# Creo 2.0

## Auto Constraints,
## How To Understand And Take Control
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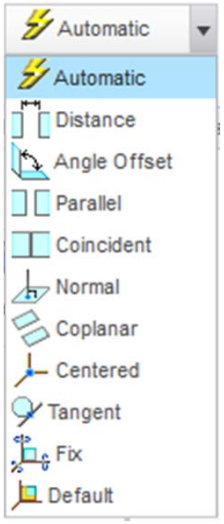
# Assembly

- **Auto Constraint Behavior**
  - When assembling components into an assembly, what kind of constraints Creo chooses is seemingly random and inconsistent.
- **What gives?**



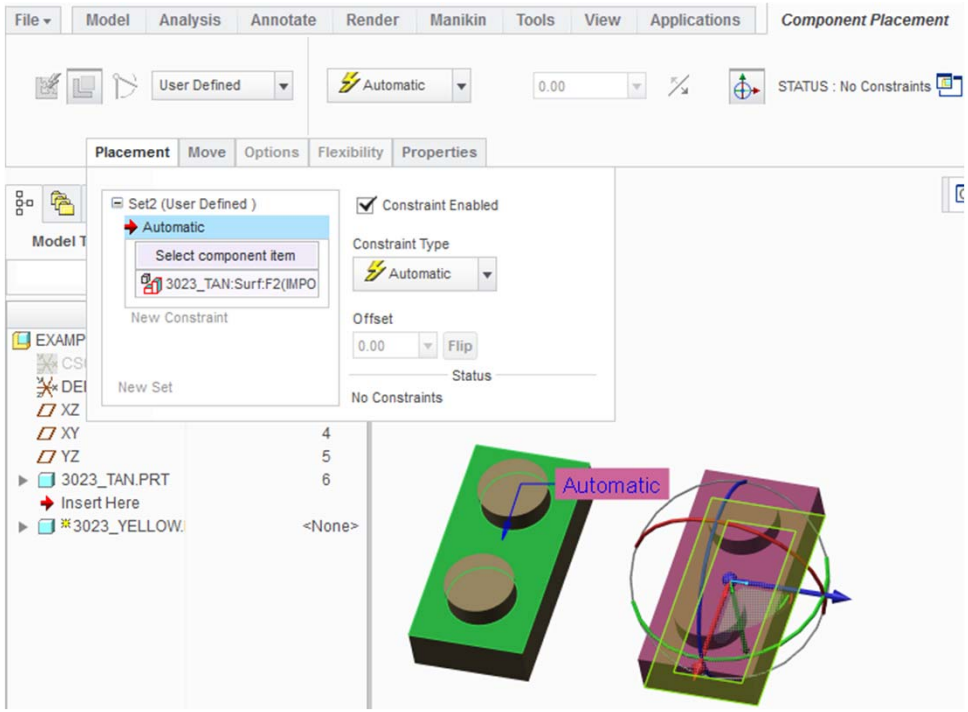

Distance
Angle Offset
Parallel
Coincident
Normal
Tangent

# Understanding How Auto Constraints Work

- **Key Points:**
  - Initial Location & Orientation
  - Model Size
  - Epsilons and Tolerances
  - Taking Control

