

Competitor:	Date: 24/02/2015	Title: Beam	
Material: Stainless Steel	Mass: 0.113 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 1 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

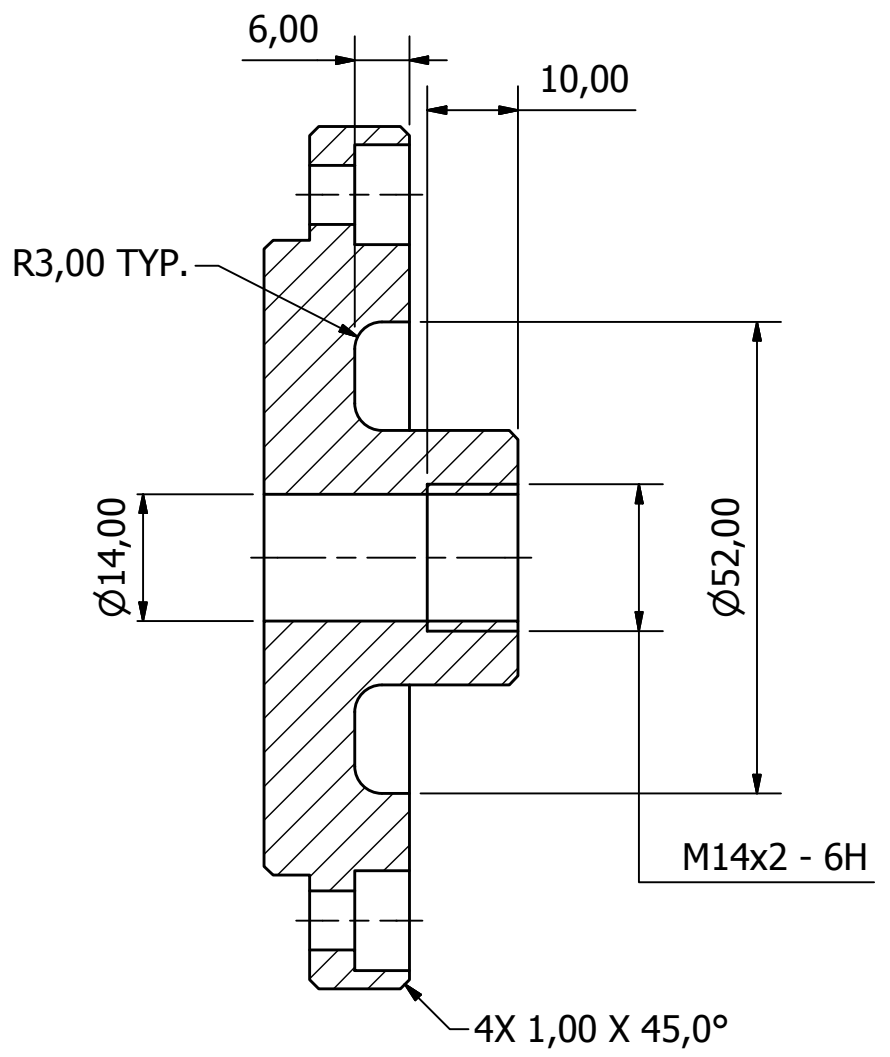
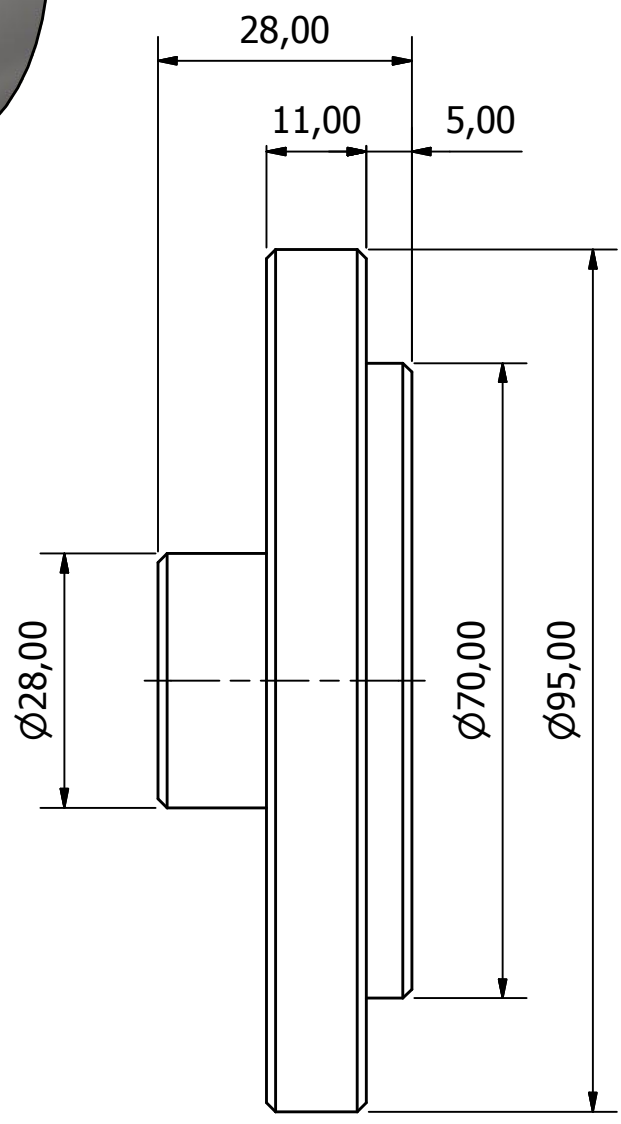
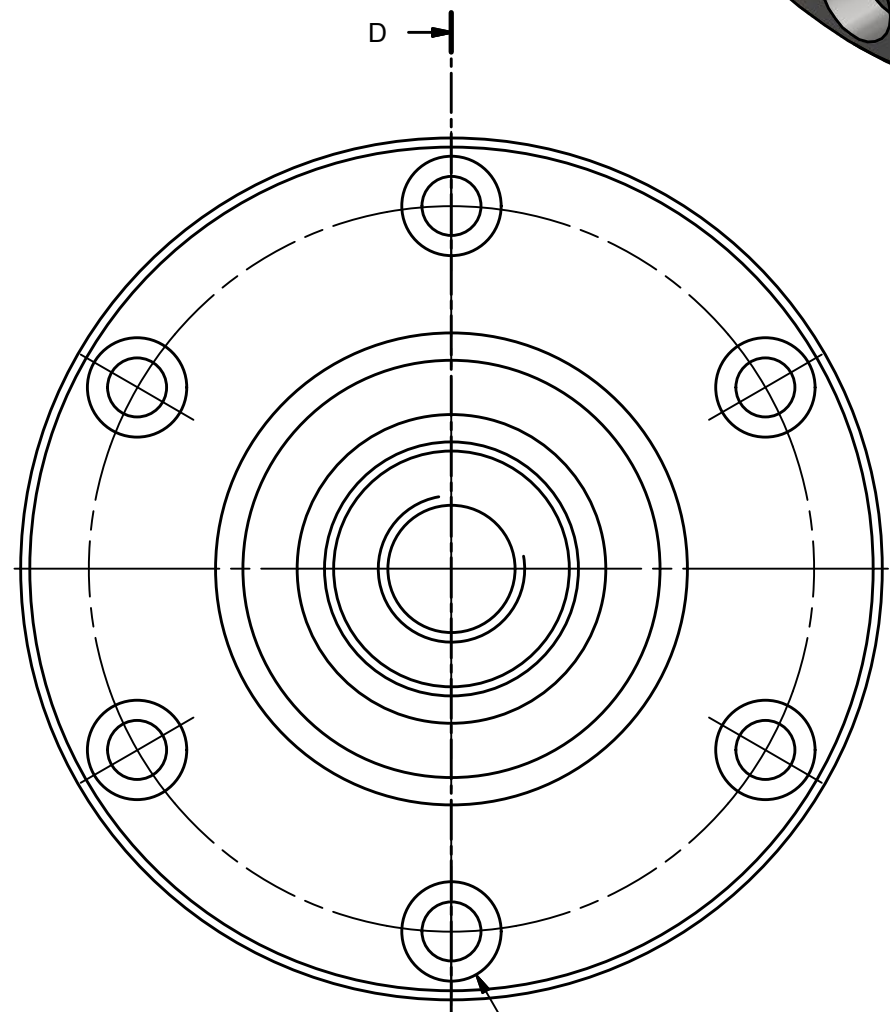
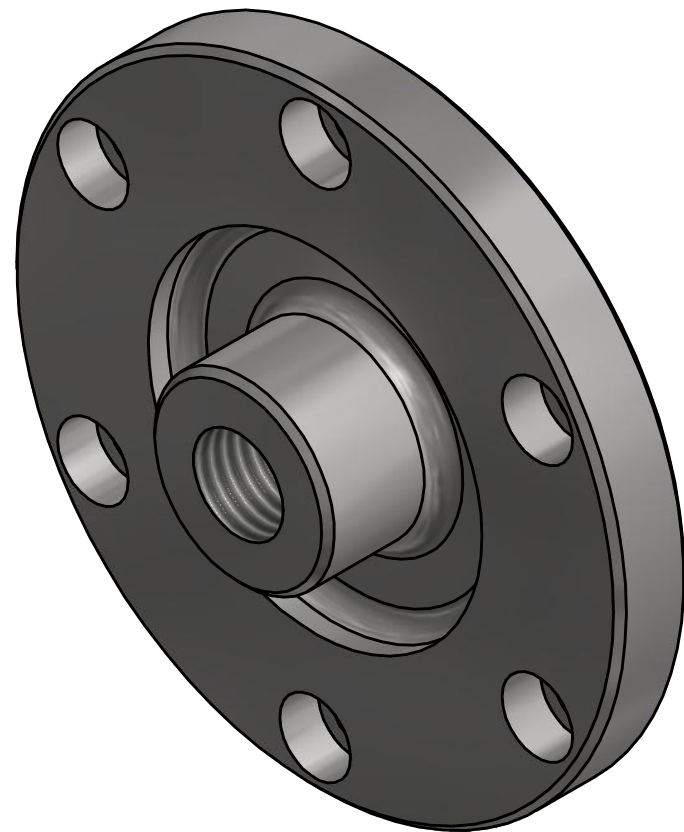
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D D

C C

B B

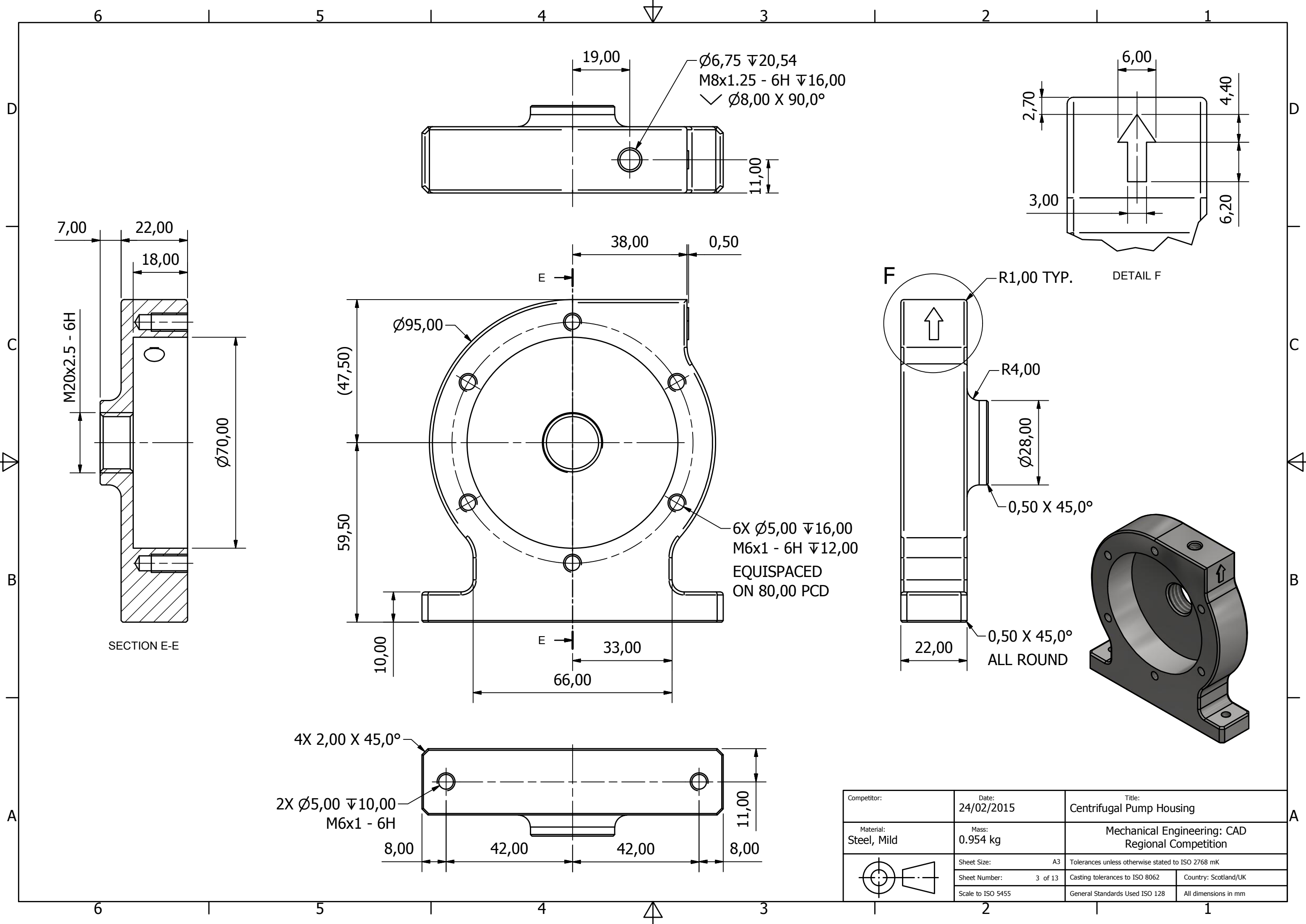
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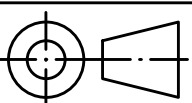


