



Creo Parametric Assemblies Unhealthy Practices and Biggest Mistakes

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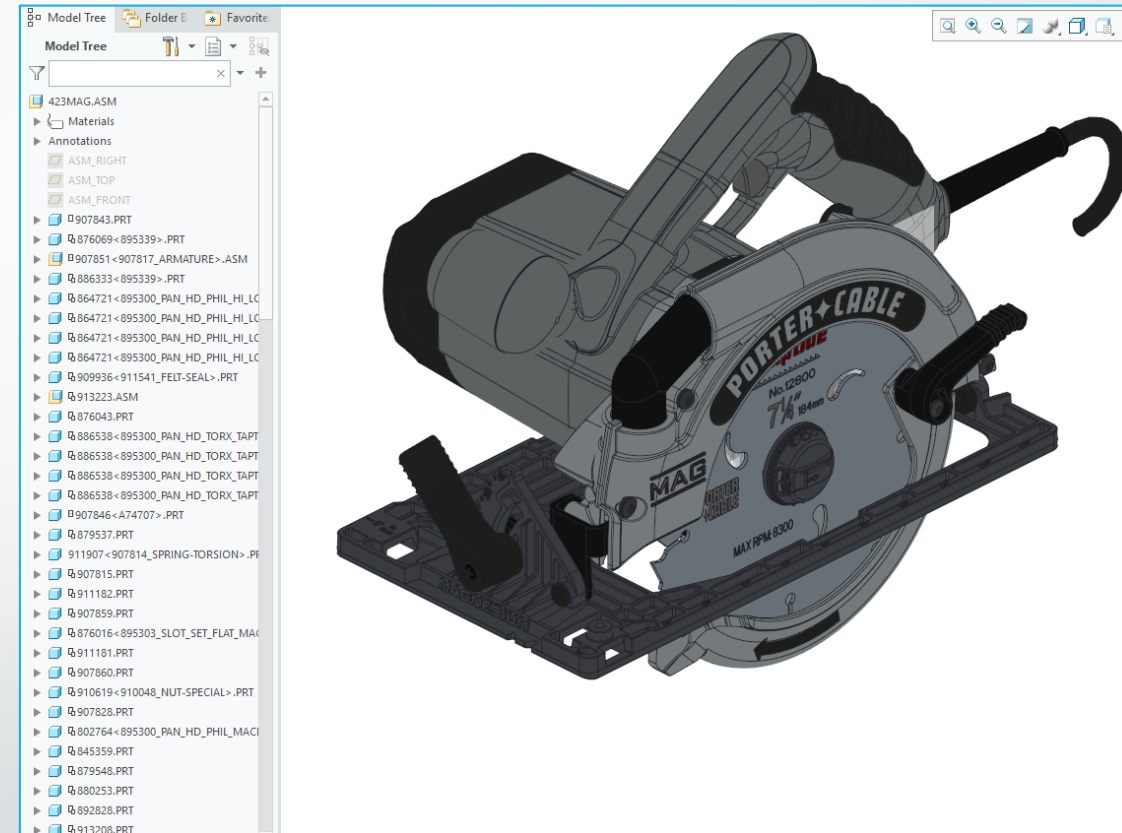
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Assembly Unhealthy Practices

Unhealthy Practice	Solution
Not assembling first component	Use Default constraint
Excessive Design in Context / part geometry created relative to Universal Coordinate System	Design part features relative to part default datums and assemble using constraints
Excessive External References	Break unnecessary External References Use only when required by Design Intent
Direct External References	Use Data Sharing Features (Copy Geometry, Shrinkwrap, Merge, and Inheritance)
Part Proliferation	Libraries
McMaster Carr Fasteners	IFX and Libraries
Assembling Family Table Generics	Create instance with same values as Generic Replace via Family Table
Assembly Constraints + Fix Constraint	Assembly Constraints or Fix Constraint
Assembly Level Features	Use only when they reflect actual manufacturing operation Turn off Automatic Update

