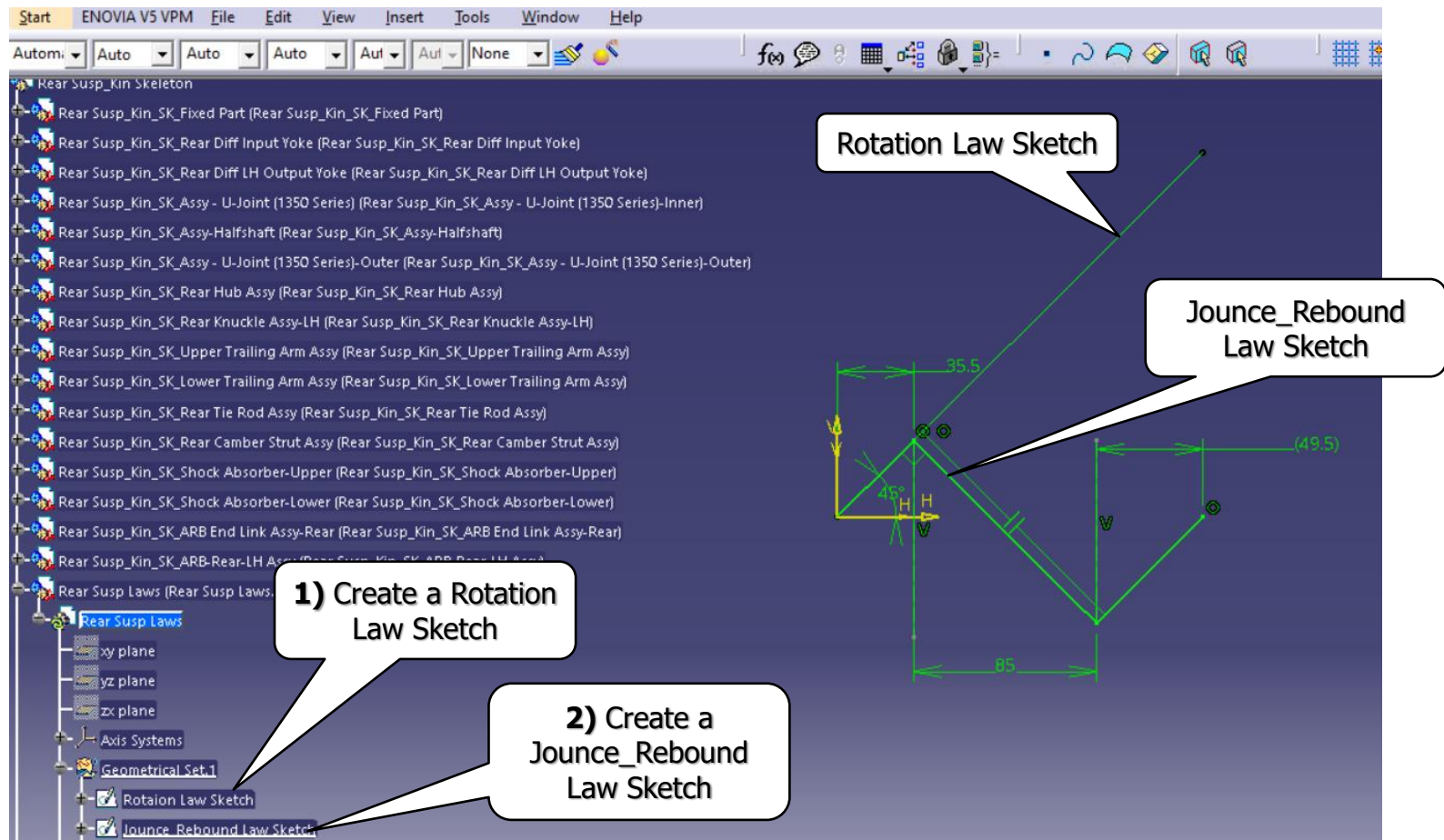
**2) Adjust the settings**

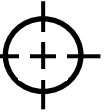
**3) Pick Reset**

**4) Pick Close**



- Create Laws for the mechanism commands.





- Attach the Laws to the mechanism Simulation.

**1) Double-pick the Gear command**

**2) Pick Link**

**3) Pick the Rotation Law Sketch**

**4) Pick OK**

**5) Pick OK**

**6) Pick OK**

Information: A new kinematics law has been successfully created.

Command Edition: Command.1 (e 2)

Command name: Command.1  
Command value: 0deg

Reset to Zero

Law Management

Import Preview Edit Link... Unlink...

Sketch Selection for Command.1

Select the sketch you want to link the command

Sketch name: Rear Susp\_Kin Skeleton/Rear Susp Laws.1/Rear Susp Laws/Geometrical Set.1/Rotaion Law Sketch

Maximum time value: 10



- Attach the Laws to the mechanism Simulation.

