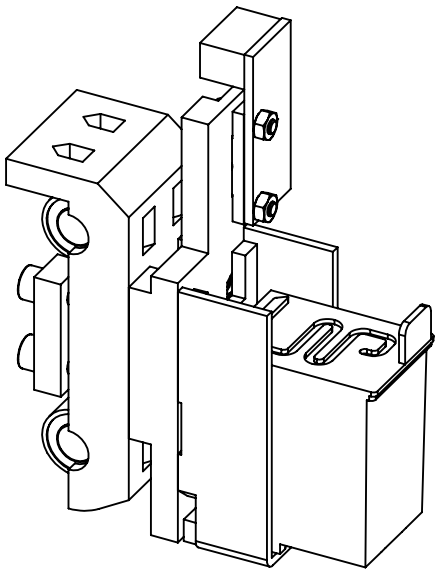
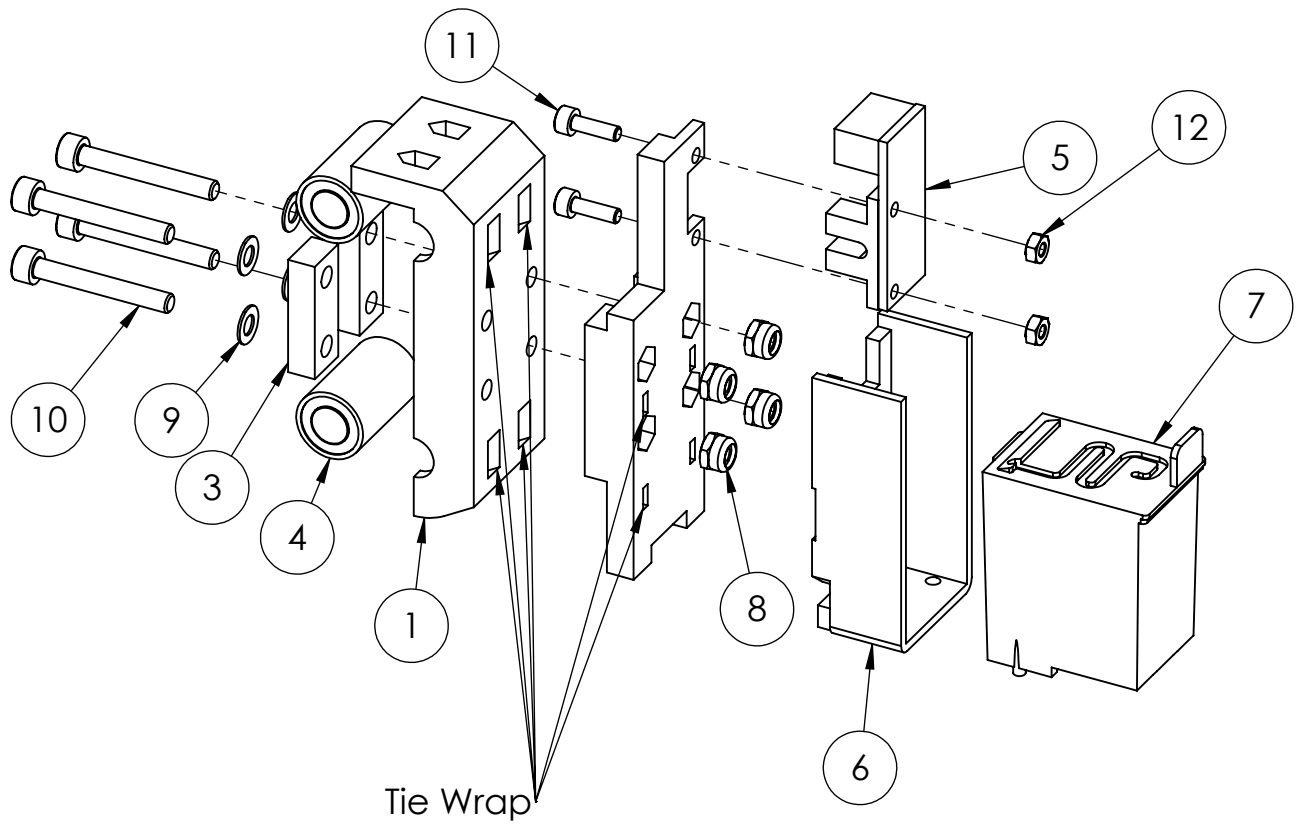


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		FINISH:		DEBUR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
SURFACE FINISH:									
TOLERANCES:									
LINEAR:									
ANGULAR:									
	NAME	SIGNATURE	DATE			TITLE:			
DRAWN	Yvo de Haas		22-02-14			<h1>5mm X-axis axel</h1>			
CHK'D									
APPV'D									
MFG									
Q.A						DWG NO.		A4	
						WEIGHT:		SCALE:1:2	
								SHEET 1 OF 1	

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5mm steel smooth rod



ITEM NO.	PART NUMBER	QTY.
1	carriage carrier	1
2	carriage Cartridge adapter	1
3	carriage Belt clamp	2
4	Vitamins LM8UU bearing	2
5	Endstop	1
6	Cartridge carrier	1
7	C6602A	1
8	Nut M4 selflocking	4
9	Washer M4	4
10	Cil screw M4 x 30	4
11	Cil screw M3 x 10	2
12	Nut M3	2

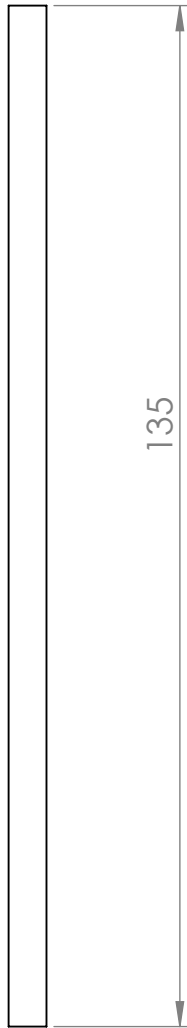
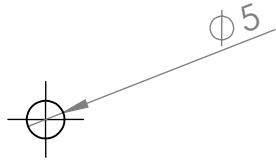
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 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:
 FINISH:
 DEBUR AND
 BREAK SHARP
 EDGES

DO NOT SCALE DRAWING
 REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		21-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

TITLE:
Carriage assembly
 DWG NO. A4
 SCALE:1:1.5
 SHEET 1 OF 1

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SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

FINISH:

DEBUR AND
BREAK SHARP
EDGES

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REVISION

NAME	SIGNATURE	DATE	REVISION
DRAWN Yvo de Haas		22-02-14	
CHK'D			
APPV'D			
MFG			
Q.A			

TITLE:

Hopper 5mm axel

DWG NO.

