Group Assignment Cover Sheet

Never Stand Still | Faculty of Engineering | School of Mechanical and Manufacturing Engineering

- Please print clearly and complete all sections. All group members must sign the declaration below.
- Before submitting this assignment, students are strongly recommended to review the course outline, assessment requirements, UNSW's Plagarism and Academic Integrity website and Administrative Matters on the School's website.
- Please retain a copy of this assignment for your records.

Course code: MMAN2130 **Course name:** Design and Manufacturing

Course Convenor name: Mr David Lyons **Assignment:** Assignment 1 - Manufacturibility Review

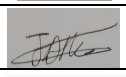
Assignment due date: 22/10/2019 **Date submitted:** 22/10/2019

In preparing this assessment task we have followed the Student Code Policy. We certify that we have read and understand the University requirements in respect of student academic misconduct outlined in the Student Code Policy and the Student Misconduct Procedure. We declare that this assessment item is our own work, except where acknowledged, and has not been submitted for academic credit previously in whole or in part.

We acknowledge that the assessor of this item may, for assessment purposes:

- Provide a copy to another staff member of the University
- Communicate a copy of this assessment item to a plagiarism checking service which may then retain a copy of the assessment item on its database for the purpose of future plagiarism checking.

We have retained a copy of this, our assignment, which we can provide if necessary. By signing this declaration we are agreeing to the statements and conditions above.

FAMILY NAME	GIVEN NAME(S)	STUDENT ID	SIGNATURE
Cunio	Alexander	5204704	
Gajdhar	Mohique	5204101	
Clegg	Jason	5115189	
Davis	Joel	5215383	
Nguyen	Dan	5206032	

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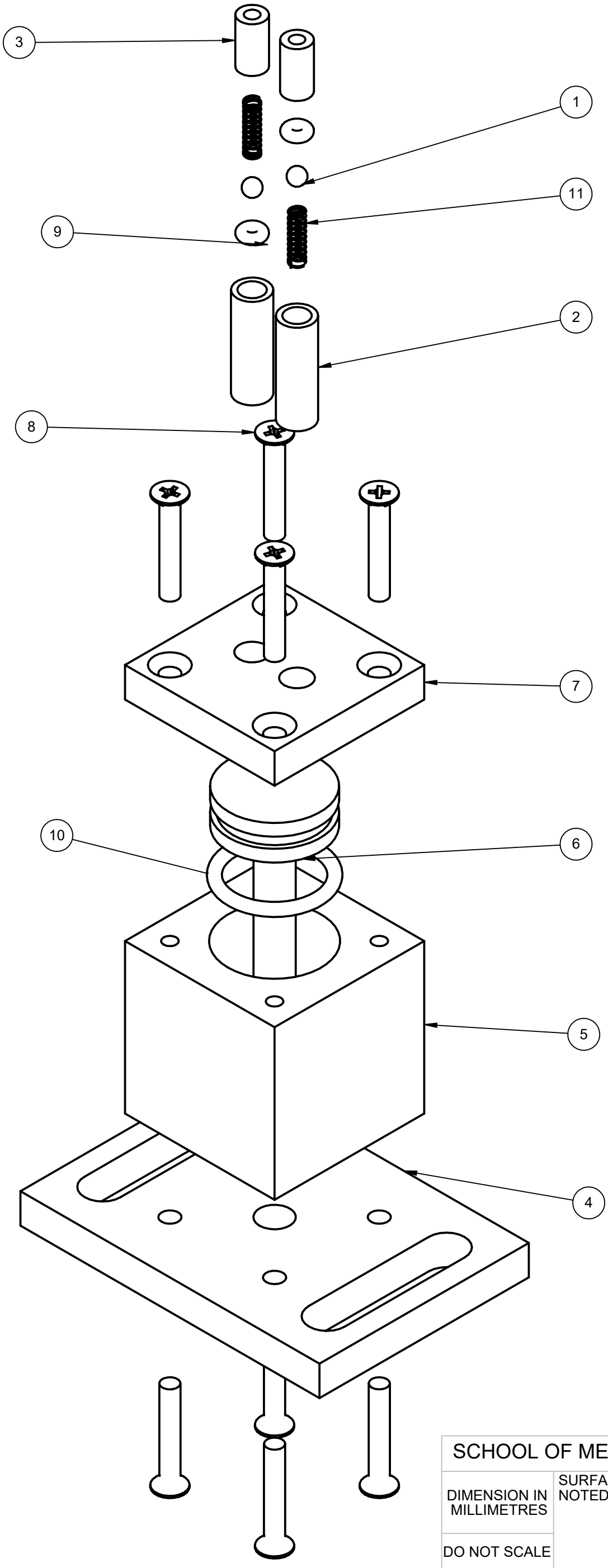
Mark: _____ **Received on:** _____ **Marked by:** _____

