Project 3 – Designing in Context

1 Designing in the Assembly Context (Top Down)

The following section will give an overview of interacting with an assembly model with in context designing. In context part creation and assembly component referencing will be used. Additional 3D constraints with complete this in process design.

1.1 Project 3

The upper press clamp assembly has been setup to its start postion as well as the handel detail. Using these postions a detail will need to be designed to mount a cam follower.



- 1. Open an existing assembly file.
 - On the Quick Access toolbar, click Open.



• In the Open dialog box, select the file Mating Press View.iam

| FRE Open | | | × |
|----------------------|-----------------------------|--------------------|-------------------|
| Content Center Files | Look in: 🌗 Workspace 🗸 | G 🌶 📂 🖽 - | |
| | Name | Date modified | Туре |
| | 🖶 Mating Press View 🛛 🗲 🗕 | 1/3/2012 4:37 PM | Autodesk Inventor |
| | 🖶 Robot-Assembly-A | 1/3/2012 9:51 AM | Autodesk Inventor |
| | 뤔 Robot-Assembly-A-Complete | 1/3/2012 4:40 PM | Autodesk Inventor |
| | 뤔 Robot-GripperAssy | 1/3/2012 4:40 PM | Autodesk Inventor |
| | 🖶 Rotor-Assembly | 11/8/2011 12:00 PM | Autodesk Inventor |
| | 🖶 Vice | 12/22/2011 11:39 | Autodesk Inventor |
| | ☐3D Navigation | 11/8/2011 11:53 AM | Autodesk Inventor |

Click Open.

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2. So that the start positions do not move while design, Shift-Select both *Press Clamp Assembly 2* and *Press Cam* in the graphics window or browser. Right-click, and select **Grounded**



- 3. Create In-Place Component
 - Start the Create In-Place Component tool Assemble tab | Component panel | Create



• On the Create In-Place Component dialog box enter CamFollower-Mount for the New Component Name

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• Click the Browse Templates to change the Template to Metric\Standard (mm).iam

| Create In-Place Component | X | | | |
|--|--------------------------|--|--|--|
| New Component Name | Template | | | |
| CamFollower-Mount | Metric\Standard (mm).ipt | | | |
| New File Location | | | | |
| D:\Workspace | | | | |
| Default BOM Structure | | | | |
| 📲 Normal 🔹 🔍 Virtual Component | | | | |
| Constrain sketch plane to selected face or plane | | | | |
| | OK Cancel | | | |

- Click OK
- 4. Sketch the following profile:



5. Start the Extrude tool

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• Extrude using the symmetric option, .75 in



- Click **Return** on the ribbon to return to the assembly.
- 6. Start the **Constrain** tool
 - On the Place Constraint dialog box set the following options Type: Mate Solution: Mate
 - Pick the top face shown of the weldment rib for Selection 1
 - Pick the underside face shown of component CamFollwer-Mount for Selection 2



• Enter 0 into the Offset field.

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- Click Apply
- 7. Continue the Constrain tool
 - On the Place Constraint dialog box set the following options Type: Mate Solution: Mate
 - Pick the face shown of component CamFollower-Mount for Selection 1



• Pick the face shown of the weldment rib for Selection 2

- Enter **0** into the **Offset** field.
- Click Apply
- 8. Continue the **Constrain** tool
 - On the Place Constraint dialog box set the following options Type: Mate Solution: Mate
 - Pick the Origin XY Plane of component CamFollower-Mount for Selection 1
 - Pick the hole centerpoint shown of the weldment rib for Selection 2





- Enter 0 into the Offset field.
- Click OK
- 9. Double click CamFollower-Mount to edit the part



10. Sketch the following profile





11. Extrude the Cut profile Through All



12. Create 5 mm Chamfers on the top edges



- 13. Position through hole for Cam Follower
 - Create sketch on side face of CamFollower-Mount



• Create .75 in construction circle to represent the Cam Follower



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• Position the construction circle as shown with the tangent constraint



- Exit the sketch
- Start the Hole tool
 Place a From Sketch Hole picking the circle center point in the sketch with following options:
 Type: Drilled
 Diameter: .375 in
 Termination: Through All





14. Add mounting holes

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• Create sketch on front face of *CamFollower-Mount*



Start Project Geometry tool
 Project tapped holes as shown

• Start Hole Tool

Place a **From Sketch Hole** picking the circle center point in the sketch with following options:

Type: Counterbore Standard: ANSI Metric M Profile Fastener Type: Socket Head Cap Screw Size: M5 Fit: Normal Termination: Through All



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| | Hole | |
|----------|---------------------------------------|---|
| | Placement | |
| | Drill Point | Termination 118 deg ▶ Through All |
| 5.500 mm | C C C C C C C C C C C C C C C C C C C | О # ОК Сапсе! Арр!у |
| | Standard | Ansi Metric M Profile 🔹 |
| | Fastener Type | Socket Head Cap Screw |
| | Size | M5 • |
| | Fit | Normal |

- Click OK
- 15. Place Components
 - Place the following components into the Mating Press View
 - CCF-360.ipt
 - .375-LockWasher.ipt
 - .375-24-HexNut.ipt
- 16. Start the Constrain tool.
 - On the Place Constraint dialog box set the following options Type: Insert Solution: Opposed
 - Pick the circular edge shown of component CCF-360 for Selection 1



• Pick the circular edge shown of component CamFollower-Mount for Selection 2



- Enter 0 into the Offset field.
- Click Apply
- **17.** Continue the **Constrain** tool.
 - On the Place Constraint dialog box set the following options
 Type: Insert
 Solution: Opposed
 - Pick the circular edge shown of component .375-LockWasher for Selection 1



• Pick the circular edge shown of component CamFollower-Mount for Selection 2



- Enter 0 into the Offset field.
- Click Apply
- **18.** Continue the **Constrain** tool.
 - On the Place Constraint dialog box set the following options Type: Insert Solution: Opposed
 - Pick the circular edge shown of component .375-24-HexNut for Selection 1



• Pick the circular edge shown of component .375-LockWasher for Selection 2



- Enter 0 into the Offset field.
- Click Apply

19. Start the **Constrain** tool.

- On the Place Constraint dialog box set the following options
 Type: Tangent
 Solution: Outside
- Pick the face shown of component Press_Cam for Selection 1
- Pick the cylindrical face shown of component CCF-360 for Selection 2

| Place Constraint |
|---|
| Assembly Motion Transitional Constraint Set Type Selections P P P P P P P P P P P P P P P P P P P |
| OK Cancel Apply >> |

• Enter 0 into the Offset field.

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- Click OK
- 20. Right-click CamFollower-Mount in the browser, select Adaptive to clear Adaptivity



- 21. Shift-select Press Clamp Assembly 2 and Press_Cam. Right-click, select Ground to Unground both components
- **22.** Drag the *Press_Cam* handel. Notice how the *Press Clamp Assembly 2* assembly moves.
- 23. Click Save on the Quick Access Toolbar
- 24. Close all files