A4

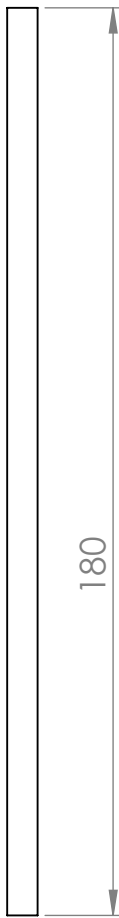
WEIGHT:

SCALE:1:1

SHEET 1 OF 1

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MATERIAL:
5mm steel smooth rod



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SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

FINISH:

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BREAK SHARP
EDGES

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REVISION

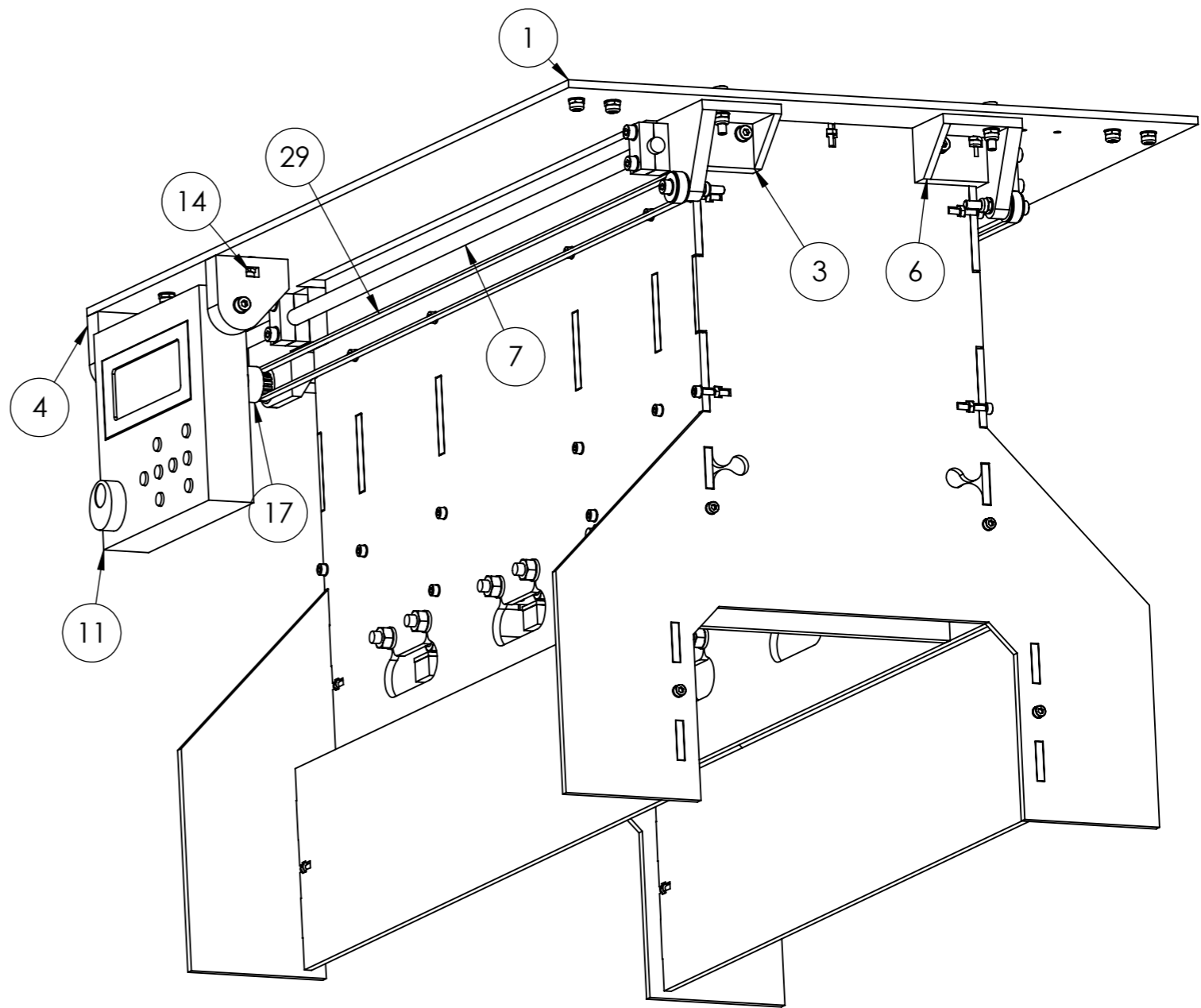
NAME	SIGNATURE	DATE		
DRAWN Yvo de Haas		22-02-14		
CHK'D				
APPV'D				
MFG				
Q.A				