**3) Pick the Jounce\_Rebound Law Sketch**

**1) Double-pick the Prismatic command**

**5) Pick OK**

**2) Pick Link**

**4) Pick OK**

**6) Pick OK**

Information: A new kinematics law has been successfully created.

Command Edition: Command.2 (Length) ? X

Command name: Command.2  
Command value: 0mm  
Reset to Zero  
Law Management  
Import... Preview... Edit... Link... Unlink...  
OK Cancel

Sketch Selection for Command.2 ? X

Select the sketch you want to link the command  
Sketch name: Rear Susp\_Kin Skeleton/Rear Susp Laws.1/Rear Susp Laws/Geometrical Set.1/Jounce\_Rebound Law Sketch  
Maximum time value: 10  
OK Cancel





# BND TechSource



- Run the Simulation with Laws.

The screenshot displays the ENOVIA V5 VPM software interface. The main window shows a 3D model of a mechanical assembly with various components and constraints. The left sidebar contains a tree view with categories like 'Rear Susp Laws', 'Constraints', 'Applications', 'Mechanisms', and 'Simulation'. The 'Simulation' category is expanded, showing 'Simulation.1' and 'Mechanism.1'. The 'Edit Simulation' dialog box is open, showing the 'Name' field set to 'Simulation.1'. The 'Use Laws' tab is selected, and the 'Start' field is set to 0.00. The 'Number of steps' is set to 40. The 'Check joint limits' checkbox is checked. The 'Edit Simulation' dialog box has buttons for 'Insert', 'Modify', 'Delete', 'Skip', 'Edit analysis', 'Edit simulation objects', 'Edit sensors', 'OK', and 'Cancel'. The 'OK' button is highlighted with a green circle.