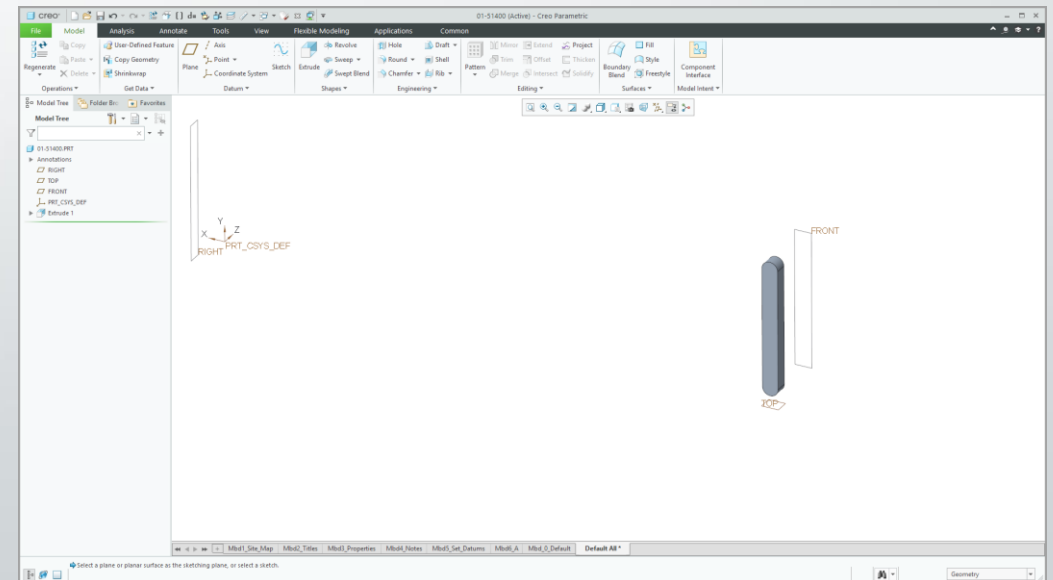
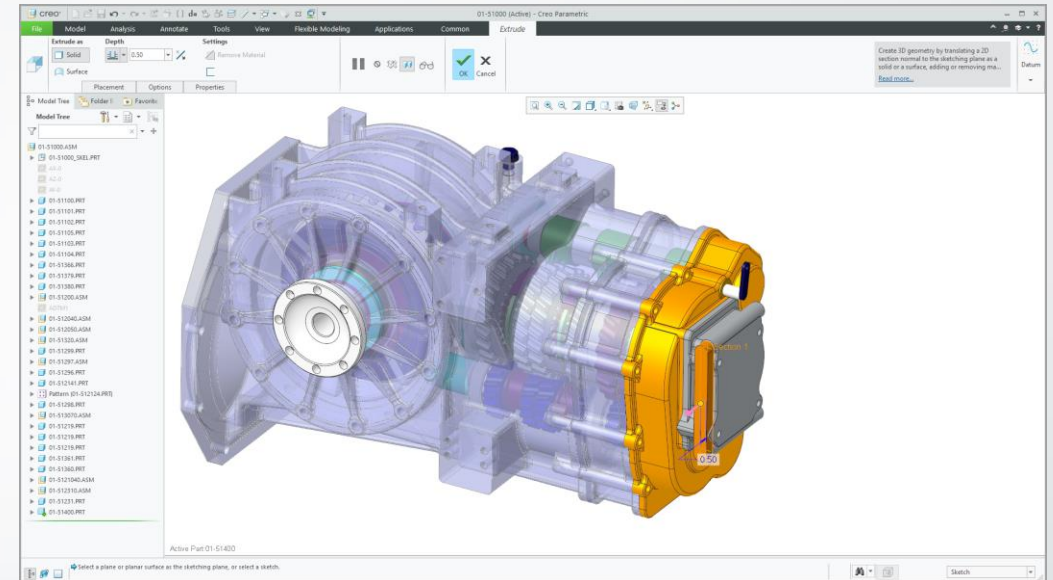
Unconstrained Base Component

