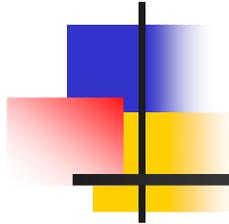


BND TechSource



Ergonomic Manikin Manipulation using CATIA V5 DMU Kinematics (Steps 1- 4 the simple solution)

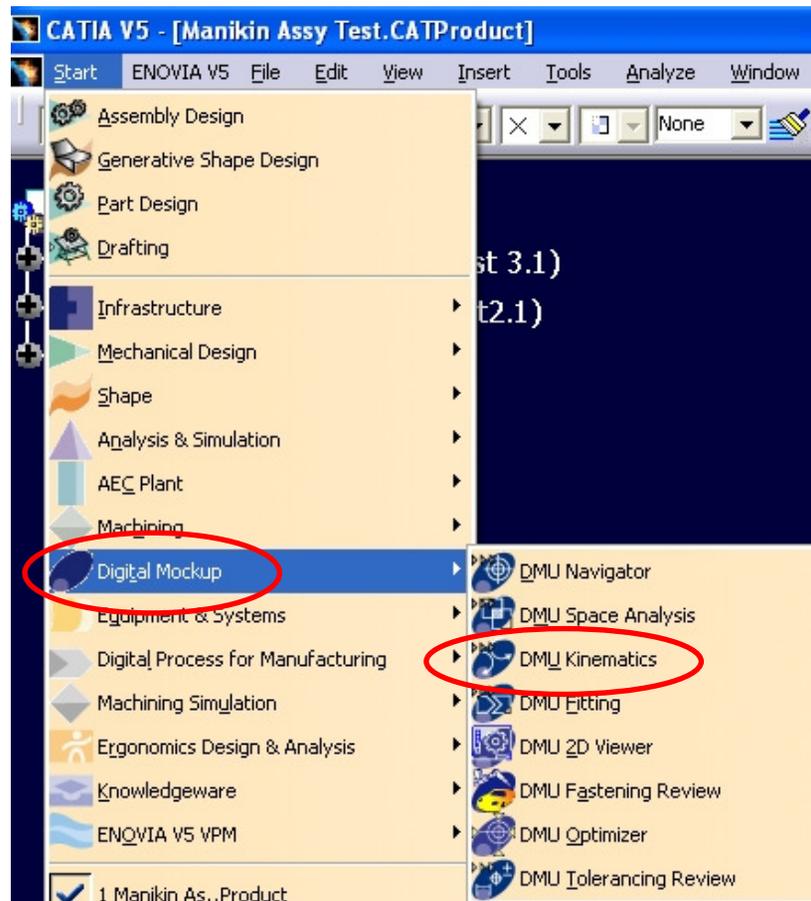
The logo features a vertical black line intersecting a horizontal black line. To the left of the intersection, there are three overlapping squares: a blue one at the top, a red one in the middle, and a yellow one at the bottom. To the right of the intersection, the text "BND TechSource" is displayed in a bold, blue, sans-serif font with a slight drop shadow.

BND TechSource

- The following licenses are required to manipulate 3D Ergonomic Manikins with CATIA V5 DMU Kinematics:
 - Digital Mockup
 - Ergonomics Design & Analysis