1) Double-pick the Simulation

2) Pick Use Laws

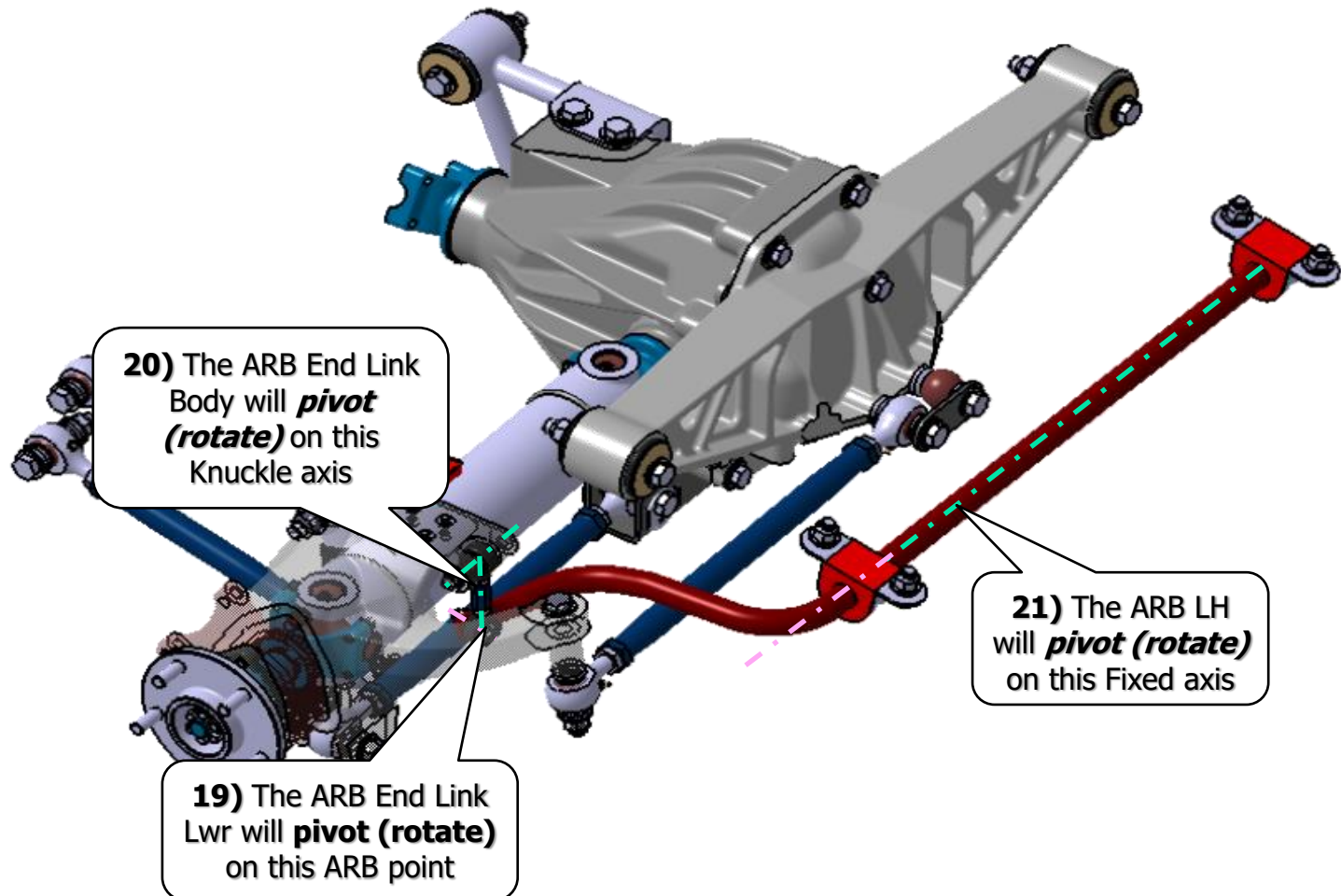
3) Pick Play Forward

4) Pick Play Back

5) Pick OK



- To finish the simulation, add the ARB into the mechanism.







- To avoid binding in the mechanism\*, create a Universal Joint between the Knuckle Assy and the ARB End Link.

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2) Or Pick Spin 1 from tree

2) Pick Spin 1 Knuckle Assy geometry

1) Pick the U-Joint icon

3) Pick Spin 2 ARB End Link geometry

4) Pick OK

3) Or Pick Spin 2 from tree

Joint Creation: U Joint

Mechanism: Mechanism.1

Joint name: U Joint.18

Current selection:

Spin 1: Rear Susp\_Kin\_SK\_Rear Knuckle Assy-LH/Line-ARB Spin Axis 1

Spin 2: Rear Susp\_Kin\_SK\_ARB End Link Assy-Rear/ARB Spin Axis 2

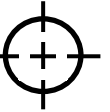
Cross-pin axis direction

☐ Normal to spin 1

☒ Normal to spin 2

☐ Any:

OK Cancel



- Create a Spherical Joint between the ARB End Link and the ARB Assy.

The screenshot displays the ENOVIA V5 VPM software interface. The top menu bar includes Start, ENOVIA V5 VPM, File, Edit, View, Insert, Tools, Analyze, Window, and Help. The left sidebar shows a tree structure with various assembly components. The main workspace shows a 3D model of a mechanical assembly with various planes and axes. A red box highlights the Spherical joint icon in the top toolbar. A callout bubble points to this icon with the text "1) Pick the Spherical icon". Another callout bubble points to a point in the tree structure with the text "2) Or Pick Point 1 from tree". A third callout bubble points to a point in the 3D model with the text "2) Pick Point 1 ARB End Link geometry". A fourth callout bubble points to another point in the 3D model with the text "3) Pick Point 2 ARB geometry". A fifth callout bubble points to the OK button in the "Joint Creation: Spherical" dialog box with the text "4) Pick OK". The dialog box shows the Mechanism as "Mechanism.1", the Joint name as "Spherical.19", and the Current selection as "Point 1: Rear Susp\_Kin\_SK\_ARB End Link Assy-Rear/Point-ARB End Link Pivot Ball-Rec" and "Point 2: Rear Susp\_Kin\_SK\_ARB-Rear-LH Assy/Point-ARB End Link Pivot Ball-Rec".

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1) Pick the Spherical icon

2) Or Pick Point 1 from tree

2) Pick Point 1 ARB End Link geometry

3) Or Pick Point 2 from tree

3) Pick Point 2 ARB geometry

4) Pick OK

Joint Creation: Spherical

Mechanism: Mechanism.1

Joint name: Spherical.19

Current selection:

Point 1: Rear Susp\_Kin\_SK\_ARB End Link Assy-Rear/Point-ARB End Link Pivot Ball-Rec

Point 2: Rear Susp\_Kin\_SK\_ARB-Rear-LH Assy/Point-ARB End Link Pivot Ball-Rec

OK Cancel



- Create a Revolute Joint between the ARB Assy and the Fixed Part.

