Assembly Tips & Techniques for Working with Associative Copy and Assembly Reflect in I-deas NX Series

Sonia Kelley
UGS

May 9, 2005

© UGS Corp. 2006. All rights reserved.

Agenda

Associative Copy

- Brief introduction and terminology review
- How to get information on the relationships?
- How to solve the most common update problems?
- How to constrain and orient the instances?
- How to break the relationships?
- How to copy the parts and associated data without breaking the relationships?

© UGS Corp. 2006. All rights reserved.

Agenda

Assembly Reflect

- What is it?
- What is the creation process?
- What are some benefits of using it?
- What are some tips to remember when using it?

© UGS Corp. 2006. All rights reserved.

Associative Copy - Introduction

Used to associatively copy geometry from one part instance to another part instance within a common parent assembly

How can an Associative Copy Relationship be created?

- Associative Copy
- Associative Assembly Boolean
- Assembly Reflect

How is it commonly used?

- Create a family of parts from one source part
- Create a machining part from a mold or casting part
- Create a left-handed part from a right-handed part
- Create matching feature content in mating parts

© UGS Corp. 2006. All rights reserved.

Associative Copy - Terminology

Source

- Original part instance from which geometry is copied

Target

- Part instance into which geometry is associatively copied

Context Assembly

- Common parent assembly that owns the relationship

Context Configuration

- Configuration of the *Context Assembly* that owns a position dependent relationship

ACR

- Associative Copy Relationship (seen on the *Assembly Relations Browser*)

ACF

- Associative Copy Feature (seen on the history tree of the target part)

© UGS Corp. 2006. All rights reserved.

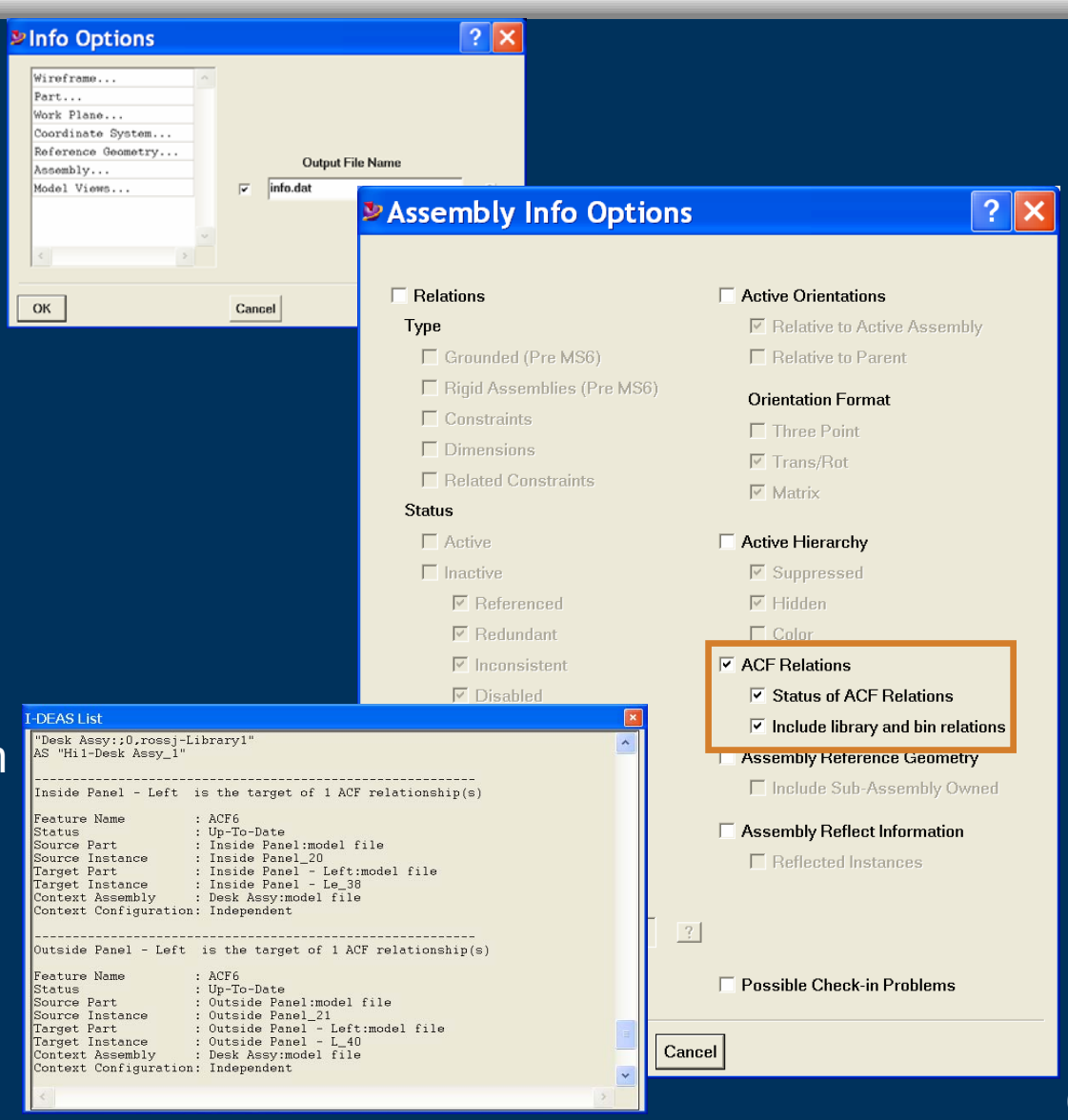
Associative Copy - Information

Assembly Info Options

1. Select *Info Options* icon
2. Select Assembly from *Info Options* form
3. Toggle on *ACF Relations* on *Assembly Info Options* form
4. Select *Info* icon and pick the desired assembly

The following information will appear about each ACR in the assembly:

- Feature Name
- Status
- Source Part and Instance
- Target Part and Instance
- Context Assembly
- Context Configuration



© UGS Corp. 2006. All rights reserved.

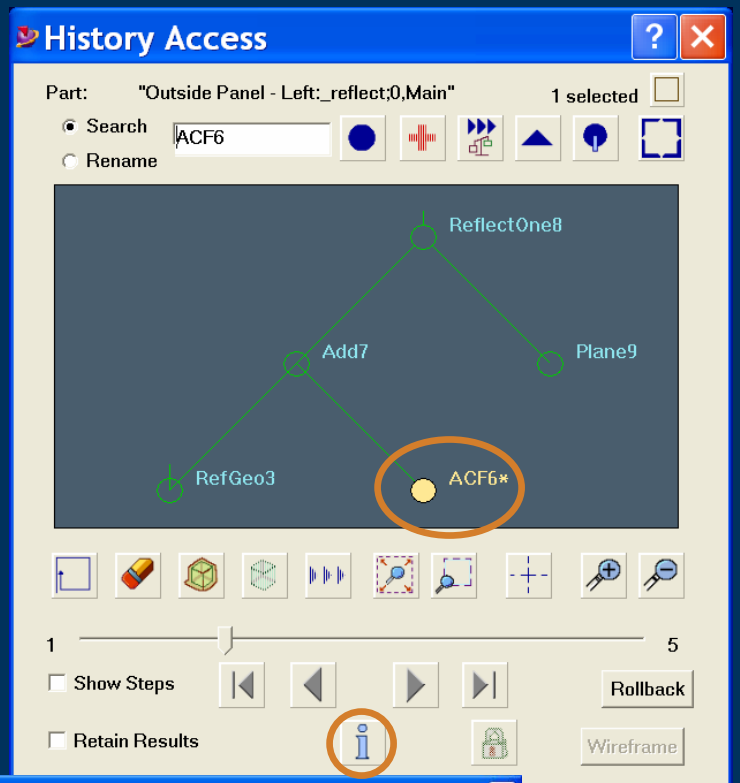
Associative Copy - Information

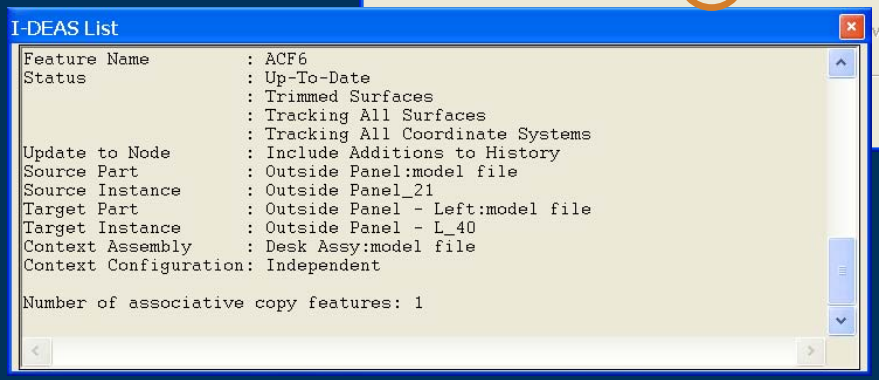
Info on ACF node

1. Select the *History Access* form for the Target part
2. Select the ACF node
3. Select the *Info* icon in the *History Access* form

