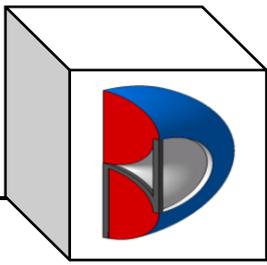


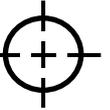
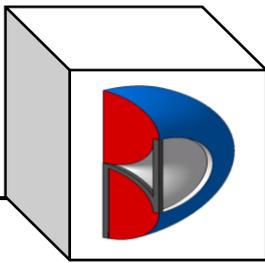
**Ergonomic Manikin  
Manipulation using  
CATIA V5 DMU Kinematics  
(Steps 1- 4 the simple solution)**



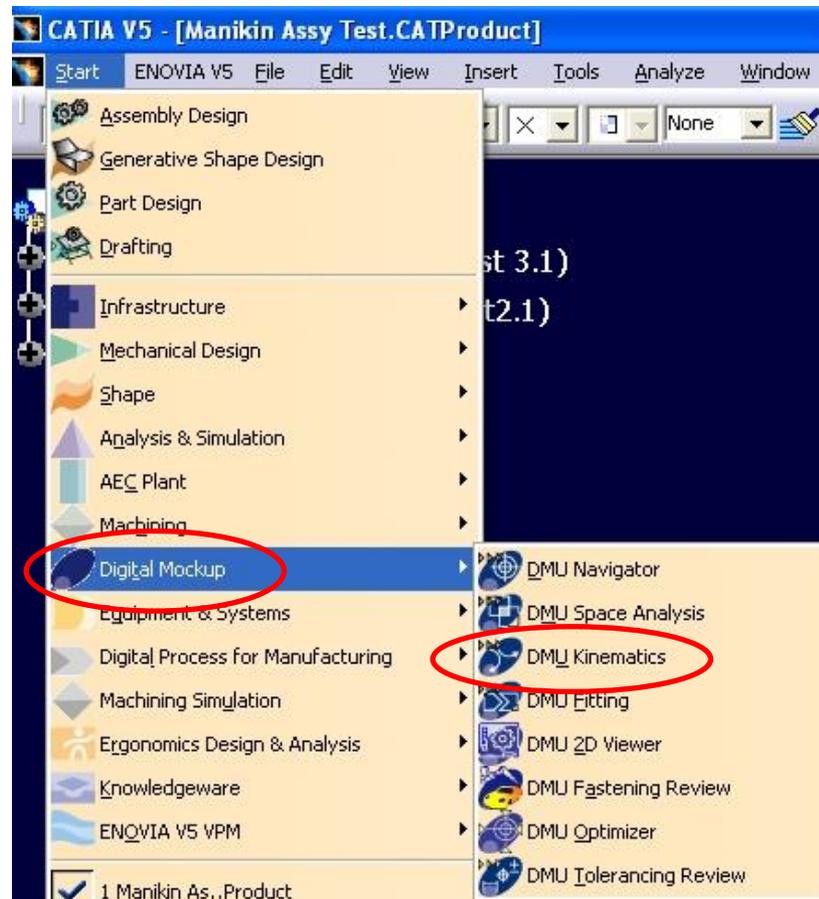
# BND TechSource

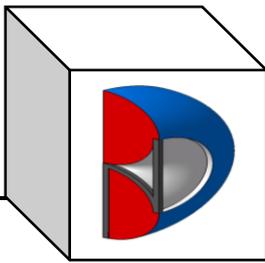


- The following licenses are required to manipulate 3D Ergonomic Manikins with CATIA V5 DMU Kinematics:
  - Digital Mockup
  - Ergonomics Design & Analysis