**2) Or Pick Line 1 from tree**

**4) Or Pick Plane 1 from tree**

**2) Or Pick Line 2 from tree**

**5) Or Pick Plane 2 from tree**

**1) Pick the Revolute icon**

**2) Pick Line 1 ARB Assy geometry**

**3) Pick Line 2 Fixed Part geometry**

**4) Pick Plane 1 ARB Assy geometry**

**5) Pick Plane 2 Fixed Part geometry**

**6) Pick OK**

Joint Creation: Revolute

Mechanism: Mechanism.1

Joint name: Revolute.20

Current selection:

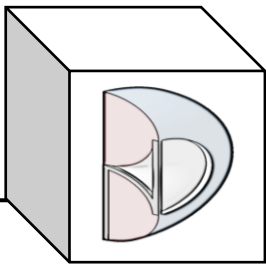
Line 1: Rear Susp\_Kin\_SK\_ARB-Rear-LH Assy/CL-  
Plane 1: Rear Susp\_Kin\_SK\_ARB-Rear-LH Assy/Plane

Line 2: Rear Susp\_Kin\_SK\_Fixed Part/CL-ARB Cen  
Plane 2: Rear Susp\_Kin\_SK\_Fixed Part/Plane.ARB-R

Null Offset ☐ Offset = Unset

Plane 4: ☐ Centered

OK Cancel



## **Step 4: Link the Kinematic Skeleton to the Main parts assembly via Mechanism Dressup**

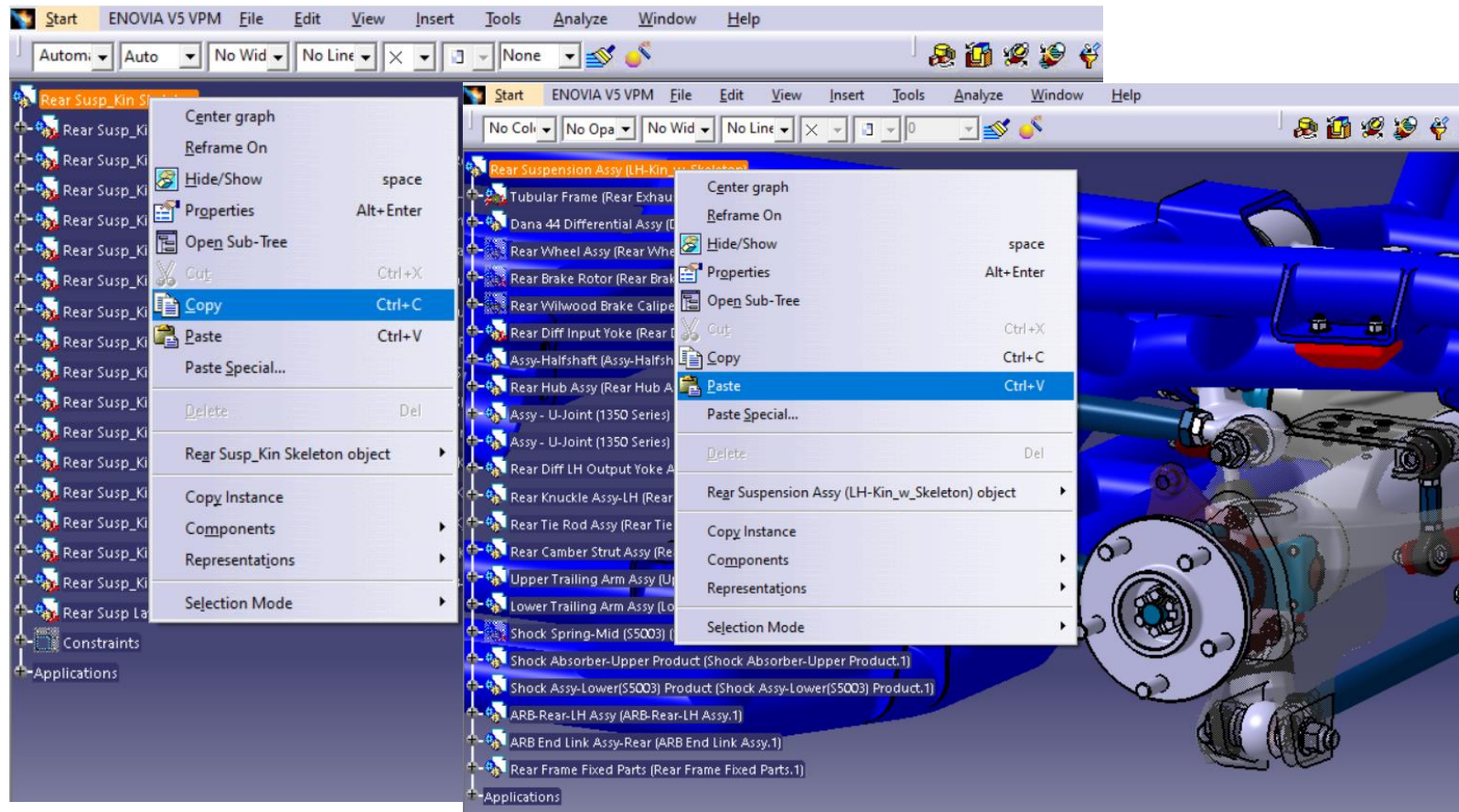




# BND TechSource



- Copy the Skeleton product and paste it into the Suspension parts assembly.