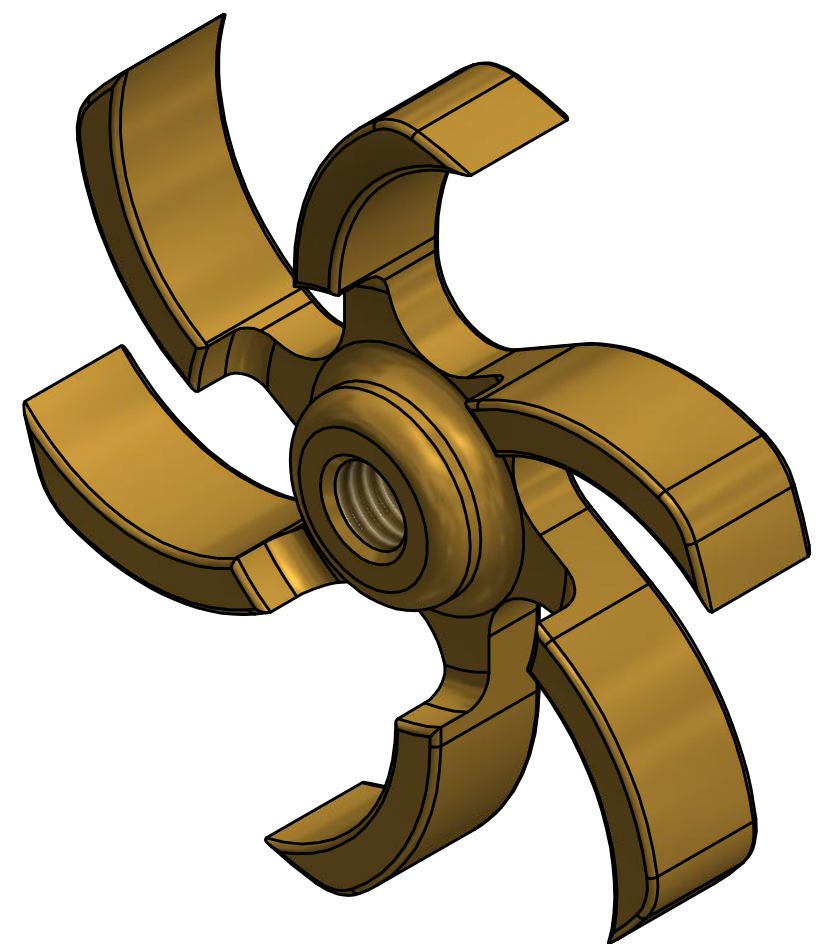
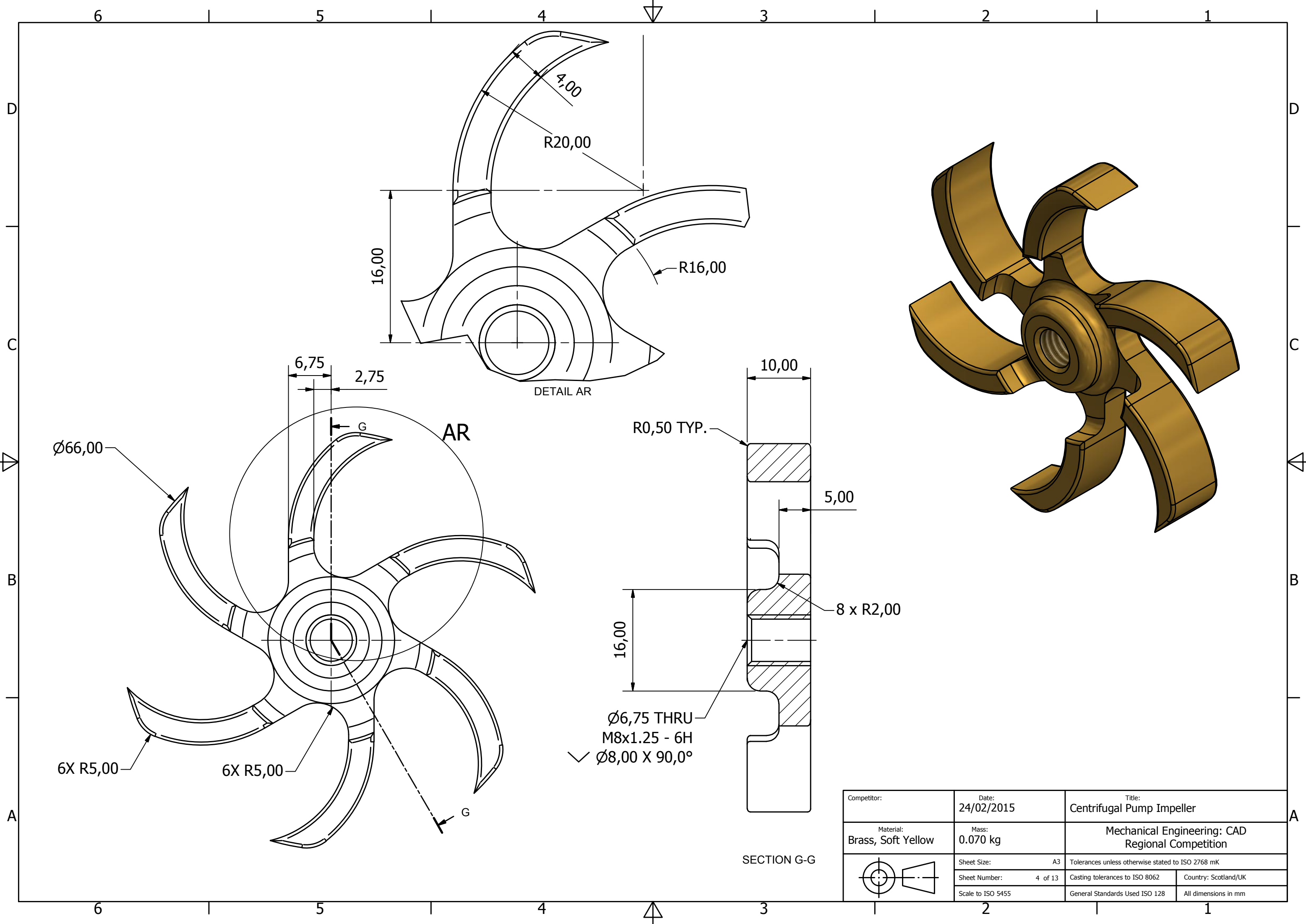
6X Ø6,50 THRU  
 □ Ø11,00 ▽ 6,00  
 EQUISPACED  
 ON 80,00 PCD

Competitor:	Date: 24/02/2015	Title: Centrifugal Pump Cover	
Material: Steel, Mild	Mass: 0.682 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 2 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

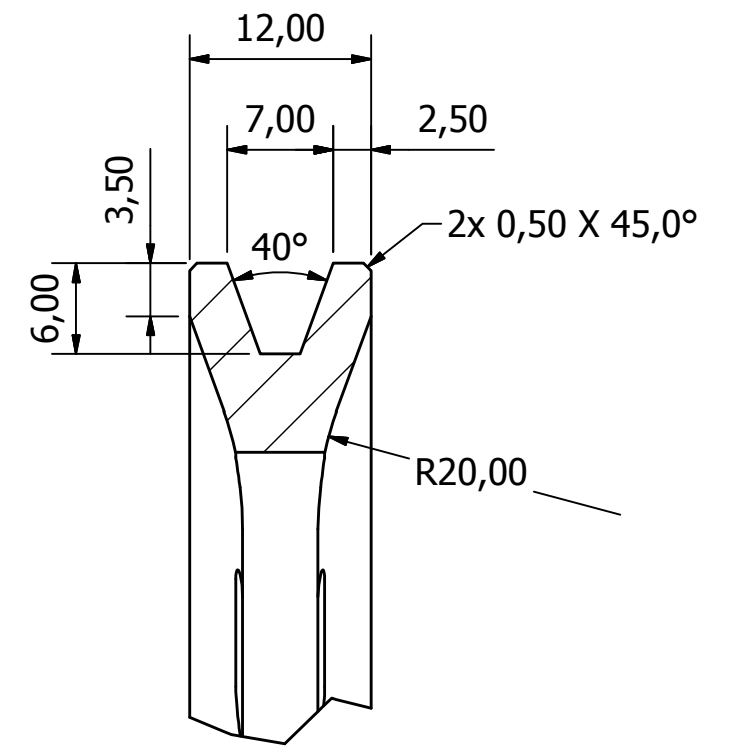
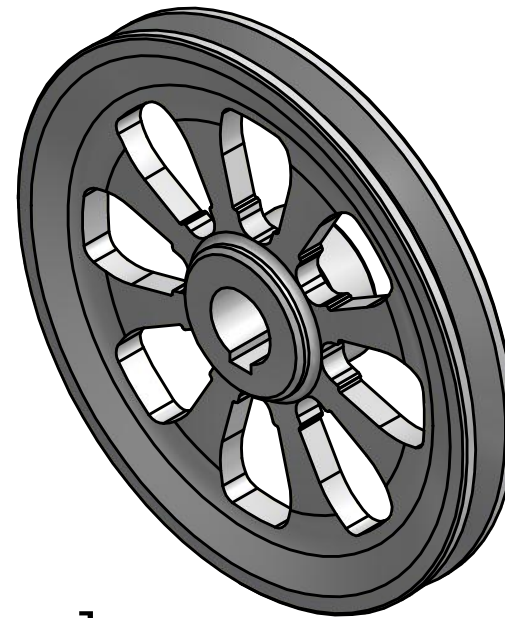
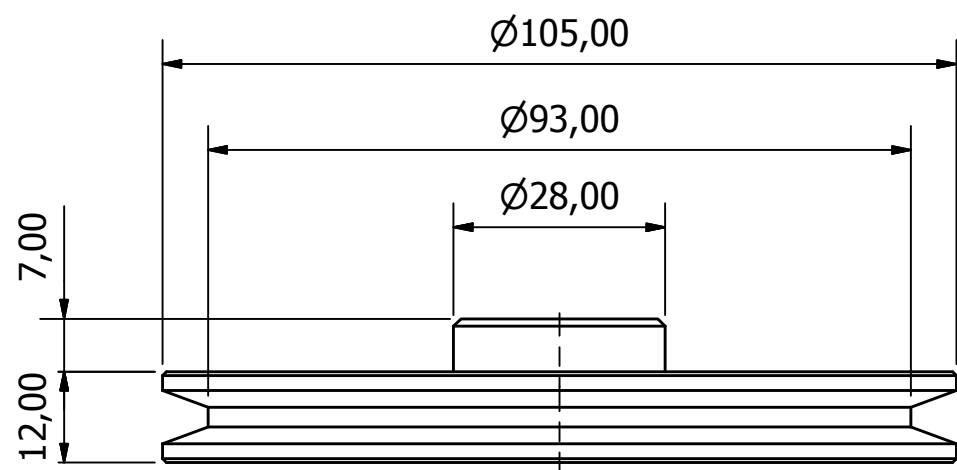
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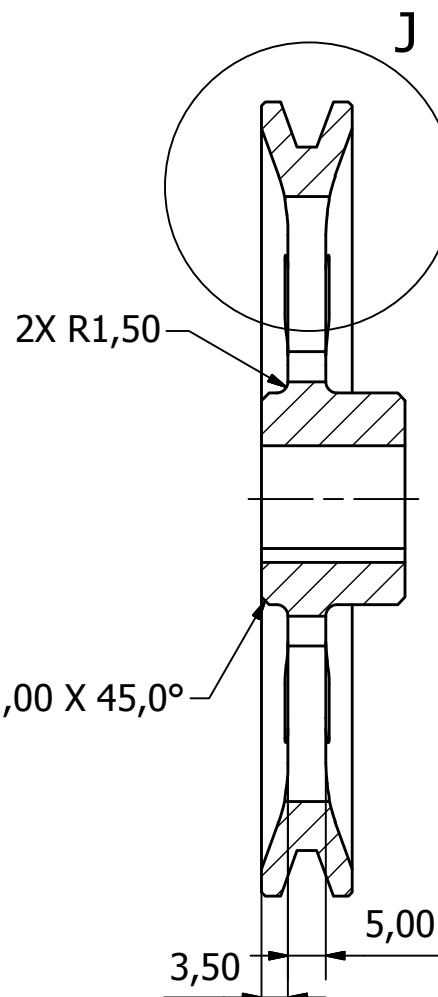
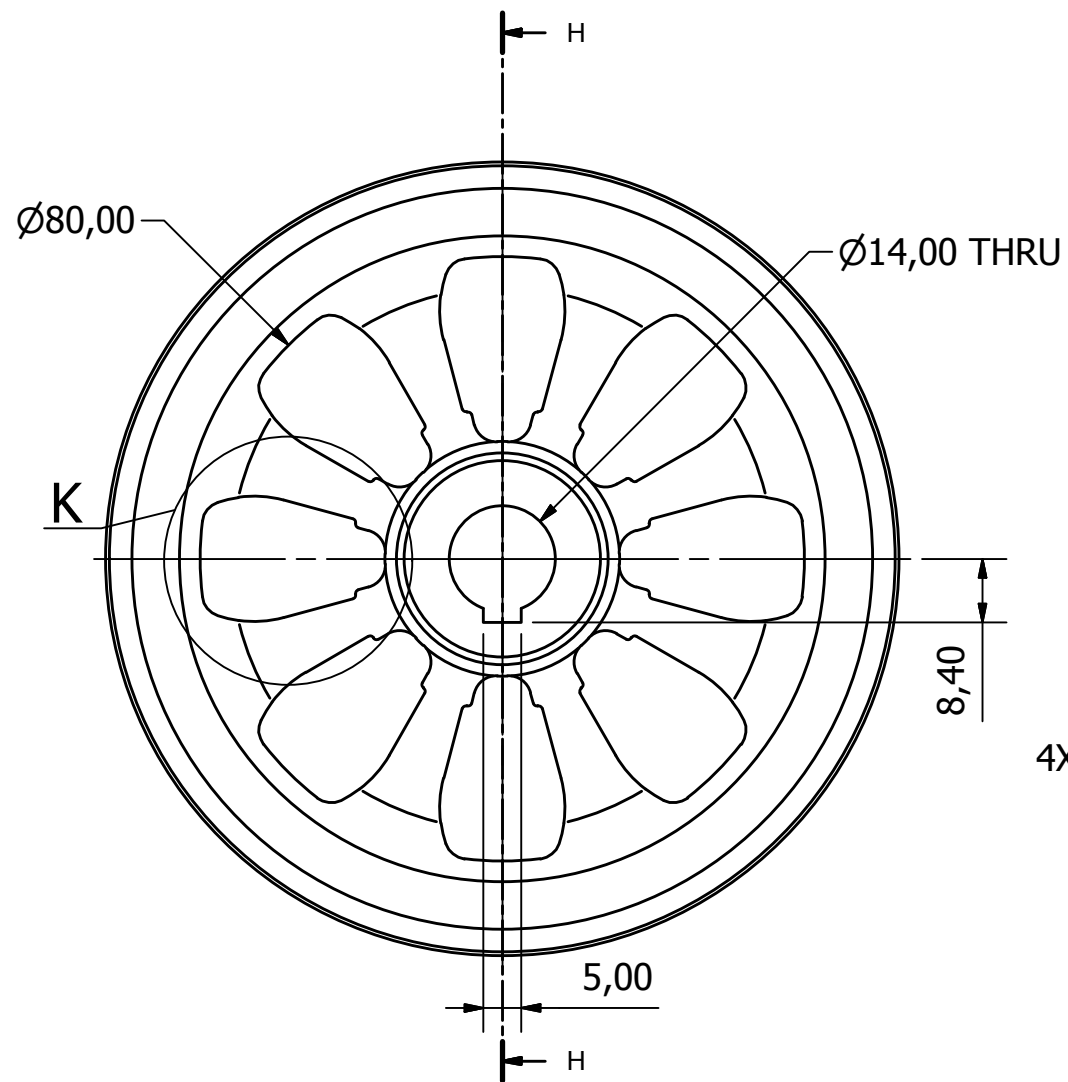
Competitor:	Date: 24/02/2015	Title: Centrifugal Pump Housing	
Material: Steel, Mild	Mass: 0.954 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 3 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm