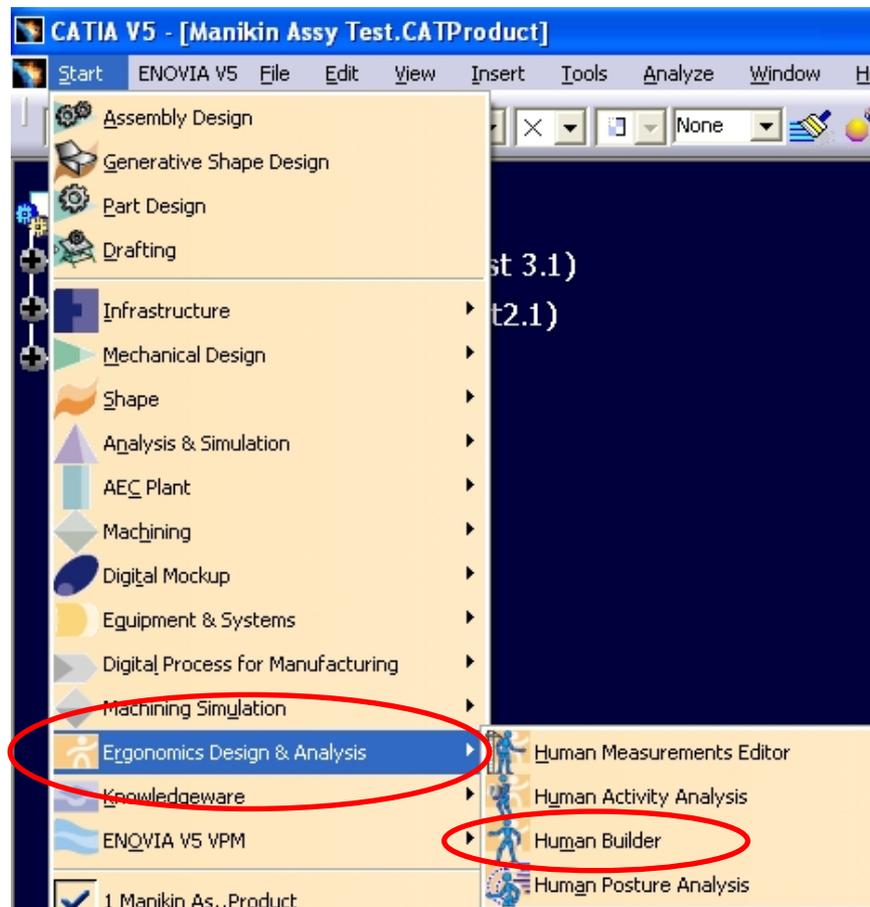


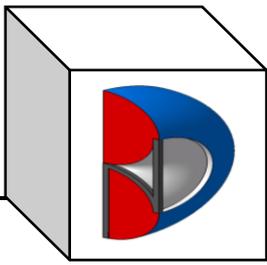
## ■ Digital Mockup





## ■ Ergonomics Design & Analysis

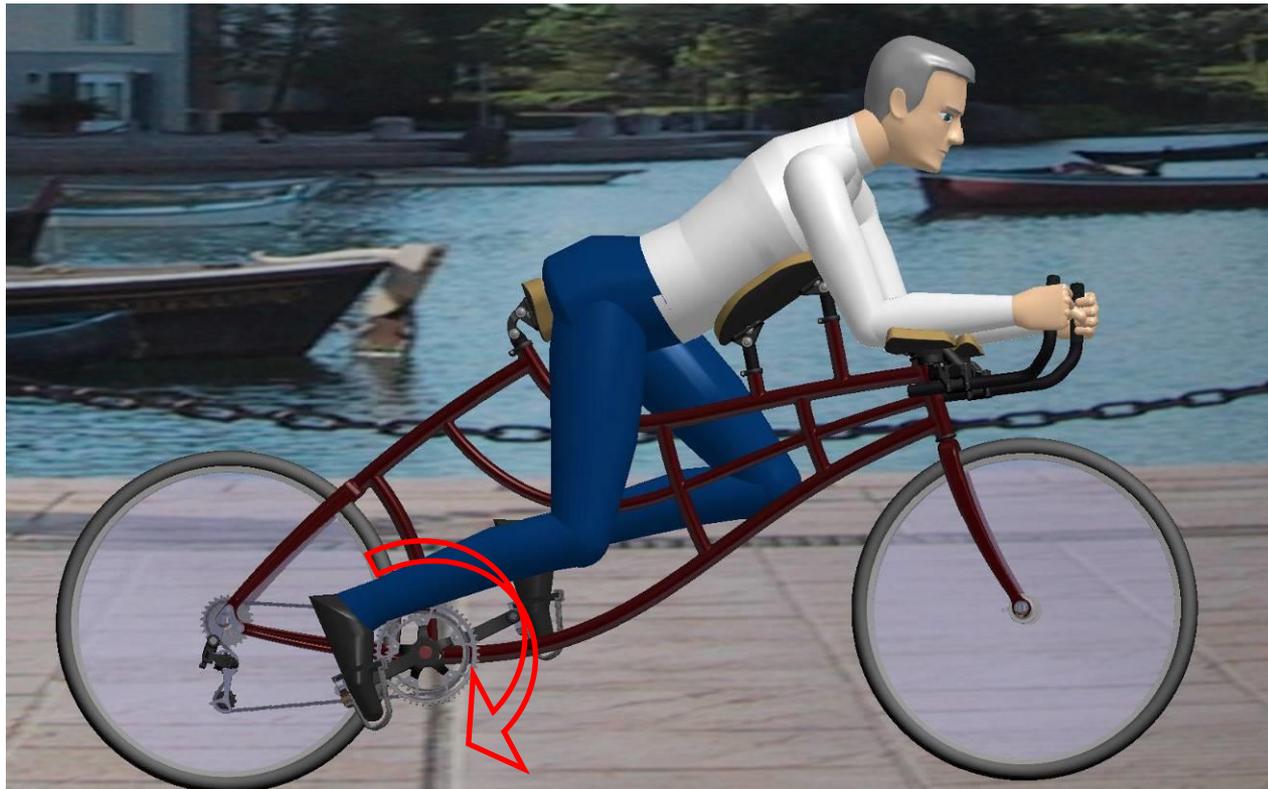


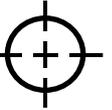
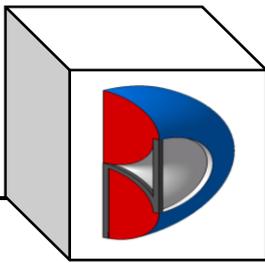