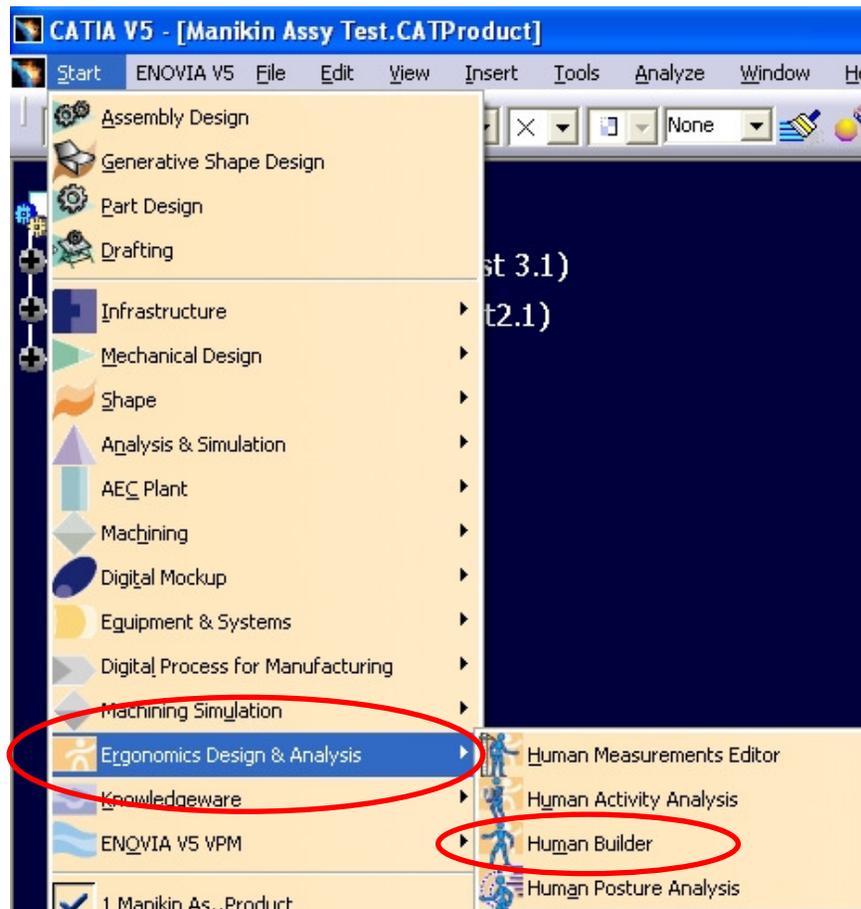
BND TechSource

- Digital Mockup



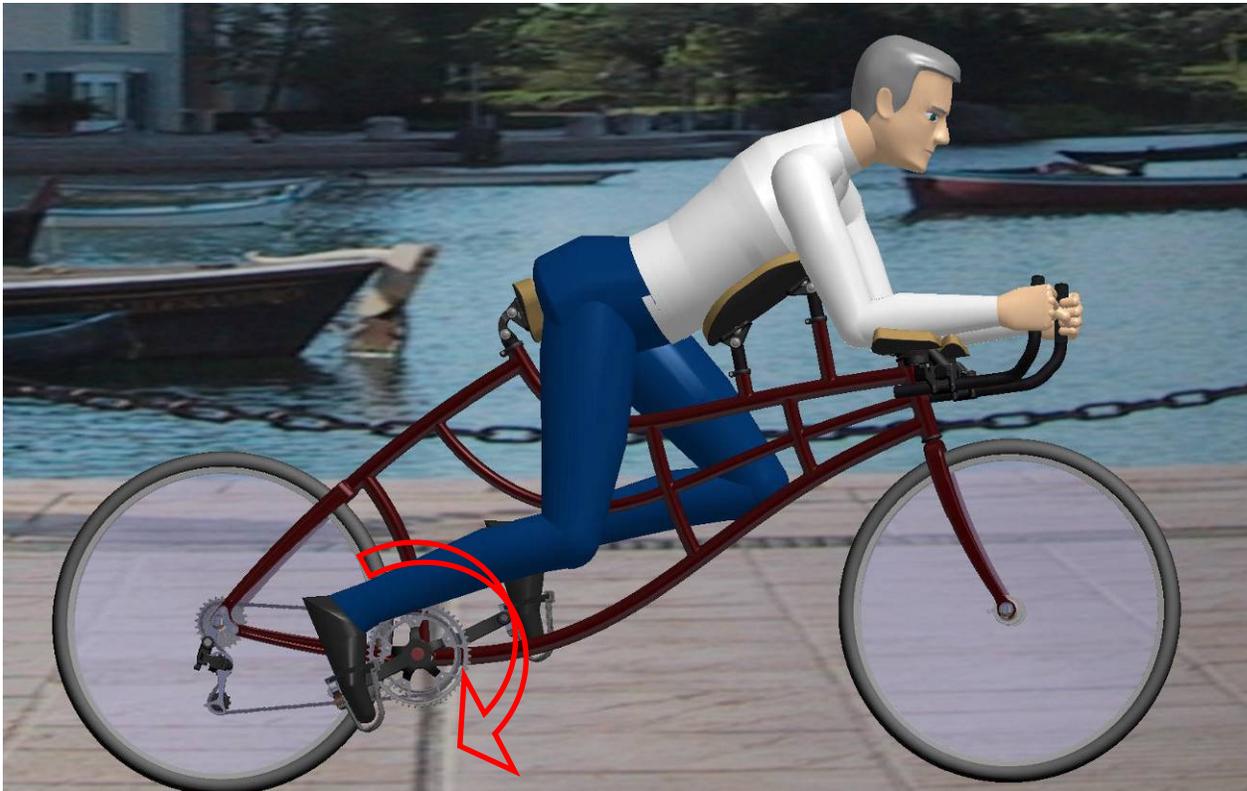
BND TechSource

- Ergonomics Design & Analysis