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M6 steel threaded rod

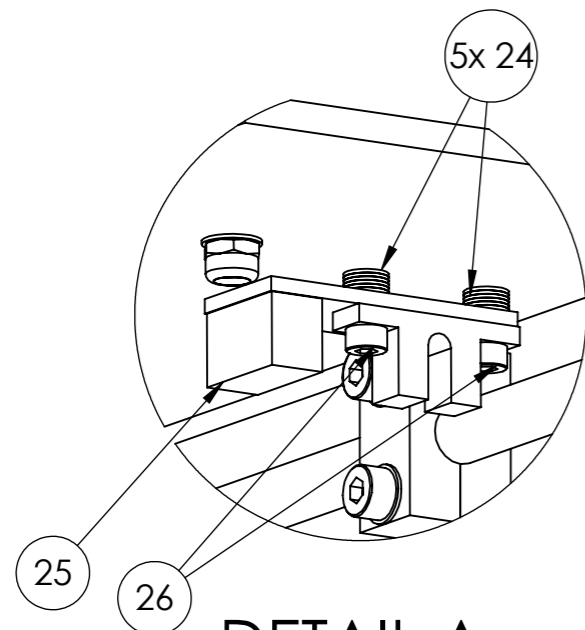
TITLE: <h1>Hopper M6 rod</h1>	
DWG NO.	A4
WEIGHT:	SHEET 1 OF 1
SCALE:1:1.5	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Hopper Subassembly sheetmetal hopper		1
2	Hopper M6 rod		6
3	Hopper subassembly idler		1
4	Hopper GUI Corner holder		2
5	Hopper 5mm axel		1
6	Hopper subassembly idler mirror		1
7	Hopper smooth rod		2
8	Hopper Subassembly linear guide With endstop		3
9	Hopper Subassembly linear guide WO endstop		3
10	Hopper Subassembly Nut trap		3
11	Hopper subassembly GUI		1
12	driver clamp		2
13	Washer M4		45
14	Nut M4 selflocking		28
15	Cil screw M4 x 20		14
16	Cil screw M4 x 30		2
17	T2.5 16T poelie		1
18	Washer M6		24
19	Nut M6		59
20	M3 hexagonal spacer post		4
21	Megatronics		1
22	Cil screw M3 x 10		4
23	Nut M3		6
24	Washer M3		14
25	Endstop		1
26	Cil screw M3 x 16		2
27	Hopper subassembly motor holder		1
28	Hopper subassembly driver holder		1
29	Hopper spreader belt		2

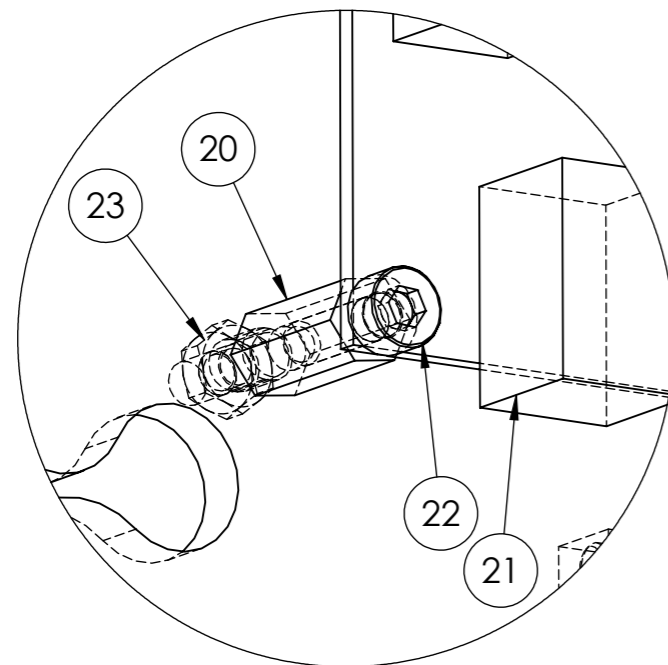


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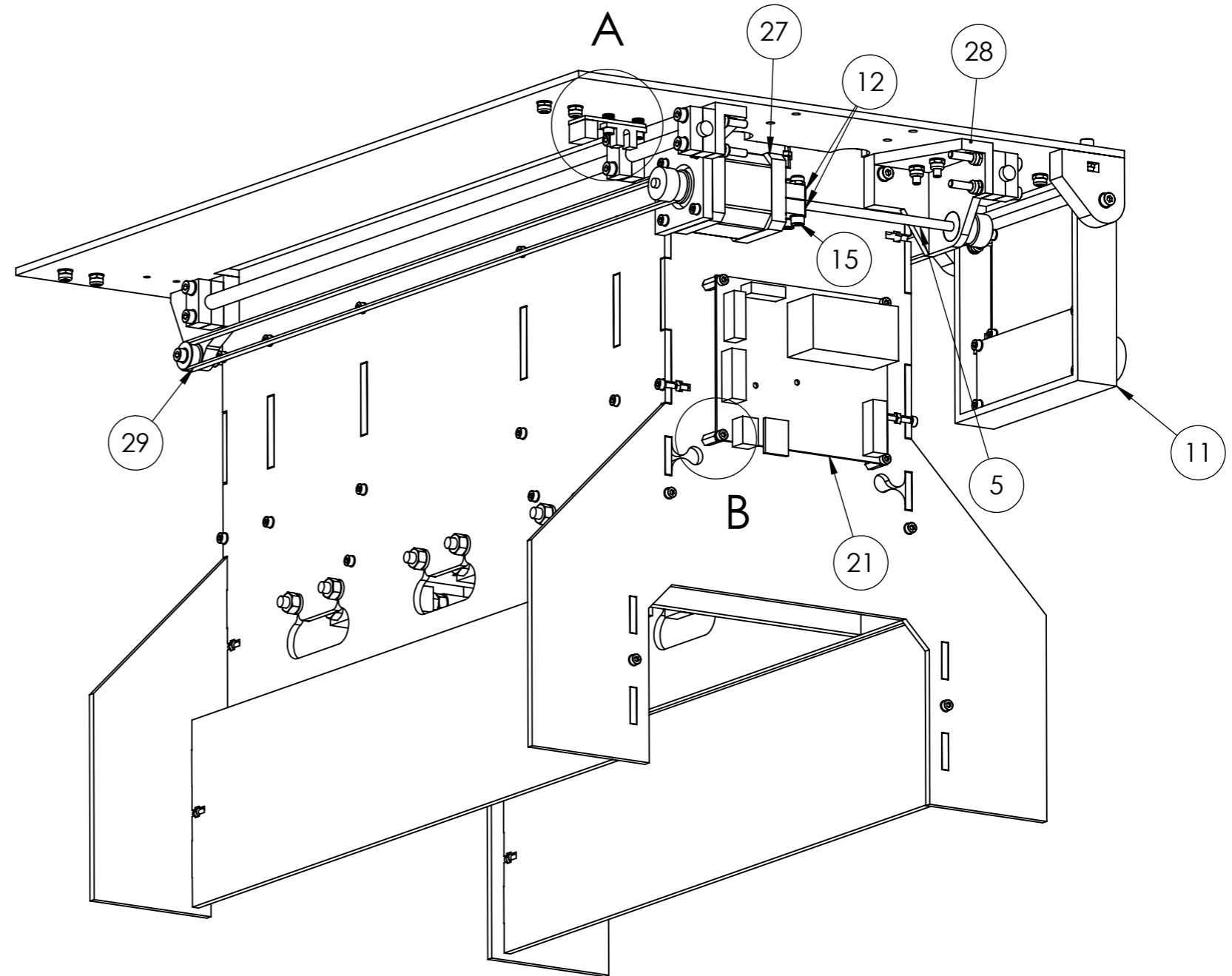
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DRAWN	NAME Yvo de Haas	SIGNATURE	DATE 23-02-14		TITLE: Hopper sheetmetal assembly	
CHK'D					DWG NO.	A3
APPV'D				MATERIAL:		
MFG						
Q.A				WEIGHT:	SCALE:1:3	SHEET 1 OF 4