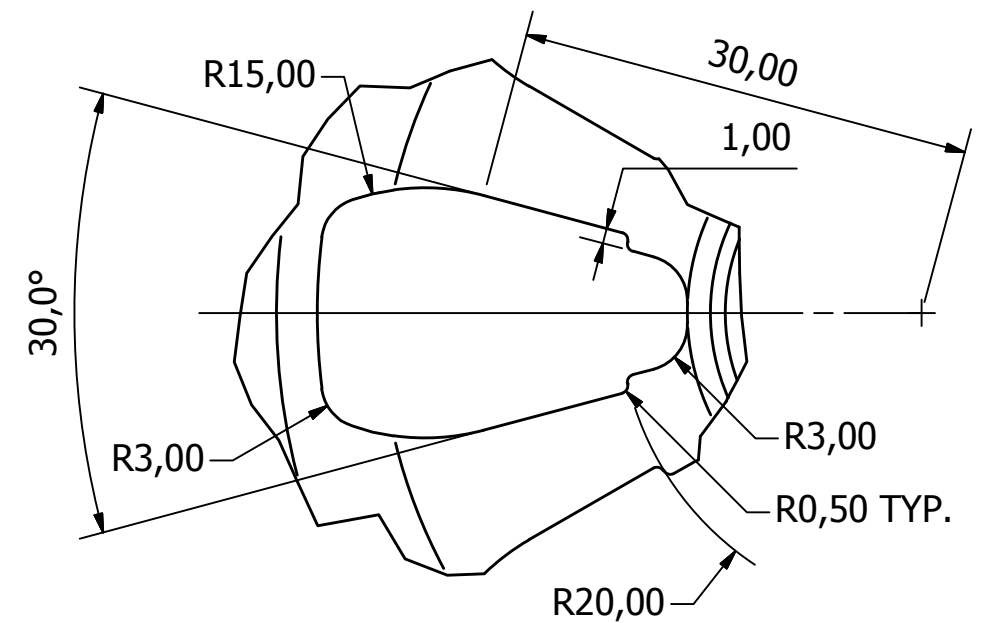
Competitor:	Date: 24/02/2015	Title: Centrifugal Pump Impeller	
Material: Brass, Soft Yellow	Mass: 0.070 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 4 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm



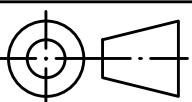
DETAIL J



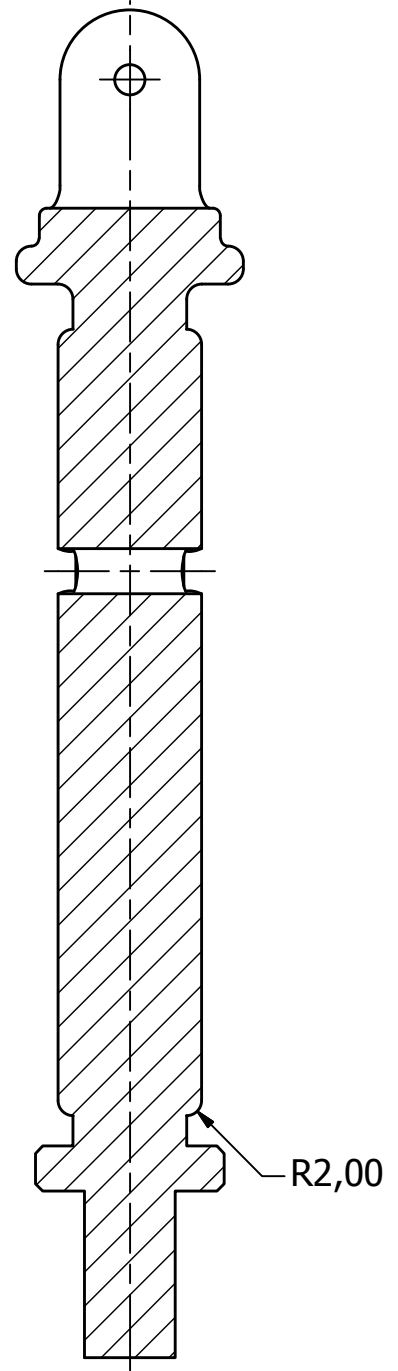
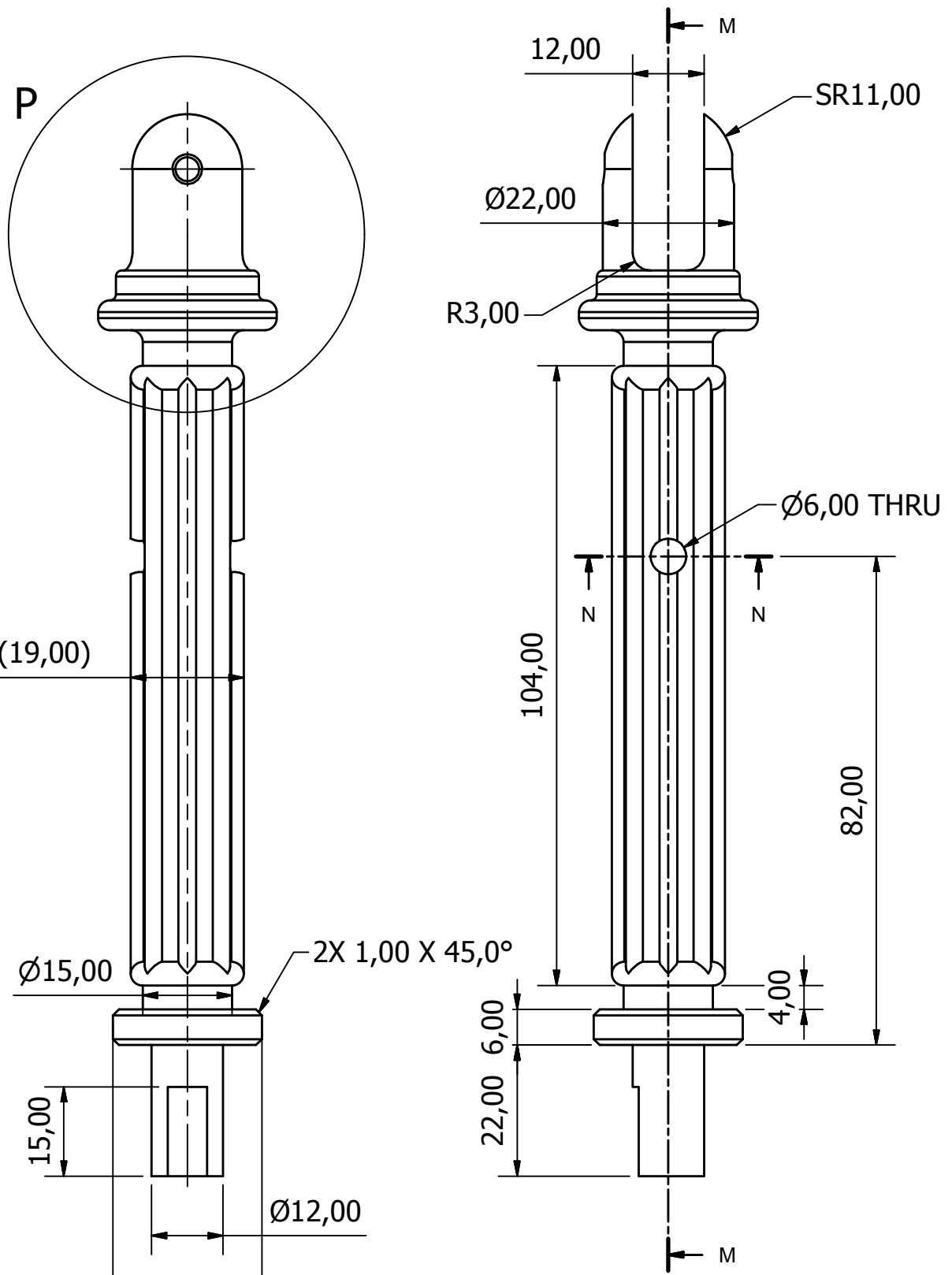
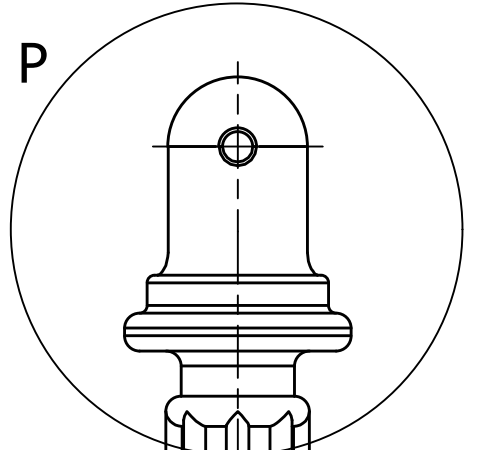
SECTION H-H