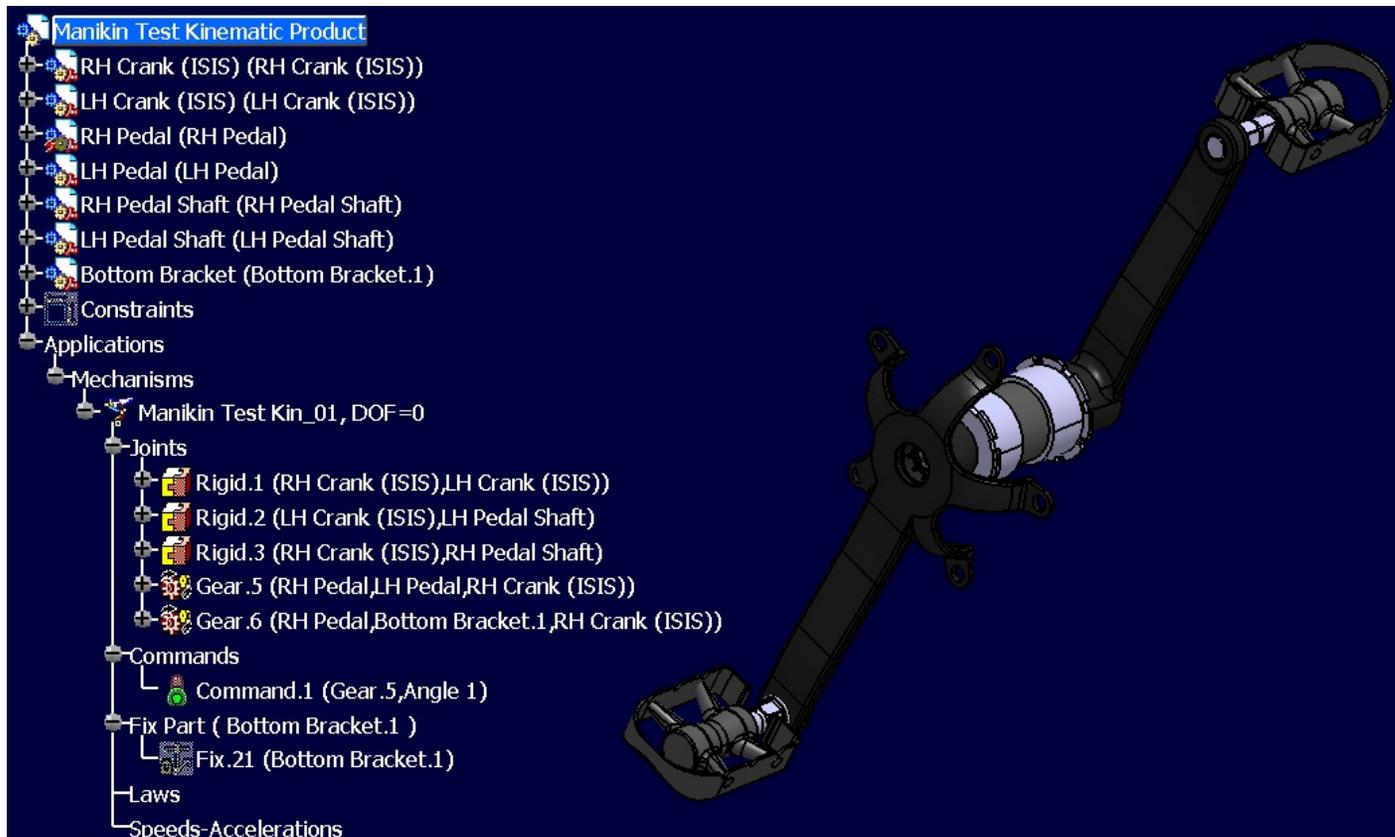
BND TechSource

- The end result we are trying to achieve is to show a bicycle rider pedaling a bike.