# BND TechSource

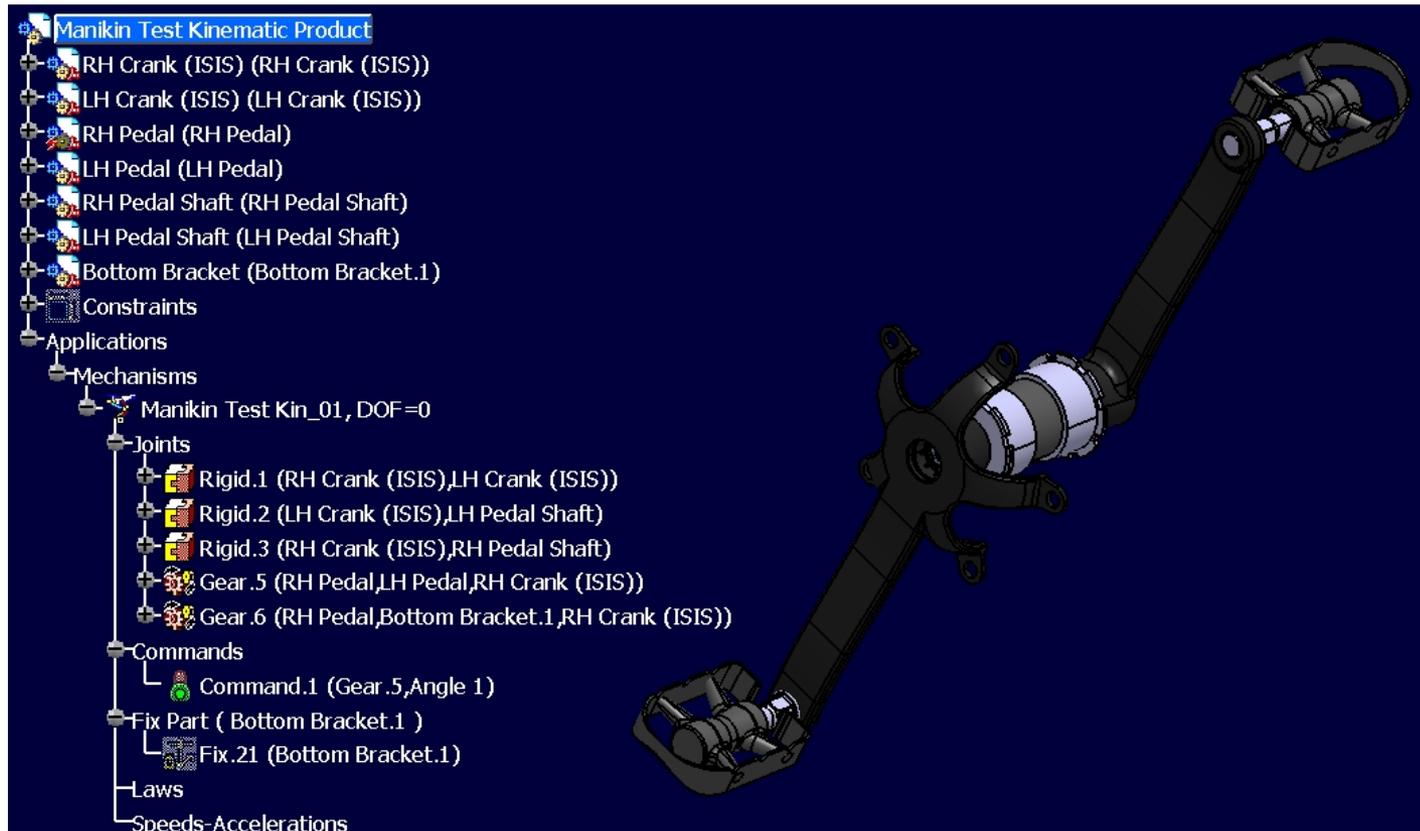


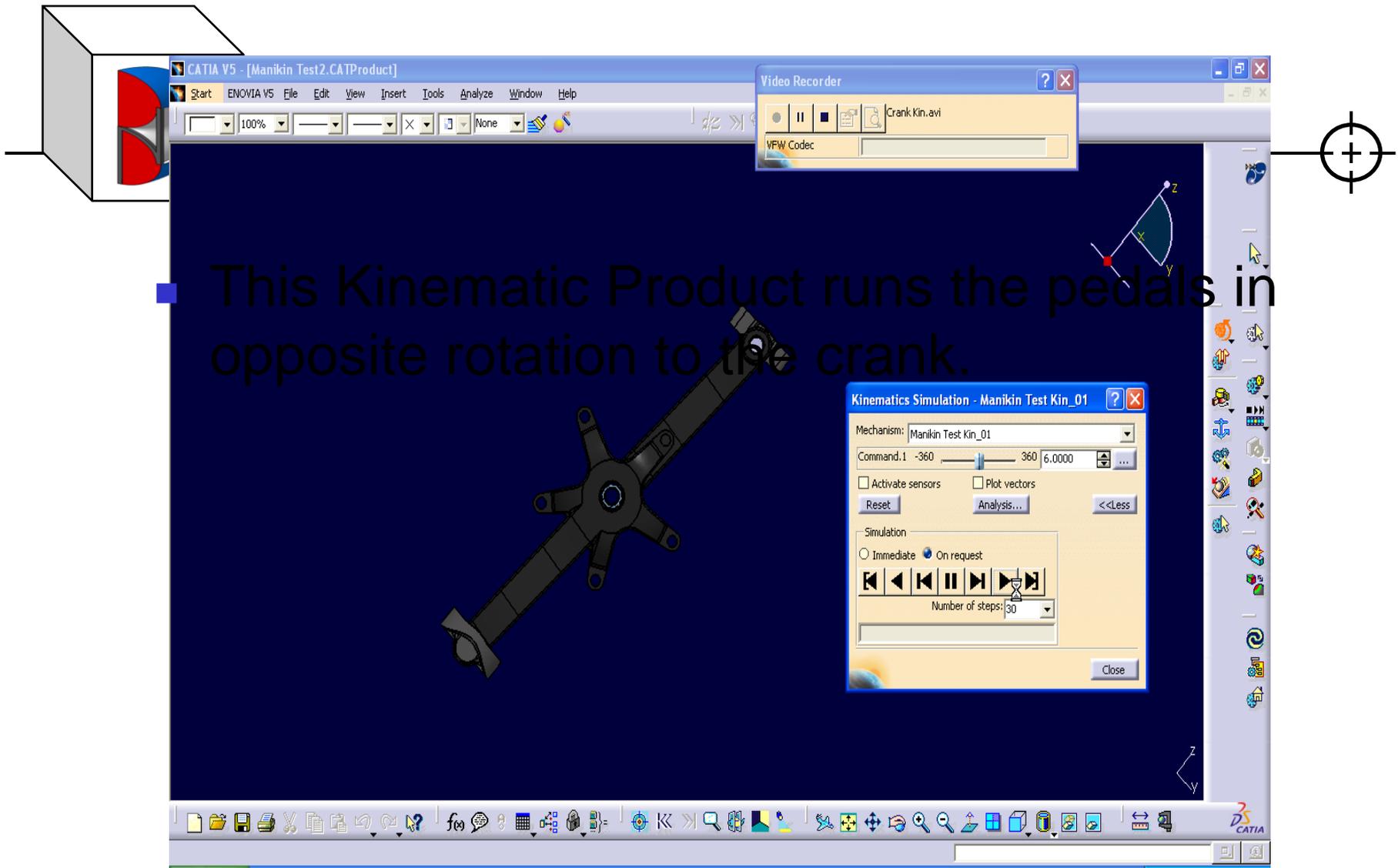
- The end result we are trying to achieve is to show a bicycle rider pedaling a bike.