The following information will appear in the *List* window:

- Feature Name
- Status
- Update to Node
- Source Part and Instance
- Target Part and Instance
- Context Assembly
- Context Configuration





© UGS Corp. 2006. All rights reserved.

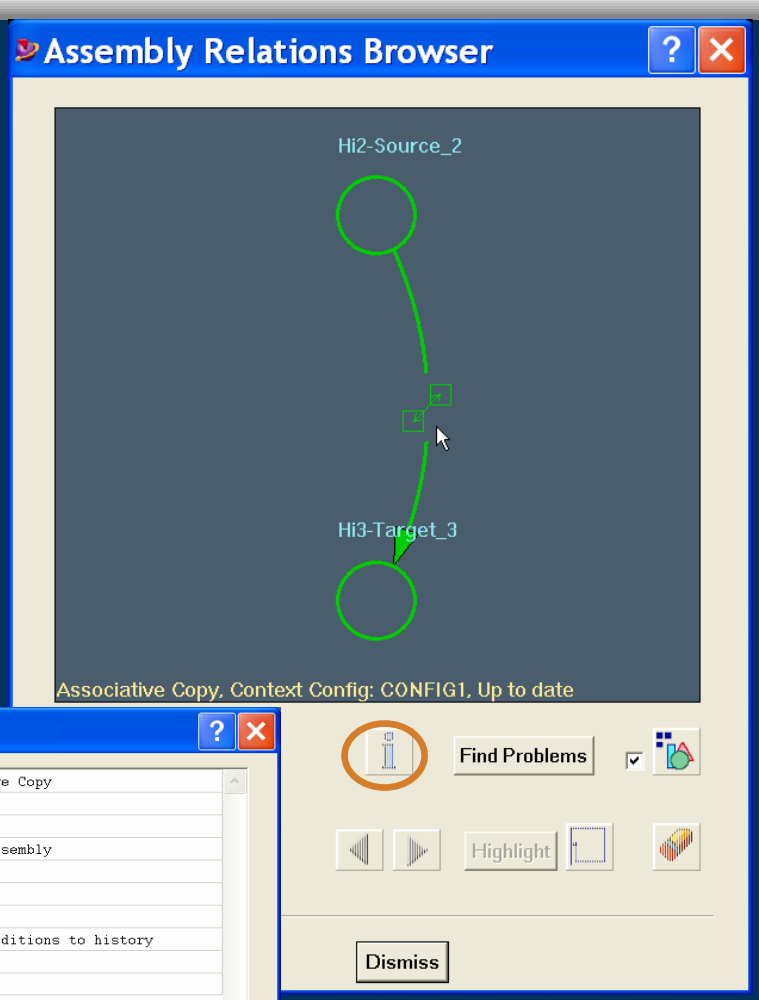
Associative Copy - Information

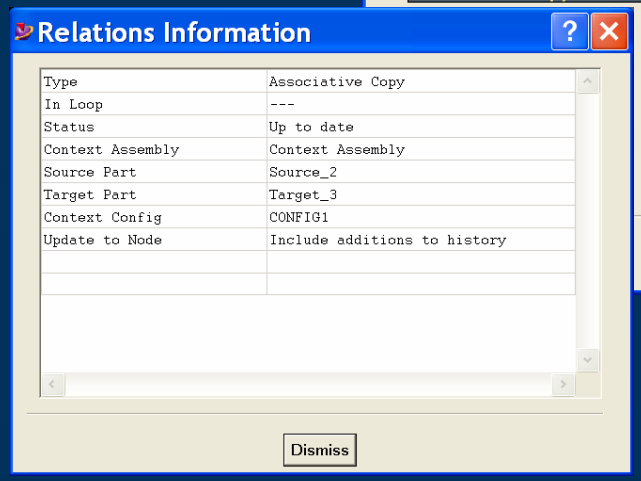
Assembly Relations Browser

1. Select the *Browse Relations* icon
2. Select the target or source instance
3. Select the *Info* icon in the *Assembly Relations Browser* form

The following information will appear in the *Relations Information* window:

- Type
- In Loop
- Status
- Context Assembly
- Source Part
- Target Part
- Context Configuration
- Update to Node



