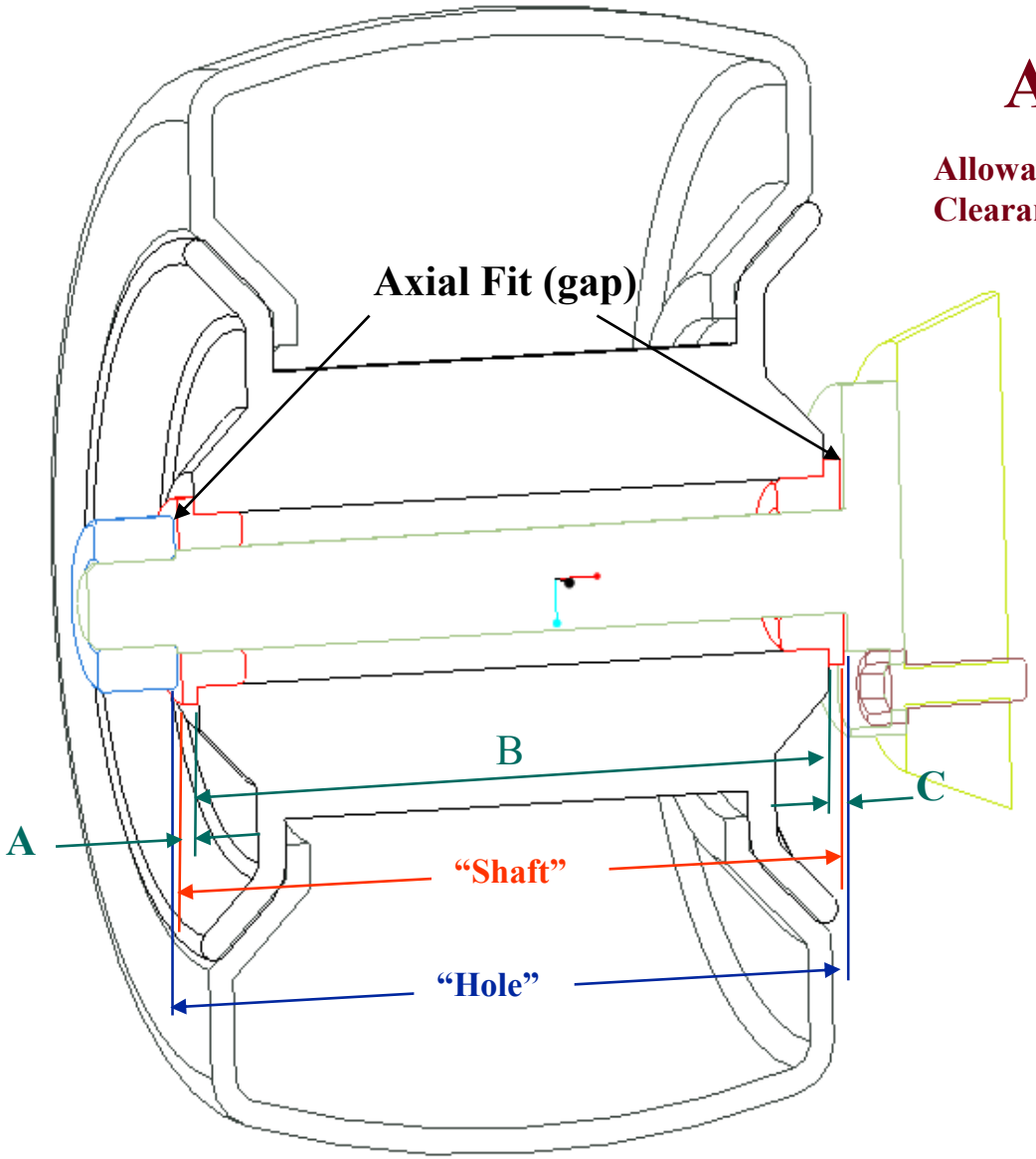
**Lecture Class Assignment #12 Axial Tolerances, Fits and Limits**

Note: This is the type of analysis I want you to do for your design projects (See Design Project Appendix – 3. Tolerance Analysis)