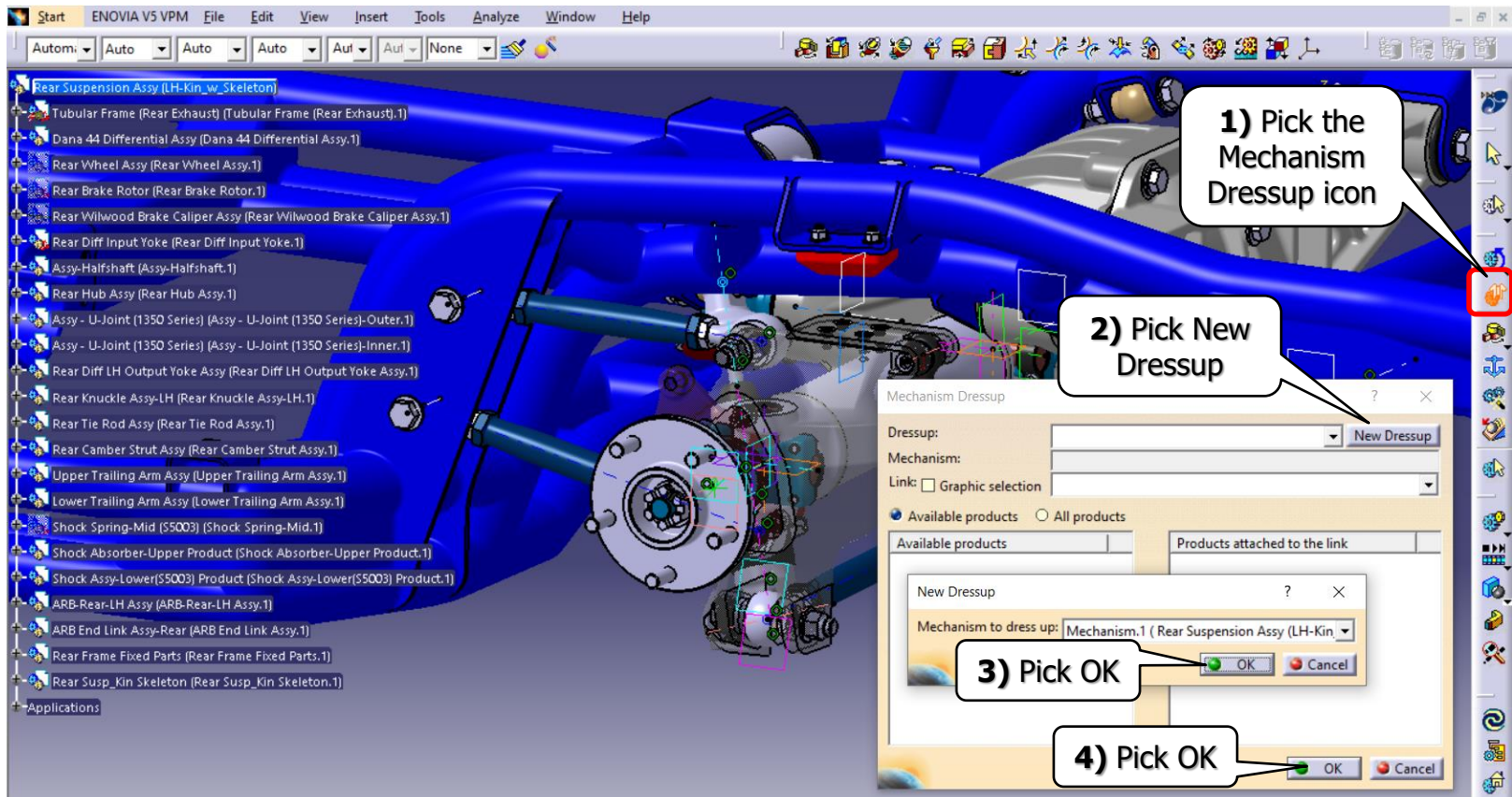




# BND TechSource



- Link the parts to the Kinematic Skeleton using Mechanism Dressup.

