ME 421 Catia

Final Project

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Notes from modeling Wright J5 Engine

**Pg. 9**

Master Rod

* The outside radius of the end of the rod that connects with the piston is not given. We assumed it was 12 which matched the other connecting rods

Back plate

* Plate thickness is missing. It can be assumed to be 0.5 mm from the drawing for the impeller

**Pg. 10**

Cam Wheel

* Inside radius of deep pocketed side is not given. Two 88mm diameters are given for the outside, but not one for the inside. We assumed that it is 84 mm to fit the Gear Rim part on the same page.
* The radius for the positioning of the 6 lighting holes is not given. As it is not important to the operation of the component we assumed that they were placed somewhere near the middle.

Gear Rim

* The drawing says to modify a particular gear to make the gear rim. As this gear could not be found online the teeth and inner dimensions were all guessed

**Pg. 11**

Cam, Breaker point

* The 5.2mm and 14.5mm dimensions given to position the concave curve do not allow for the R5 and R1 radii to meet. We assumed that all curves are tangent. This created a part that looked similar to the part. The final dimensions were 4.9mm and 13.463mm to the center of the curve.

Distributor Cap

* The depth of the inset hole (diameter 50mm) was not given

Gear Box

* Depth of the inside pocket (diameter 23mm) was not given

**Pg. 12**

Distributor Base

* The depth of the main pocket is not given
* The positioning for the pocketed screw hole in section C-C creates a very far off centered hole. As it did not need to be exact for other components to work we assumed that it should be centered on the square surface

Tungsten Point from Fixed point assembly

* Dimensions for the tungsten point are not given, as it is not crucial we assumed dimensions that were slightly larger than the bolt it is mounted on

**Pg. 16**

Cylinder Head:

* All dimensions missing for exterior fins
* We assumed that the inlet and exhaust ports were drilled at an angle to allow for exterior dimensions to be correct and to align with interior surfaces
* Dimensions missing for top surfaces of head where Rocker box fits
  + We assumed that it matched with the Rocker box exactly

Piston Ring Fixture V5b

* Largest diameter is not given

**Pg. 19**

Heat Exchanger

* Inside diameter is not given for the inside of the finned pipe inside the heat exchanger
* Thickness of wall of finned pipe is not given
* Dimensions for left and right sides of the air intake opening are not given
* No dimensions are given for the air intake shutter, all was assumed to make it fit over the opening

**Pg. 8**

Impeller Drive Gear

* Total diameter not given. Assuming all wall thicknesses are the same, the diameter would be 21 mm.

**Pg. 7**

Drive Shaft

* Chamfer length assumed to be 1 mm

**Pg. 15**

Piston

* In section view B-B the diameter of the small hole is not given. Assumed to be 2 mm

**Pg. 6**

Blower Housing

* Section views A-A and B-B do not provide anything and should not be there

**Pg. 18**

Tappet Guide

* Chamfer length assumed to be 1 mm
* Length of hole until start of chamfer is 14 mm to match up with assumption of 1 mm chamfer

Pushrod Cover

* Bottom feature height assumed to be 5 mm from bottom to the start of the chamfer

Intake Pipe

* The drawing is a solid pipe. This cannot be correct. Inside diameter assumed to be 7 mm

Stud

* Angle at bottom assumed to be 45 deg.

Intake Pipe Flange

* Total length of flange contradict each other in the different views. The actual length is 16 mm not 17 mm like the bottom view shows
* In addition to the total length on the bottom view being wrong it is also not necessary
* Radius of 2 mm on the corners is not stated to be a typical radius but is assumed to be

Exhaust Pipe Flange

* Corner radius assumed to be a diameter of 5 mm
* Large angles assumed to be 145 deg.

**Pg. 13**

Fixed Point

* On far left view the 12.5 mm was changed to 13 mm
* On the center view the 10.25 mm and 9.75 mm lengths were removed and the circles were made to be tangent to the other ones
* Also, on the center view the Diameter of the hole was assumed to be 4.5 mm

**Pg. 3**

Crankcase

* The 9 holes going around the side of the crankcase are 32 mm in diameter with 40 degrees between each hole.
* On the section view there are many dimensions for diameters of certain areas. The diameter of 105 mm I think is incorrect and it is actually 102mm.
* The holes at the top and bottom of the crankcase I assumed were size of M4. These are the holes that attach the crankcase to two other parts.

**Pg. 5**

Planetary Gear Housing

* There is a square with a hole in it on the side of the housing that have four small holes surrounding the hole in the middle. The small holes are 7 mm from the center of the big circle in both the vertical and horizontal direction.
* In the top view the smallest hole in the center of the housing has a diameter of 14.5.
* In the cross section view, the hole in the side of the housing the angle between the horizontal and the bottom line of the hole is 170 degrees.

**Pg. 2**

Oil Cap

* I made the inside diameter 11mm. I assumed it was hallowed out to save weight.
* On the top of the cap it seems there is a groove for a flat head screw driver, so I made it to a depth of 3 mm.

**Pg. 17**

Rocker Box

* Radius of the tip of the box is 4.5 mm.
* The distance from the center of the smaller angled circle and the edge of the part that has the bolt holes in 8mm.
* The length of the center section, before each of the rounded parts is 30 mm.
* The thickness of the box is 1.5 mm except for the wider part which is 3 mm thick.
* The distance between the center of the smaller angled circle and the center of the bigger hole is 25 mm.

Rocker Box Cover

* I assumed it was 5 mm tall. The bottom half is 3 mm tall, and the top half is 2 mm tall.
* I just used the outside dimensions of the rocker box. Then just made it 1.5 times smaller than the outside. The holes are the same size as the holes in the rocker box.