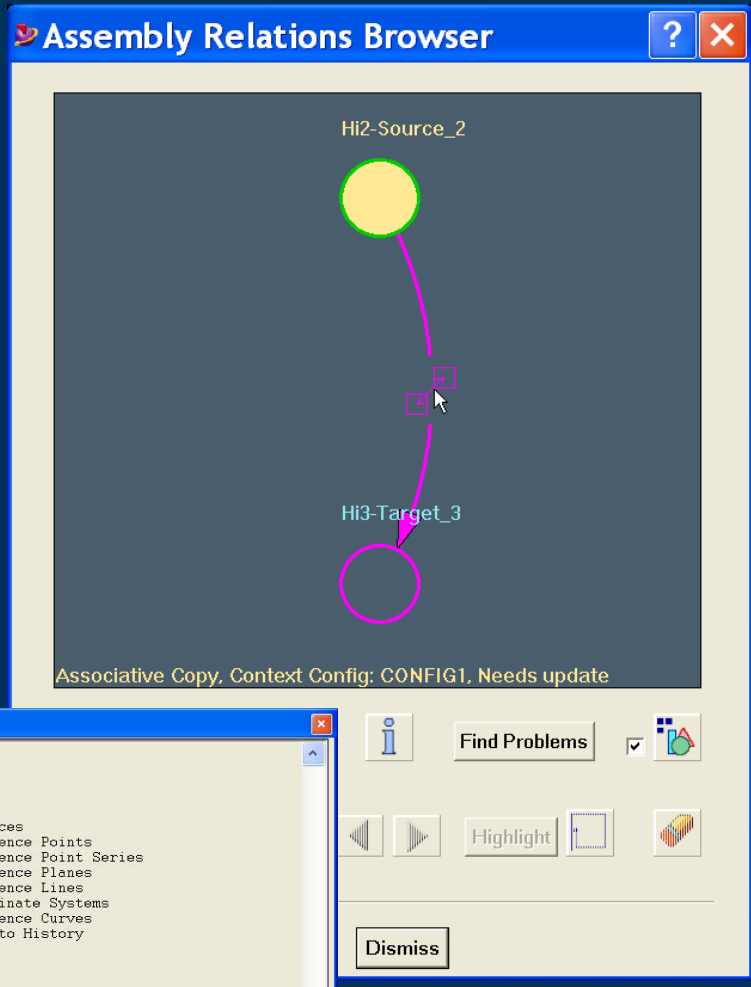


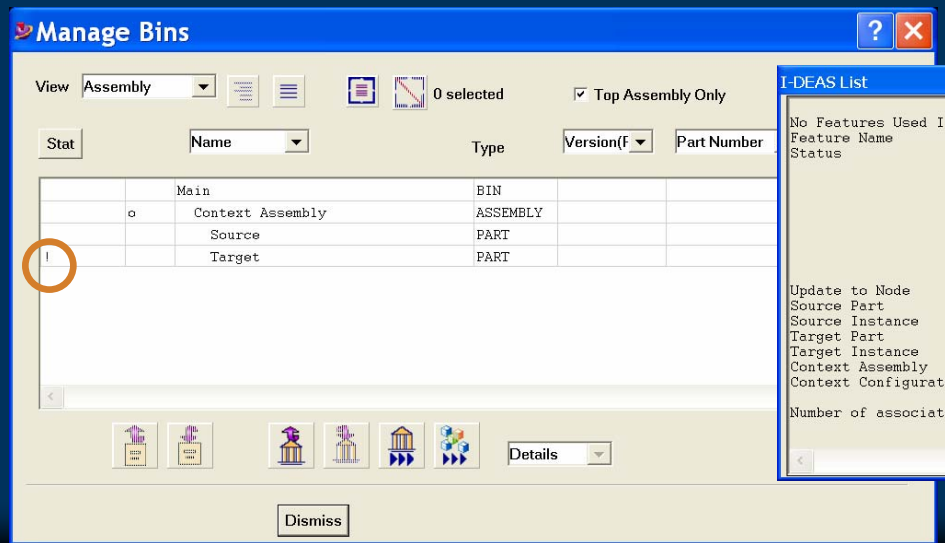
© UGS Corp. 2006. All rights reserved.

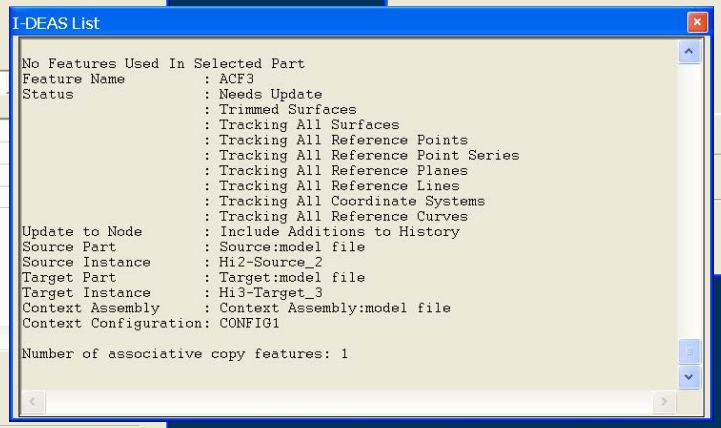
Associative Copy - Update

How to tell if ACR is out-of-date?

- Target part instance appears pink
- ACR appears magenta or yellow in *Assembly Relations Browser*
- Information on the assembly, ACF node, or ACR in the *Assembly Relations Browser* form shows the *Status* as *Needs Update*
- The *Status* of the Target part in the *Manage Bins* form is “!” or “!?”



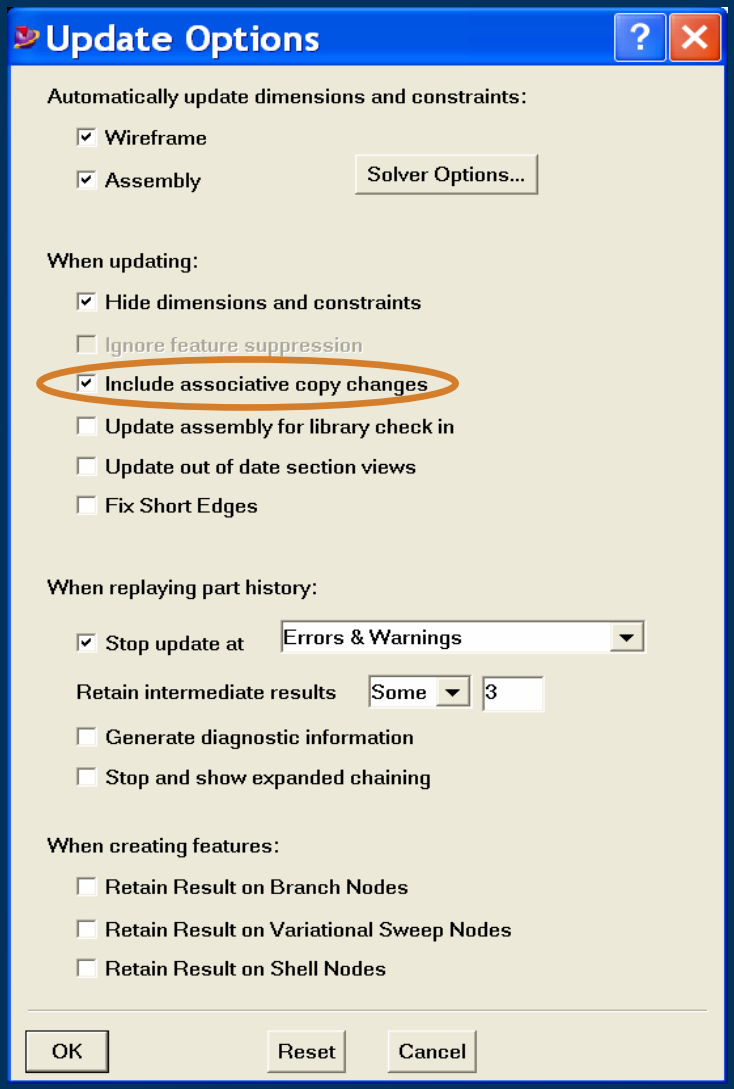




Associative Copy - Update

How to update the Associative Copy?

- Get the Context Assembly onto the workbench
- Check out the Target part
- Activate the Context Configuration if the relationship is position dependent
- Toggle on *Include associative copy changes* in the *Update Options* form
- Select the *Update* icon

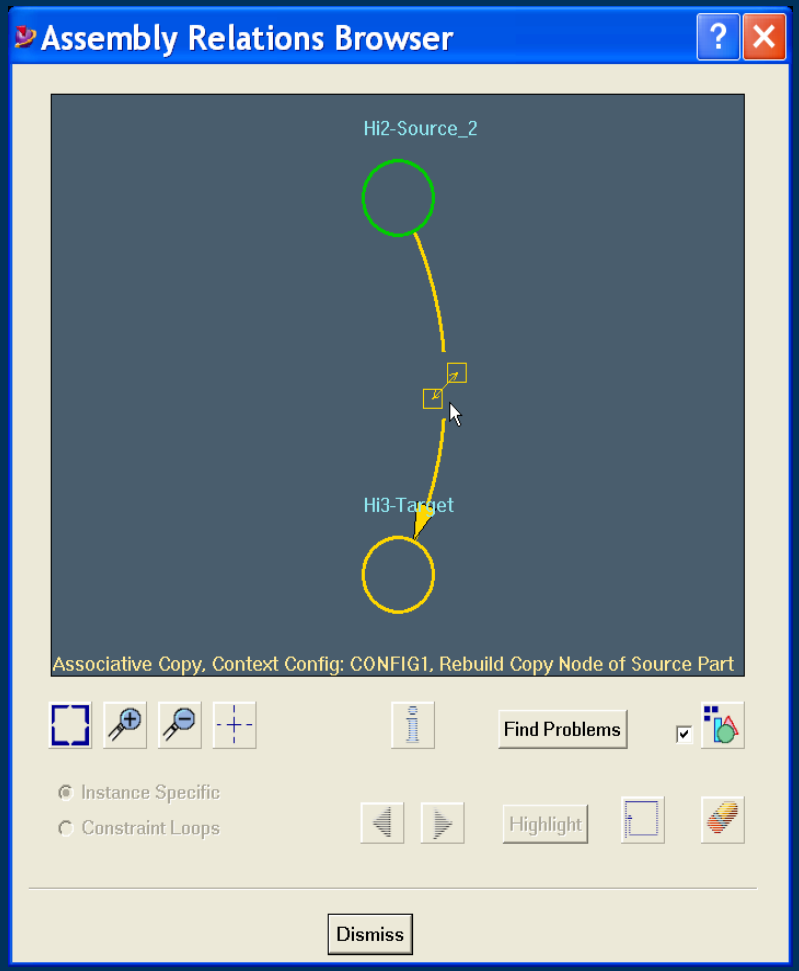


© UGS Corp. 2006. All rights reserved.

