

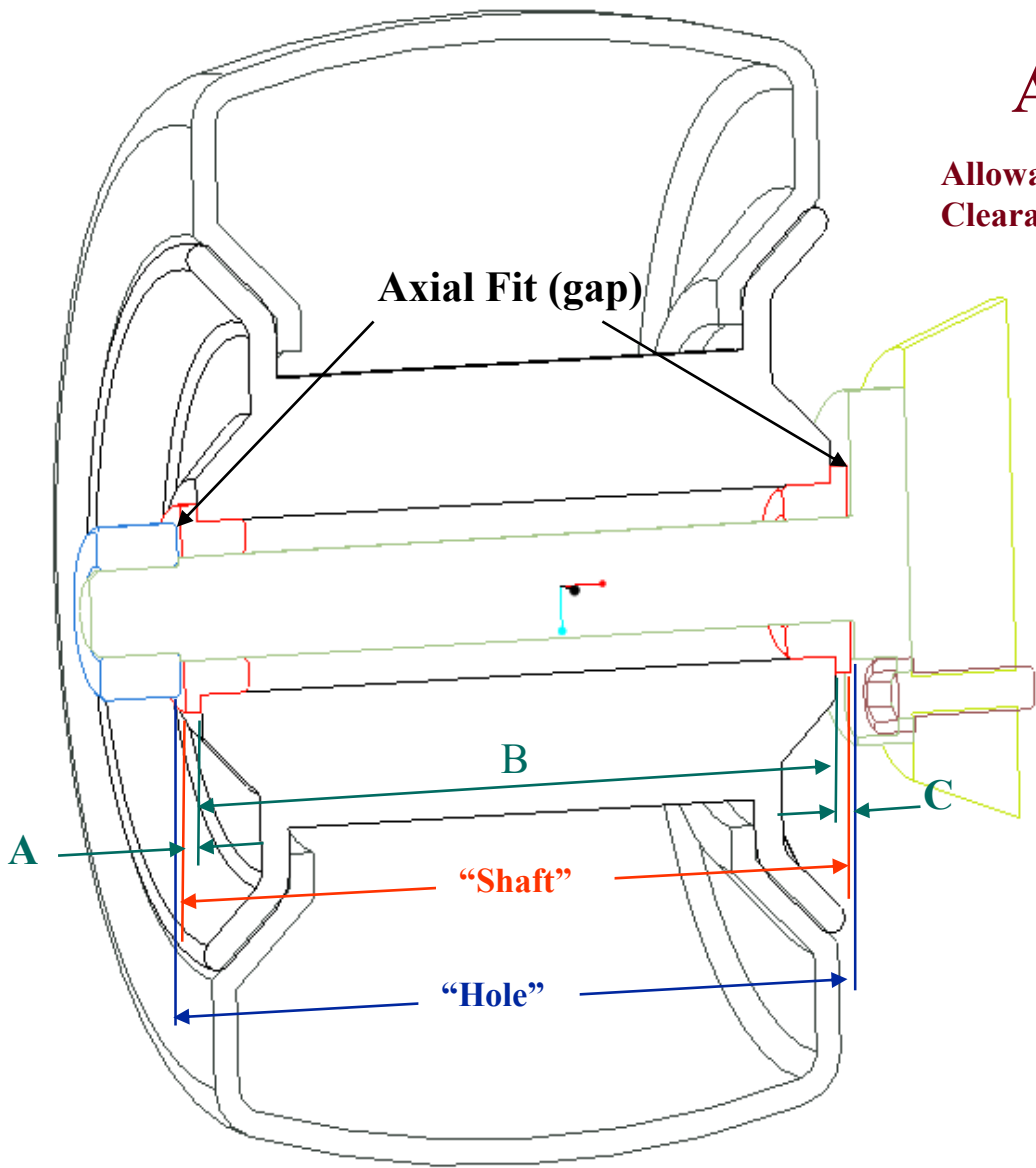
Lecture Class Assignment #12 Axial Tolerances, Fits and Limits

Name: _____
 Section: _____

Note: This is the type of analysis I want you to do for your design projects
 (See Design Project deliverables – 9. Tolerance Analysis)

Axial Fit - Tolerance Analysis

Allowance: the minimum allowable difference between mating parts
Clearance: the maximum allowable difference between mating parts