- The first component in an assembly is sometimes called the Base Component as often the other components are assembled to it.
- Sometimes people do not define any constraints for the first component, so it still has 6 Degrees of Freedom.
- In the Model Tree the first component will have a glyph indicating it is underconstrained and other components will have a glyph indicating that it is assembled to an underconstrained component.
- Solution: Edit Definition of the first component to add constraints. The overwhelming majority of the time you can use the Default constraint.



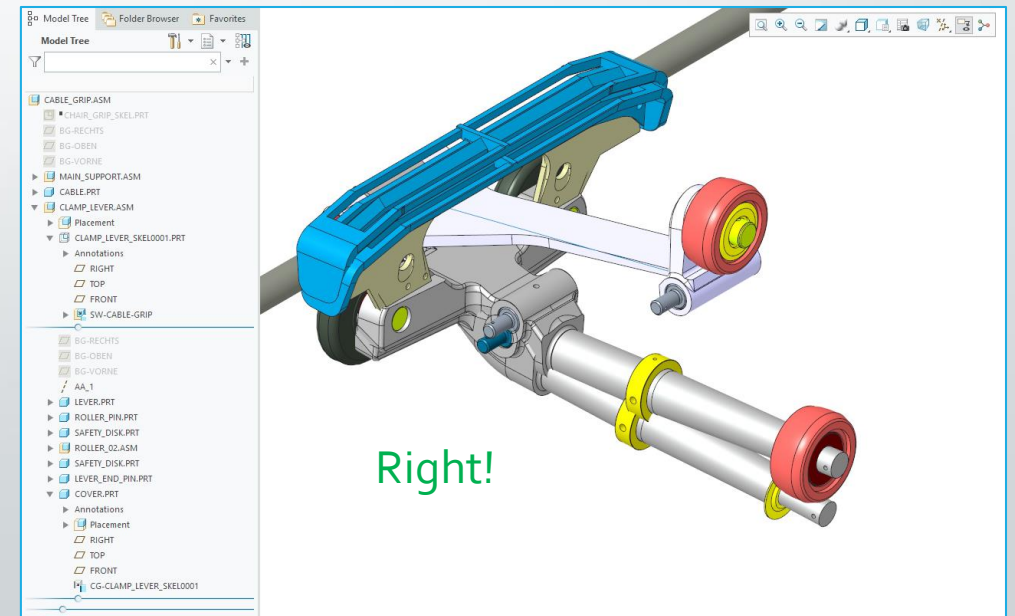
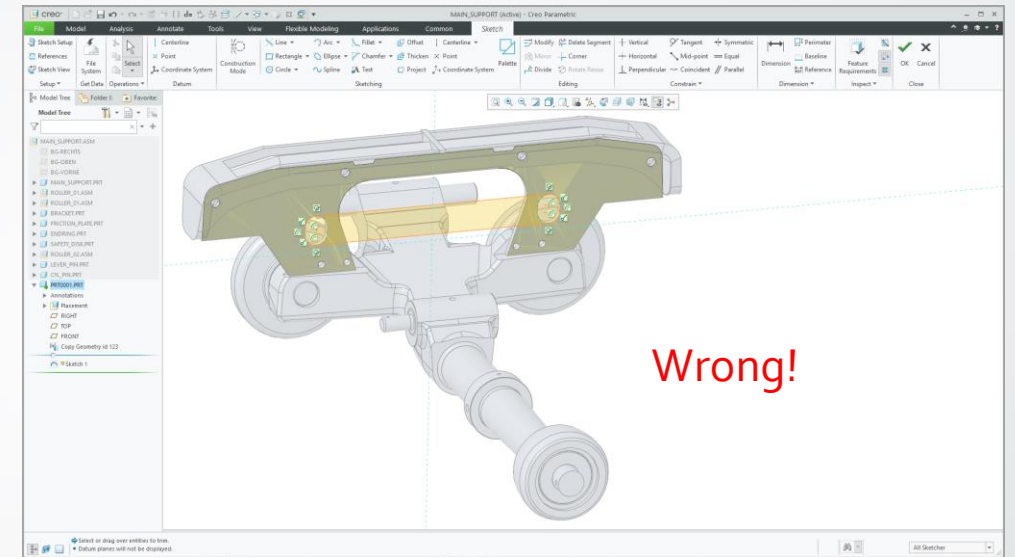
Excessive Design in Context (DIC)