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

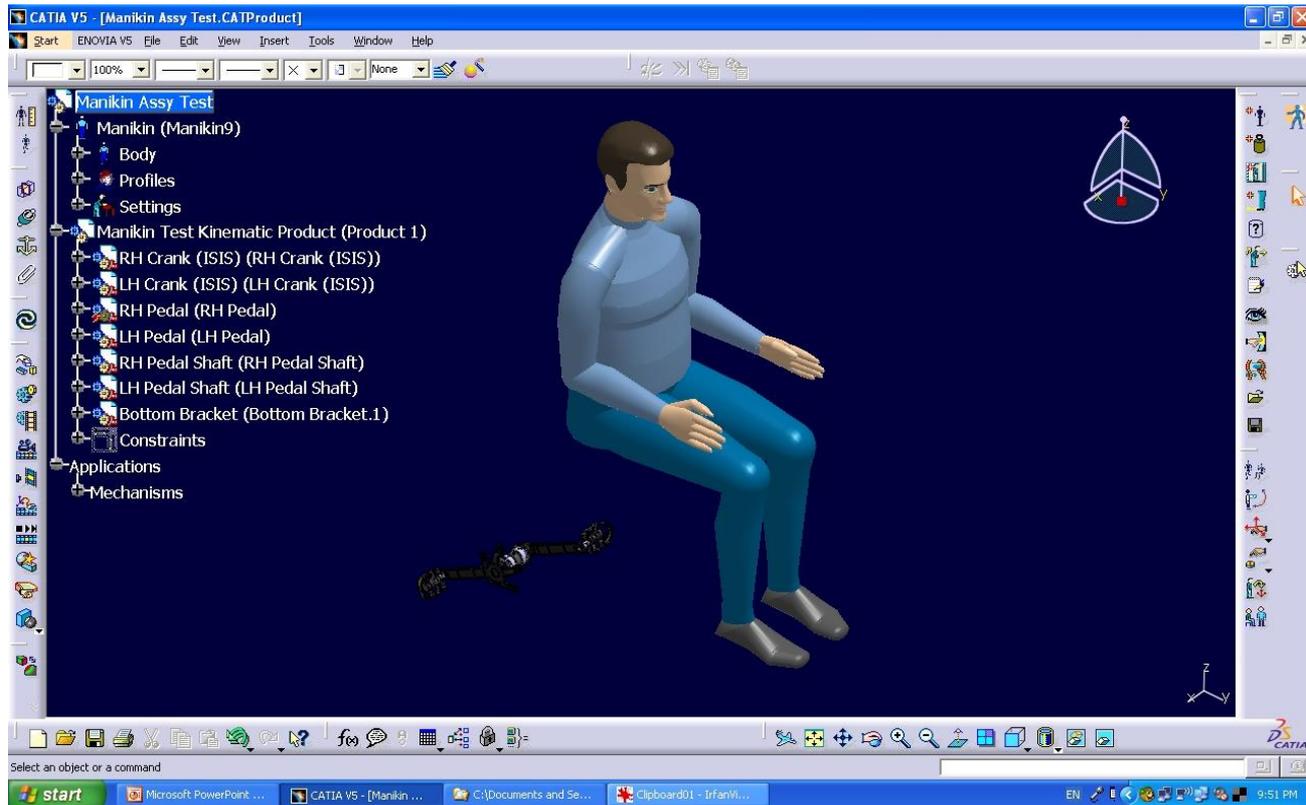


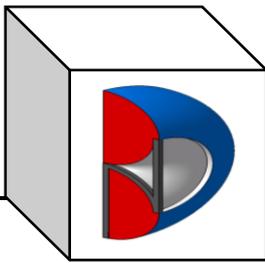


This Kinematic Product runs the pedals in opposite rotation to the crank.

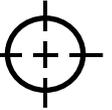
**Double click on the picture to "Play Movie"**

- 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.

**There are many choices for this inside the Human Builder workbench. We chose Poster Editor.**

Posture Editor (Manikin9)

Segments

- Arm
- Cleavicular
- Foot
- Forearm
- Full Spine (Lumbar+Thoracic)
- Head
- Leg
- Line of sight
- Lumbar

