Project 2.3.1 – Arbor Press

Purpose

Have you ever ridden on a skateboard or strapped on a pair of in-line skates? If so, what are those devices that exist between the wheels and the axles that allow the wheels to spin, and the axles to remain stationary? If you are thinking wheel bearings, then you are correct. Wheel bearings fit snugly inside the bored holes of the wheels and are held in place by friction. In fact, they are pressed into position with devices that are similar to an arbor press.

An arbor press is a device that is used to press objects together or force them apart. Typical arbor press applications include pressing bearings into gears or pulleys, pressing gears or pulleys onto shafts, and pressing alignment pins into fixtures. The arbor press contained in this project is powered by an air-actuated rotary cylinder, while the lever-type version is powered by the user’s muscles.

Being able to read dimensioned drawings of an object is an important engineering skill. Understanding how to transpose these drawings into computer models of parts is also important. As you have learned in previous lessons, a sketch serves as the foundation for all the technical work that comes afterward. Being able to perform this technical work is an obvious must. Relaying this technical work correctly is a skill that allows a group of people to function as a design team.

Equipment

- Computer with 3D CAD solid modeling program
- Printer
- Engineer’s notebook
- CAD Files
  - Part_5
  - Part_12a
  - Part_12b
  - Part_13

Your teacher will demonstrate where to access the hardware and provide you with the above listed parts needed for the Arbor Press Assembly.

Procedure

This project will provide you the opportunity to further develop your modeling skills, as well as your ability to use the computer as an efficient communication tool.
What you learned in the past two lessons will be systematically applied to this project.

In this project, you will model the eight remaining parts needed for the Arbor Press Assembly. The parts with the dimensions are listed below.

### Parts List

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Name</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Column</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Base</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Table</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Table Pin</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Rack</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Cover Plate</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>Rack Pad</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>Cover Plate Screw</td>
<td>8-32 UNC x .50 cap screw</td>
<td>STL</td>
</tr>
<tr>
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<td>1</td>
<td>Column Screw</td>
<td>3/8-16 UNC x 1.00 cap screw</td>
<td>STL</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Punch Holder</td>
<td></td>
<td>AL 6061</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>Punch Holder Screw</td>
<td>8-32 UNC x 1.25 flat countersunk head cap screw</td>
<td>STL</td>
</tr>
</tbody>
</table>
Part #1: Column FAO 63 µN

Part #3: Table FAO 63 µN
Part #2: BaseFAO 63 μIN

Part #14: Gear Plate FAO 63 μIN
Part #4: Table Pin FAO 63 µm

Part #6: Cover Plate FAO 63 µm
Part #7: Rack Pad FAO 63 μln

Part #10: Punch Holder FAO 63 μln

Extending your Learning

You may be asked to create the two remaining parts listed below. Check with your teacher before modeling these two parts.
Conclusion

1. Why are drawings composed of different line conventions?