DETAIL A
SCALE 1 : 1

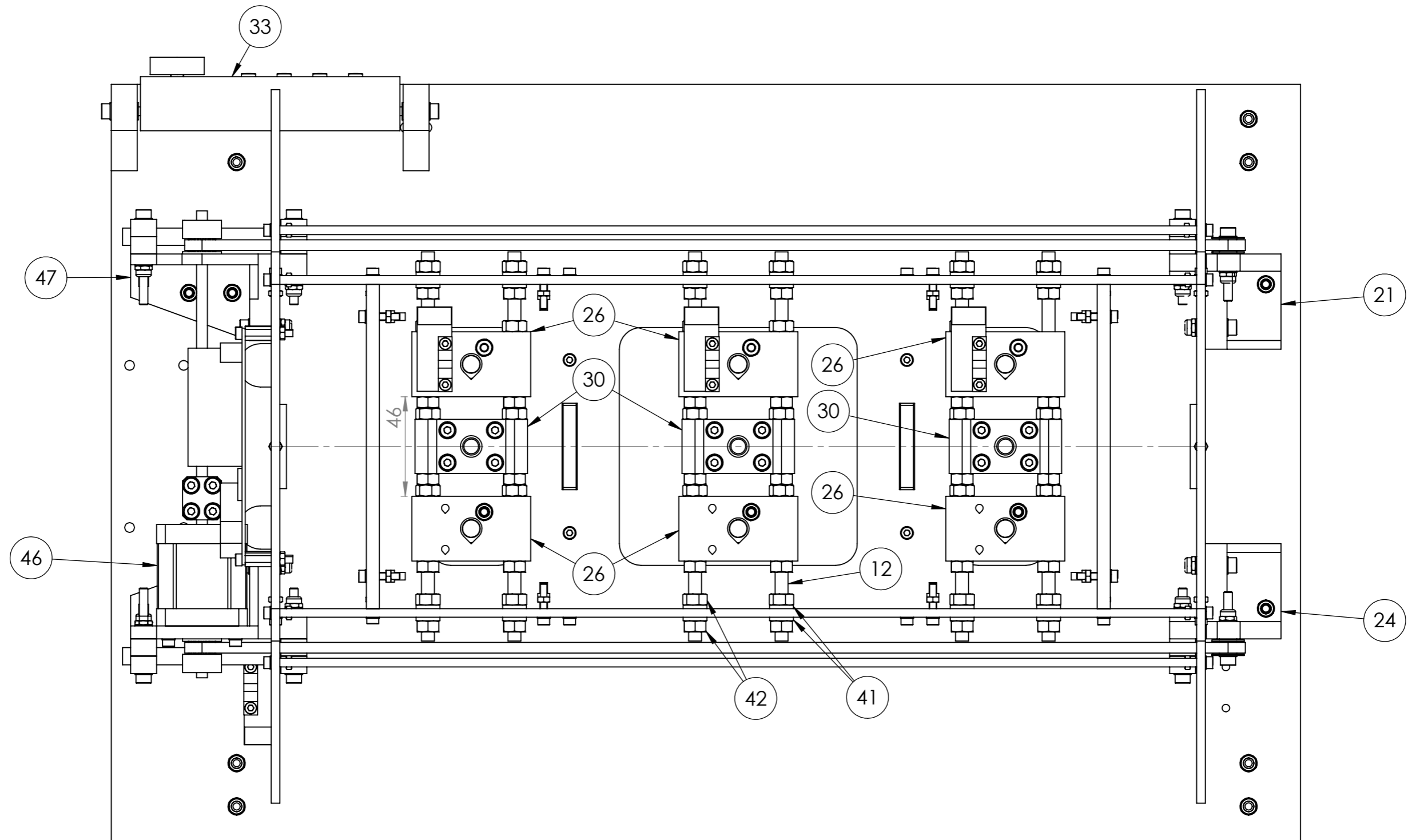


DETAIL B
SCALE 2 : 1



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBUR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
DRAWN				NAME		SIGNATURE		DATE		TITLE:	
CHK'D				Yvo de Haas				23-02-14		Hopper sheetmetal assembly	
APPV'D										DWG NO.	
MFG										A3	
Q.A								MATERIAL:		SCALE:1:3	
								WEIGHT:		SHEET 2 OF 4	