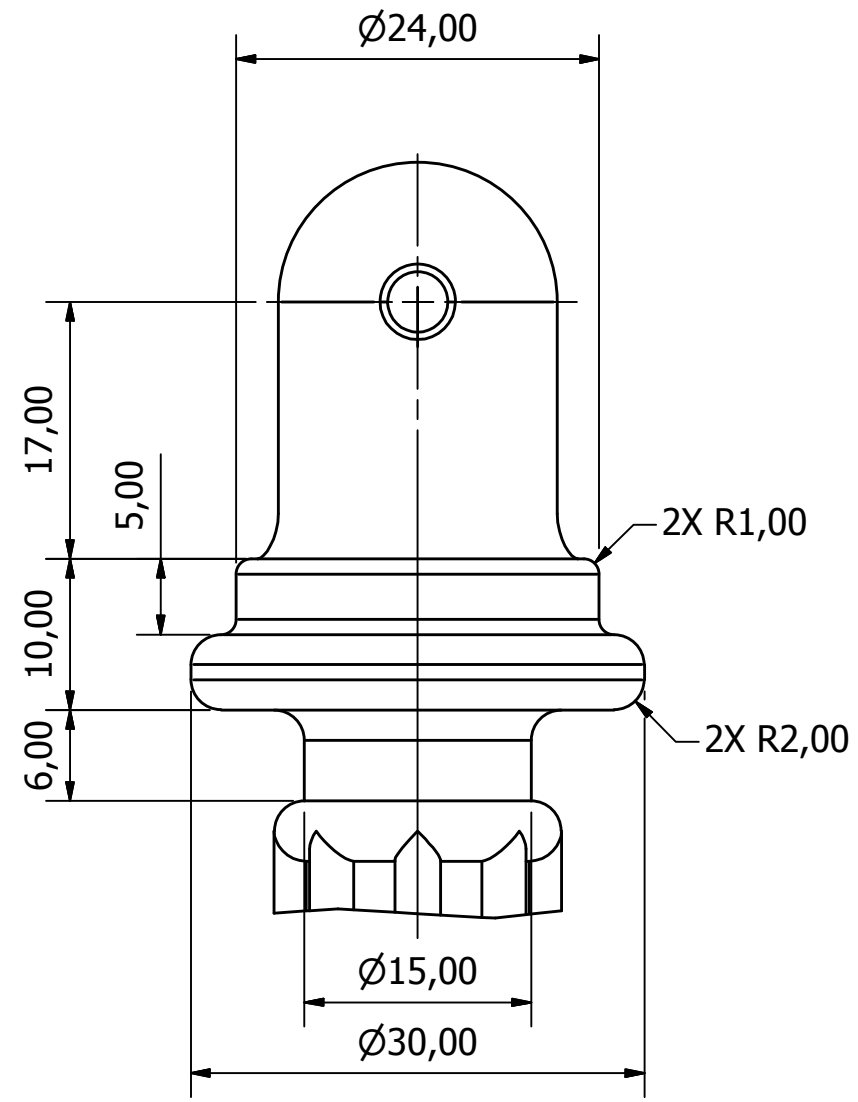
DETAIL K

Competitor:	Date: 24/02/2015	Title: Centrifugal Pump Pulley	
Material: Aluminum 6061	Mass: 0.120 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 5 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

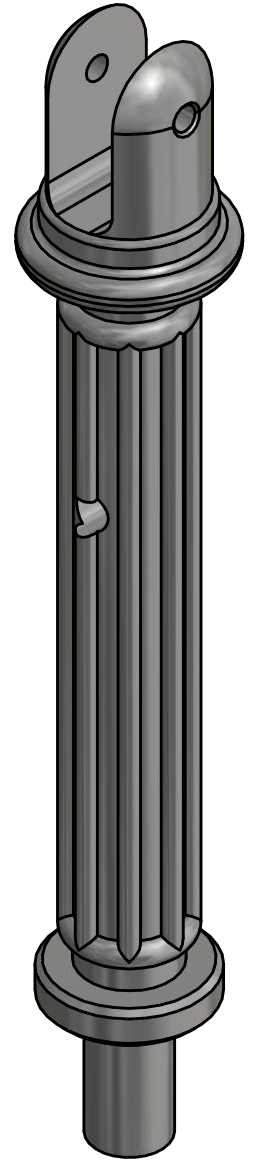
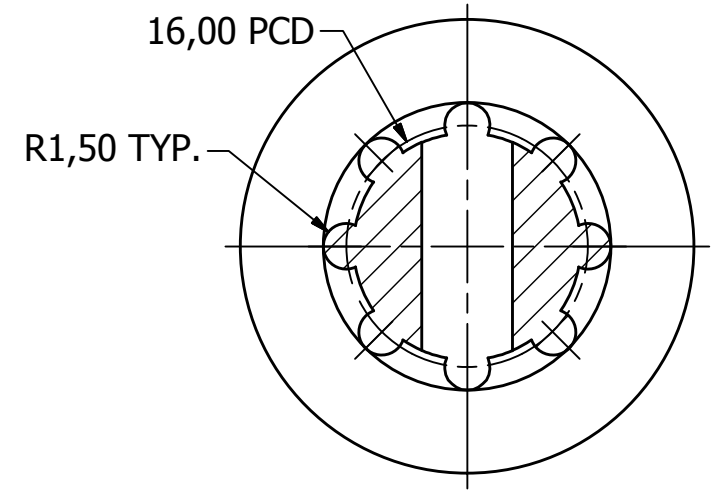




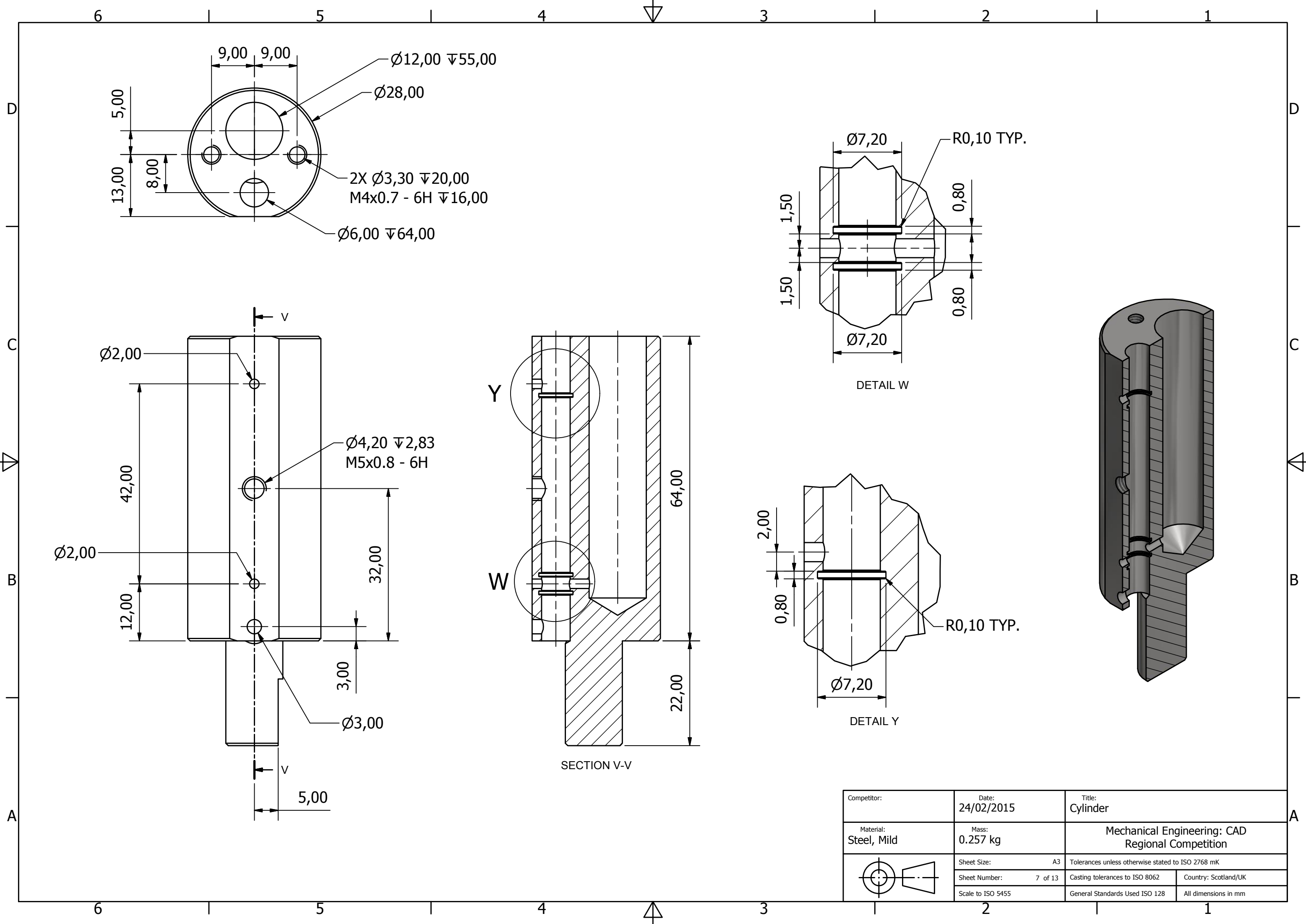
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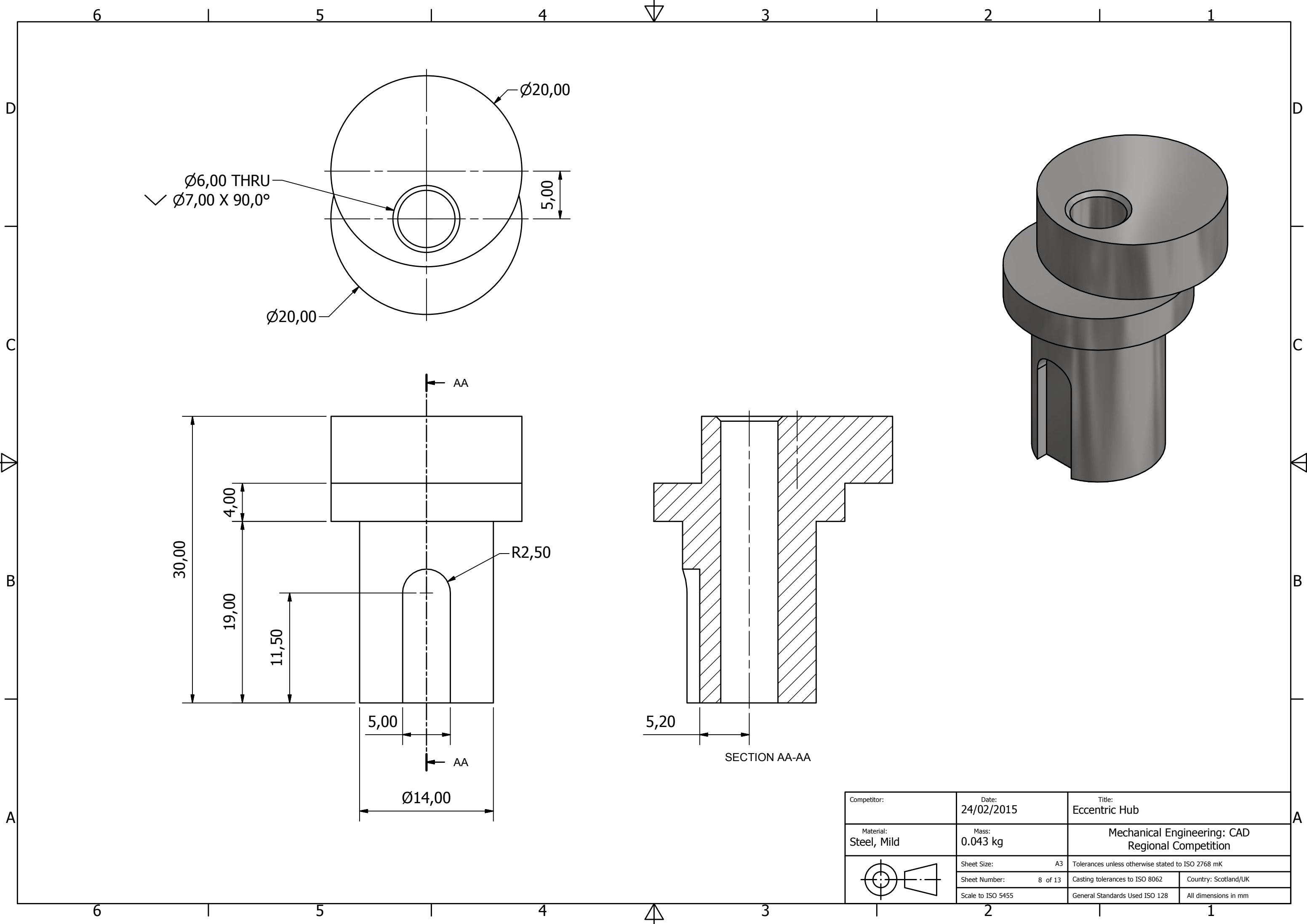
DETAIL P