- Design in Context is a technique in which components are designed in a high level assembly and the part geometry is located off in space relative to the part's default datums.
- Alternatively, individual component parts can be design off in space relative to the part default coordinate system. Then all the components can be assembled using the Default constraint.
- There are proper use cases for these modeling methods and can be powerful.
- However, when used in excess, they defeat the parametric nature of Creo, work against Design Intent, and reduce the reusability of components in other assemblies.
- Solution: do not use Design in Context or a Universal Coordinate System for simple parts, or when it's not required, or when you intend to reuse the models.



Direct External References

- Direct External References are created when a part uses explicit geometry from other components as parents for a feature, such as sketch planes, sketch references, projected edges, depth references, and so on.
- Ideally, External References within an assembly are created via Data Sharing Features like Copy Geometry, Shrinkwrap, Merge, and Inheritance.
- External References to higher- or parallel- level assemblies should be made via a Skeleton within the subassembly that contains Data Sharing Features, and the component references the Skeleton.

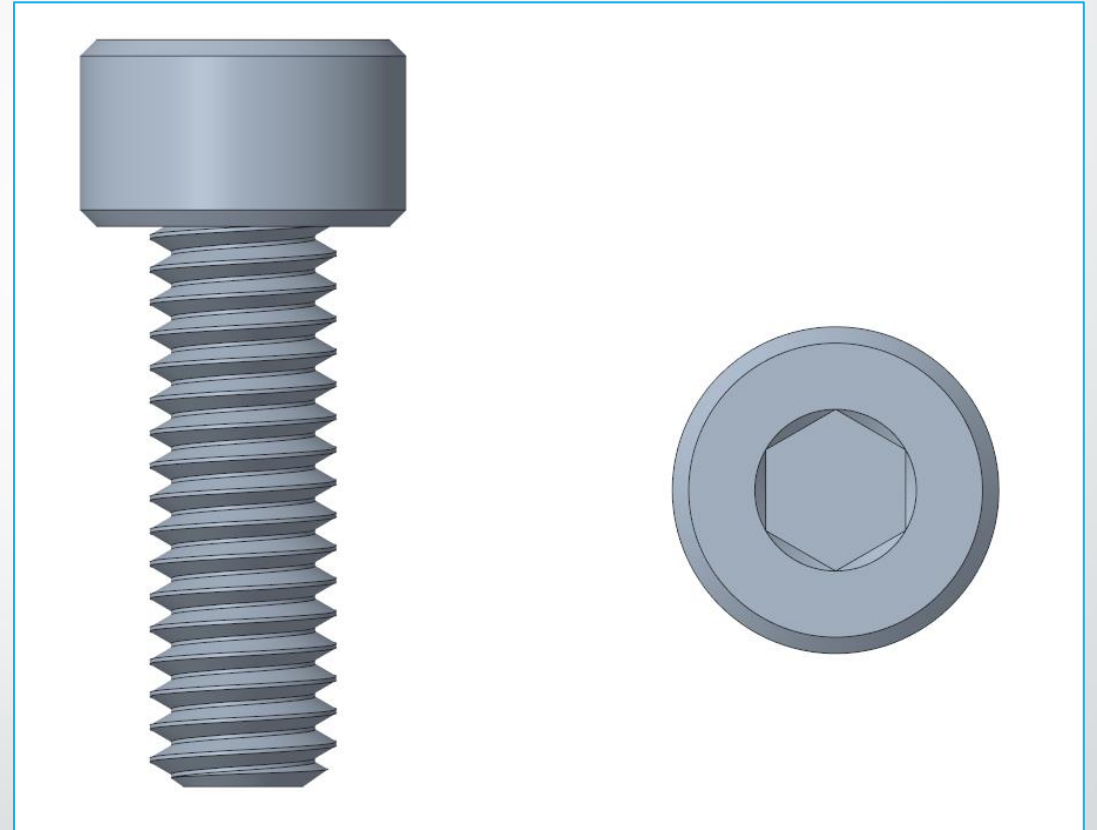


Part Proliferation

- Too often users will duplicate components that other users have already created.