Hand filter

Hand Only  Hand and Fingers Side: Right

Degree of Freedom

flexion/extension

Value --- Default

SI % 73.0deg

Motion: flexion

Reset DOF  Enable Coupling

Display

Angular Limitations

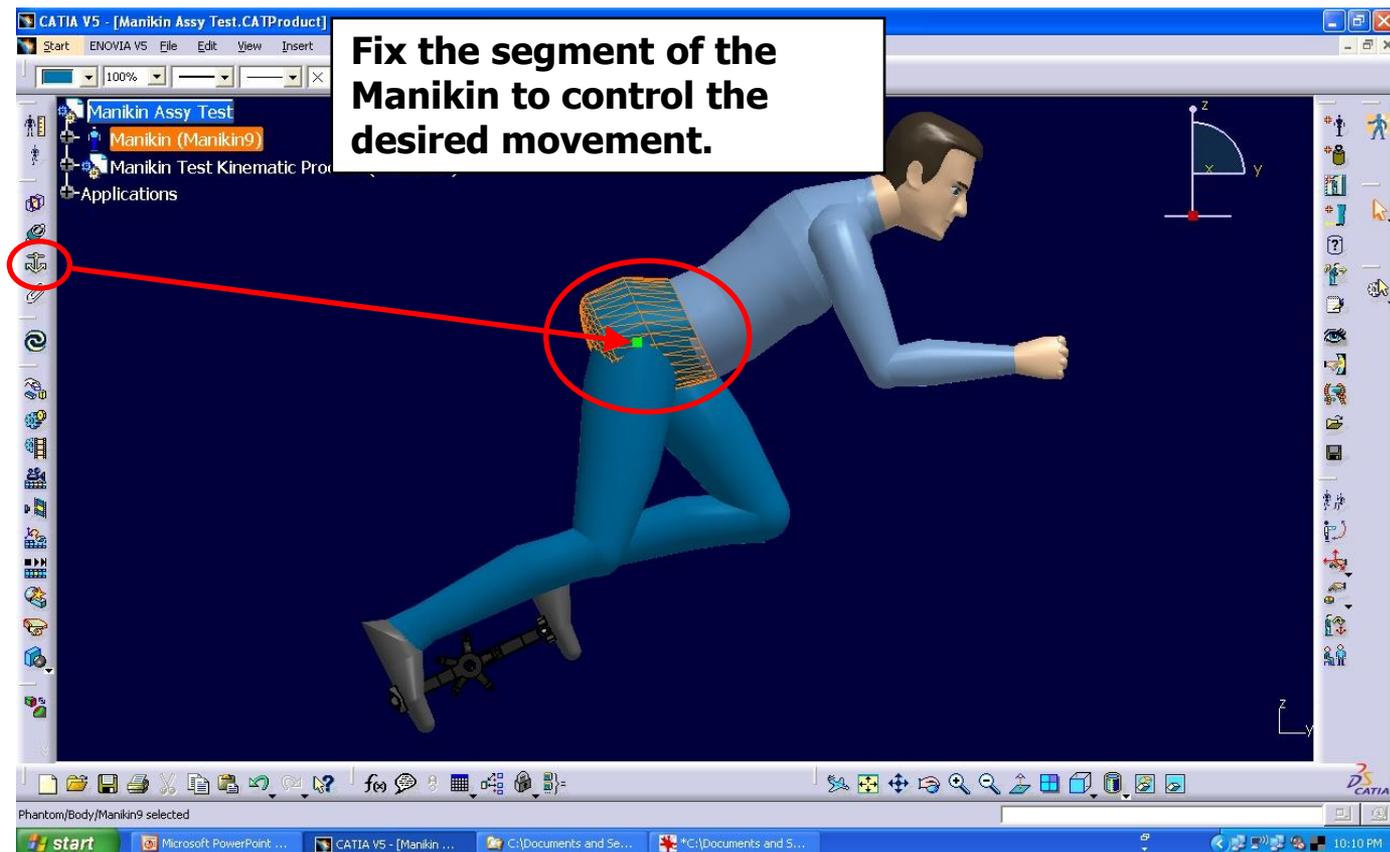
Animate Viewpoint

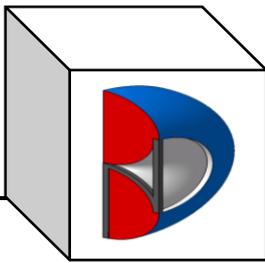
Predefined Postures

Initial

Close

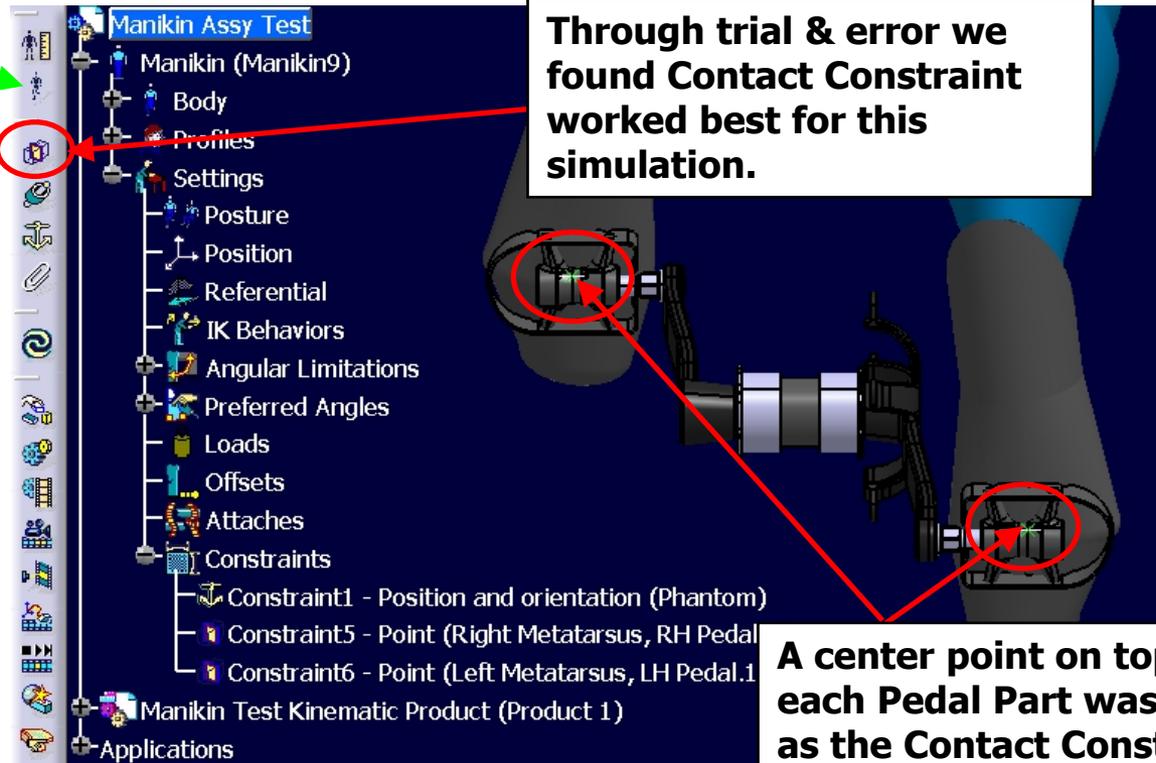
- Step 3: Constrain the Manikin for the simulation.