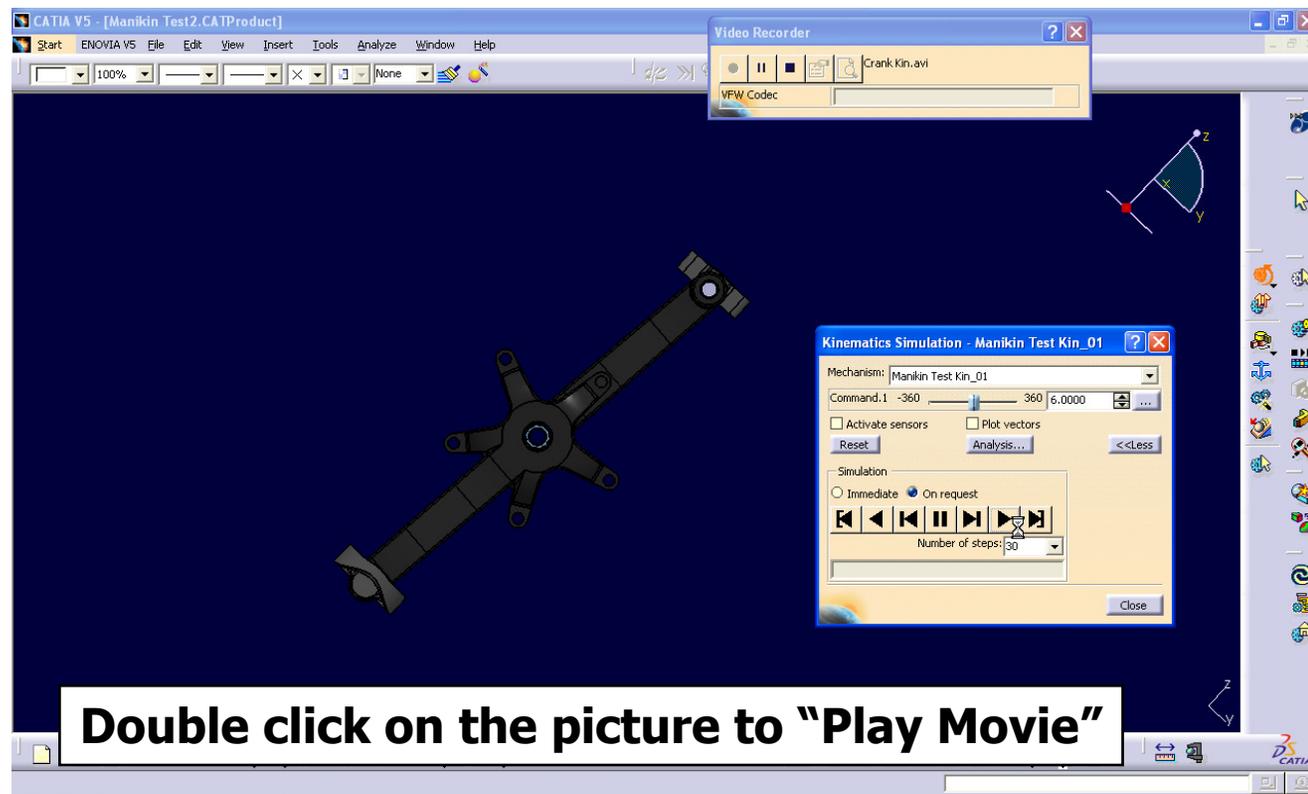
BND TechSource

- Step1: Create a Product for the Kinematic movement of the crank and pedals.



