

Figure 6a: Exploded View of Transmission

- ① BALL BEARING
- ② 5TH SYNCHRO HUB
- ③ 5TH SYNCHRO SLEEVE
- ④ SYNCHRO SPRING
- ⑤ SYNCHRO RING
- ⑥ 5TH GEAR
- ⑦ 32 x 37 x 23.5 mm
NEEDLE BEARING
- ⑧ SPACER COLLAR
- ⑨ 34 x 39 x 23 mm
NEEDLE BEARING
- ⑩ 4TH GEAR
- ⑪ SYNCHRO RING
- ⑫ SYNCHRO SPRING
- ⑬ 3RD/4TH SYNCHRO SLEEVE
- ⑭ 3RD/4TH SYNCHRO HUB
- ⑮ 3RD GEAR
- ⑯ 34 x 39 x 27.5 mm
NEEDLE BEARING
- ⑰ MAINSHAFT
- ⑱ WASHER
- ⑲ SPRING WASHER
- ⑳ BALL BEARING
- ㉑ 26 x 42 x 7 mm OIL SEAL
Replace.
- ㉒ 28 mm PLUG BOLT
55 N·m (5.5 kg-m, 40 lb-ft)
- ㉓ 1ST/2ND SELECT SPRING
- ㉔ SHIFT ARM SHAFT
- ㉕ INTERLOCK GUIDE BOLT
40 N·m (4.0 kg-m, 29 lb-ft)
- ㉖ CLUTCH HOUSING
- ㉗ REVERSE SHIFT HOLDER
- ㉘ REVERSE IDLER GEAR
- ㉙ REVERSE IDLER GEAR SHAFT
- ㉚ 5 x 22 mm SPRING PIN
Replace.
- ㉛ 3 x 12 mm SPRING PIN
Replace.
- ㉜ 1ST/2ND SHIFT FORK SHAFT
- ㉝ 5TH/REVERSE SHIFT PIECE
- ㉞ SPRING

- ㉟ 3RD/4TH SHIFT FORK
- ㊱ STEEL BALL
- ㊲ 5 x 10 mm ROLLER
- ㊳ 5TH SHIFT FORK
- ㊴ 1ST/2ND SHIFT FORK
- ㊵ 5TH/REVERSE SHIFT FORK
SHAFT
- ㊶ 65 mm THRUST SHIM (*1)
70 mm THRUST SHIM (*2)
Selection, page 13-28
- ㊷ OIL GUIDE PLATE
- ㊸ WASHER Replace.
- ㊹ BACK-UP LIGHT SWITCH
25 N·m (2.5 kg-m, 18 lb-ft)
- ㊺ BREATHER CAP
- ㊻ RELEASE PIPE STAY
- ㊼ TRANSMISSION HANGER B
- ㊽ 10 mm SEALING BOLT
10 N·m (1.0 kg-m, 8 lb-ft)
- ㊾ 32 mm SEALING BOLT
25 N·m (2.5 kg-m, 18 lb-ft)
- ㊿ OIL SEAL
Replace.
- ① OIL DRAIN PLUG
40 N·m (4.0 kg-m, 29 lb-ft)
- ② OIL FILLER PLUG
45 N·m (4.5 kg-m, 33 lb-ft)
- ③ WASHER Replace.
- ④ TRANSMISSION HOUSING
- ⑤ OIL GUTTER PLATE
- ⑥ 52 mm SNAP RING
- ⑦ REVERSE LOCK CAM
- ⑧ REVERSE SELECT SPRING
- ⑨ REVERSE SELECT RETAINER
- ⑩ SHIFT ARM C
- ⑪ SHIFT ARM B
- ⑫ INTERLOCK
- ⑬ COLLAR
- ⑭ SHIFT ARM A
- ⑮ SPRING WASHER
- ⑯ MAGNET
- ⑰ SET BALL SPRING BOLT
22 N·m (2.2 kg-m, 16 lb-ft)