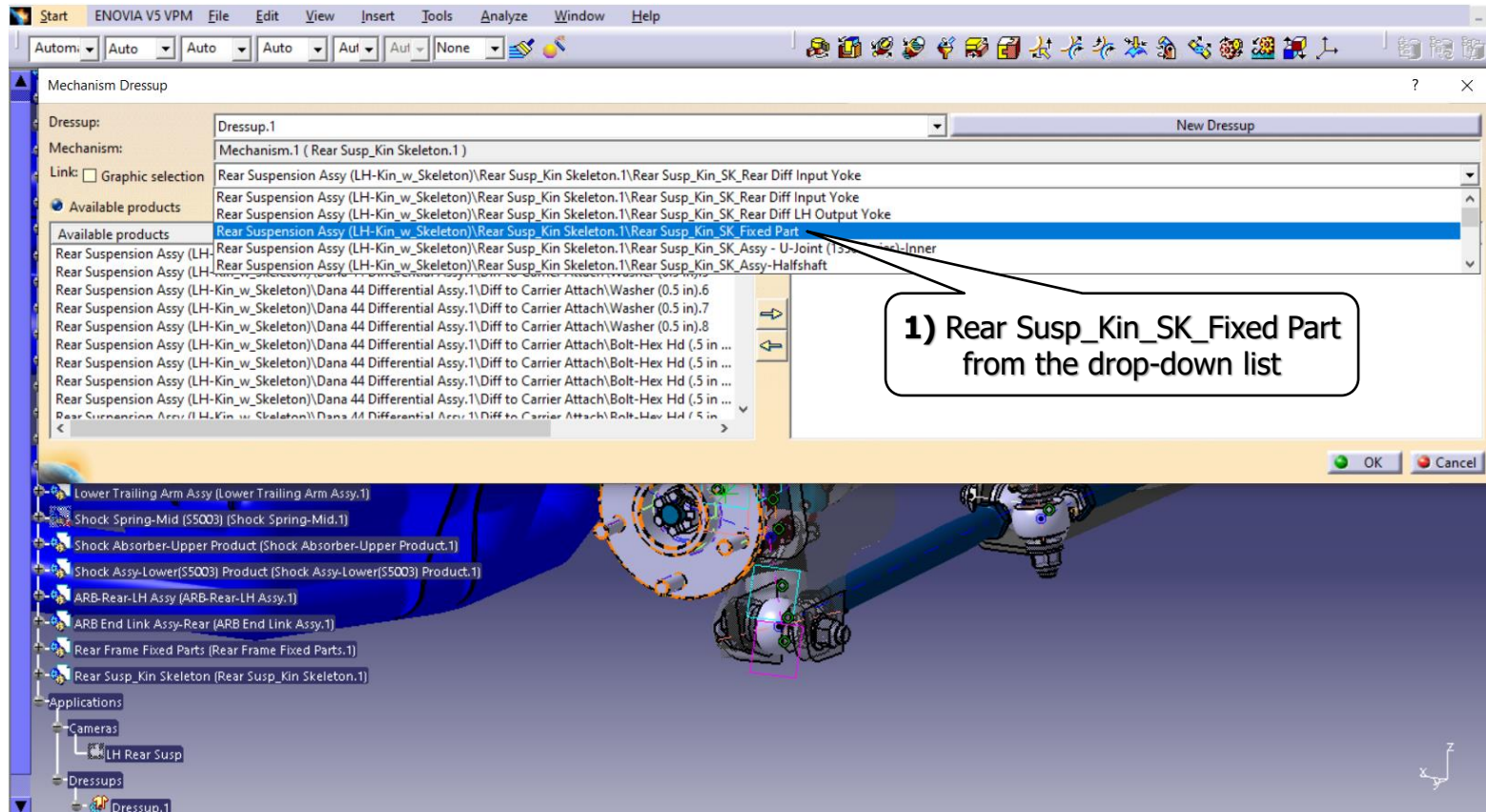




# BND TechSource

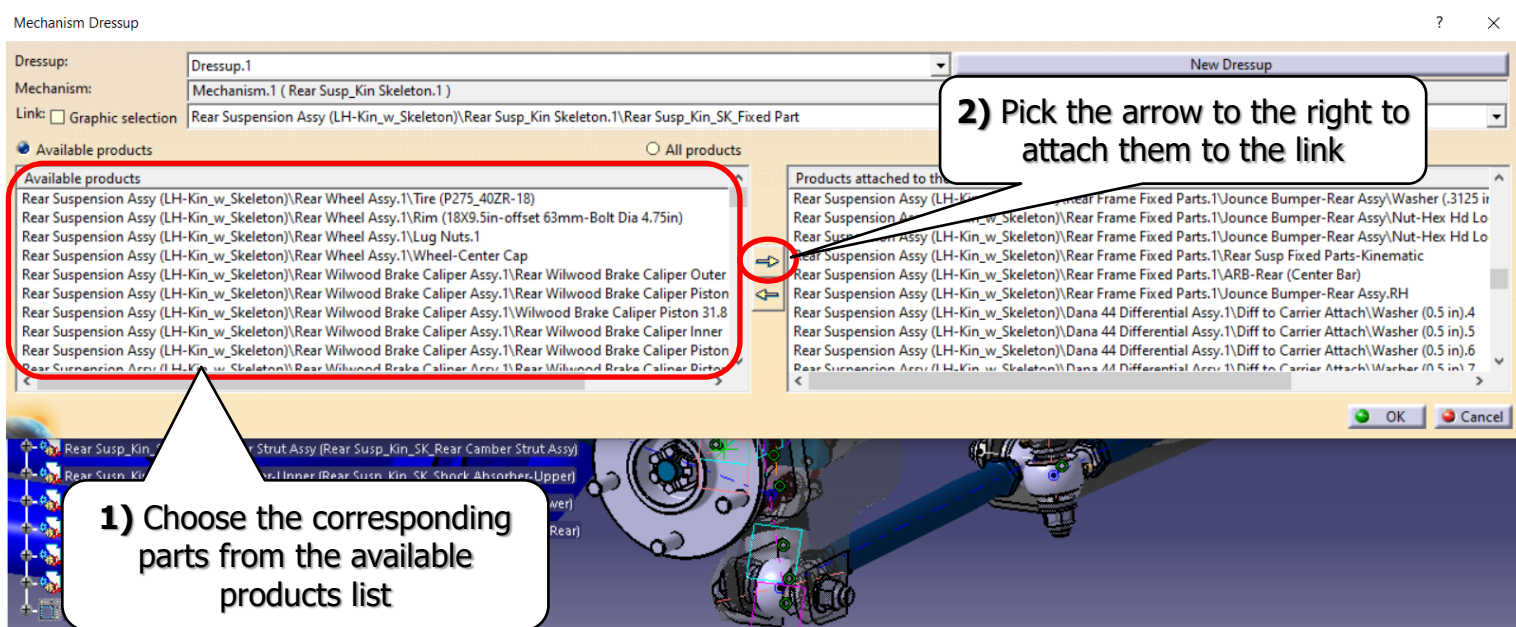


- Step A: Choose Rear Susp\_Kin\_SK\_Fixed Part from the drop-down list.

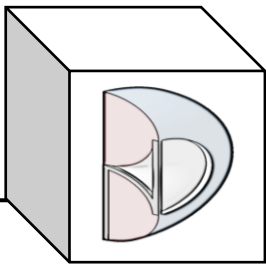


# BND TechSource

- Step B: Choose the parts from the available products list and pick the arrow to the right to attach them to the link.



- Repeat Steps A & B until all the links on the drop-down list have been attached to the available products.

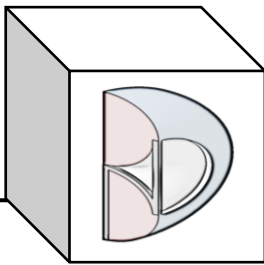


# BND TechSource



## **Step 5: Create and Save a Kinematic Simulation**





# BND TechSource

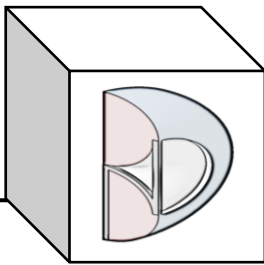


- At this point we can create a Simulation using Laws to record all parts are now moving according to the kinematic mechanism.

The screenshot displays the SolidWorks interface with a 3D model of a rear suspension assembly. The left-hand tree view lists various components, including 'Rear Suspension Assy (LH-Kin\_w\_skeleton)', 'Tubular Frame (Rear Exhaust)', 'Dana 44 Differential Assy', 'Rear Wheel Assy', 'Rear Brake Rotor', 'Rear Wilwood Brake Caliper Assy', 'Rear Diff Input Yoke', 'Assy-Halfshaft', 'Rear Hub Assy', 