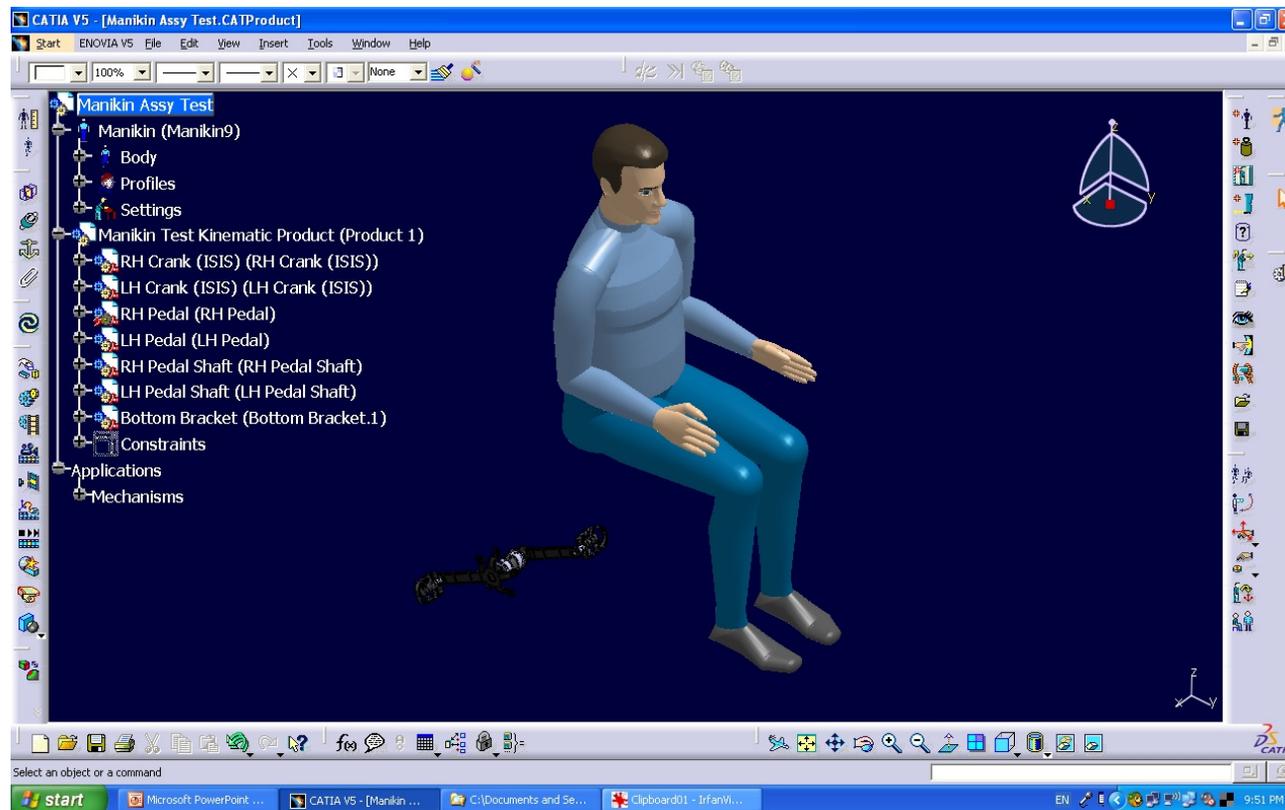
BND TechSource

- This Kinematic Product runs the pedals in opposite rotation to the crank.



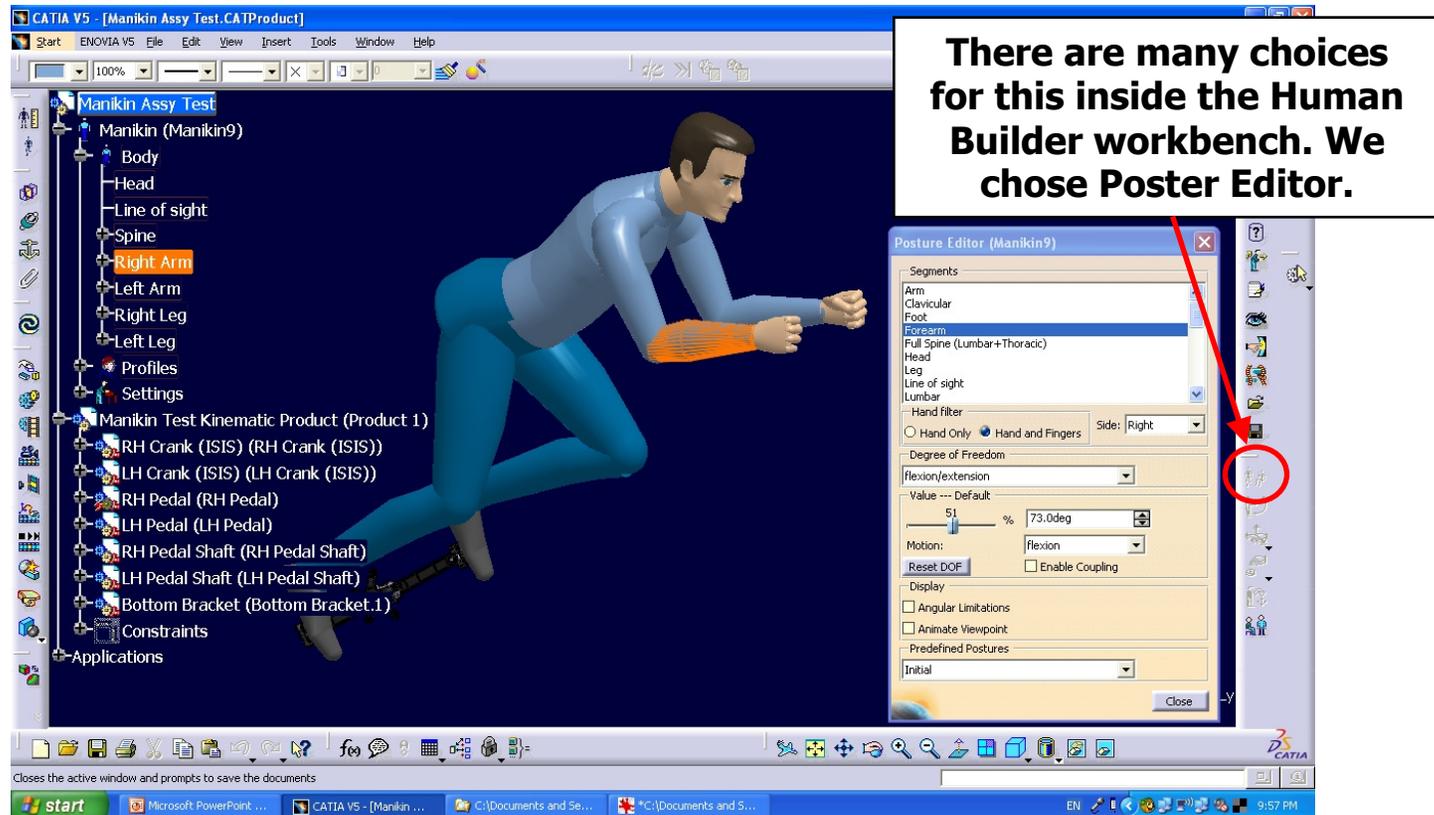
BND TechSource

- Step 2: Create a Product with a Manikin Part and include the Kinematic Product.