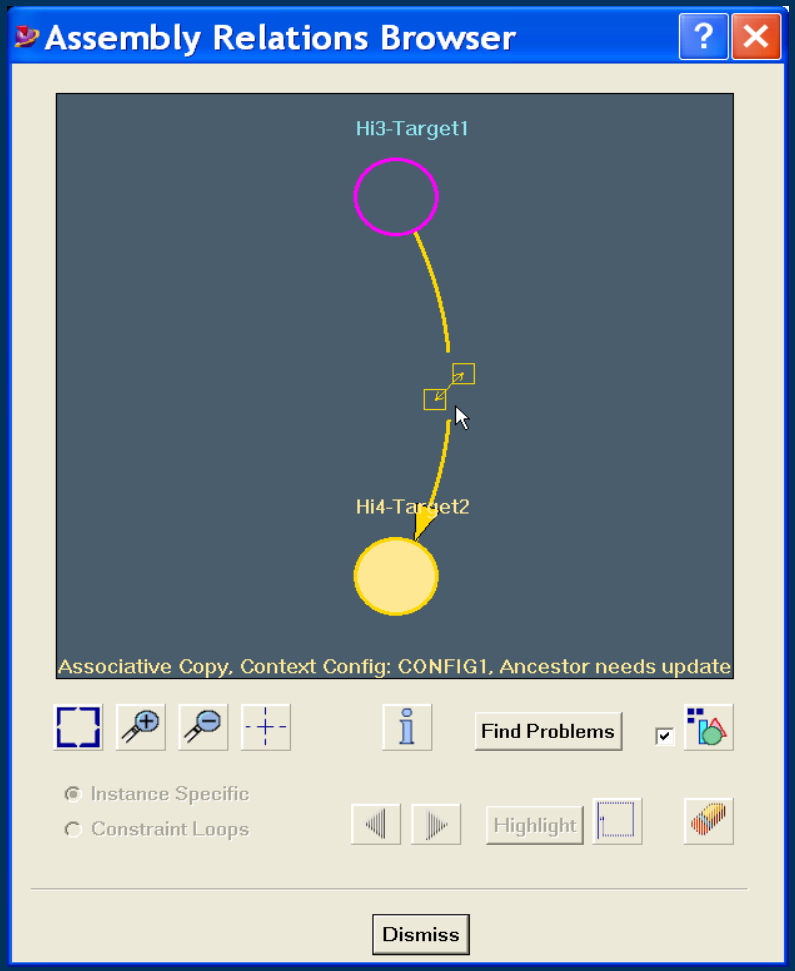
Associative Copy - Update

Why might a Target part have a “!?” status in *Manage Bins*?

Rebuild Copy Node of Source Part



Ancestor Needs Update

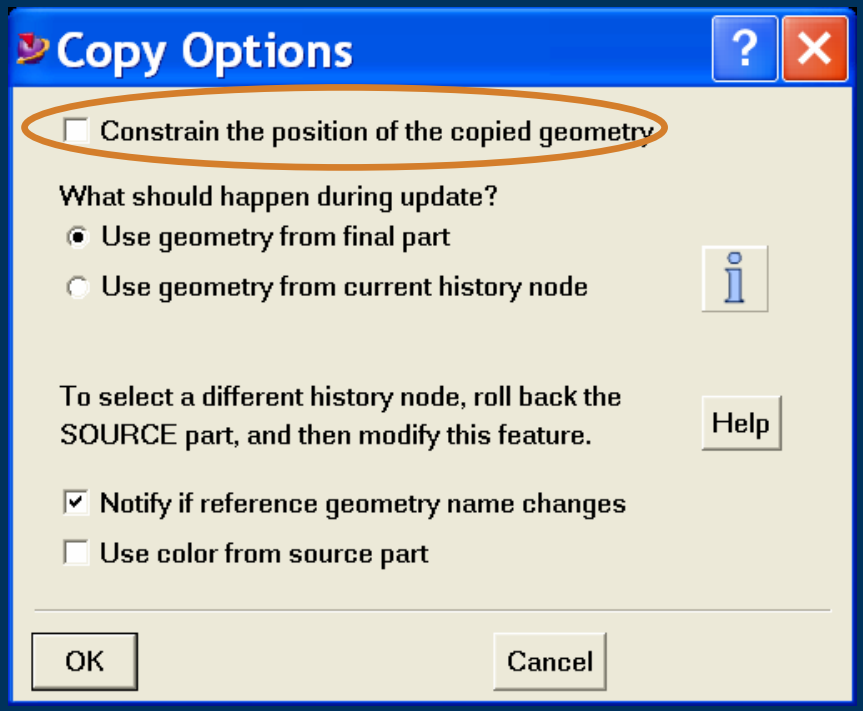


© UGS Corp. 2006. All rights reserved.

Associative Copy – Constrain & Orient

Position Independent

- ACR created with the *Constrain the position of the copied geometry* toggled OFF in *Copy Options*
- ACR is configuration independent
- Target can be constrained and oriented in any configuration
- Target will not reflect any position changes applied to the Source
- May need to apply 3D part VGX constraints to control position of copied geometry in the Target

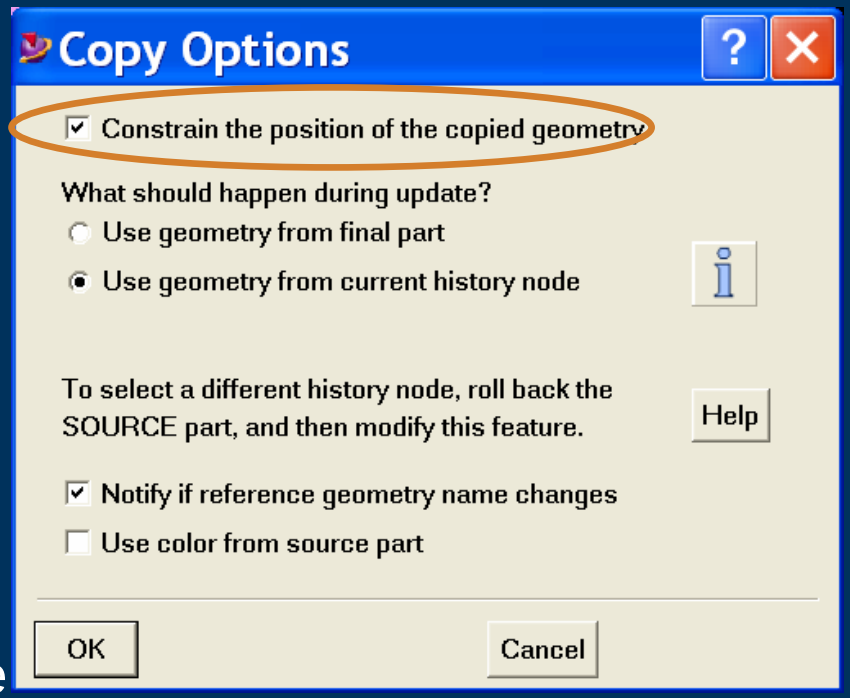


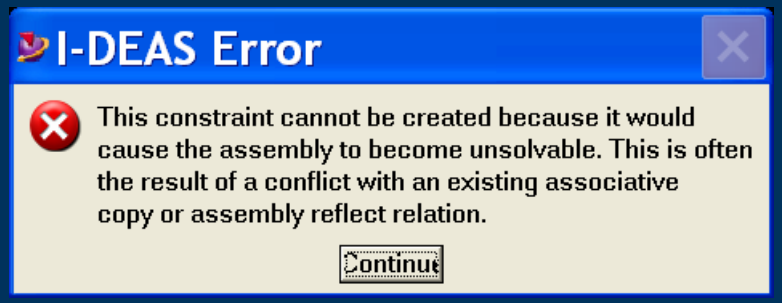
© UGS Corp. 2006. All rights reserved.