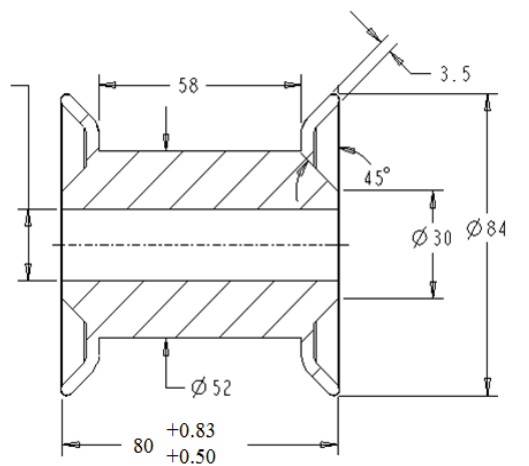
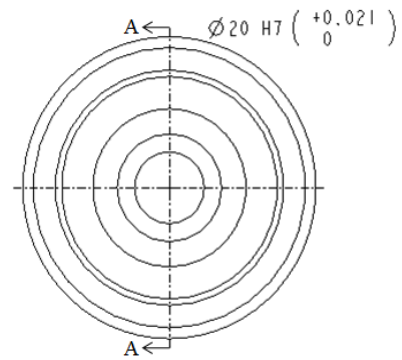
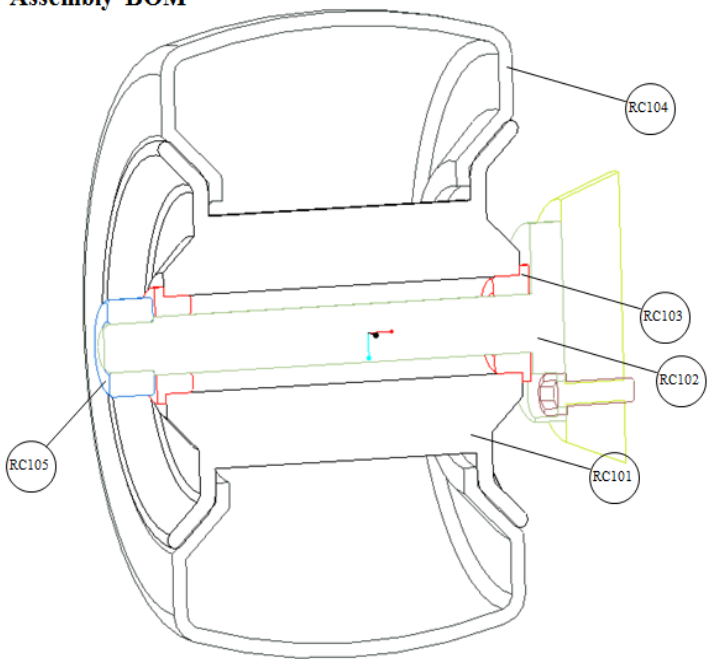
Allowance = Smallest Hole – Largest Shaft
Clearance = Largest Hole – Smallest Shaft

Allowance:
 Smallest Hole = _____
 Largest Shaft = 1.5 + _____ + 1.5 = 83.83
 = _____
 A B C

Clearance:
 Largest Hole = _____
 Smallest Shaft = _____ + 80.50 + _____ = _____
 = _____
 A B C

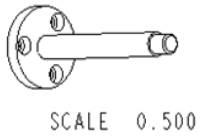
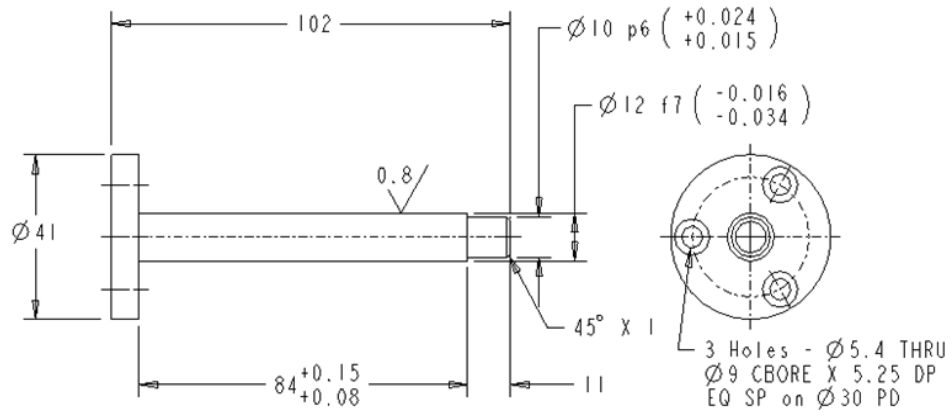
1. What is the axial 'allowance' between the wheel subassembly and the shaft _____
2. What is the axial 'clearance' between the wheel subassembly and the shaft _____

Assembly BOM

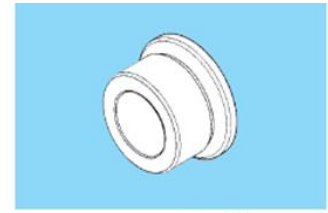
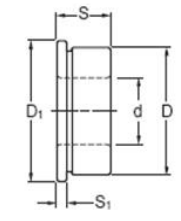


Section A-A

UIUC General Tolerance ± 0.125	Drawn By: Mike Philpott	
	Title: Model Car Wheel	
Material: Aluminum	Date: 2/12/2008	
DWG#: RC101	Units: mms	



UIUC General Tolerance ± 0.125	Drawn By: Mike Philpott	
	Title: Model Car Shaft	
Material: 1040 Steel	Date: 2/12/2008	
DWG#: RC102	Units: mms	



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	D1 Flange Dia. h14	S1 -0.05 Flange Width	Load Speed Rating N • rpm
S99BP4MFB030625	3	3	6	2.5	8	0.5	84000
S99BP4MFB030830	3	3	8	3	10	0.5	100000
S99BP4MFB031040	3	3	10	4	12	1	134000
S99BP4MFB040840	4	4	8	4	10	1	134000
S99BP4MFB051050	5	5	10	5	12	1	167000
S99BP4MFB051240	5	5	12	4	14	1	134000
S99BP4MFB051350	5	5	13	5	14	1	167000
S99BP4MFB061050	6	6	10	5	12	1	167000
S99BP4MFB061650	6	6	16	5	18	1	167000
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