- This results in part proliferation and duplication of effort, because downstream processes (manufacturing, procurement, inventory) have to be recreated instead of being reused.
- Can also happen when users:
 - Insist on having their own independent sandboxes.
 - Don't follow correct part numbering and include improper information like project, revision, date, and user names in the part number.
 - Don't use Common Names or parameters / attributes that are easily searchable.
- To solve these issues, implement:
 - Libraries in Windchill or in network locations.
 - Proper naming conventions for both Number and Common Name.
 - Part classification systems like Windchill PartsLink.

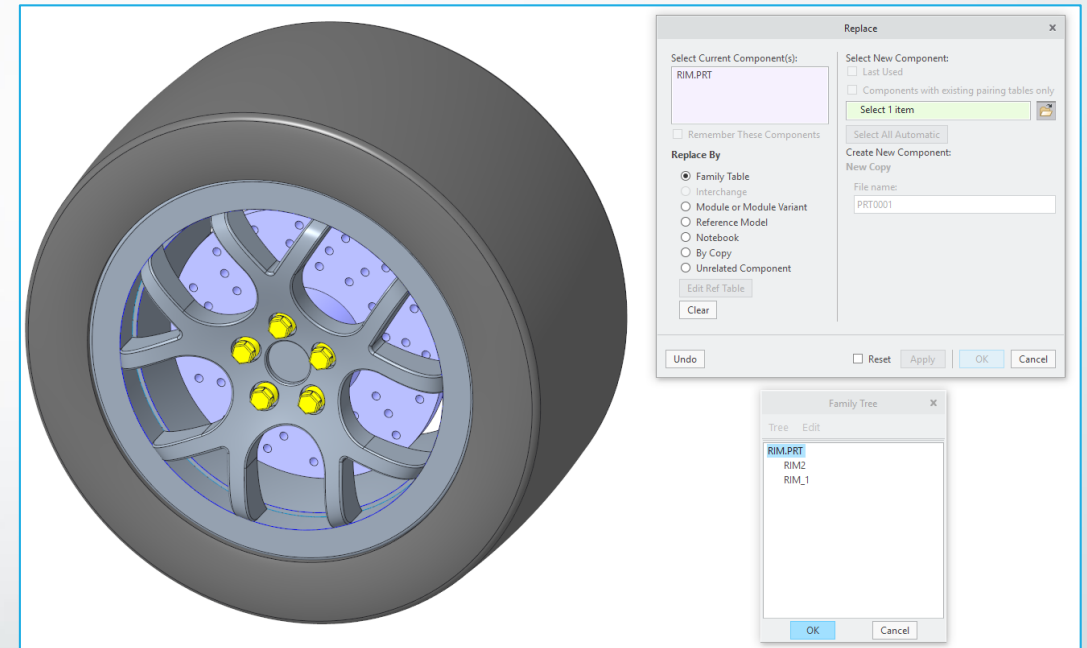
McMaster Carr Fasteners

- McMaster Carr is a wonderful resource for component models. It's convenient and easily searchable.
- However, the components typically contain too much detail, especially fastener threads and hex heads.
- Assemblies that contain numerous instances of these components can take longer to regenerate than necessary.
- Calling out specific McMaster Carr components as opposed to AN, NAS, MS, AS, DIN, ISO, etc. specification standard fasteners may imply to procurement that the component you need is single-sourced from McMaster Carr.
- McMaster Carr components might not have the necessary traceability for organizations that need to comply with quality management certifications like ISO 9001 or AS9100.