Associative Copy – Constrain & Orient

Position Dependent

- ACR created with the *Constrain the position of the copied geometry* toggled ON in *Copy Options*
- ACR has a Context Configuration
- Target will update with position changes applied to the Source in the Context Configuration
- Target cannot be constrained or oriented in the Context Configuration





© UGS Corp. 2006. All rights reserved.

Associative Copy – Constrain & Orient

Three options to constrain and orient a Position Dependent Target

1. Ground Target part instance and constrain instances to it
   - Can constrain instances to Target
   - Cannot orient Target in context configuration
2. Manage associative copy in a separate assembly
   - Can constrain and orient in non-Context Assembly
   - Requires at least two assemblies
3. Manage ACR in a configuration with *Ignore constraints* turned *ON* and constrain and orient the Target in other configurations
   - Can constrain and orient in non-Context Configurations
   - Requires an understanding of managing multiple configurations

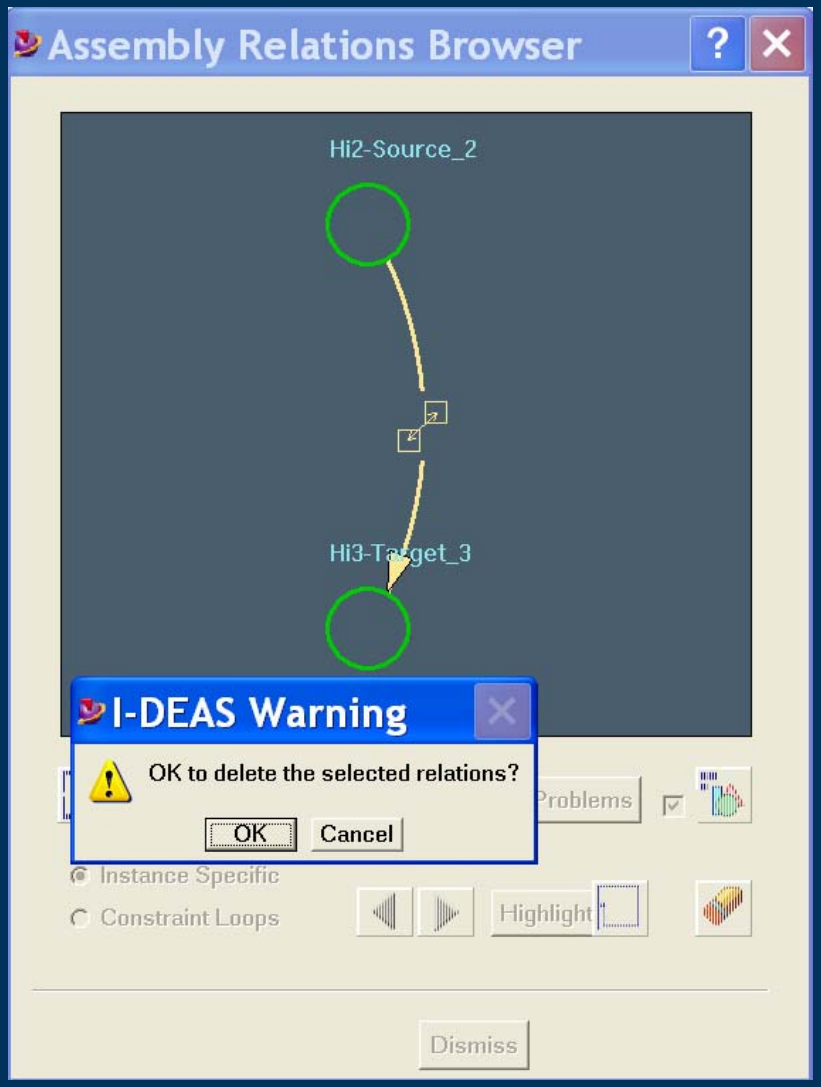
© UGS Corp. 2006. All rights reserved.

Associative Copy – Break Relationship

How to break the ACR?

- Delete ACR from Relations Browser
- Remove Target or Source from Context Assembly
- Select *Break Associativity* when modifying ACF node
- ACR will be broken as a result of a local copy of the Context Assembly or Target
- ACR will be broken on original Target when *Make Unique*

***Note: The relationships can't be repaired once broken, they must be recreated

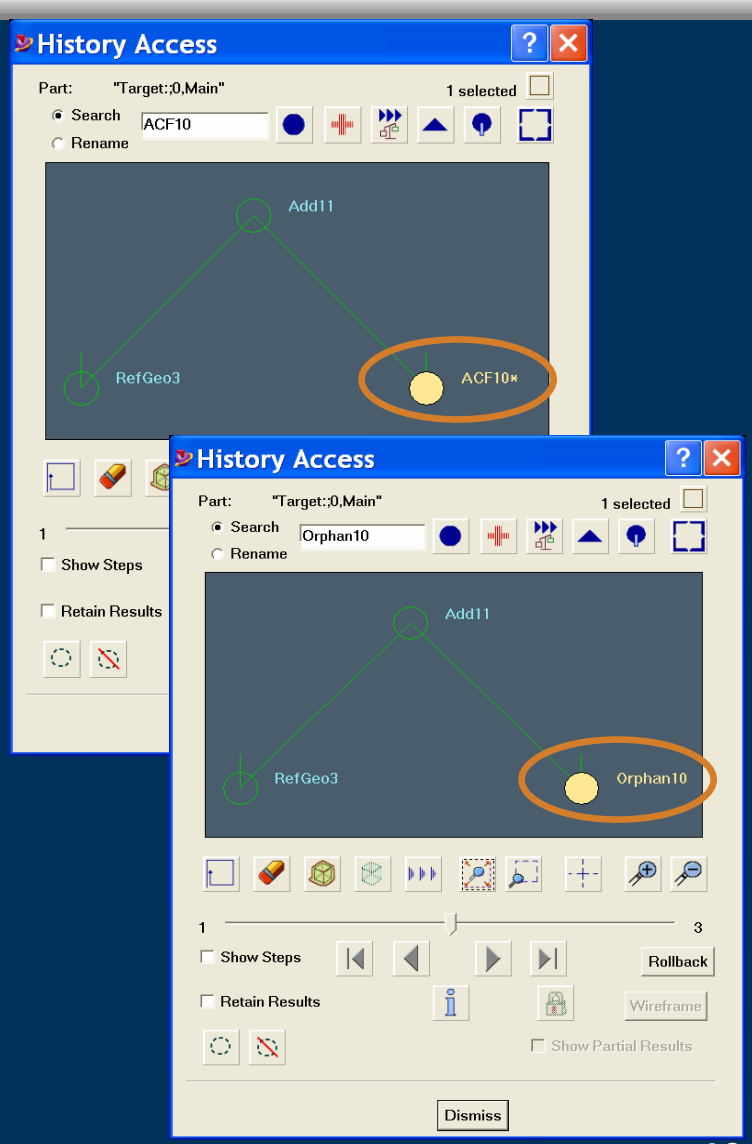


© UGS Corp. 2006. All rights reserved.

Associative Copy – Break Relationship

How to tell if the ACR is broken?

- The ACR no longer appears in the information on the Context Assembly
- The ACR no longer appears in the *Relations Browser*
- ACF node in *History Access* on the Target part is renamed to Orphan
  - Some exceptions…
    - The original Target part will still contain the ACF* node if *Make Unique* was used to create a new Target, but the relationship will be broken.
    - Remove the Target or Source instance from the Context Assembly. The Target will still contain the ACF* node even though the relationship is gone.