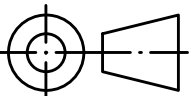


Competitor:	Date: 24/02/2013	Title: Column	
Material: Steel, Mild	Mass: 0.300 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 6 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

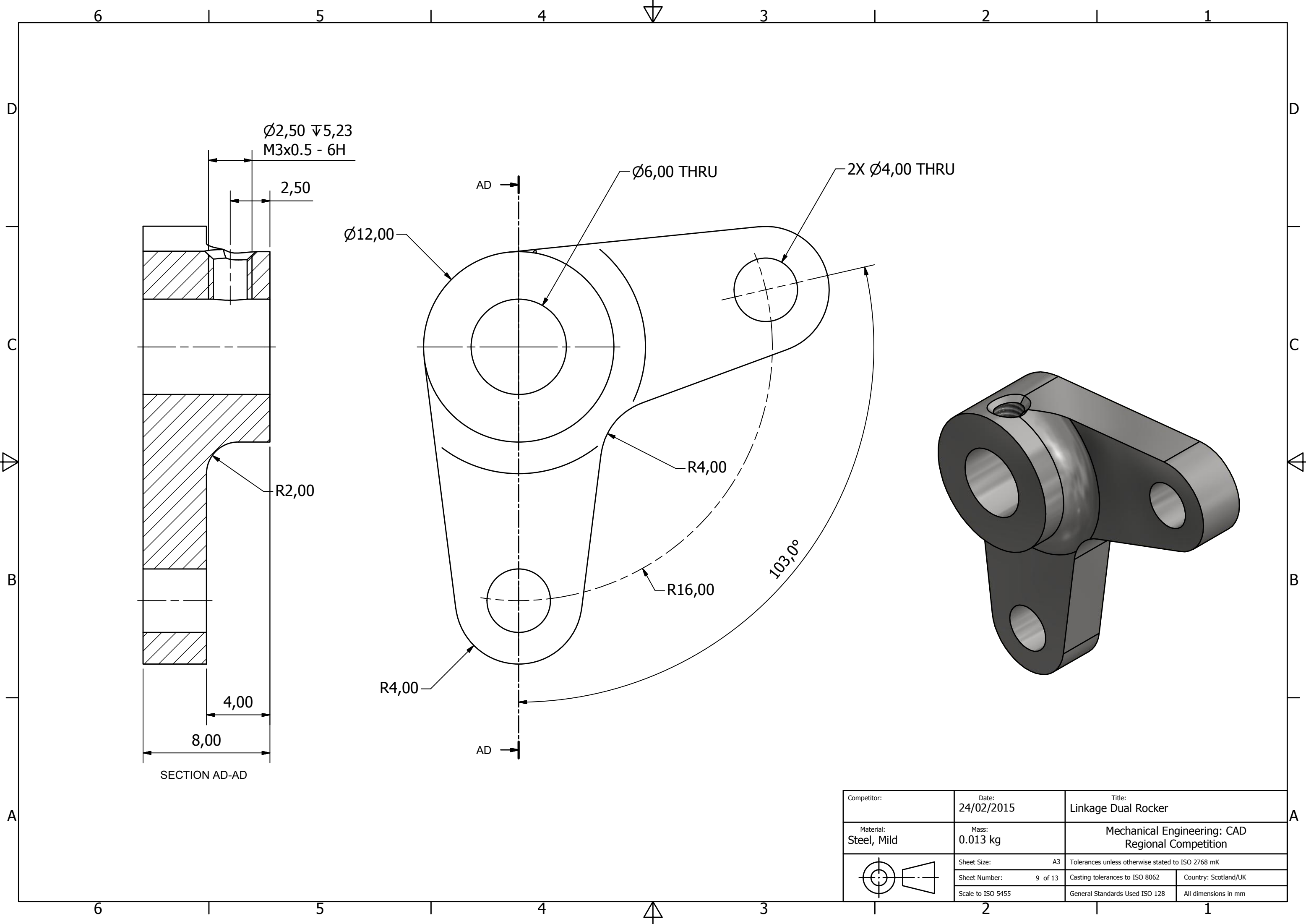


Competitor:	Date: 24/02/2015	Title: Cylinder	
Material: Steel, Mild	Mass: 0.257 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 7 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm



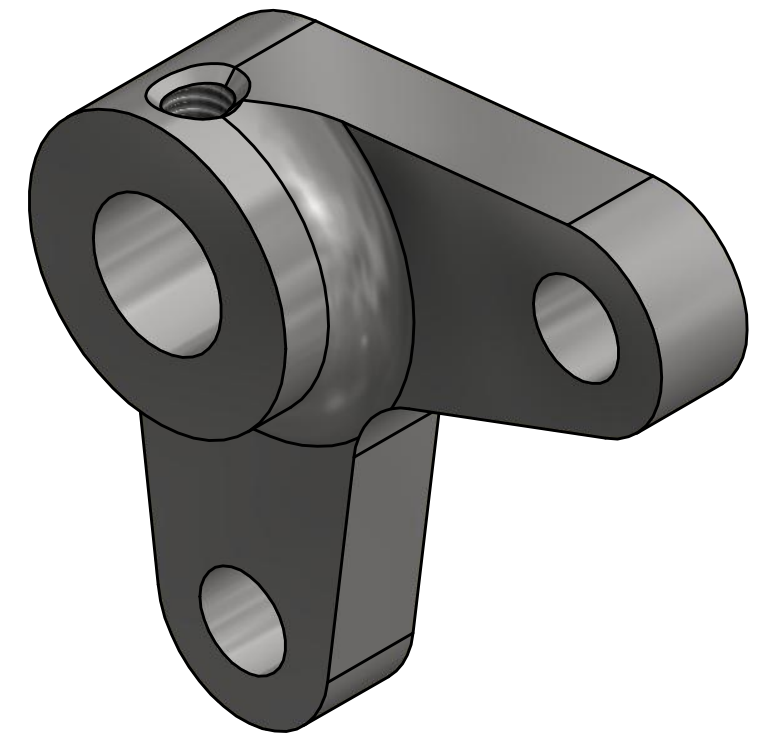
Competitor:	Date: 24/02/2015	Title: Eccentric Hub	
Material: Steel, Mild	Mass: 0.043 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 8 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm



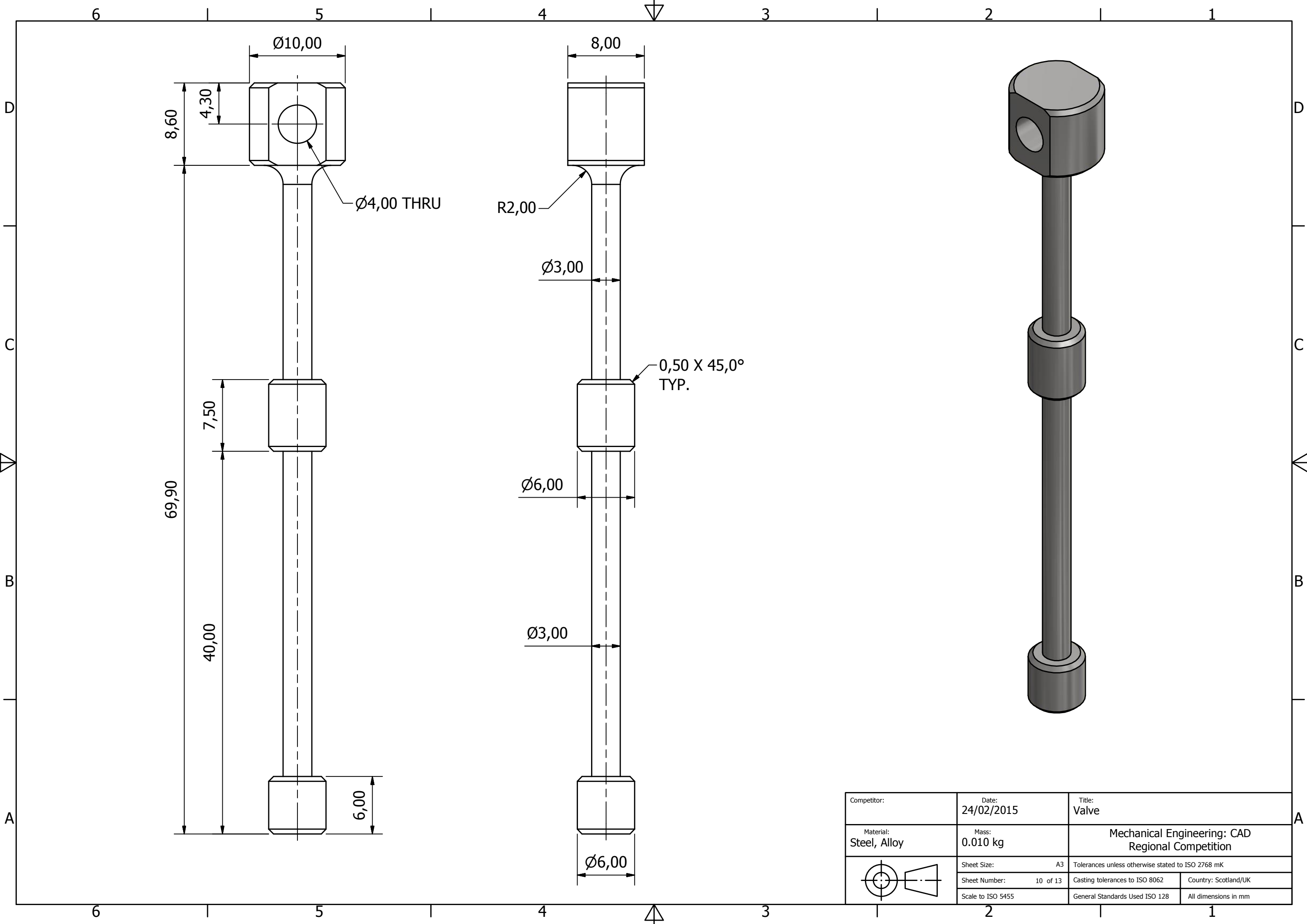


$\text{Ø}2,50 \pm 0,23$   
 M3x0.5 - 6H  
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 R2,00  
 4,00  
 8,00  
 SECTION AD-AD

AD  
 $\text{Ø}12,00$   
 $\text{Ø}6,00$  THRU  
 2X  $\text{Ø}4,00$  THRU  
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 R16,00  
 $103,0^\circ$   
 R4,00  
 AD

