

# PTC® Creo® Mechanism Dynamics Option

Analyze Dynamic Forces with a Powerful Prototyping Solution

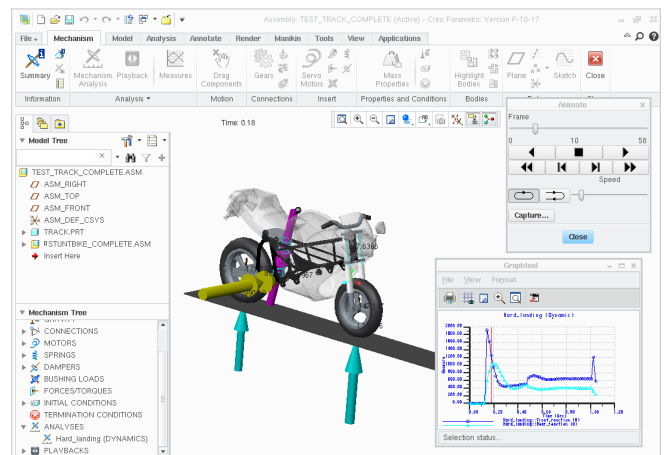
PTC Creo Mechanism Dynamics Option (MDO) allows you to virtually simulate real-world forces and analyze how your product will react to them, Analyze Dynamic Forces with a Powerful Prototyping Solution without building costly physical prototypes. Gaining insight into product behavior early in the design phase allows you to build better products, while saving you time and money.

## Simulate real-world forces

With PTC Creo MDO, you can determine, on a desktop –, how your design will react to dynamic forces such as gravity and friction. Since you can conduct this analysis without having to build a physical prototype, you can perform your tests very early in the design phase when correcting problems is much less costly. Also, when building a physical prototype it's likely to be of much higher quality as you've already completed a series of vigorous tests, virtually. By building fewer physical prototypes, you not only cut costs, but you also reduce time-to-market because you're building a better quality product that is 'right the first time.'

## Design and analyze concurrently

PTC Creo MDO takes advantage of the integrated toolset of PTC Creo. This means there are no errors in data translation from one application to another. Additionally, engineers working with PTC Creo MDO are already familiar with the graphical user interface, as it is the same one used to design the product in PTC Creo. Furthermore, since PTC Creo MDO already leverages the same model data as PTC Creo, you won't waste time translating data for analysis. After implementing engineering changes, you simply rerun the analysis, generating a higher quality model, faster.



PTC Creo MDO simulates real-world forces, reducing the number of physical prototypes and shortening the design cycle.

## Key benefits

- Eliminate time, effort, and money spent on data translation and associated errors by using fully integrated design and analysis tools
- Reduce development costs by creating virtual prototypes for desktop testing
- Incorporate changes into the products faster and earlier, and get immediate results from desktop testing
- Deliver higher quality products to market first by reducing development time

- Reduce warranty costs by generating a better estimate of your product's life
- Eliminate costly manufacturing errors with specific, animated production instructions for assembly
- Create more innovative products by using the time-savings gained from virtual testing to evaluate more design ideas
- Work within an easy-to-learn, highly intuitive user interface

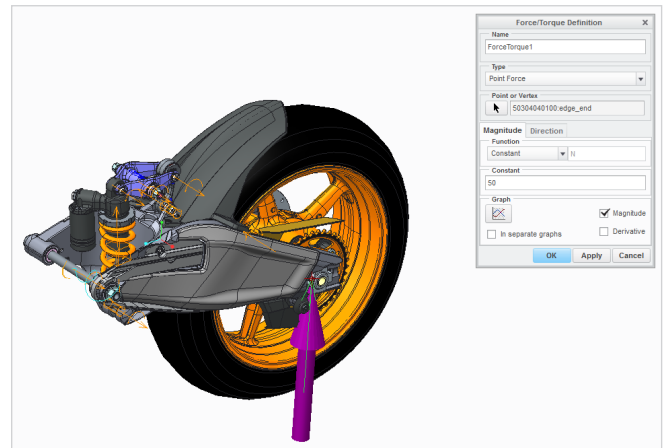
## Capabilities and specifications

### Explore real-world behavior

- Simulate gravity, springs, dampers, belts, gears, contact, and friction without creating a physical prototype
- Perform kinematic analysis (position, velocity, and acceleration analysis) as well as dynamic motion analysis (friction, gravity, and forces)
- Detect problems with clearances and interferences early in the design cycle
- Import behavioral data from applications such as PTC Mathcad® or Microsoft® Excel®, and apply to existing models to determine their performance under this behavior

### Easily share results via intuitive graphs

- Measure and graph custom specifications, such as velocity, at a specific joint
- Graph critical reactionary forces, (e.g., loads and torques) to better communicate how the product will respond in a specific environment
- Share results with others using graphs and animations; output your tabular data to spreadsheets for additional analysis
- Compare real-time motion with the graphical results



Dynamic forces are applied to the assembly using PTC Creo MDO to optimize quality.

### Increase flexibility to explore complex, real-world situations with advanced motion analysis

- Use static analysis to determine loading at a static point
- Analyze belt connections, slot motors, dynamic gears, and generic gears for all motion relationships
- Determine forces necessary to put a mechanism into motion, with inverse static loading (force balance)
- Easily create complex motion envelope parts of select components in your mechanism for use either in space claim studies or as place holders in any assembly
- Use PTC Creo TOOLKIT™ to program a variety of complex behaviors, such as force-based gear systems, belts driven by flexible pulleys, linear beam and truss elements, and tire models
- Create user-defined forces and motor profiles as custom functions of measured force, torque, time, acceleration, velocity, or position
- Model intelligent, proportional-integral-derivative (PID) controllers, as well as non-linear springs and dampers

### Integrate design and simulation

- Transfer reaction, gravity, and inertial loads directly to PTC Creo Simulate™
- Set design feasibility and optimization study goals for kinematic and dynamic performance
- Leverage integration with other PTC Creo solutions, such as PTC Creo Simulate and PTC Creo Behavioral Modeling Extension, both for optimization and complete virtual product analysis
- Leverage design information from other calculation applications, such as PTC Mathcad, PTC's engineering calculation software, or Microsoft Excel
- Use parametric motion features to re-use and create variants of motion models
- Ensure that changes are propagated to all other downstream deliverables of the product design via PTC Creo associativity

### Platform support and system requirements

For the most up-to-date platform support information, please visit the [PTC Support Page](#).

For more information, visit: [PTC.com/products/creo](http://PTC.com/products/creo)

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