**Name:**

**Section:**




# Axial Fit - Tolerance Analysis

**Allowance: the minimum allowable difference between mating parts**

**Clearance: the maximum allowable difference between mating parts**

**Allowance = Smallest Hole – Largest Shaft**

**Clearance = Largest Hole – Smallest Shaft**

**Allowance:**

**Smallest Hole = _____**

**Largest Shaft = 1.5 + _____ + 1.5 = 83.83**

**= _____**

**A B C**

**Clearance:**

**Largest Hole = _____**

**Smallest Shaft = _____ + 80.50 + _____ = _____**

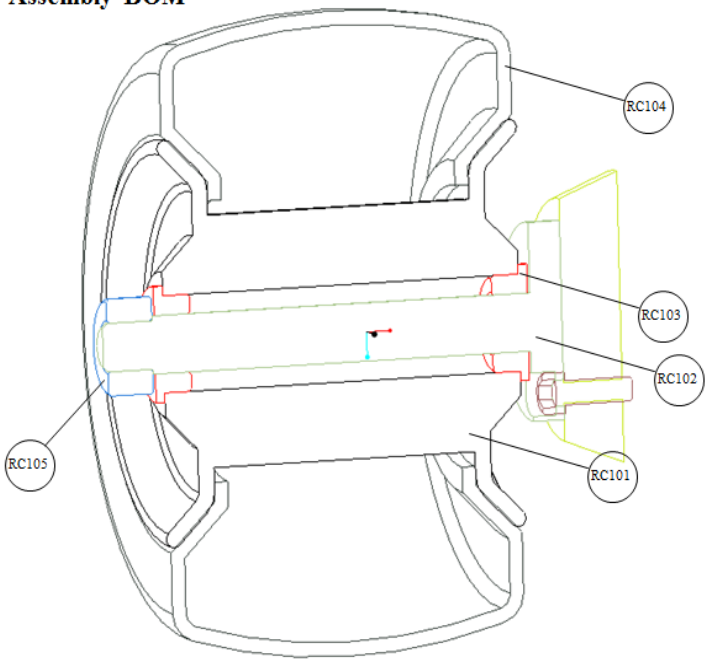
**= _____**

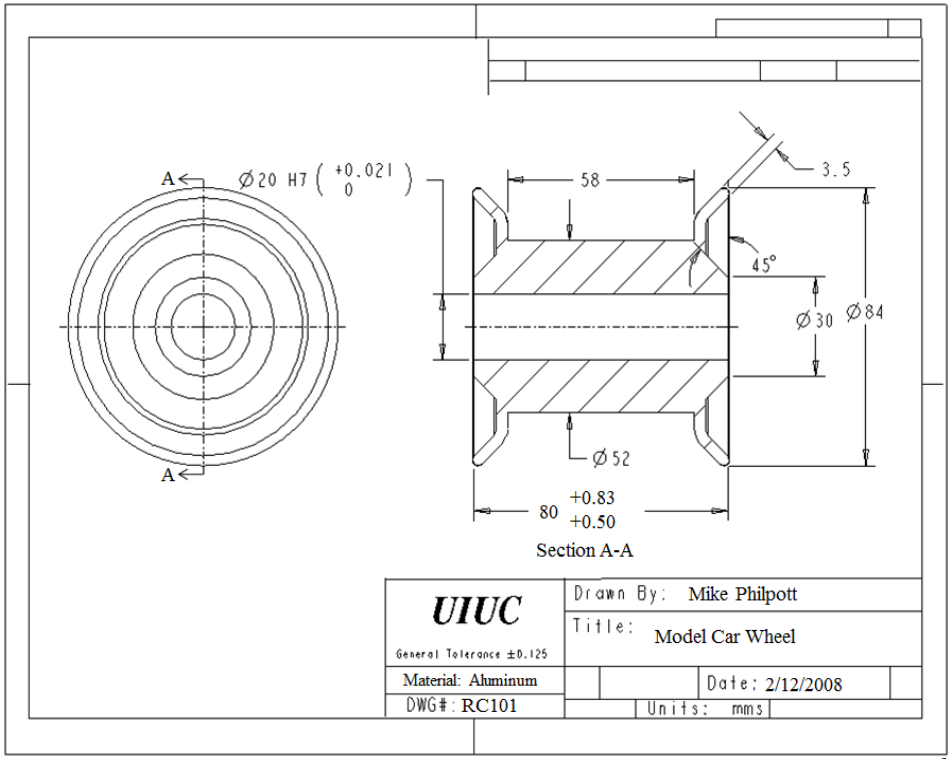
**A B C**

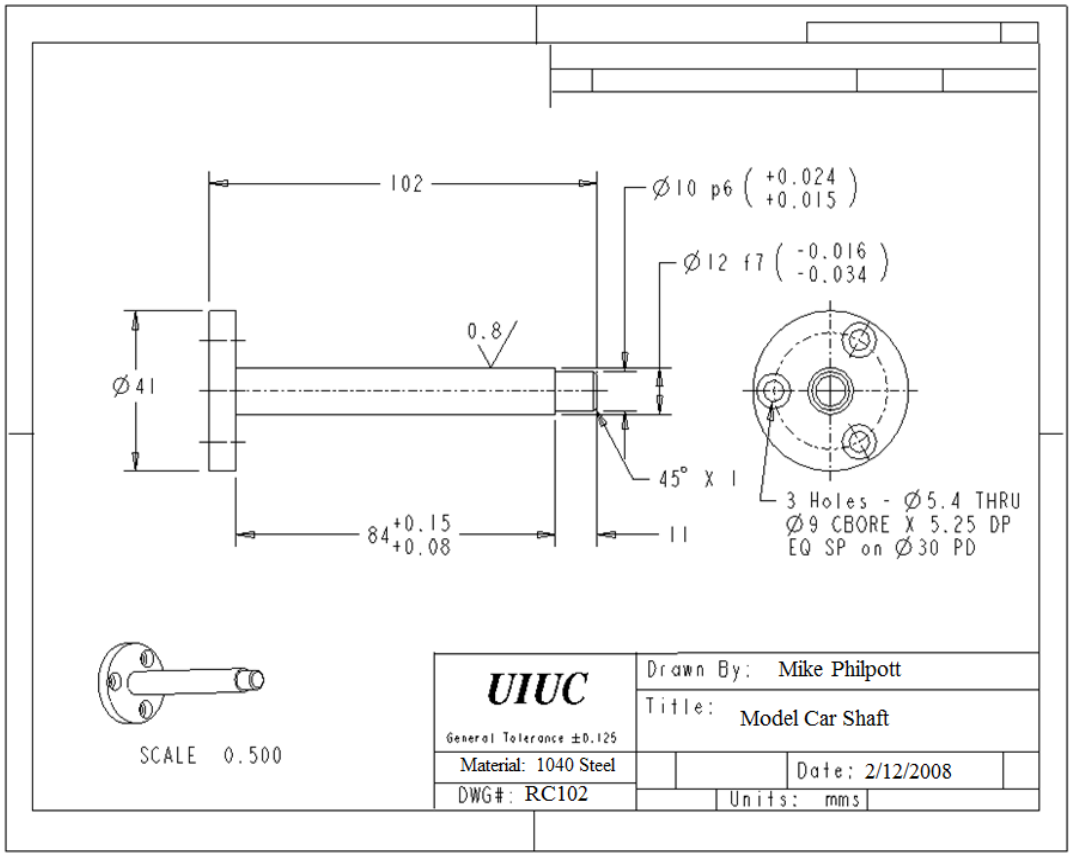
1. What is the axial 'allowance' between the wheel subassembly and the shaft _____

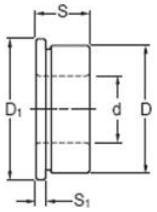
2. What is the axial 'clearance' between the wheel subassembly and the shaft _____

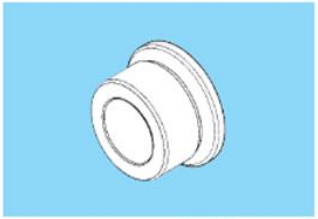
**Assembly BOM**



Precision Component

**FEATURES:**
- Economical replacement for ball bearings.
- Dimensioned to be readily interchangeable with comparable ball bearings.