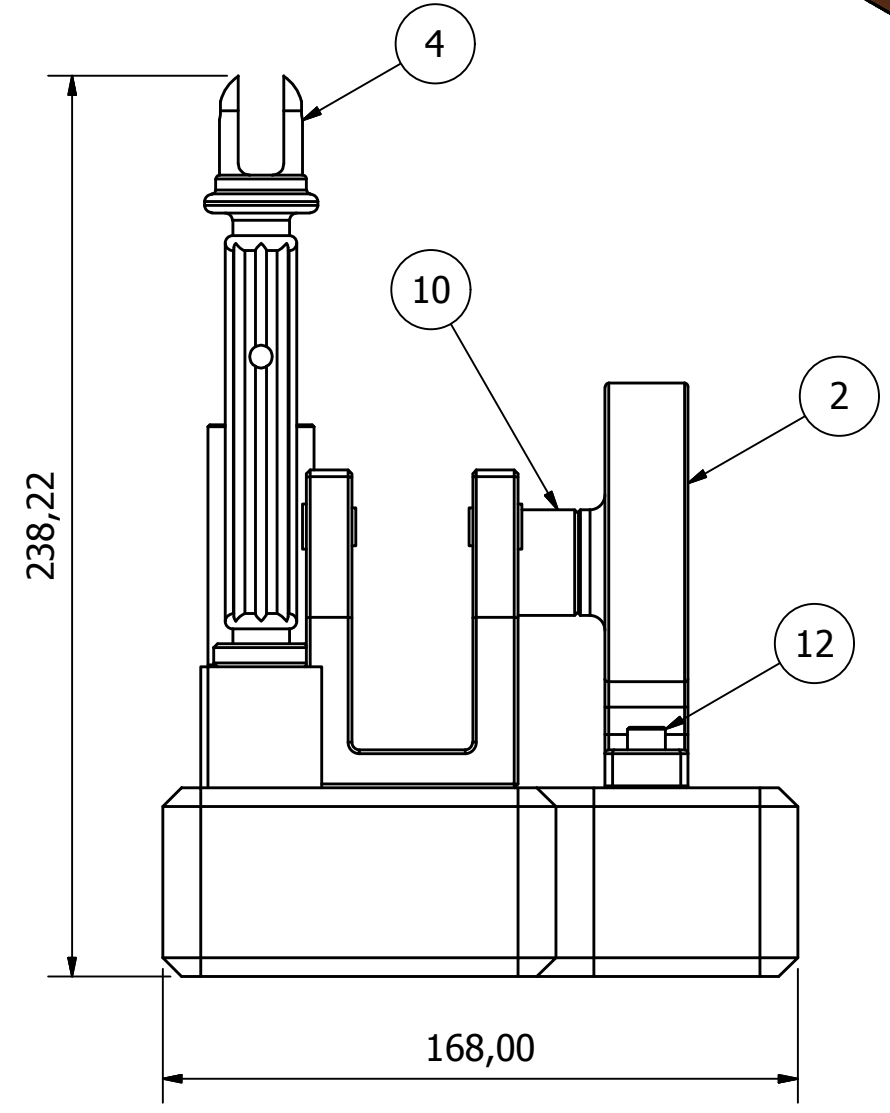
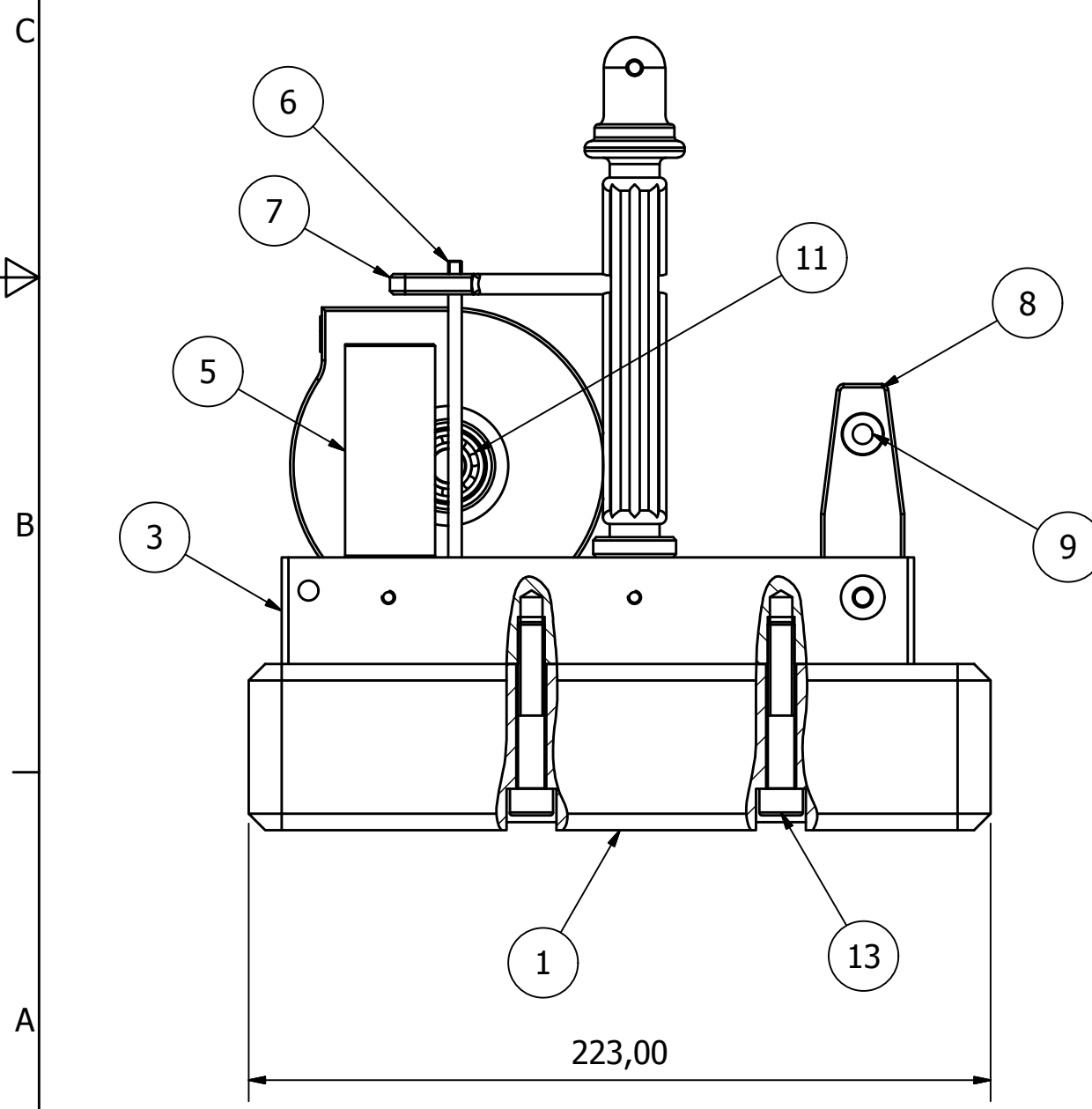
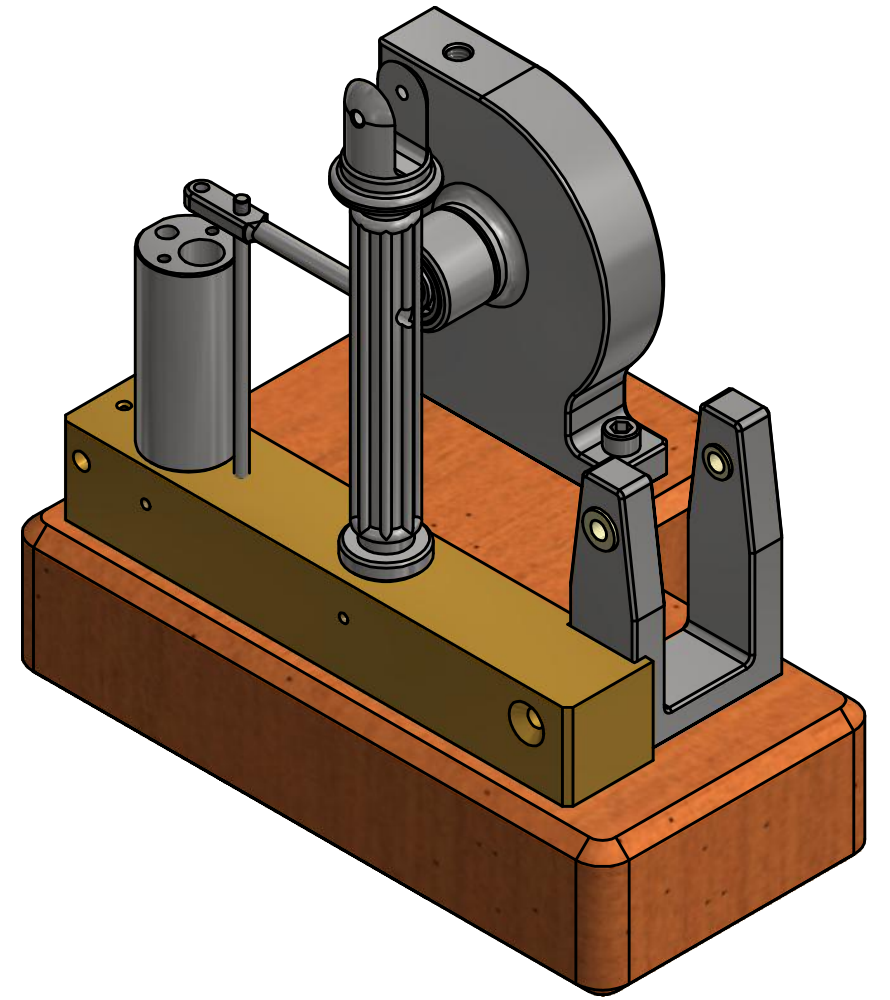


Competitor:	Date: 24/02/2015	Title: Linkage Dual Rocker	
Material: Steel, Mild	Mass: 0.013 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 9 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

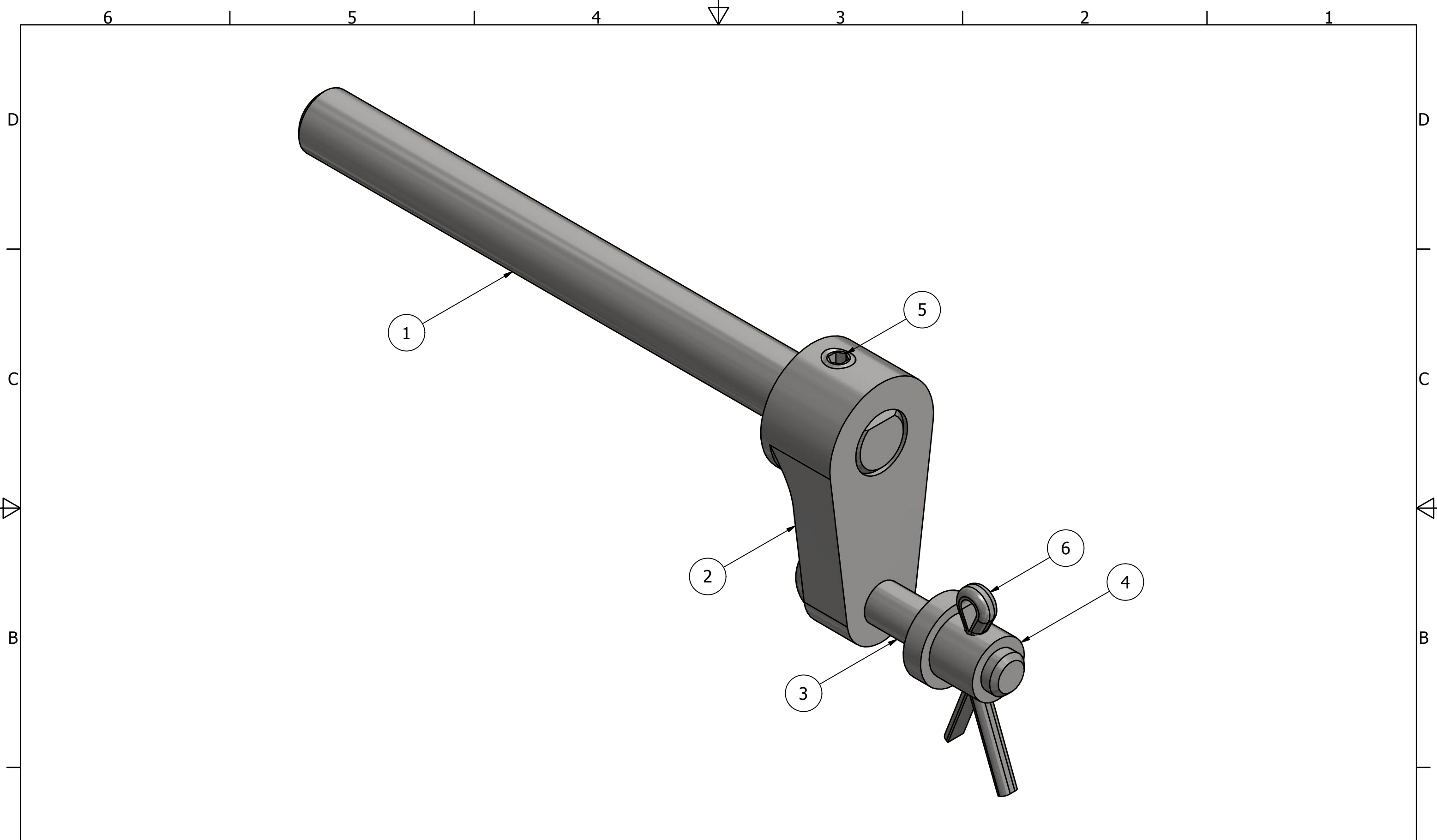


Competitor:	Date: 24/02/2015	Title: Valve	
Material: Steel, Alloy	Mass: 0.010 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 10 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

PARTS LIST				
ITEM	QTY	PART NUMBER	MATERIAL	DESCRIPTION
1	1	Floor	Wood (Cherry)	
2	1	Centrifugal Pump Housing	Steel, Mild	
3	1	Base	Brass, Soft Yellow	
4	1	Column	Steel, Mild	
5	1	Cylinder	Steel, Mild	
6	1	Piston Support Rod	Steel, Mild	
7	1	Piston Support Beam	Steel, Mild	
8	1	Bearing	Steel, Mild	
9	2	Plain Bearing	Nylon 6/6	
10	1	Centrifugal Pump Bearing	Steel, Mild	
11	1	DIN 625 SKF - SKF 61900-RZ	Steel, Mild	Deep groove ball bearings single row with one low-friction seal SKF
12	2	DIN 912 - M6 x 16	Steel, Galvanized	Cylinder Head Cap Screw
13	2	ISO 4762 - M8 x 50	Stainless Steel, 440C	Hexagon Socket Head Cap Screw



Competitor:	Date: 24/02/2015	Title: Assembly Base	
Material: See Parts List	Mass: 4.388 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 11 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