Assembling Family Table Generics

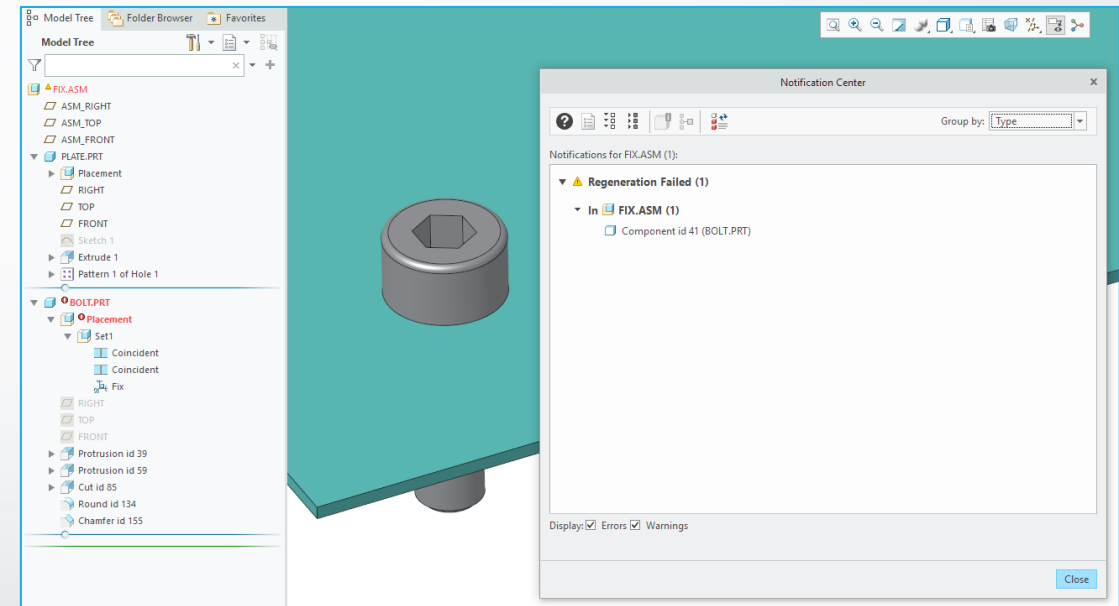
- The Generic (lead instance) of a Family Table should never be placed as a component in an assembly.
- If assembled, the Generic will drag all instances along with it.
- To alleviate this situation, an instance with the same values as the Generic should be created in the Family Table, and that instance should be assembled.
- In this situation, only the assembled instance and its Generic would be required in session or your workspace.



Replace via Family Table

Assembly Constraints with Fix Constraint

- The Fix constraint locks a component in space relative to the default coordinate system.
- The Fix constraint can be used to eliminate any remaining degrees of freedom for a component if other constraints (e.g., Coincident, Distance, Parallel, etc.) have already been applied.
- However, if the geometry to which the component is assembled is modified, then the Fix constraint will result in a regeneration failure for the component.
- In general, you are better off using standard constraints or the Fix constraint, but combining the two could result in problems.



Assembly Level Features

- Assembly Level Features should only be used to represent machining operations that occur at integration.
- Too often Assembly Level Features are used when the machining will actually take place at the component level.
- If you do use features for match drill holes or cuts, turn off Automatic Update and select the Intersected Components manually.
- Use Merge/Inheritance features to represent the different steps of the manufacturing process.