**MATERIAL:** Porous Sintered Bronze

**LUBRICATION:** Vacuum impregnated with oil

**SPECIFICATIONS:**
O.D. concentric to bore within 0.005 mm.
Faces square to bore within 0.008 mm.

$$\text{Load} = \frac{\text{Load Speed Rating}}{\text{rpm}} = \text{Newtons}$$

| Catalog Number | Shaft Size h6 | d Bore H7 | D h6 | S -0.17 Width | $D_1$ Flange Dia. h14 | $S_1$ -0.05 Flange Width | Load Speed Rating N • rpm |
|---|---|---|---|---|---|---|---|
| S99BP4MFB030625 | 3 | 3 | 6 | 2.5 | 8 | 0.5 | 84000 |
| S99BP4MFB030830 | | | 8 | 3 | 10 | 0.5 | 100000 |
| S99BP4MFB031040 | | | 10 | 4 | 12 | 1 | 134000 |
| S99BP4MFB040840 | 4 | 4 | 8 | 4 | 10 | 1 | 134000 |
| S99BP4MFB051050 | 5 | 5 | 10 | 5 | 12 | 1 | 167000 |
| S99BP4MFB051240 | | | 12 | 4 | 14 | | 134000 |
| S99BP4MFB051350 | | | 13 | 5 | 14 | | 167000 |
| S99BP4MFB061050 | 6 | 6 | 10 | 5 | 12 | 1 | 167000 |
| S99BP4MFB061650 | | | 16 | | 18 | | |
| S99BP4MFB081660 | 8 | 8 | 16 | 6 | 18 | 1 | 200000 |
| S99BP4MFB101970 | 10 | 10 | 19 | 7 | 21 | 1.5 | 220000 |
| S99BP4MFB122080 | 12 | 12 | 20 | 8 | 22 | 1.5 | 220000 |

RC103