# Initial Location & Orientation

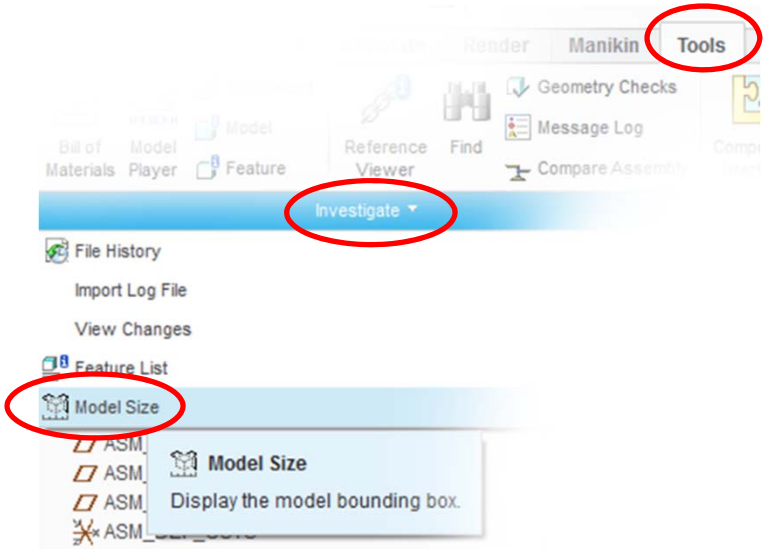
- **Initial position & orientation of references *upon* selection of the final reference, is the primary key to how auto constraint behaves.**