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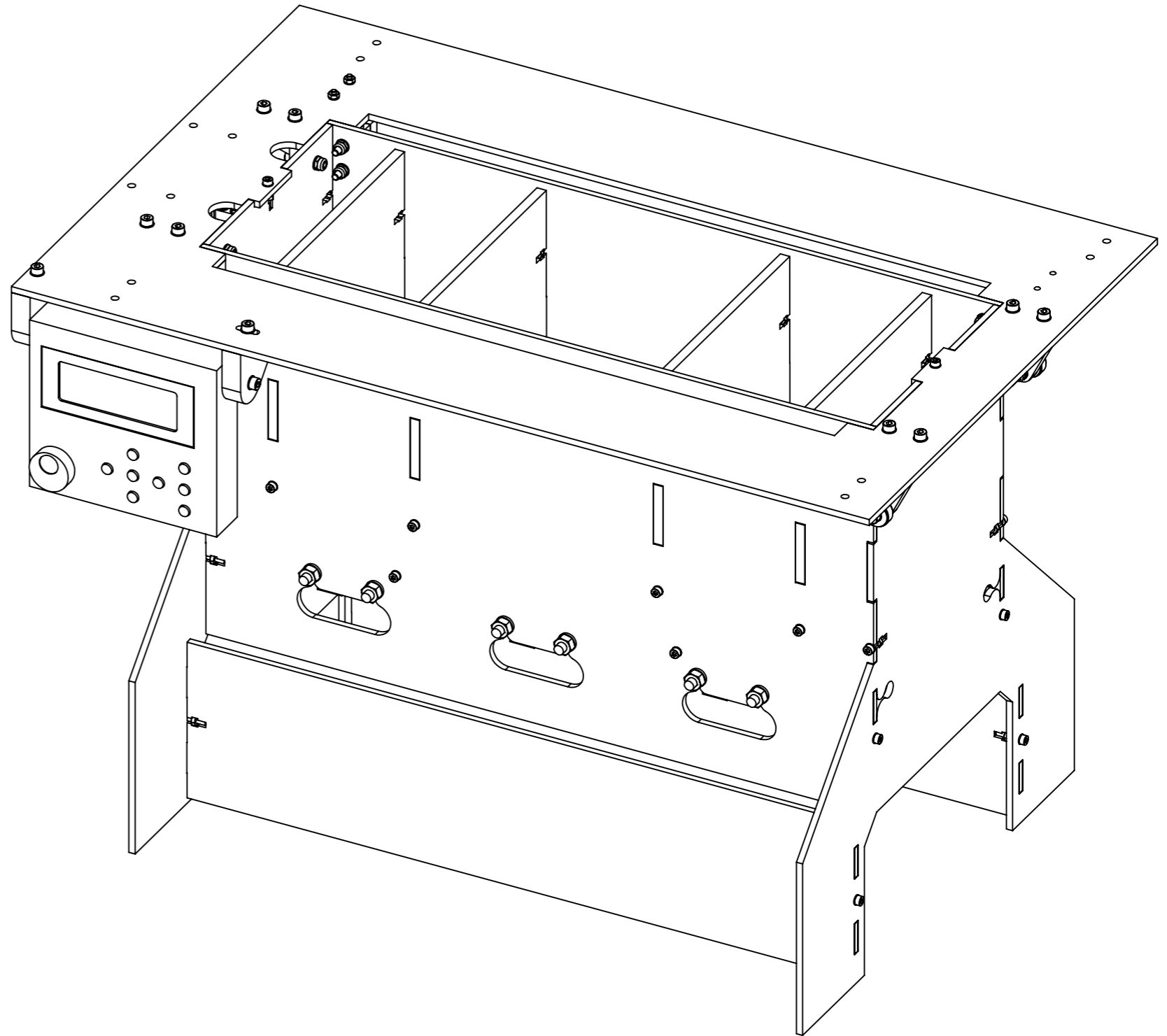


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBUR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
								TITLE: Hopper sheetmetal assembly			
DRAWN		NAME		SIGNATURE		DATE		DWG NO.			
CHK'D		Yvo de Haas				23-02-14		A3			
APPV'D								SCALE:1:2			
MFG								SHEET 3 OF 4			
Q.A								WEIGHT:			

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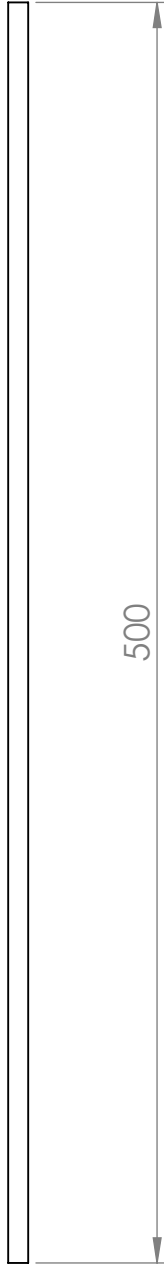
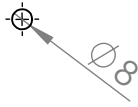
PART NUMBER	QTY.
Hopper hopper side	2
Hopper hopper feedwall	2
Hopper hopper wall	2
Hopper hopper backwall	1
Hopper hopper backwall with megamount	1
Hopper Bottom brace	1
Hopper Top surface	1
Hopper hopper Legbrace	2
Washer M3	90
Cil screw M3 x 16	54
Nut M3	54
Hopper M6 rod	6
Washer M4	103
Hopper smooth rod clamp	12
Cil screw M4 x 40	18
Fender washer M5	4
Vitamins 624 bearing	2
Cil screw M4 x 30	4
Nut M4 selflocking	57
Cil screw M4 x 20	30
Hopper Idler	1
Hopper GUI Corner holder	2
Hopper 5mm axel	1
Hopper Idler mirror	1
Hopper smooth rod	2
Hopper LM8UU holder	6
Vitamins LM8UU bearing	6
Nut M4	3
Endstop	4
Hopper Nut trap	3
Hopper Nut trap nut holder	3
Nut M8	3
Hopper GUI holder	1
Hopper GUI button	8
4x20 LCD	1

PART NUMBER	QTY.
Cil screw M3 x 10	16
driver clamp	2
T2.5 16T poelie	2
Washer M6	24
Nut M6	59
M3 hexagonal spacer post	4
Megatronics	1
Hopper motor holder	1
Motor Stepper NEMA17 double	1
Hopper rod clamp	1
Vitamins 625 bearing	1
Hopper spreader belt	2