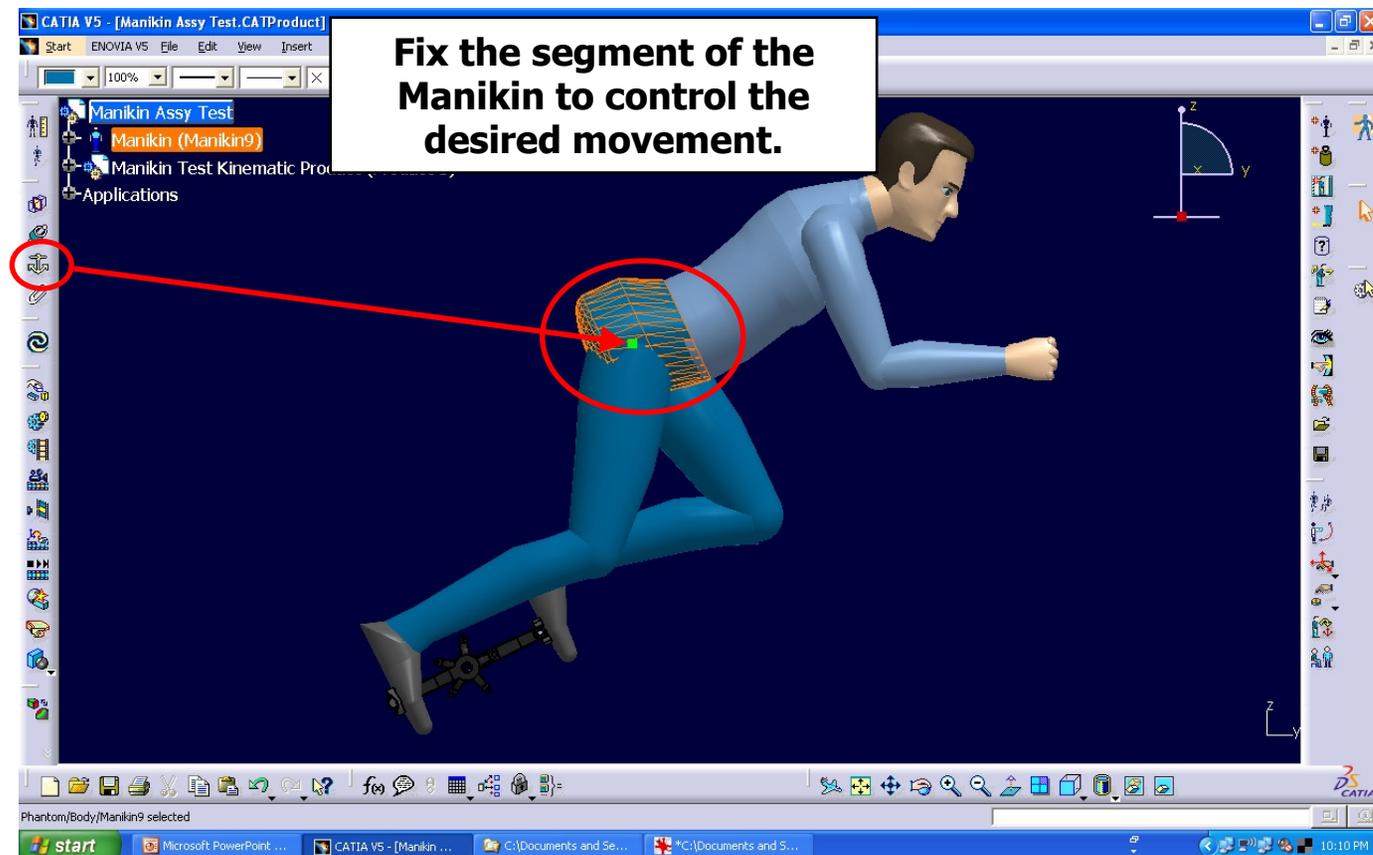
BND TechSource

- You may have to manually manipulate the Manikin to get it to a “start” position.



BND TechSource

- Step 3: Constrain the Manikin for the simulation.



BND TechSource

- Constrain the Manikin to the Parts within the Kinematic Product.