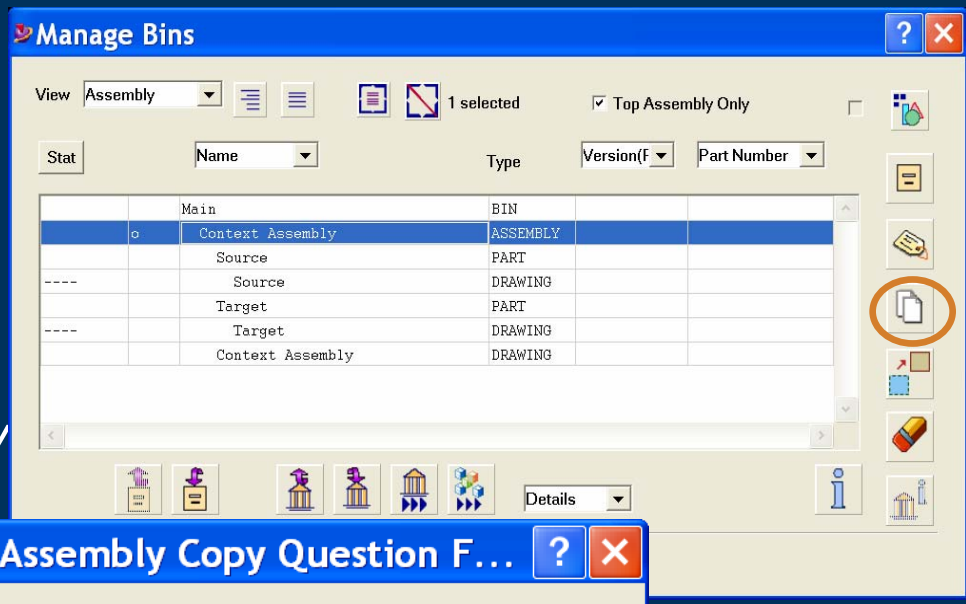


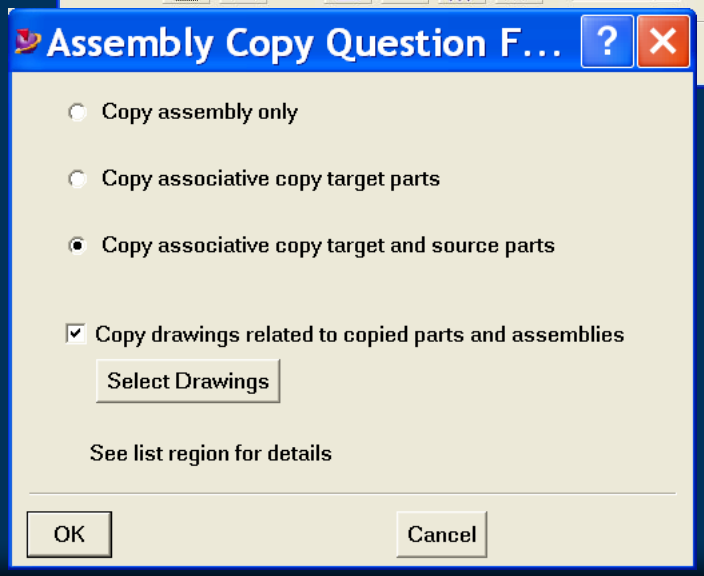
© UGS Corp. 2006. All rights reserved.

Associative Copy - Copying

How to copy the Source, Target, Context Assembly, and/or related drawings?

1. Reference or Check-out the desired Context Assembly and drawings
2. Select the Context Assembly in *Manage Bins* and select the *Copy* icon
3. Name the new assembly
4. Choose the appropriate copy option
   - Assembly Only
   - Assembly and Target Parts
   - Assembly, Target, and Source





© UGS Corp. 2006. All rights reserved.

Assembly Reflect

Assembly Reflect can be used to help increase productivity when building symmetrical assemblies.

Introduced in I-deas 10 NX Series

- Reflect existing assemblies to make new assemblies
- Create mirror images of part instances
- Ability to have the mirror image part models be associative to the originals

Significantly enhanced in I-deas 11 NX Series

- Create and modify reflection sets
- Usability enhancements
- Update reflection sets
- View reflection relations

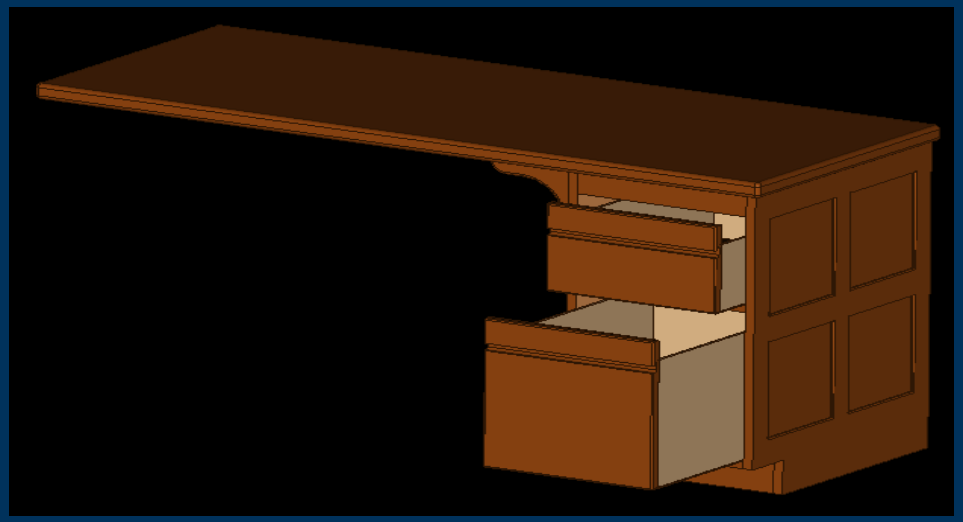
Enhanced in I-deas 12 NX Series

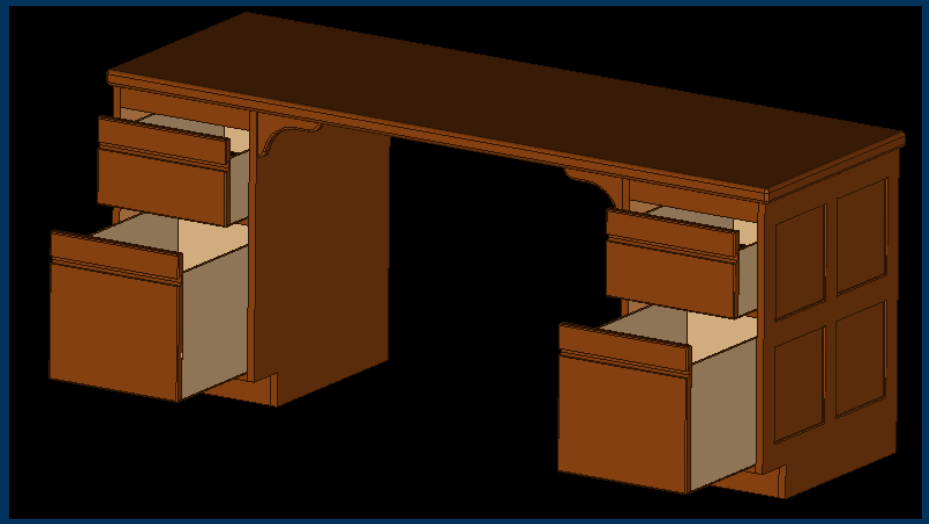
- Added the ability to reflect assembly annotation

© UGS Corp. 2006. All rights reserved.