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DRAWN	NAME	SIGNATURE	DATE			TITLE: Hopper sheetmetal assembly	
CHK'D	Yvo de Haas		23-02-14			DWG NO.	A3
APPV'D						SCALE:1:3	SHEET 4 OF 4
MFG							
Q.A					MATERIAL:		
					WEIGHT:		



UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MILLIMETERS
 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:

FINISH:

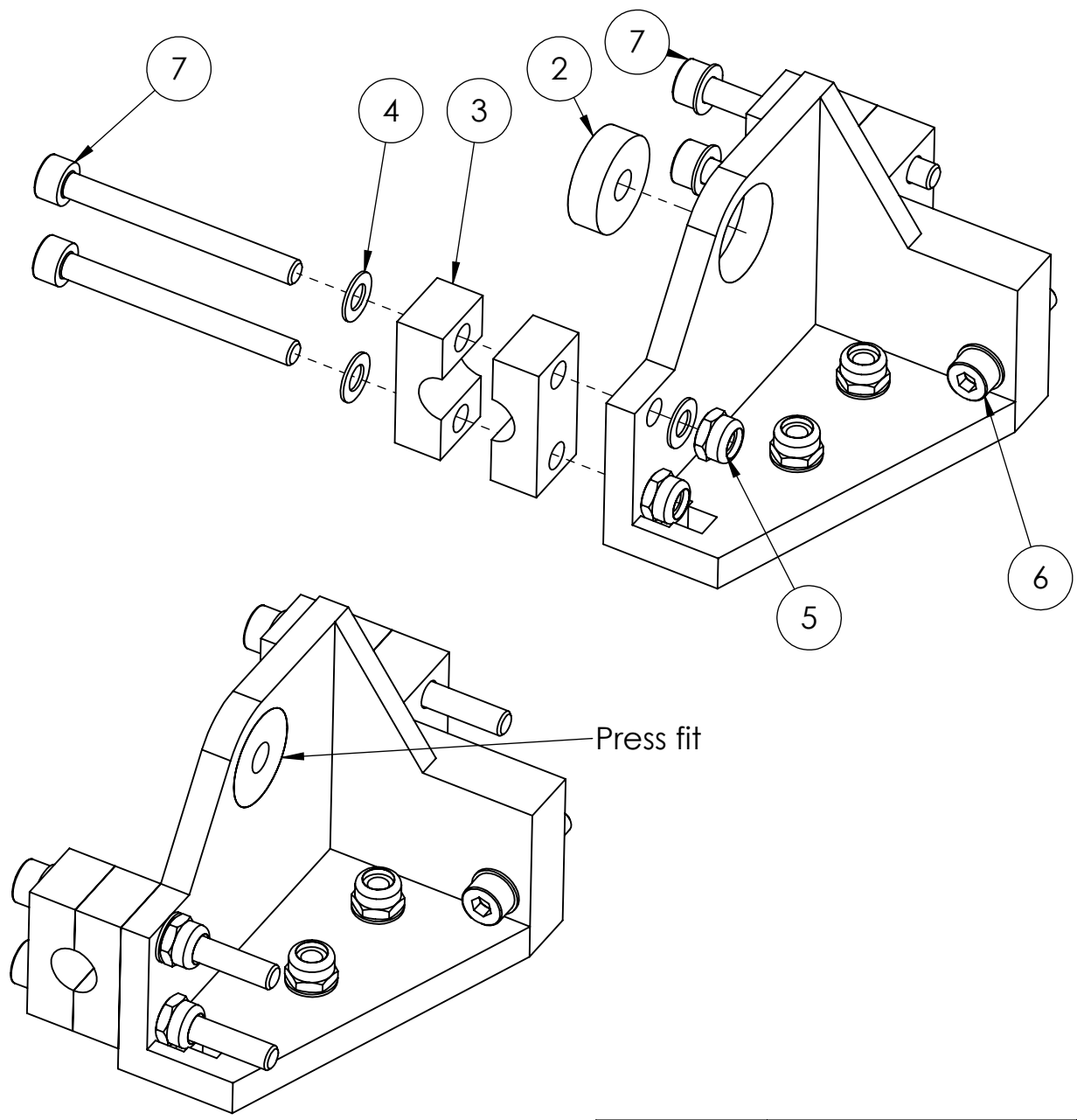
DEBUR AND
 BREAK SHARP
 EDGES

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REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		22-02-14
CHK'D			
APPV'D			
MFG			
Q.A			
SolidWorks Student Edition. For Academic Use Only.			8mm steel smooth rod WEIGHT:

TITLE:		<h1>Hopper smooth rod</h1>
DWG NO.	A4	
SCALE:1:3	SHEET 1 OF 1	



ITEM NO.	PART NUMBER	QTY.
1	Hopper rod clamp	1
2	Vitamins 625 bearing	1
3	Hopper smooth rod clamp	4
4	Washer M4	8
5	Nut M4 selflocking	4
6	Cil screw M4 x 20	1
7	Cil screw M4 x 40	4