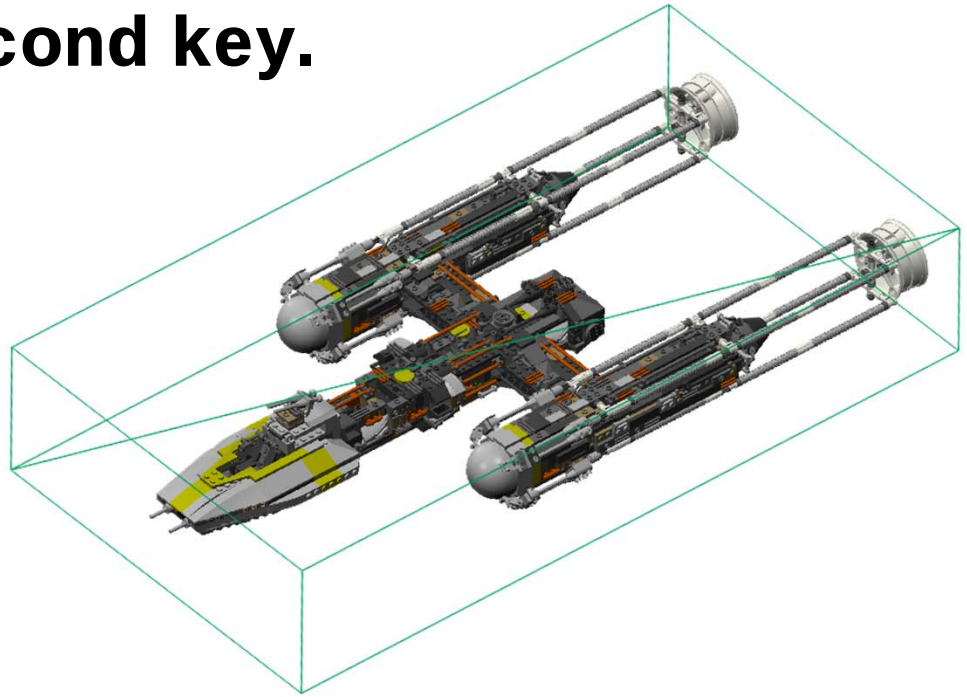


# Model Size

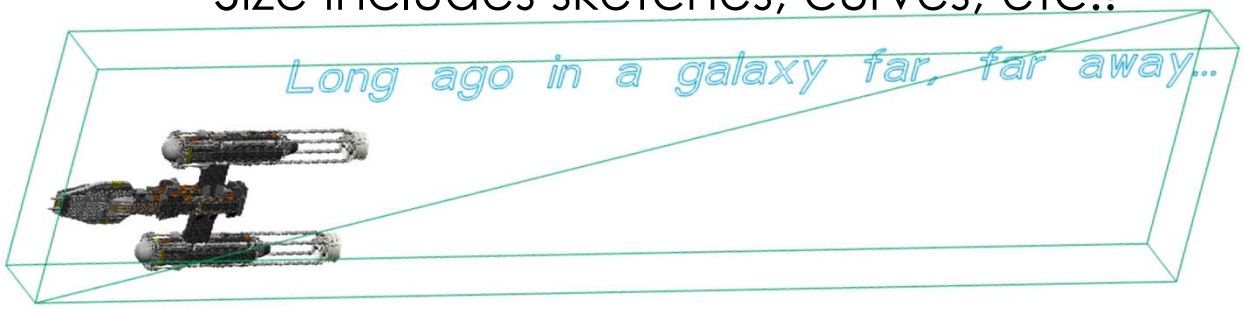
- **Model size is the second key.**

Tools → Investigate → Model Size



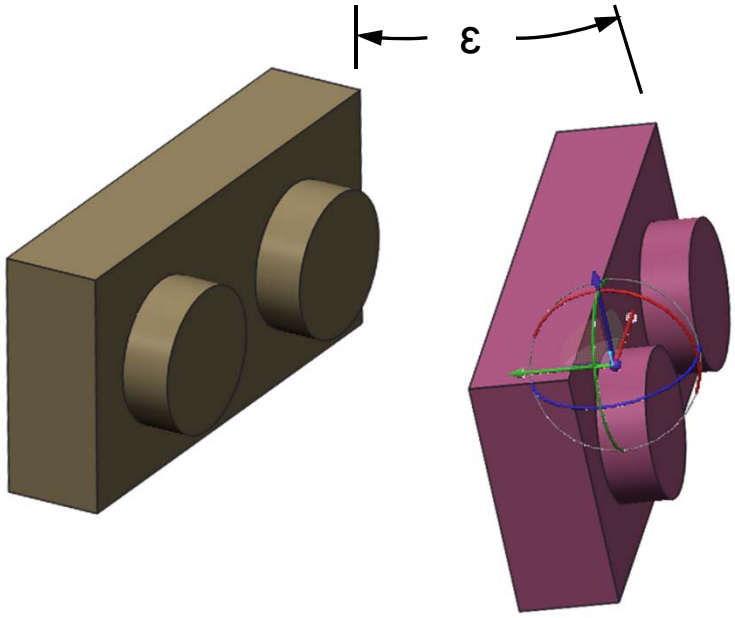



Size includes sketches, curves, etc.!