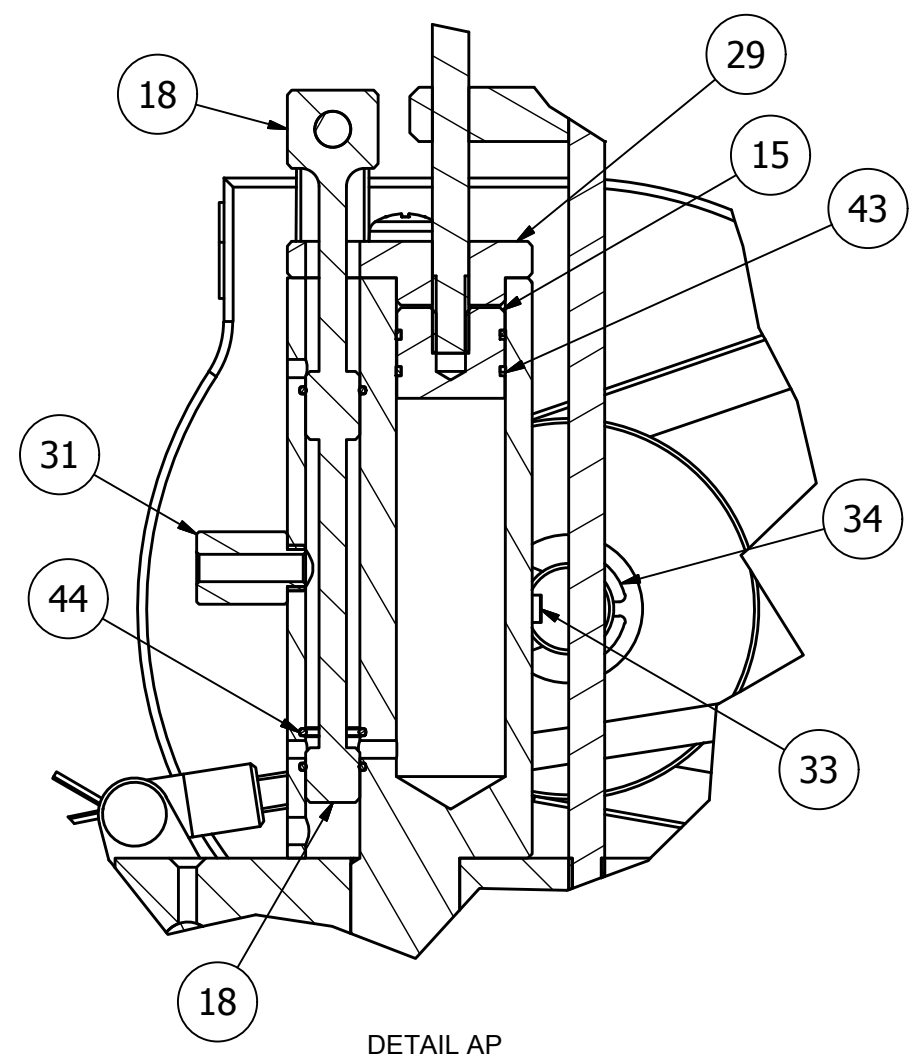


PARTS LIST

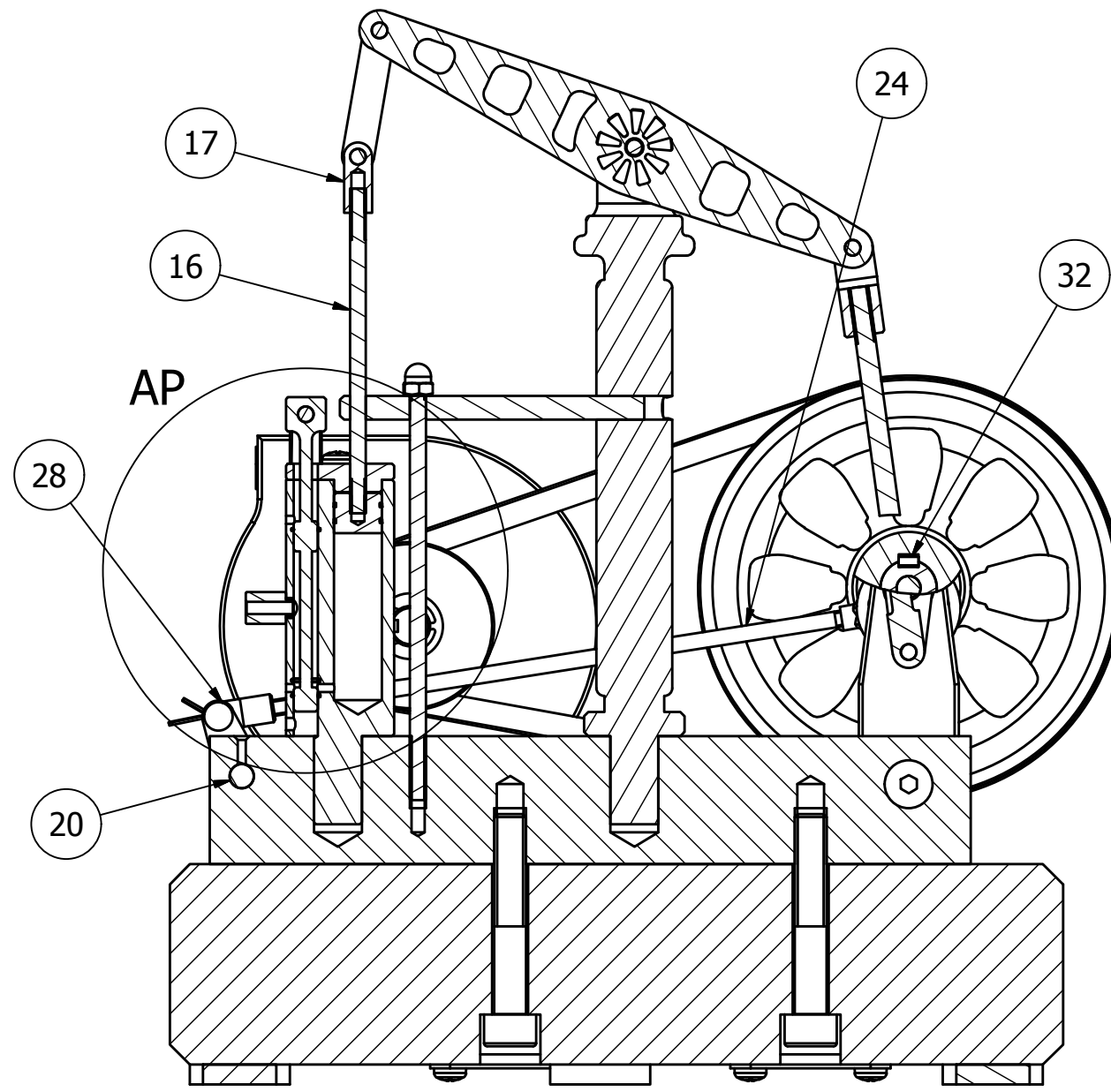
ITEM	QTY	PART NUMBER	MATERIAL	DESCRIPTION
1	1	Crankshaft Rod	Steel, Mild	
2	1	Crankshaft Rocker	Steel, Mild	
3	1	Crankshaft Bolt	Steel, Cast	
4	1	Crankshaft Nut	Steel, Cast	
5	1	DIN 913 - M3 x 4	Steel, Galvanized	Hexagon Socket Set Screw
6	1	DIN 94 - 2 x 12	Steel, Galvanized	Split Pin

Competitor:	Date: 24/02/2015	Title: Crankshaft Assembly	
Material:	Mass: 0.028 kg	Mechanical Engineering: CAD Regional Competition	
	Sheet Size: A3	Tolerances unless otherwise stated to ISO 2768 mK	
	Sheet Number: 12 of 13	Casting tolerances to ISO 8062	Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128	All dimensions in mm