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 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:
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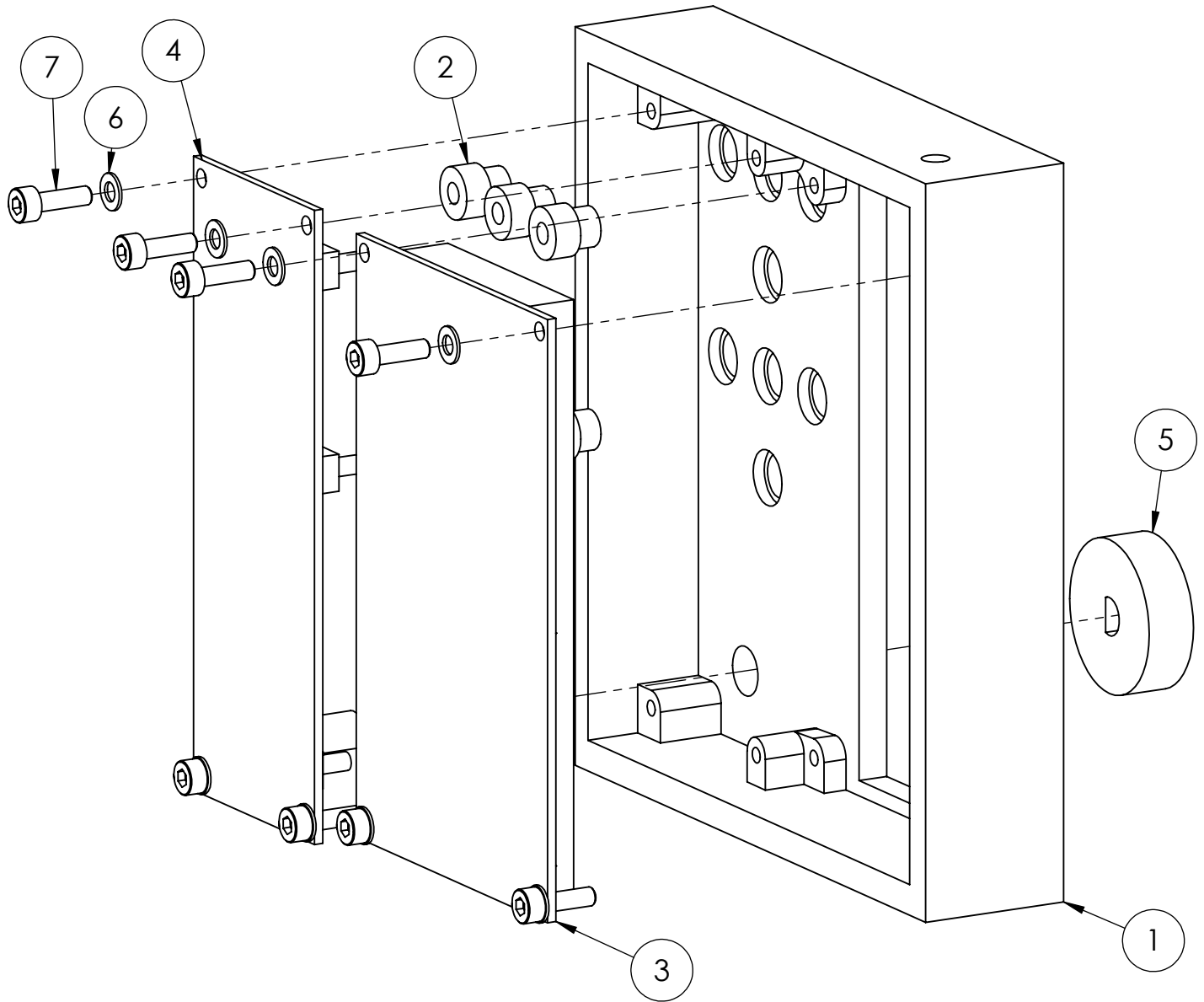
DO NOT SCALE DRAWING
 REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		23-02-14
CHK'D			
APPV'D			
MFG			
Q.A			
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WEIGHT:			

TITLE:
**Hopper subassembly
 driver holder**

DWG NO. A4

SCALE:1:1 SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Hopper GUI holder	1
2	Hopper GUI button	8
3	4x20 LCD	1
4	Keypad	1
5	Hopper Rotary	1
6	Washer M3	8
7	Cil screw M3 x 10	8

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MILLIMETERS
 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:

FINISH:

DEBUR AND
 BREAK SHARP
 EDGES

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REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		21-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

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TITLE:

Hopper subassembly GUI

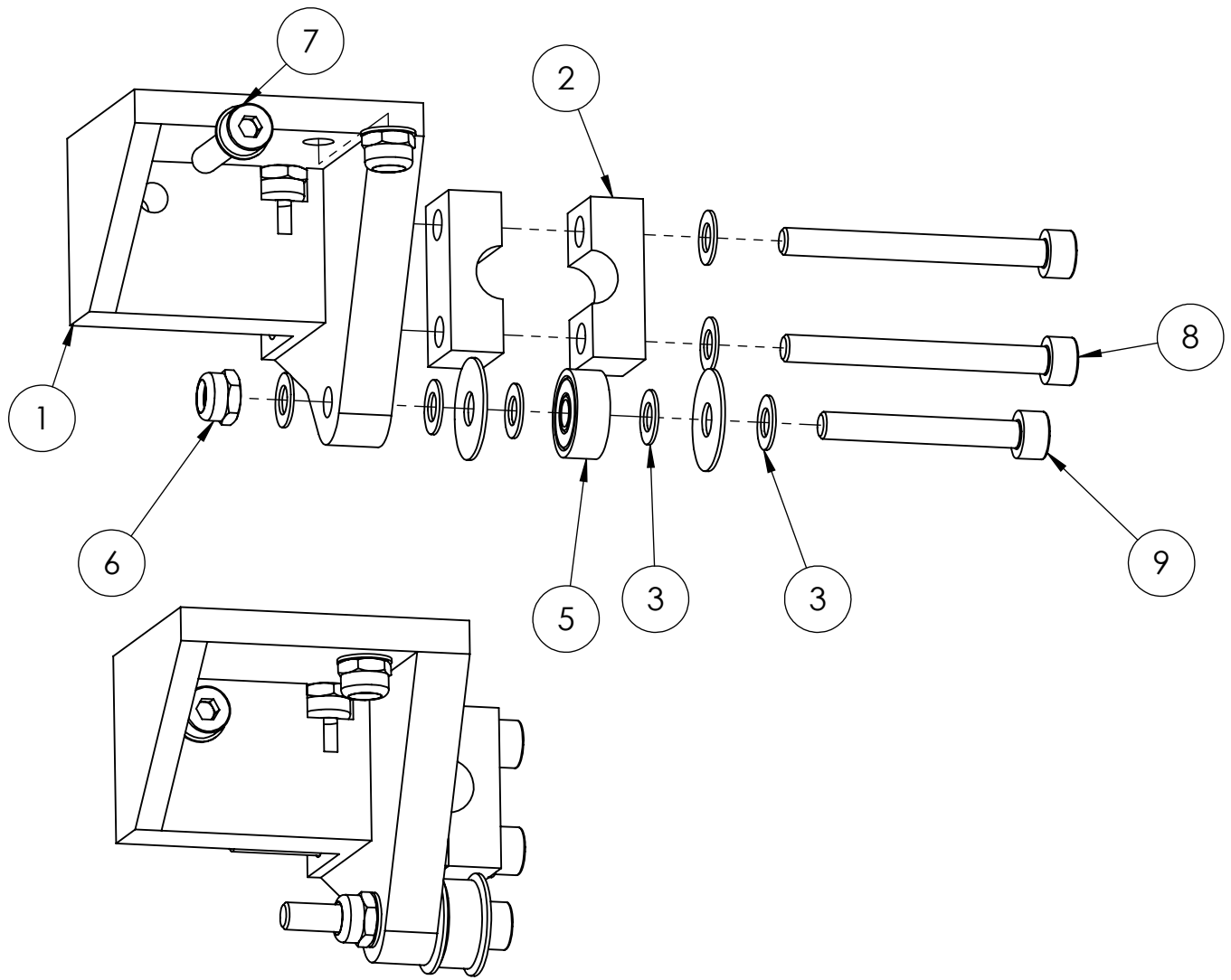
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Hopper Idler mirror	1
2	Hopper smooth rod clamp	2
3	Washer M4	9
4	Fender washer M5	2
5	Vitamins 624 bearing	1
6	Nut M4 selflocking	3
7	Cil screw M4 x 20	1
8	Cil screw M4 x 40	2
9	Cil screw M4 x 30	1