- ⑱ 14 x 20 mm DOWEL PIN
- ⑲ 72 mm THRUST SHIM (*1)
80 mm THRUST SHIM (*2)
Selection, See section 15
- ㉑ DIFFERENTIAL ASSEMBLY
See section 15
- ㉒ 14 x 25 x 17.5 mm OIL SEAL
Replace.
- ㉓ 35 x 56 x 8 mm OIL SEAL
Replace.
- ㉔ SHIFT ROD
- ㉕ BOOT
- ㉖ OIL GUIDE PLATE
- ㉗ 30 x 47 x 21 mm
NEEDLE BEARING (*1)
30 x 55 x 21 mm
NEEDLE BEARING (*2)
- ㉘ COUNTERSHAFT
- ㉙ 36 x 41 x 25.5 mm
NEEDLE BEARING
- ㉚ 1ST GEAR
- ㉛ FRICTION DAMPER
- ㉜ SYNCHRO RING
- ㉝ SYNCHRO SPRING
- ㉞ 1ST/2ND SYNCHRO HUB
- ㉟ REVERSE GEAR
- ① SYNCHRO SPRING
- ② SYNCHRO RING
- ③ FRICTION DAMPER
- ④ DISTANCE COLLAR
- ⑤ 39 x 44 x 27 mm
NEEDLE BEARING
- ⑥ 2ND GEAR
- ⑦ 3RD GEAR
- ⑧ 4TH GEAR
- ⑨ 5TH GEAR
- ⑩ BALL BEARING (*1)
NEEDLE BEARING (*2)
- ⑪ BALL BEARING
- ⑫ SPRING WASHER
- ⑬ LOCKNUT
110-0-110 N·m
11.0-0-11.0 kg-m,
80-0-80 lb-ft

*1: D1588, D1587, D1521

*2: D1626

Figure 6b: Parts List of Transmission

CONCORDIA UNIVERSITY
GINA CODY SCHOOL OF ENGINEERING AND COMPUTER SCIENCE
DEPARTMENT OF MECHANICAL, INDUSTRIAL & AEROSPACE ENGINEERING

Course - Lab Section (i.e. AI-X): MIAE 313 - Lab _____	Workstation No.:
Lab Number - Title: # 3 - TRANSMISSION	Date:

TEAM INFORMATION

ID #	Last Name	First Name

CHECKLIST

Item	Description	Instructor's Initials
1	On Time	
2	Equipped	
3	Pre-Disassembly Check	
4	Checkpoint 1	
5	Checkpoint 2	
6	Checkpoint 3	
7	Post Reassembly Function Check	
8	Report Submission	
9	Device Correctly Reassembled	
10	Tools Returned Clean & Organized	

GRADE BREAKDOWN (FOR LAB INSTRUCTOR ONLY)

Drawing 1 (/25 or /33.3)	Drawing 2 (/25 or /33.3)	Drawing 3 (/25 or /33.3)	Drawing 4 (/25)	Penalty	TOTAL (/100)
+	+	+	-	=	

LAB #3 - TRANSMISSION



DRAWING INSTRUCTIONS

1. All dimensions are in metric.
2. Choose adequate views includes section views. Redundant views will be penalized.
3. When dimensioning, feature sizes (hole and shaft diameters), feature locations and datum point.
4. Dimensional method used leading to the least accumulated tolerance.
5. Employ limits of size on two important features.
6. Employ geometric tolerance dimensioning (GTD) on two important features.
7. Use third angle projection and special views (zone in or out, view not in a convention location with a note).
8. Use proper scale and paper space.
9. Overall neatness is important.