Assembly Reflect

Process Overview





1. Build initial assembly

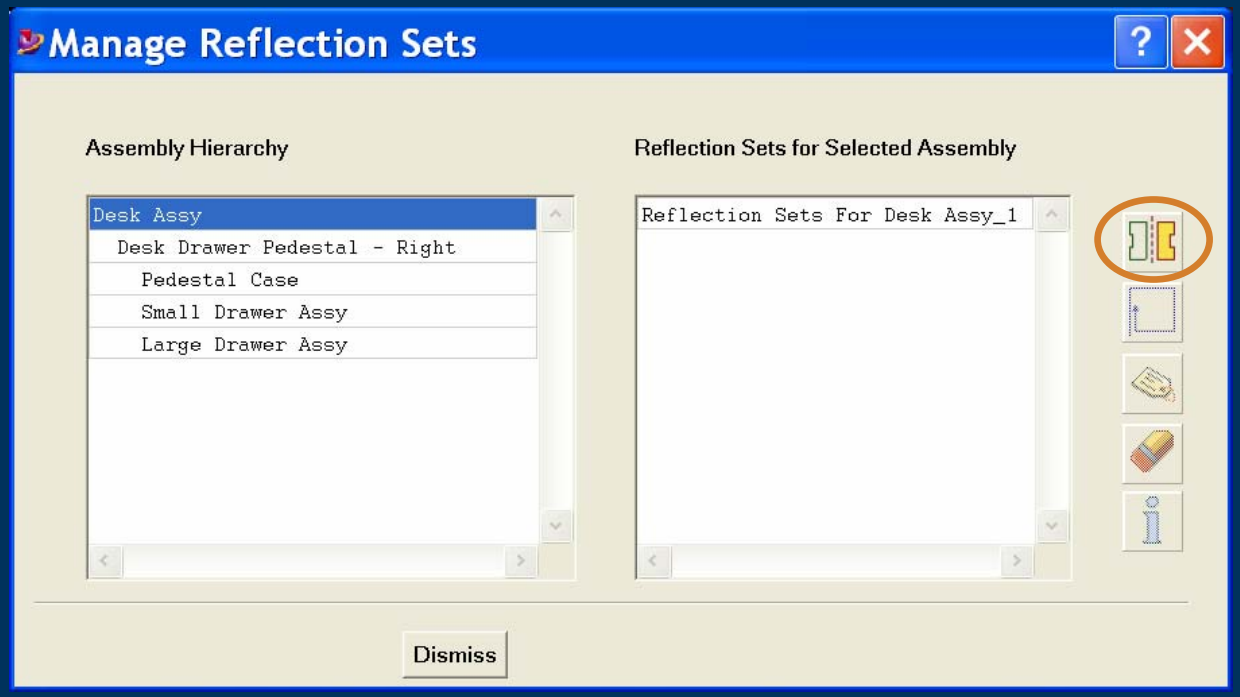
2. Select *Assembly Reflect* icon

© UGS Corp. 2006. All rights reserved.

Assembly Reflect

Process Overview

3. Choose the assembly to store the reflection set from the *Manage Reflection Sets* form



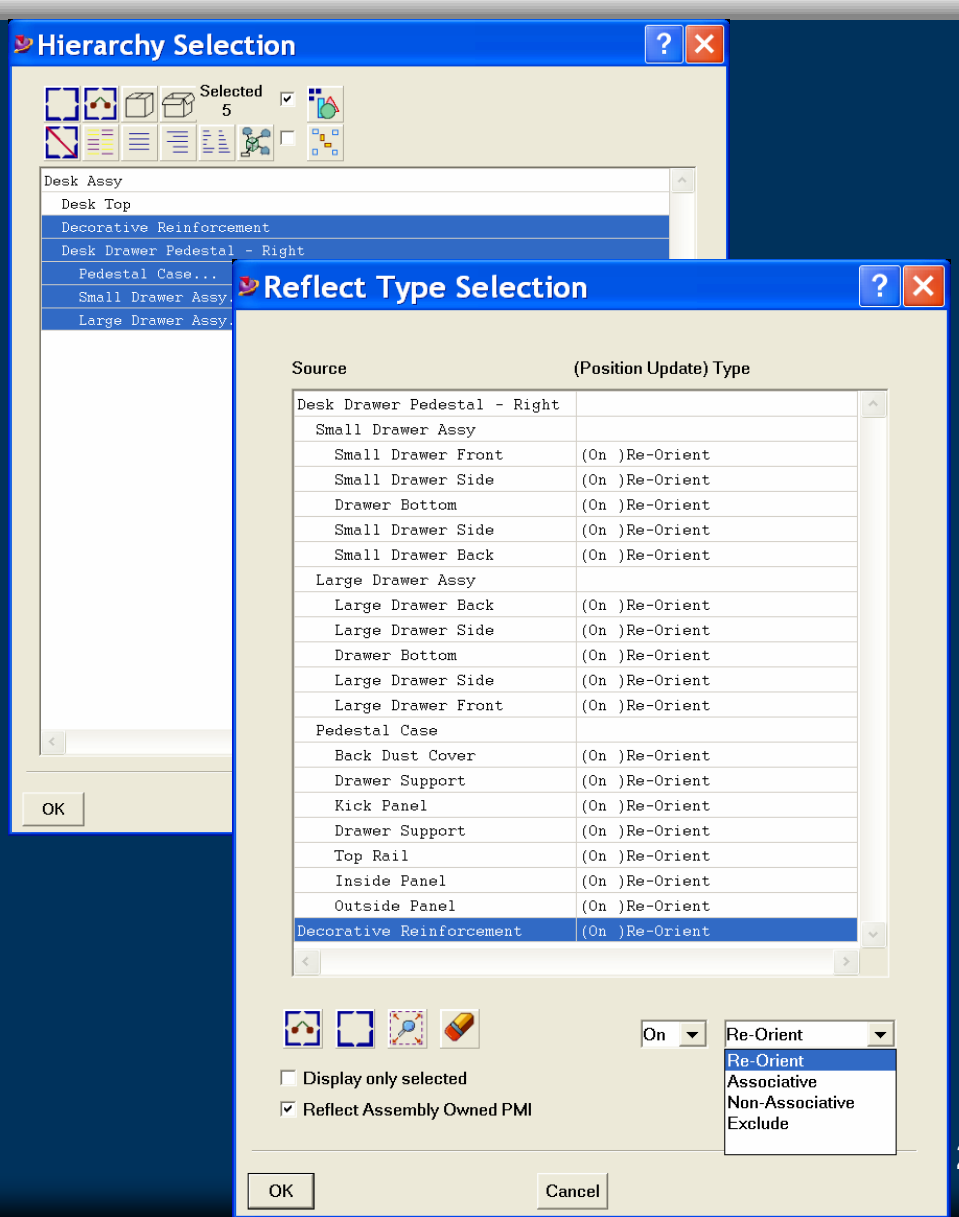
4. Select Create on the *Manage Reflection Sets* form

© UGS Corp. 2006. All rights reserved.

Assembly Reflect

Process Overview

5. Select the instances to reflect
6. Select plane to reflect about
7. Select *Position Update* (ON or OFF) and *Type* of reflection for each part instance in the *Reflection Type Selection* form
   - Re-Orient
   - Associative
   - Non-Associative
   - Exclude



© UGS Corp. 2006. All rights reserved.