Human Posture Analysis

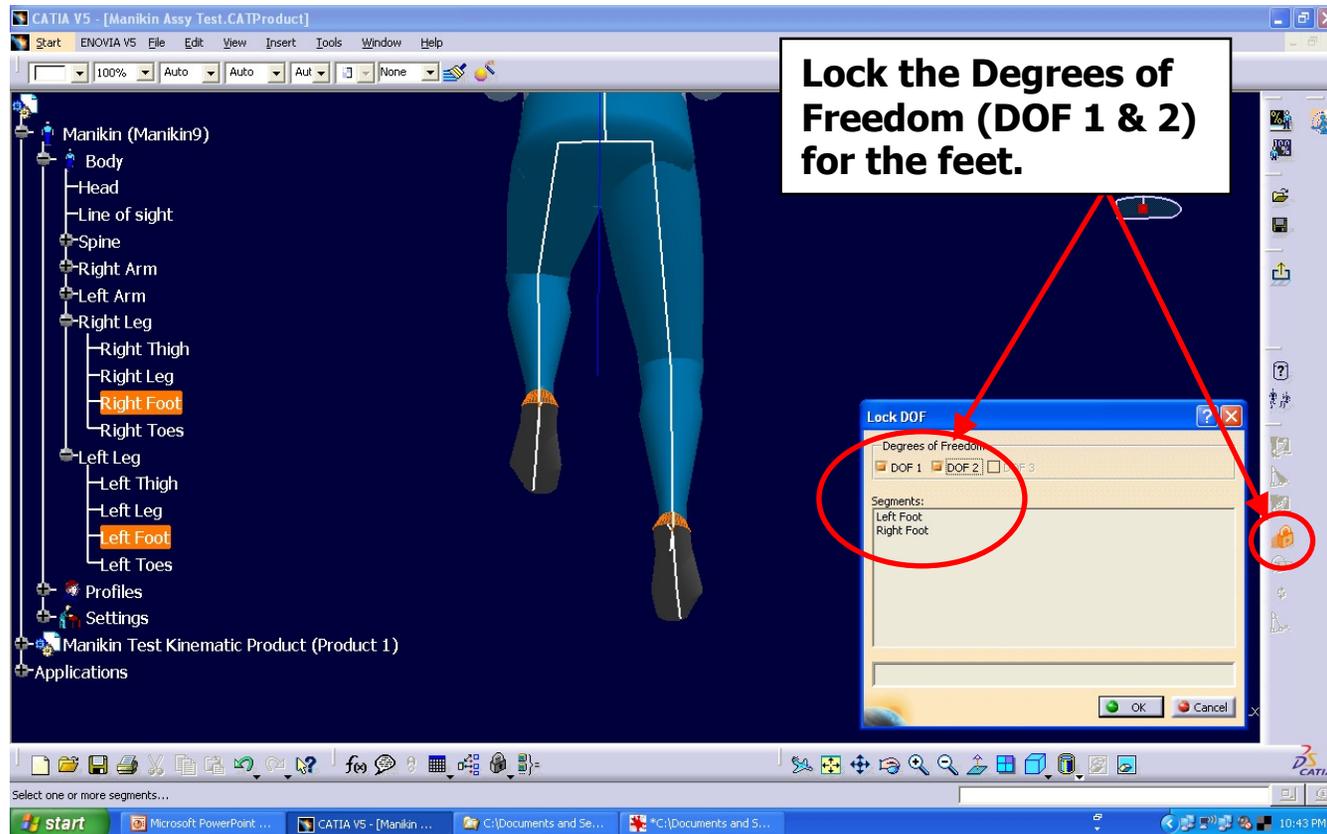
Through trial & error we found Contact Constraint worked best for this simulation.

A center point on top of each Pedal Part was used as the Contact Constraint to the foot.

The screenshot displays a software interface for Human Posture Analysis. On the left is a vertical toolbar with various icons. The main area shows a tree view of the simulation setup for 'Manikin Assy Test'. The tree includes nodes for Manikin (Manikin9), Body, Profiles, Settings, Posture, Position, Referential, IK Behaviors, Angular Limitations, Preferred Angles, Loads, Offsets, Attaches, and Constraints. Under the Constraints node, three specific constraints are listed: Constraint1 - Position and orientation (Phantom), Constraint5 - Point (Right Metatarsus, RH Pedal), and Constraint6 - Point (Left Metatarsus, LH Pedal.1). To the right of the tree is a 3D model of a manikin's lower body and feet, with two red circles highlighting the contact points on the top of each pedal. Red arrows point from the text boxes to these circles and the 'Contact Constraint' icon in the toolbar.