'Assy - U-Joint (1350 Series)', 'Rear Diff LH Output Yoke Assy', 'Rear Knuckle Assy-LH', 'Rear Tie Rod Assy', 'Rear Camber Strut Assy', 'Upper Trailing Arm Assy', 'Lower Trailing Arm Assy', 'Shock Spring-Mid', 'Shock Absorber-Upper Product', 'Shock Assy-Lower', 'ARB-Rear-LH Assy', 'ARB End Link Assy-Rear', 'Rear Frame Fixed Parts', and 'Rear Susp\_Kin Skeleton'. The main 3D view shows the assembly with blue and white parts. Overlaid on the image are six numbered callouts with arrows pointing to specific UI elements:

- 1) Pick the Simulation icon**: Points to the 'Simulation' icon in the top-right corner of the SolidWorks interface.
- 2) Pick Use Laws**: Points to the 'Use Laws' button in the 'Kinematics Simulation' dialog box.
- 3) Set Number of steps to 170**: Points to the 'Number of steps' input field in the 'Kinematics Simulation' dialog box, which is set to 170.
- 4) Pick Automatic Insert**: Points to the 'Automatic insert' checkbox in the 'Edit Simulation' dialog box.
- 5) Pick Play Forward**: Points to the 'Play Forward' button in the 'Kinematics Simulation' dialog box.
- 6) Pick OK**: Points to the 'OK' button in the 'Edit Simulation' dialog box.