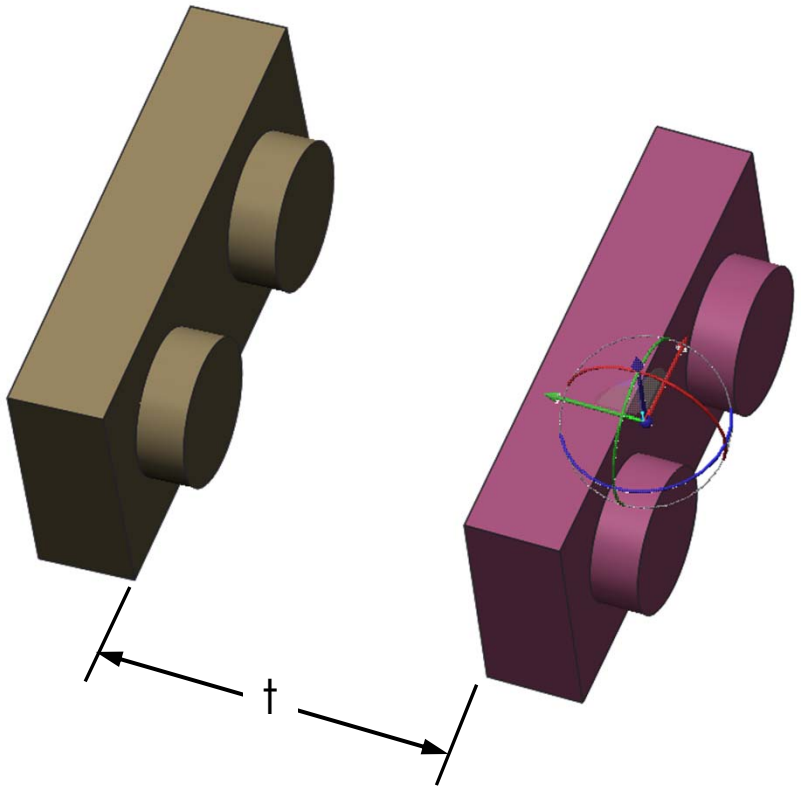
# Epsilons & Tolerances

- **Epsilon (ε) - Corresponds to Angles**



# Epsilons & Tolerances

- **Tolerance (t) – Corresponds to Distance**



# Taking Control

- **Config.pro Options**
  - comp_angle_offset_eps
  - comp_normal_offset_eps
  - auto_constr_offset_tolerance
  - auto_constr_always_use_offset

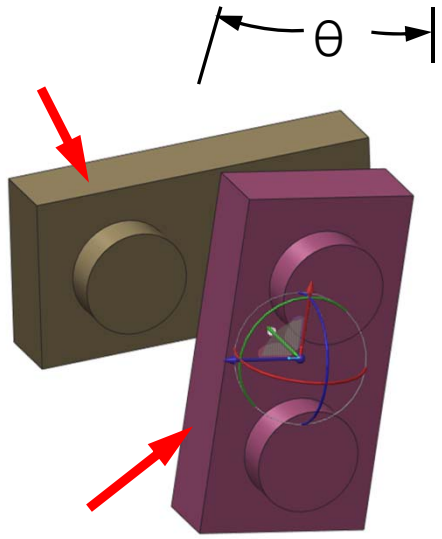
# Taking Control

- **Config.pro Options**
  - comp_normal_offset_eps

    Specifies the angle epsilon such that if the desired surfaces are equal or less than the epsilon (in degrees), then a normal constraint will be created. ***No default value.***

# Taking Control

- **Config.pro Options**
  - comp_normal_offset_eps




If $\theta \leq \varepsilon_n$ *<u>from normal</u>*, then a normal constraint is created.

If $\varepsilon_n = 45°$, what kind constraint will be created?

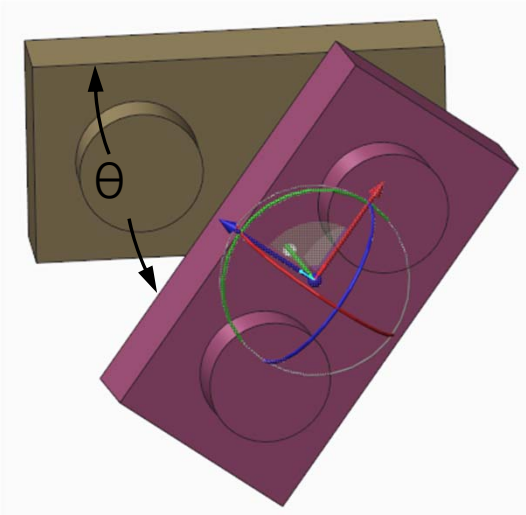
# Taking Control

- **Config.pro Options**
  - comp_angle_offset_eps

    Specifies the angle epsilon such that if the desired surfaces are equal or greater than the epsilon (in degrees), then an angle offset constraint will be created. ***No default value.***