Part Responsibilities

Individual	Part No.	Part Name
Alexander Cunio	1	BASE
Mohique Gajdhar	2	HOUSE
Joel Davis	3	PISTON
Jason Clegg	4	COVER
Dan Nguyen	5, 6	VALVE TOP, VALVE BTM



AS1100

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
11	-	COMPRESSION SPRING	STEEL	2
10	-	28.52MM O-RING	RUBBER	1
9	-	5.00MM O-RING	RUBBER	2
8	-	30MM M5X1.0 SCREWS	STEEL	8
7	4	COVER	ALUMINIUM	1
6	3	PISTON	ALUMINIUM	1
5	2	HOUSING	ALUMINIUM	1
4	1	BASE	ALUMINIUM	1
3	6	VALVE TOP	ALUMINIUM	2
2	5	VALVE BTM	ALUMINIUM	2
1	-	BALL BEARING	STEEL	2

SCHOOL OF MECHANICAL AND MANUFACTURING ENGINEERING - UNSW

DIMENSION IN MILLIMETRES	SURFACE FINISH UNLESS NOTED OTHERWISE 1.6	DRAWN BY ALEXANDER (Z5204704)			TITLE PUMP			
DO NOT SCALE		CHECKED BY DAN (Z5206032)			DRAWING NUMBER 7			
	TOLERANCE UNLESS NOTED OTHERWISE ±0.1	APPROVED BY MOHIQUE (Z5204101)			FIRST RELEASE DATE 21/10/2019			
		QTY 1	MATL ALUMINIUM	SCALE 1:1	REV 1	DATE 21/10/2019		A3

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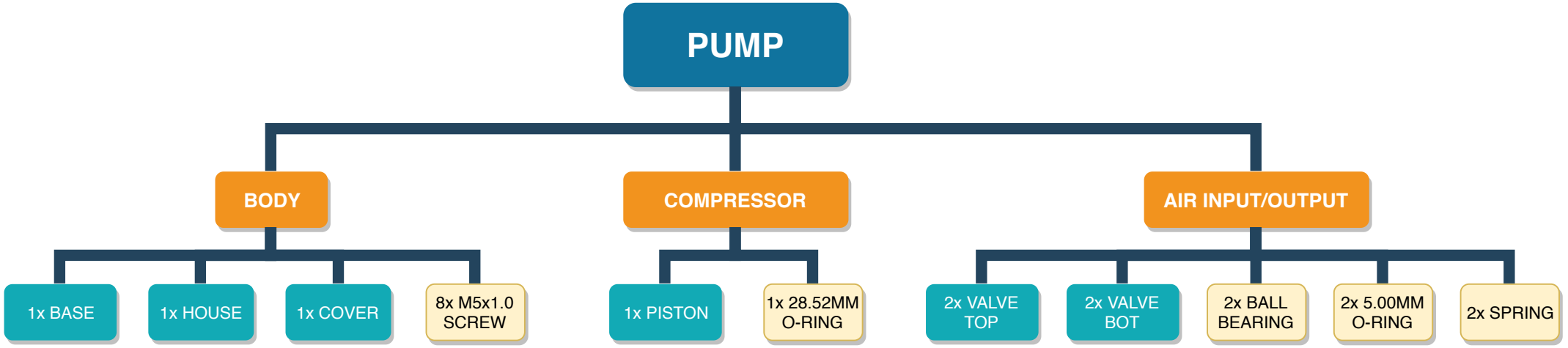

LEGEND

Assembly Title

Sub-assemblies

Individual Components

Off-the-shelf Components

Pump Routing Chart

PART: BASE
PART NO: 01
MATL: ALUMINIUM
DIM: 100x100x10MM RECTANGULAR PRISM
QTY: 1

2 min	101	INSPECT material for defects
20 min	102	FACE all surfaces to dimensions of 100x70x10mm
2 min	103	INSPECT surfaces and dimensions
2 min	104	DEBURR edges
10 min	105	MARK and PUNCH locations for all holes
5 min	106	DRILL central 10mm through hole
2 min	107	INSPECT dimensions and hole location
10 min	108	DRILL 5.5mm through holes
2 min	109	INSPECT dimensions and hole location
5 min	110	COUNTERSINK 5.5mm holes
2 min	111	INSPECT all drilled holes and countersinks
10 min	112	BORE 10mm through hole to 10.05mm
2 min	113	INSPECT all drilled holes and countersinks
15 min	114	MILL two 6mm slots
2 min	115	DEBURR edges
2 min	116	INSPECT part