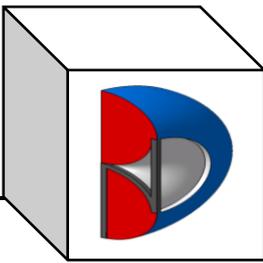
- Constrain the Manikin to the Parts within the Kinematic Product.

**Human Posture Analysis**

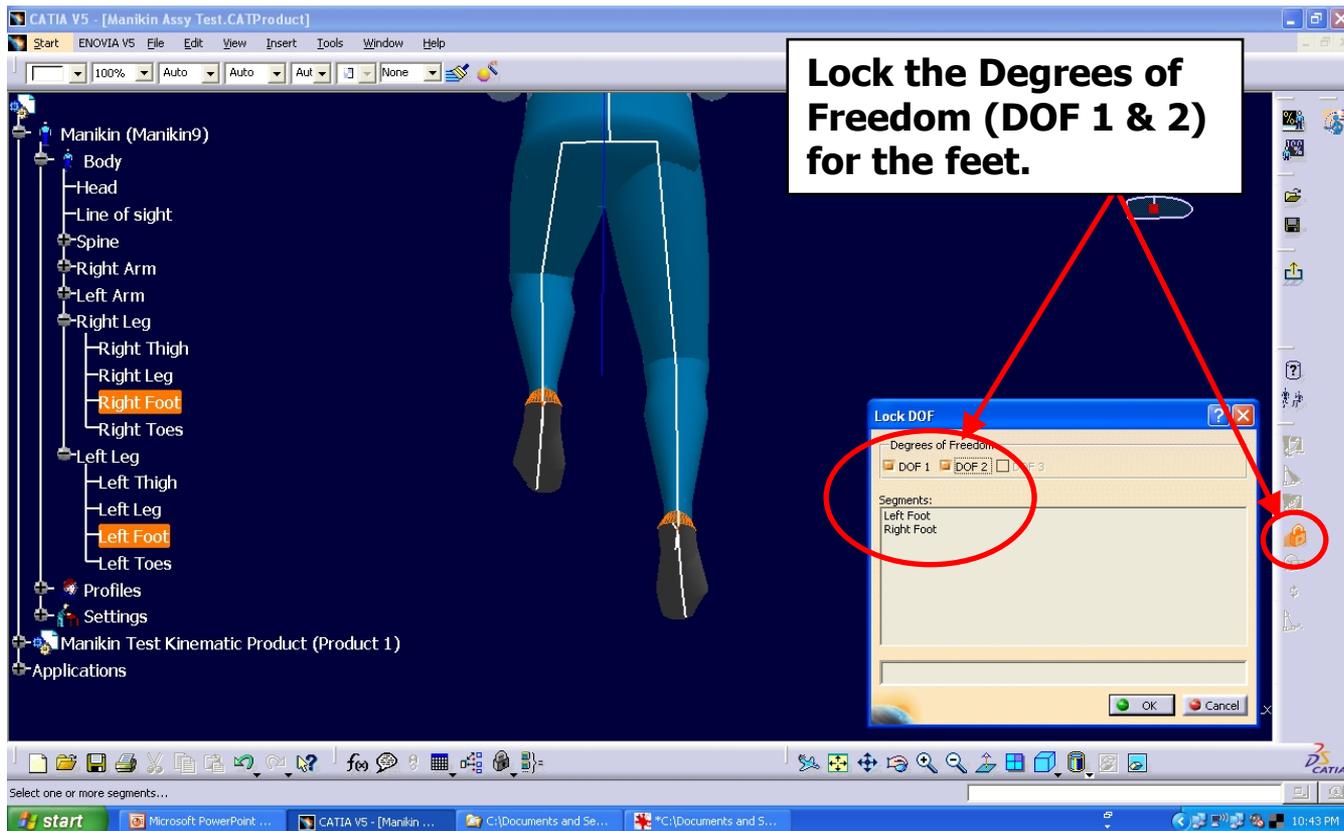


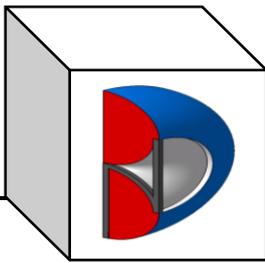
**Through trial & error we found Contact Constraint worked best for this simulation.