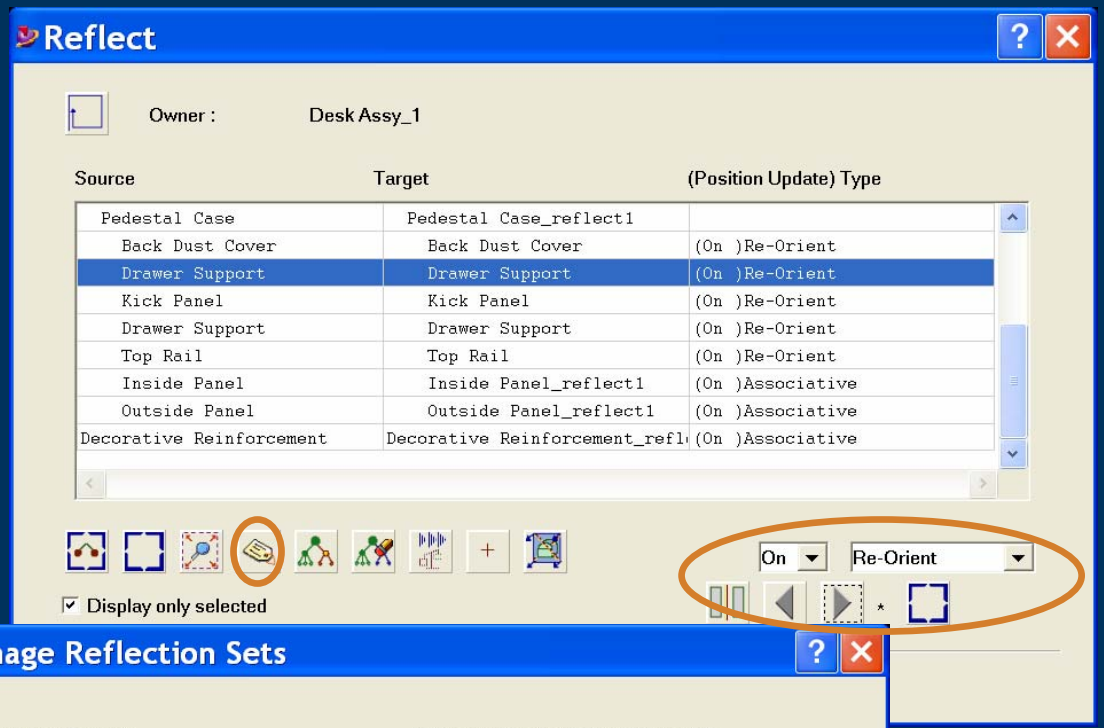
Assembly Reflect

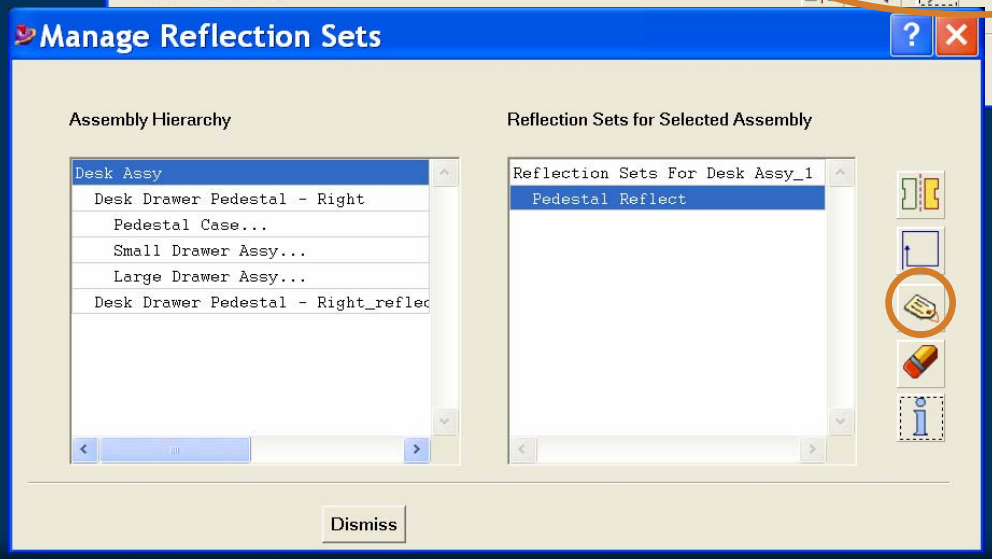
Process Overview

8. Verify orientations and make any needed type or orientation changes using the *Reflect* form

9. Use the *Rename the Target Part* icon to rename any newly created instances

10. Rename the created reflection set in the *Manage Reflection Sets* form





© UGS Corp. 2006. All rights reserved.

Assembly Reflect

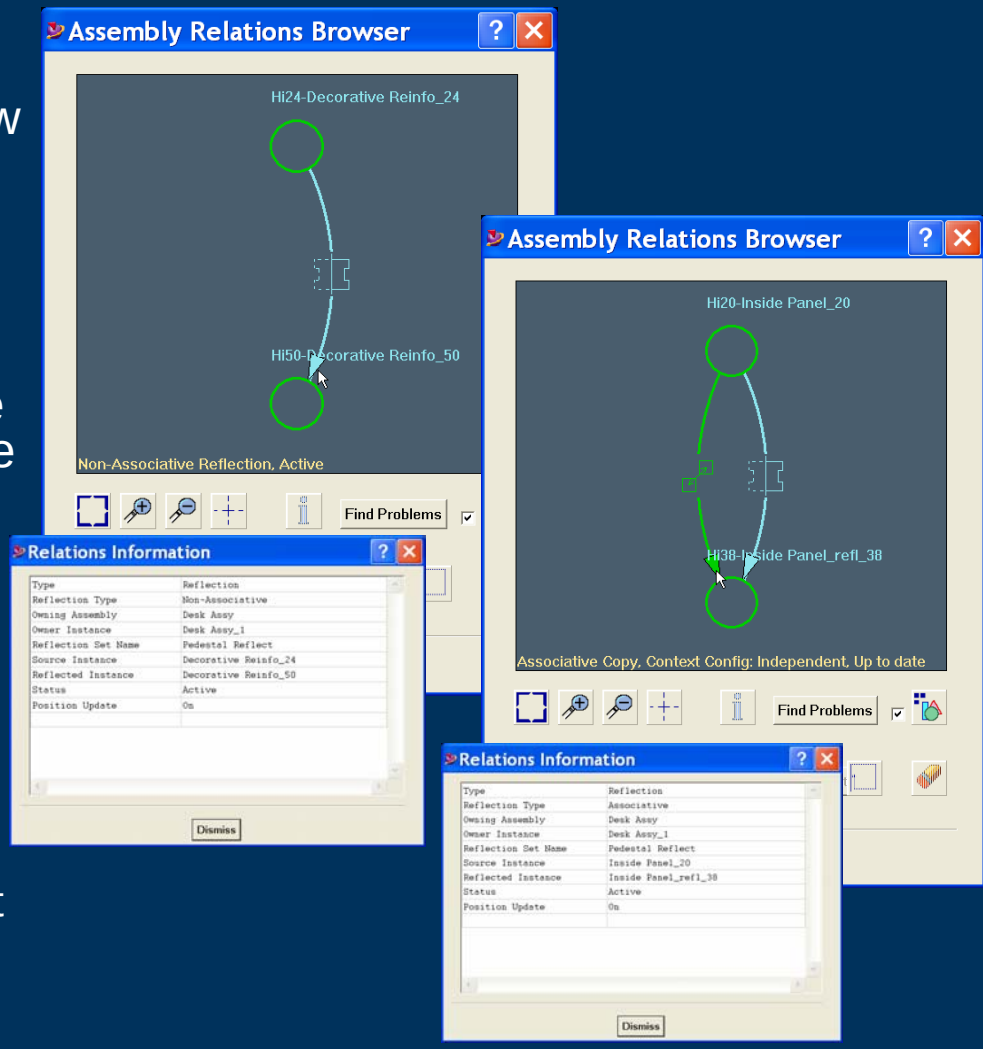
- Benefits
  - Duplicate part instances are automatically created, added to the assembly, and re-oriented if the *Re-Orient* reflect option is selected
  - Parts are copied, reflected, and instanced into the assembly if the *Non-Associative* or *Associative* reflect option is selected
  - Associative copy relationships to the original parts are automatically created if the *Associative* reflect option is chosen
  - Reflected assemblies can be updated to reflect any changes made to the hierarchies of the original assemblies
  - Reflected instances will update to show position changes of the original instances if *Position Update* is ON
  - Reflection sets can be modified to add, remove, or change the reflection type of instances

© UGS Corp. 2006. All rights reserved.

Assembly Reflect

Tips

- Reflecting an assembly will create a new assembly with the part instances reflected
- Constraints and dimensions are not copied when the assembly is reflected
- Reflected assemblies will only have one configuration even if source had multiple configurations
- Reflect relationship is shown in *Assembly Relations Browser* between the source and target instances of the reflect
- Associative reflect creates a position independent ACR
  - Breaking the ACR will change the reflect type to Non-associative
- More information on *Assembly Reflect*
  - http://support.ugs.com/docs/i-deas/wp/cad/ideas_Assembly_Reflect_in_I11.pdf



© UGS Corp. 2006. All rights reserved.

Assembly Tips & Techniques for Working with Associative Copy and Assembly Reflect in I-deas NX Series

Sonia Kelley
UGS

May 9, 2005

© UGS Corp. 2006. All rights reserved.