PART: HOUSING
PART NO: 02
MATL: ALUMINIUM
DIM: 50x50x50MM RECTANGULAR PRISM
QTY: 1

10 min	201	FACE the top and bottom surfaces
2 min	202	INSPECT the dimensions
2 min	203	DEBURR the edges
5 min	204	MARK out the centre and points for holes
5 min	205	DRILL 31mm through hole at the centre for the piston
2 min	206	INSPECT the dimensions
10 min	207	DRILL eight 4.2mm through holes on the top and bottom surfaces
15 min	208	TAP eight M5 holes in the 4.2mm holes on the top and bottom surfaces with 20mm depth
2 min	209	DEBURR the edges
2 min	210	INSPECT the part

PART: PISTON
PART NO: 03
MATL: ALUMINIUM
DIM: 39x100MM ROD
QTY: 1

2 min	301	INSPECT dimensions of material
4 min	302	FACE all surfaces for SURFACE FINISH of 1.6
10 min	303	LATHE at speed of 270RPM to cut material to a height of 80mm
2 min	304	INSPECT dimensions of the job
15 min	305	TURN connecting rod diameter to 10mm with a length of 68.5mm using central lathe
2 min	306	INSPECT dimensions of the job
15 min	307	TURN o-ring slot to a height of 3.5mm with diameter 27.5mm, 4mm from the top surface
5 min	308	DRILL a 6mm diameter hole, 10mm from the bottom surface
5 min	309	DEBURR edges
2 min	310	INSPECT dimensions of the job

PART: COVER
PART NO: 04
MATL: ALUMINIUM
DIM: 50x50x20MM RECTANGULAR PRISM
QTY: 1

1 min	401	INSPECT dimensions
15 min	402	MILL surfaces to 50x50x10mm
2 min	403	INSPECT dimensions
15 min	404	DRILL four 5.5mm corner holes
2 min	405	INSPECT dimensions
15 min	406	COUNTERSINK each corner hole
2 min	407	INSPECT dimensions
10 min	408	DRILL 8.6mm valve holes
2 min	409	INSPECT dimensions
15 min	410	TAP the two 8.6mm holes
3 min	411	INSPECT tap with M10 bolt
5 min	412	DEBURR edges
5 min	413	INSPECT all dimensions and ensure absence of burrs

PART: VALVE BTM
PART NO: 05
MATL: ALUMINIUM
DIM: 10x50MM ROD
QTY: 2

1 min	501	INSPECT the part
5 min	502	FACE top surface for SURFACE FINISH of 1.6
1 min	503	INSPECT surface dimensions
5 min	504	CENTREDRILL centre of top surface
10 min	505	DRILL 4mm through hole in centre of top surface
1 min	506	INSPECT hole position and depth
20 min	507	BORE 7mm hole with 25mm depth in centre of top surface
1 min	508	INSPECT hole position and depth
5 min	509	SAW rod at 31mm from top surface
10 min	510	FACE bottom surface to 30mm from top surface for SURFACE FINISH of 1.6
1 min	511	INSPECT surface dimensions
10 min	512	THREAD M10x1.0 on external surface for depth of 10mm from bottom surface
10 min	513	THREAD M8x1.0 in 7mm hole from top surface for depth of 10mm
5 min	514	DEBURR edges
1 min	515	INSPECT the part

PART: VALVE TOP
PART NO: 06
MATL: ALUMINIUM
DIM: 10x25MM ROD
QTY: 2

1 min	601	INSPECT the part
5 min	602	FACE top surface for SURFACE FINISH of 1.6
20 min	603	TURN curved surface of rod for 8mm external diameter for depth of 15mm from top surface for SURFACE FINISH of 1.6
1 min	604	INSPECT surface dimensions
5 min	605	CENTREDRILL centre of top surface
10 min	606	DRILL 4mm through hole in centre of top surface
1 min	607	INSPECT hole position and depth
5 min	608	SAW rod at 16mm from top surface
10 min	609	FACE bottom surface to 15mm from top surface for SURFACE FINISH of 1.6
1 min	610	INSPECT surface dimensions
10 min	611	THREAD M8x1.0 on external surface for depth of 10mm from bottom surface
5 min	612	DEBURR edges
1 min	613	INSPECT the part

5 min	901	SCREW four 30mm M5x1.0 screws into the base and housing
10 min	902	PUT 28.52mm o-ring into piston o-ring slot
1 min	903	INSERT piston into housing with 10mm diameter connecting rod into 10.1mm hole in the base
5 min	904	SCREW four 30mm M5x1.0 screws into the cover and housing
1 min	905	INSERT in order the 5mm o-ring, ball and spring into the valve bottom
1 min	906	SCREW the valve top into the valve bottom
1 min	907	INSERT in order the spring, ball and 5mm o-ring into the valve bottom
1 min	908	SCREW the valve top into the valve bottom
1 min	909	SCREW the valves into the top of the cover
1 min	910	INSPECT the assembly