**

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

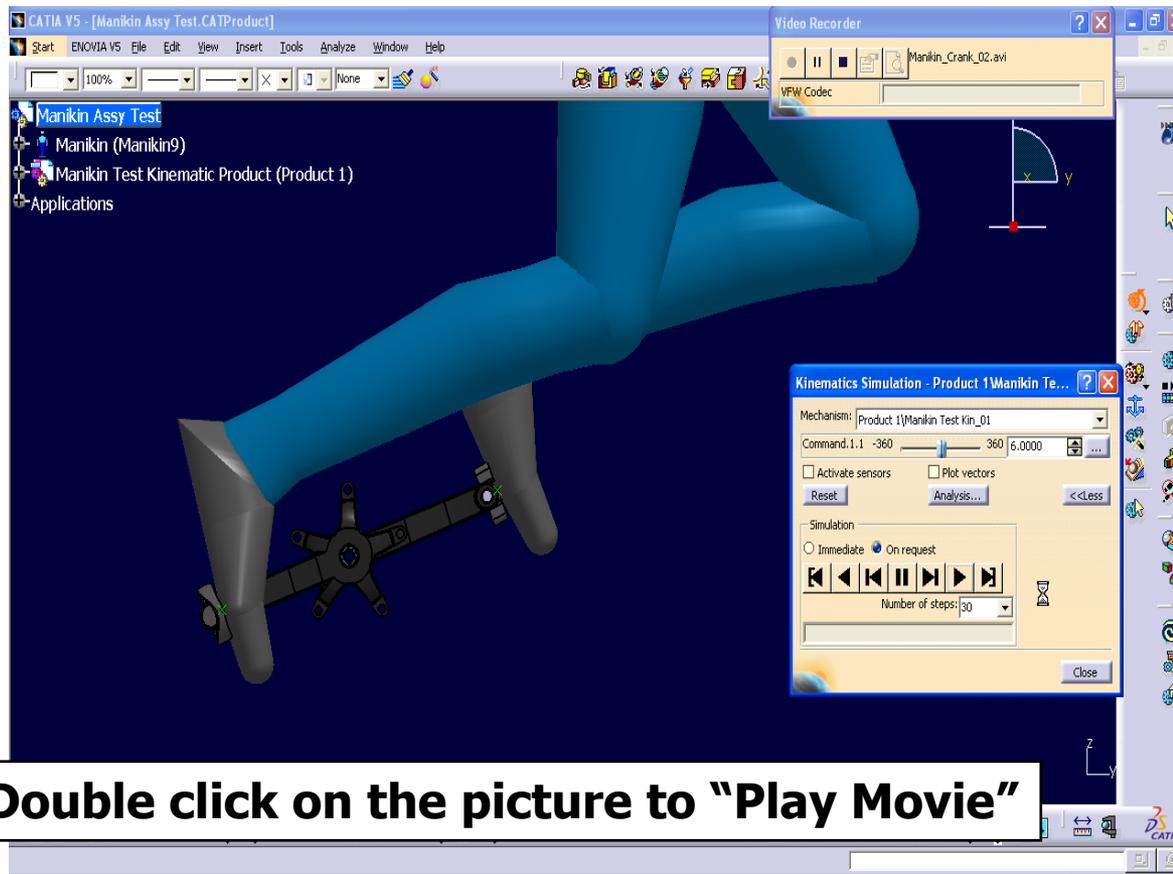


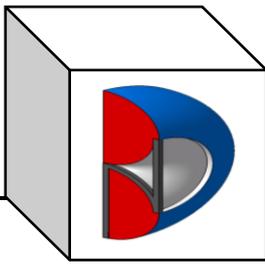
- Open the Human Posture Analysis Workbench.





- Step 4: Run the Kinematic Simulation.





- 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.