5 4 3 2 1

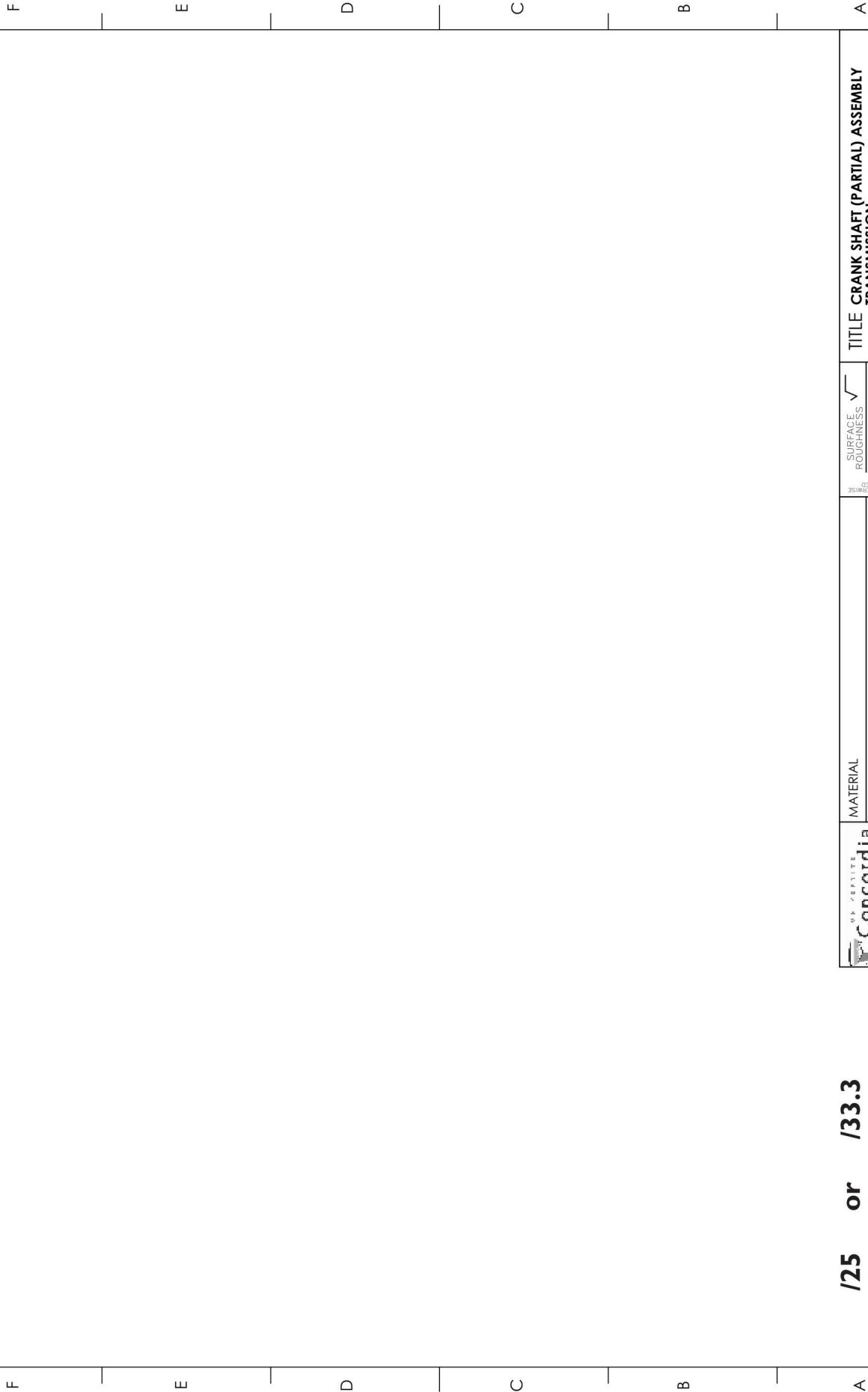
F
E
D
C
B
A

1/25 or / 33.3



 UNIVERSITY OF CONCORDIA CONCORDIA UNIVERSITY	MATERIAL	SURFACE ROUGHNESS TOLERANCES	TITLE SHIFT ARM C			
	FINISH			A SIZE	DATE	USED ON
	DRAFTER	UNLESS OTHERWISE SPECIFIED		SCALE	SHEET	DWG NO. 1
	CHECKED	APPROVED				

5 4 3 2 1

5 4 3 2 1





1/25 or 1/33.3

 CONCORDIA UNIVERSITY PROPRIETARY INFORMATION NOT TO BE RELEASED WITHOUT WRITTEN PERMISSION FROM CONCORDIA UNIVERSITY	MATERIAL		SURFACE  FINISH		TITLE				
	FINISH				CRANK SHAFT (PARTIAL) ASSEMBLY				
	DRAFTER	ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED	TOLERANCES		TRANSMISSION				
	CHECKED	APPROVED	SCALE		DATE				
5		4		3		2		1	
				DWG NO. 2		USED ON		MIAE 313	
				SHEET		REV NO.			

5 4 3 2 1



1/25 or /33.3

 PROPRIETARY INFORMATION NOT TO BE RELEASED WITHOUT WRITTEN AUTHORIZATION FROM CONCORDIA UNIVERSITY	MATERIAL		SURFACE $\sqrt{\text{ }}$ ROUGHNESS		TITLE INTERLOCK			
	FINISH		TOLERANCES					
	DRAFTER	ALL DIMENSIONS IN UNLESS OTHERWISE SPECIFIED			A SIZE	DATE	USED ON	MIAE 313
	CHECKED	APPROVED	SCALE	SHEET	DWG NO. 3	REV NO.		

5 4 3 2 1

5 4 3 2 1

F

E



D

C

B

A

1/25

 PROPERTY INFORMATION THIS DRAWING AND ALL INFORMATION HEREON ARE THE PROPERTY OF CONCORDIA UNIVERSITY	MATERIAL		SURFACE ROUGHNESS TOLERANCES	TITLE GEAR & HUB ASSEMBLY			
	FINISH				A SIZE	DATE	USED ON
	DRAFTER	ALL DIMENSIONS IN UNLESS OTHERWISE SPECIFIED	SCALE				
	CHECKED	APPROVED					

5 4 3 2 1