# Taking Control

- **Config.pro Options**
  - comp_angle_offset_eps

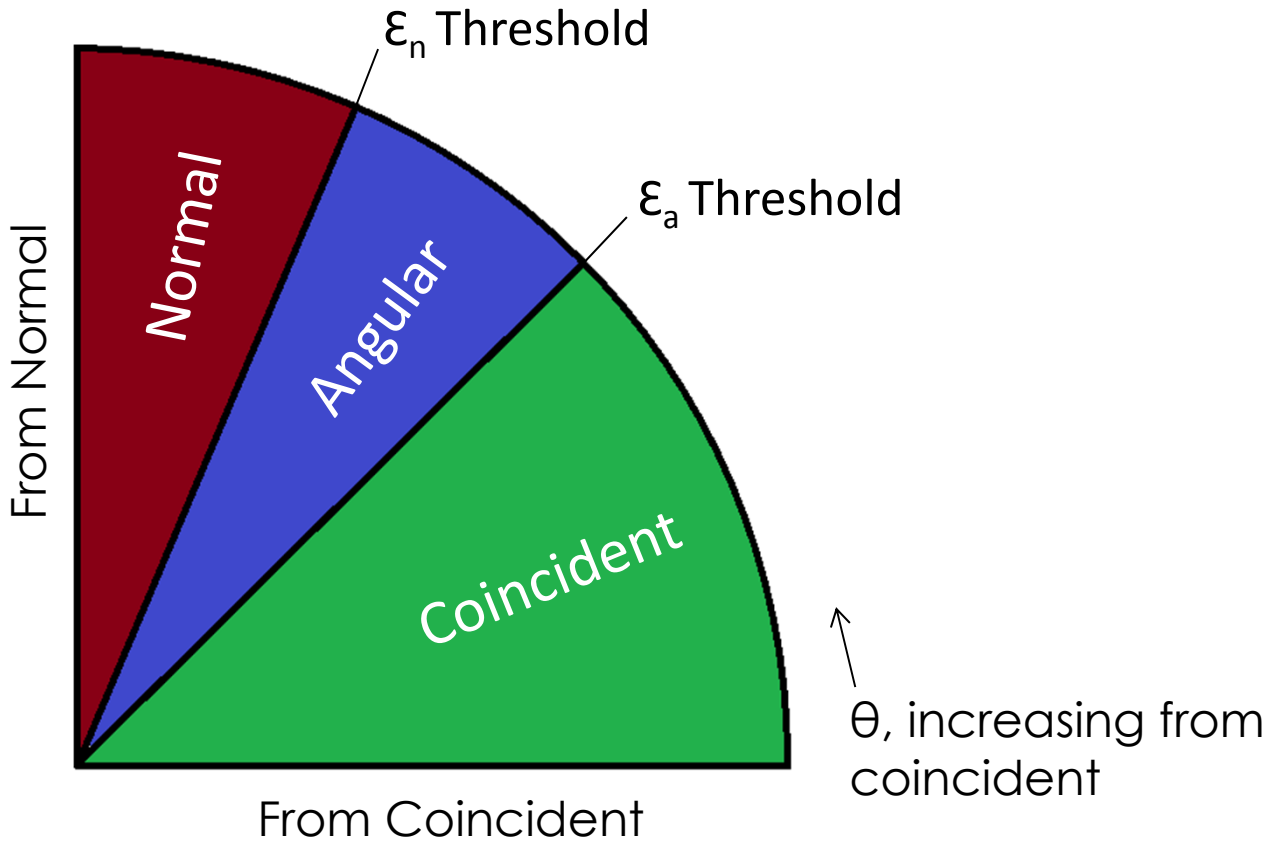



If $\theta \geq \varepsilon_a$ *from coincident*, then an angle offset constraint is created.

If $\varepsilon_a = 15°$, what kind constraint will be created?