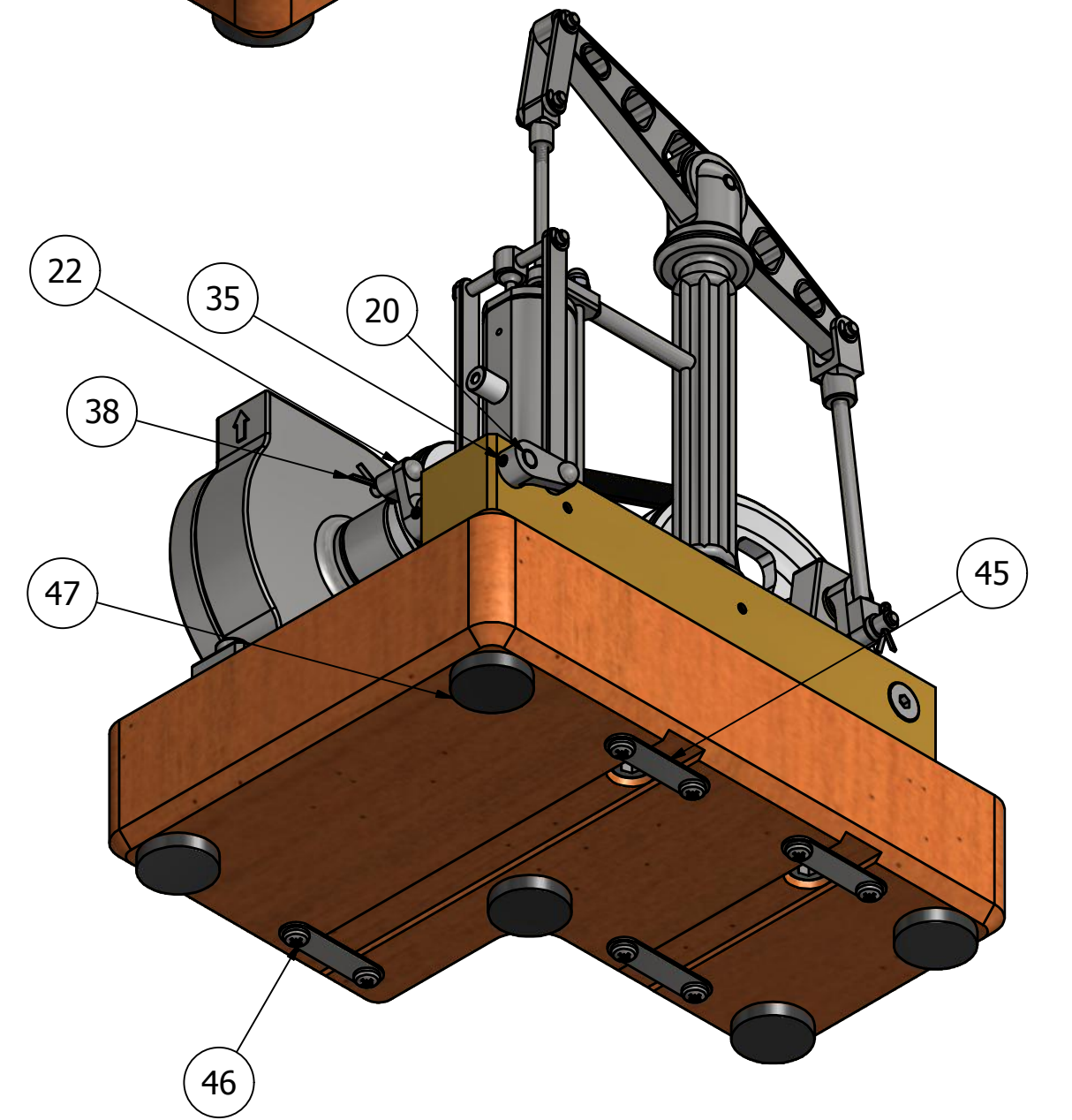
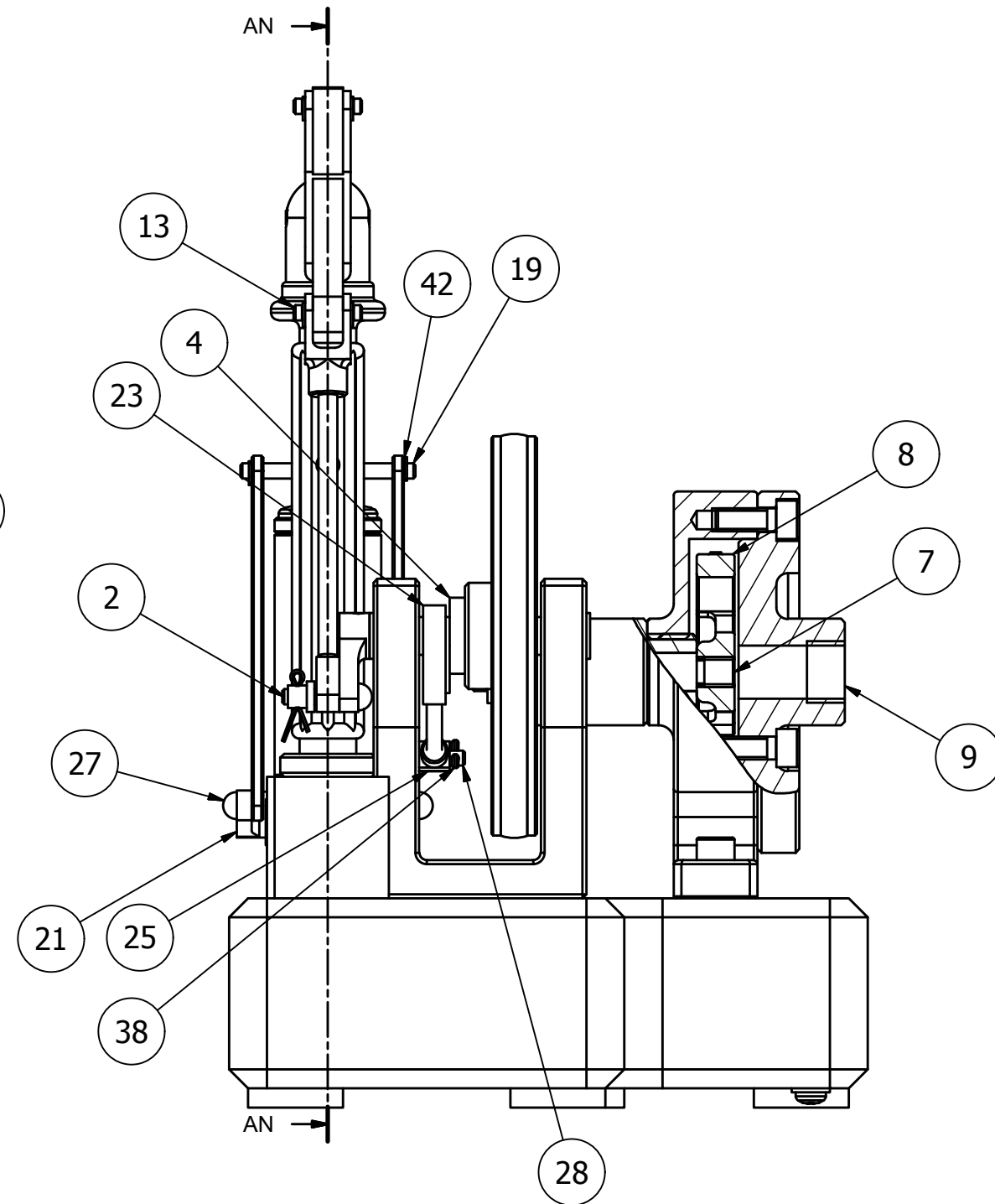
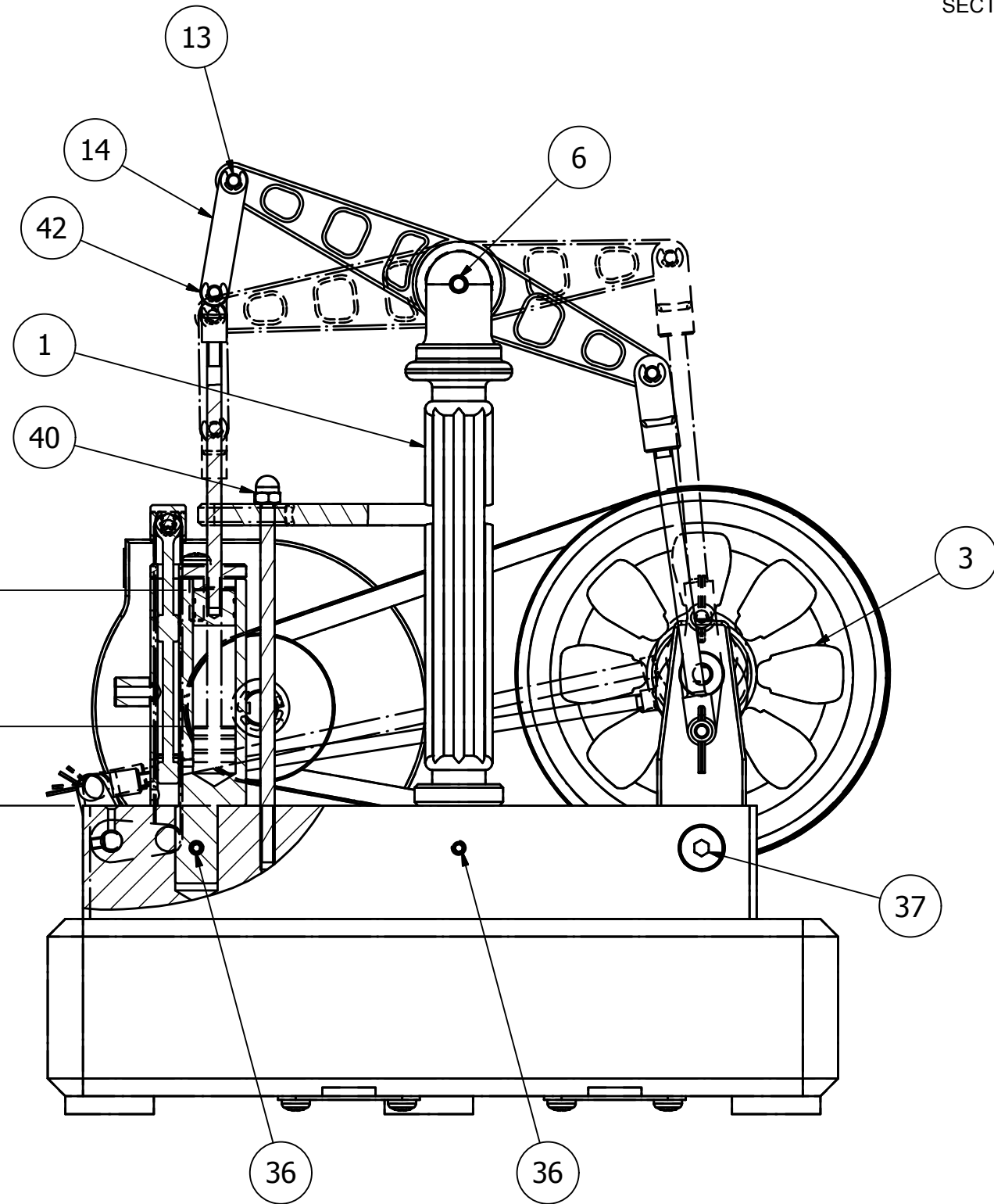
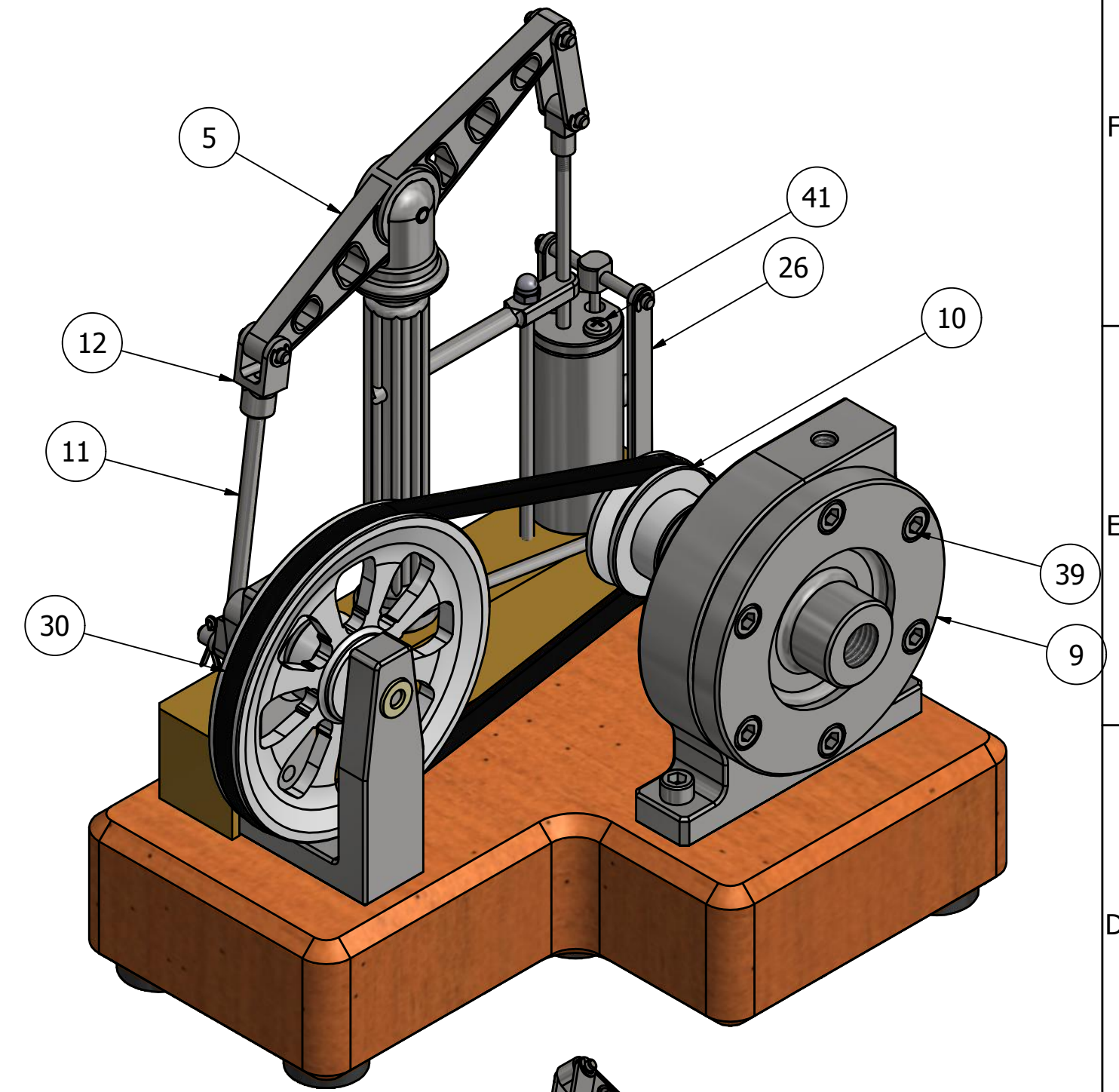




DETAIL AP



SECTION AN-AN



Competitor:	Date: 24/02/2015	Title: Beam Engine
Material: N/A	Mass: N/A	Mechanical Engineering: CAD Regional Competition
	Sheet Size: A2	Tolerances unless otherwise stated to ISO 2768 mK
	Sheet Number: 13 of 13	Casting tolerances to ISO 8062 Country: Scotland/UK
	Scale to ISO 5455	General Standards Used ISO 128 All dimensions in mm

## PARTS LIST

ITEM	QTY	PART NUMBER	MATERIAL	DESCRIPTION
1	1	Assembly Base		
2	1	Crankshaft Assembly		
3	1	Centrifugal Pump Pulley	Aluminum 6061	
4	1	Eccentric Hub	Steel, Mild	
5	1	Beam	Stainless Steel	
6	1	Rod D4 L22	Steel, Mild	
7	1	Centrifugal Pump Shaft	Steel, Mild	
8	1	Centrifugal Pump Impeller	Brass, Soft Yellow	
9	1	Centrifugal Pump Cover	Steel, Mild	
10	1	Turbine Pulley	Aluminum 6061	
11	1	Connecting Rod Link	Steel, Mild	
12	1	Connecting Rod Head	Steel, Mild	
13	3	Rod D4 L18	Steel, Mild	
14	2	Beam Linkage	Steel, Mild	
15	1	Piston	Brass, Soft Yellow	
16	1	Piston Rod	Steel, Mild	
17	1	Piston Rod Head	Steel, Mild	
18	1	Valve	Steel, Alloy	
19	1	Rod D4 L18	Steel, Mild	
20	1	Rod D6 L46	Steel, Mild	
21	1	Linkage Dual Rocker	Steel, Mild	
22	1	Linkage Dual Rocker	Steel, Mild	
23	1	Eccentric Strap	PAEK Plastic	
24	1	Eccentric Strap Rod	Steel, Mild	
25	1	Eccentric Strap Head	Steel, Mild	
26	2	Linkage	Steel, Mild	
27	2	Linkage Stud	Steel, Alloy	
28	1	Linkage Stud	Steel, Mild	
29	1	Cylinder Head	Steel, Mild	
30	1	V - Belt	Nylon 6/6	
31	1	Inlet	PAEK Plastic	
32	1	ISO 2491 - A 5 x 3 x 14	Steel, Galvanized	Thin parallel keys
33	1	DIN 6885 - A 3 x 3 x 22	Steel, Galvanized	Parallel Key
34	1	DIN 6799 - 8	Steel, Galvanized	Retaining Washer
35	2	DIN 913 - M3 x 4	Steel, Galvanized	Hexagon Socket Set Screw
36	2	DIN 913 - M4 x 10	Steel, Galvanized	Hexagon Socket Set Screw
37	1	DIN 7991 - M6x40	Steel, Galvanized	Hexagon socket countersunk head cap screws
38	1	DIN 94 - 2 x 12	Steel, Galvanized	Split Pin
39	6	DIN 912 - M6 x 16	Steel, Galvanized	Cylinder Head Cap Screw
40	1	DIN 1587 - M4	Stainless Steel AISI 440C, Welded	Hexagon Domed Cap Nuts
41	2	EN ISO 7045 - M4 x 16 - 4.8 - H	Steel, Galvanized	Pan head screws with type H or type Z cross recess - Product grade A
42	8	DIN 6799 - 3,2	Steel, Galvanized	Retaining Washer
43	2	Piston Rings	PAEK Plastic	
44	3	Valve O-Ring	Rubber	
45	4	Band Straps	Steel, Mild	
46	8	ISO 7045 - M4 x 8 - 4.8 - Z	Stainless Steel, 440C	Pan head screw with type Z cross recess - product grade A
47	5	Feet	Rubber	