Projecting features on or through curved surfaces

In some cases you will want to make a hole or other feature perpendicular to a curved surface. Since you cannot define a sketch plane to be a curved surface, you need to create a workplane adjacent to the surface from which to project your feature. Here we will put a hole through the side of the base of the part.



1. Define a sketch plane on the bottom surface of the part.

2. Project the Z Axis.



3. Draw a construction line diagonal outside the part as shown.





4. Constrain the construction line tangent to the base OD.

5. Set the construction line at 15° to the Z Axis.



6. Exit the sketch and select the Work Plane feature tool. Click on the 15° construction line.



7. Click on the XZ Plane in the Model browser. We are going to make a hole which is parallel to the XZ Plane; if you wanted to make your hole perpendicular to the tapered surface of the base, you would click on that surface instead.





8. Set the Angle to 90° to create a plane perpendicular to the XZ Plane.

9. The new work plane should be coincident with the construction line (therefore tangent to the base circumference).



10. Make a new sketch on Work Plane2.



11. Project the Y Axis onto the sketch plane.





12. Place a Point, Hole Center on the projected axis.

13. Dimension the point .300 in. above the bottom surface. Note that you can select the base geometry for this dimension (without projecting it onto the sketch plane).



14. Exit the sketch.



15. Make a 0.25 in. diameter hole through to the inside surface. (To see why we don't use Through All, try using that setting and look at what happens to the opposite side of the part.)



The completed Base



Edits & Revisions

- 12/17/04 Initial release.
- 1/2/05 Work Planes, Features & Constraints, Pg 15 step 9, corrected Taper angle (1°, was -1°).