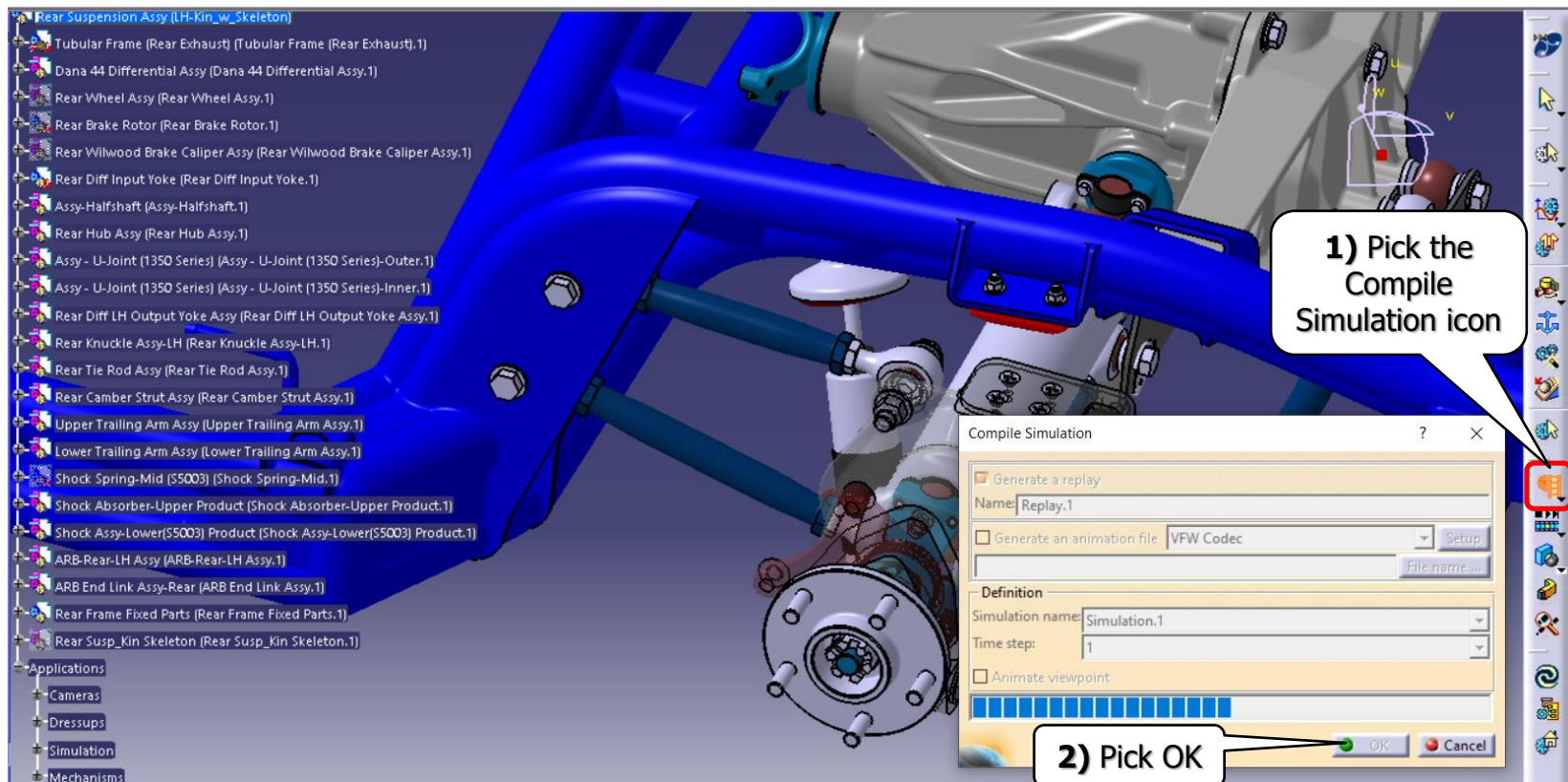




# BND TechSource



- Compile a Replay of the Simulation.





# BND TechSource



- Replay the Simulation.

**1) Pick the Replay icon**

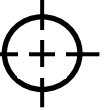
**2) Select Continuous Mode**

**3) Pick Play Forward**

**4) Pick Close to finish**







- Conclusion:

This is an example of how to create a CATIA DMU Kinematic simulation for a Rear Independent 5-link suspension.

We hope this will help those who need this type of simulation.

As always, we are open to any discussions this may bring.

Please ***subscribe*** to our YouTube channel!