# Taking Control

- **Epsilon Summary**

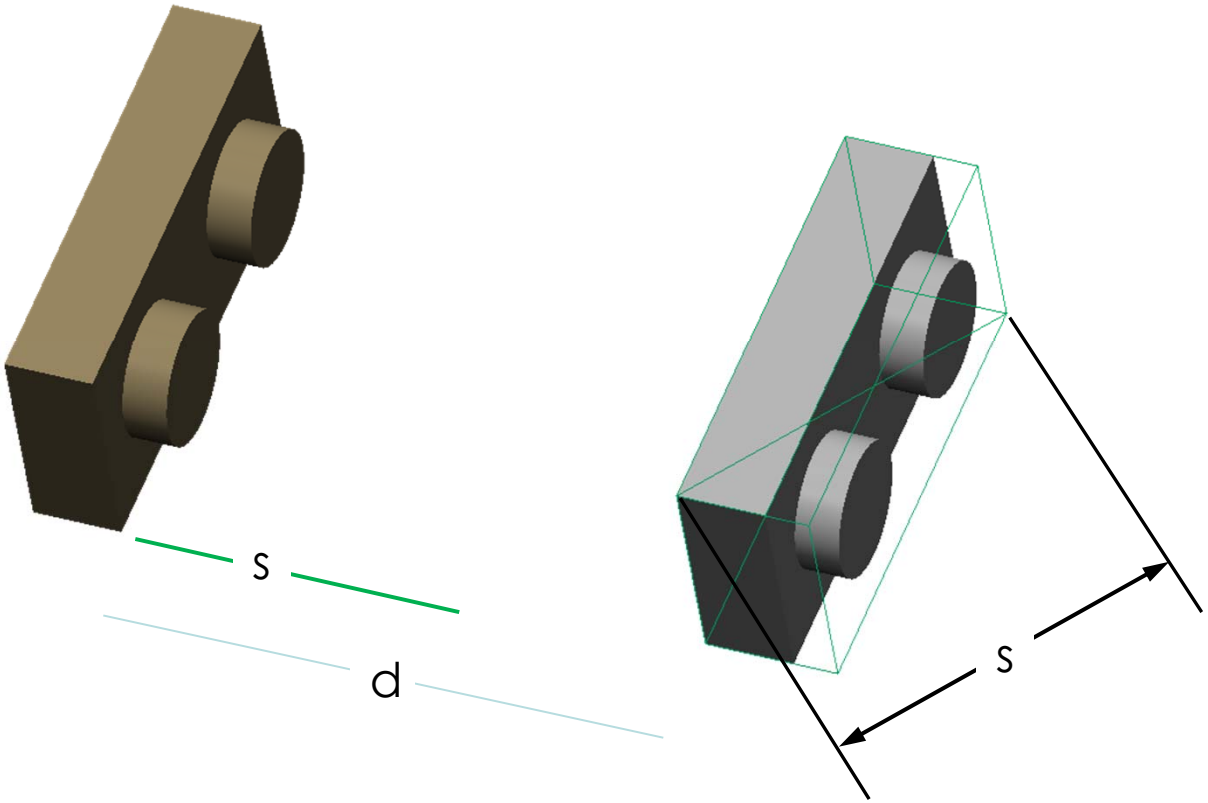


# Taking Control

- **Config.pro Options**
  - auto_constr_offset_tolerance

    Sets the auto constraint tolerance for creating offset dimensions. If the distance is less than this tolerance multiplied by component size, offset is set as coincident. Default value is 0.5.

# Taking Control




If $d \leq t*s$ then the constraint becomes coincident.
Otherwise it becomes a distance constraint. *UNITS ARE NOT CONVERTED!!!*

If t = 1, what kind of constraint will be created in the image above?

# Taking Control

- **Config.pro Options**
  - auto_constr_always_use_offset

    Controls whether auto constraint should create offsets.

    **Yes**: Auto constraint always creates offsets.

    **No**: Auto constraint snaps align or mate if surfaces are within tolerance.

    **Never**: Auto constraint never creates offsets.

# Taking Control

- **What settings do I use?**
  - auto_constr_always_use_offset **NO**
  - comp_angle_offset_eps **45**
  - comp_normal_offset_eps **15**
  - auto_constr_offset_tolerance **1**

# Taking Control

- **How to always create coincident**
  - auto_constr_always_use_offset **NEVER**
  - comp_angle_offset_eps **91**
  - comp_normal_offset_eps **-1**

# Taking Control

- **Points to Remember**
  - Default values for epsilons can lead to frustration. Recommend disabling (always create coincident) or entering more tailored values.
  - Units are ignored for tolerance. If a small part with units of millimeters (i.e. model size of 15mm) is assembled into something with inches, the model size of 15in is used for computing the offset tolerance.
  - Play with the settings to find values that will work for you or else outright disable them. Taking control of your Creo session will also make you faster.

# Questions?

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