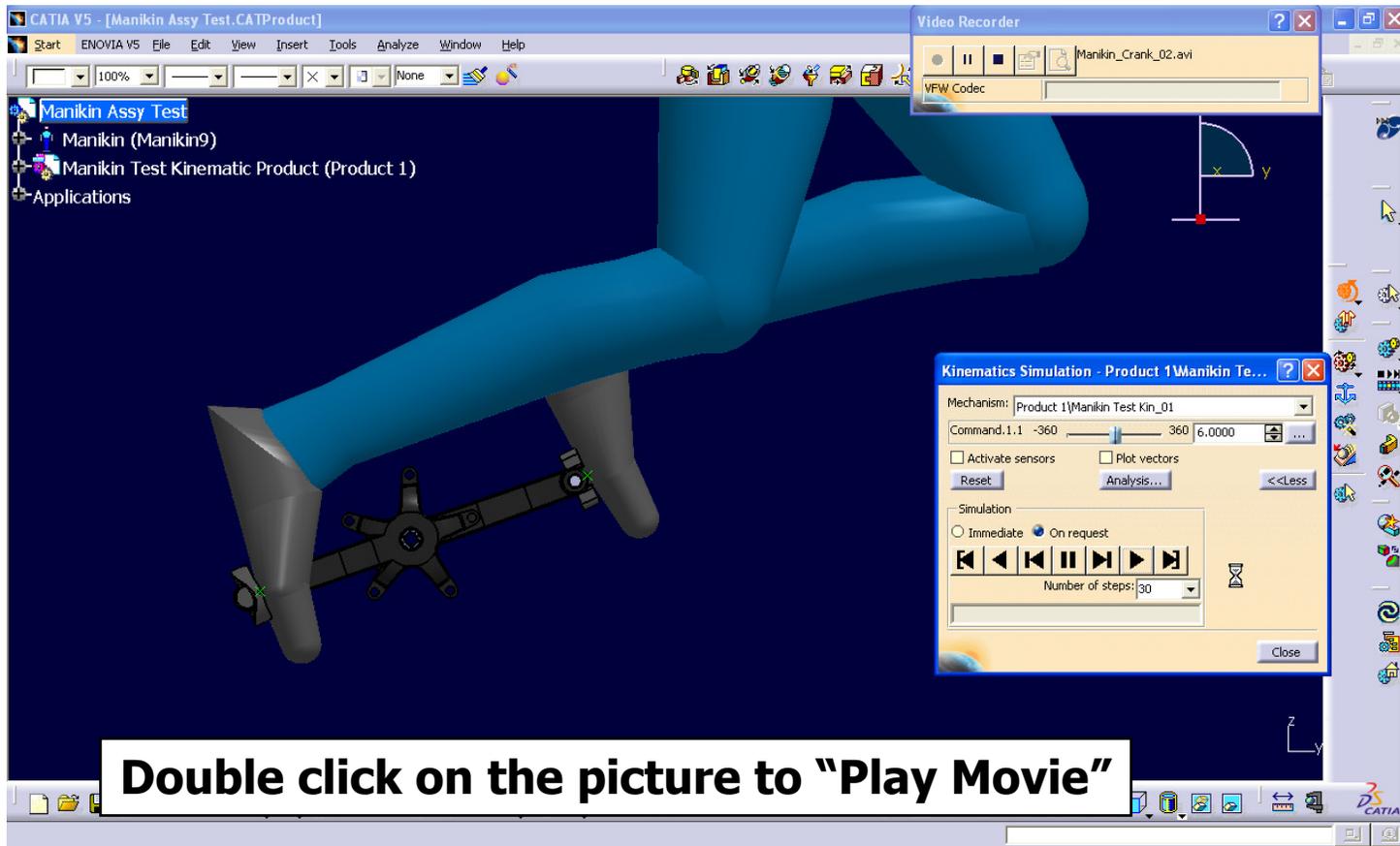
BND TechSource

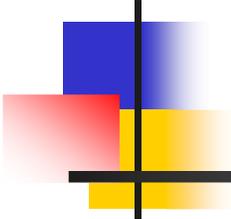
- Open the Human Posture Analysis Workbench.



BND TechSource

- Step 4: Run the Kinematic Simulation.



The logo for BND TechSource features a vertical black line intersecting a horizontal black line. To the left of the intersection, there are three overlapping squares: a blue one at the top, a red one in the middle, and a yellow one at the bottom. The text "BND TechSource" is positioned to the right of the vertical line, with "BND" in a smaller font size than "TechSource".

BND TechSource

- Conclusion:

This example is simply to show how to connect an Ergonomic Manikin to a Kinematic Simulation using CATIA V5.

We will optimize the contact angle of the feet to the pedals in the next presentation.