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MILLIMETERS
 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:

FINISH:

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 BREAK SHARP
 EDGES

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REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		23-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

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TITLE:

**Hopper subassembly
 idler mirror**

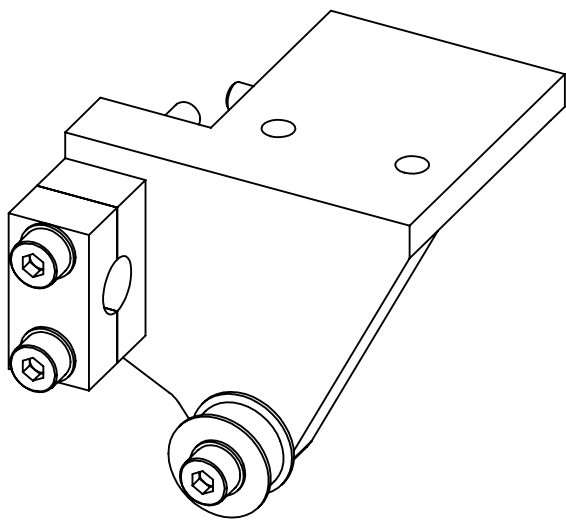
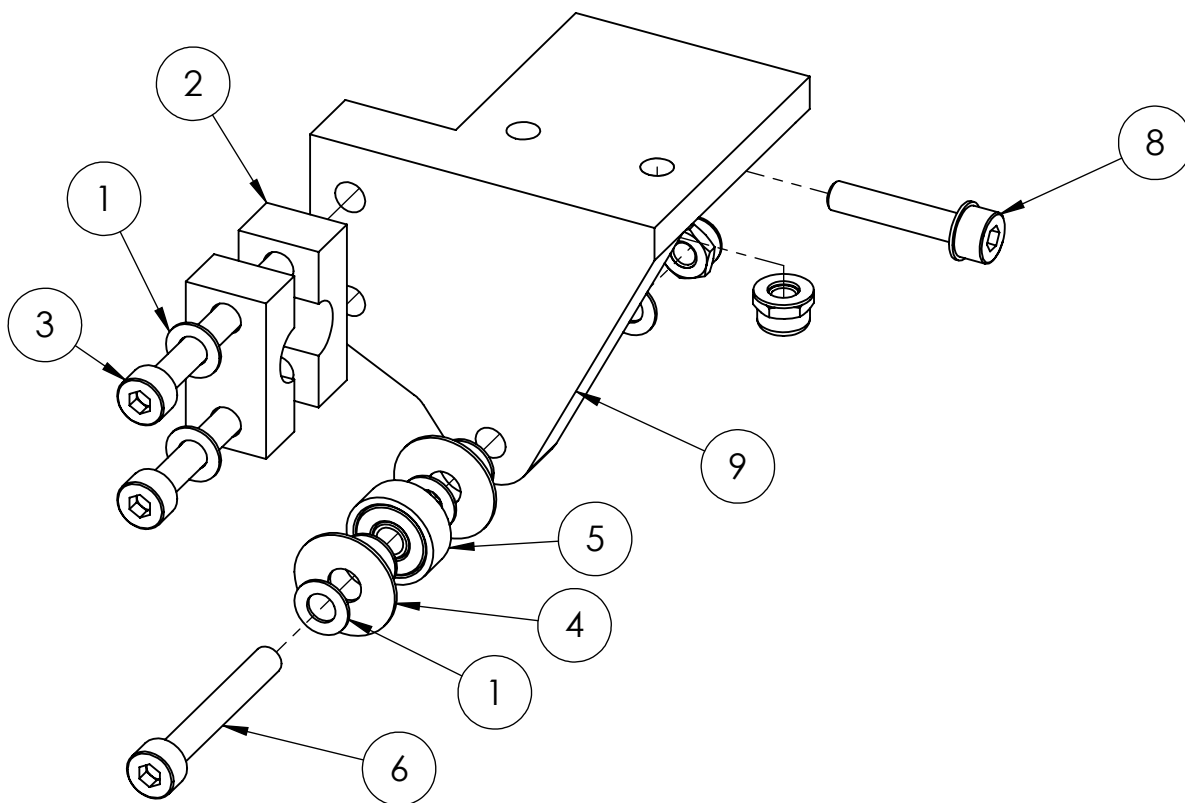
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Washer M4	9
2	Hopper smooth rod clamp	2
3	Cil screw M4 x 40	2
4	Fender washer M5	2
5	Vitamins 624 bearing	1
6	Cil screw M4 x 30	1
7	Nut M4 selflocking	3
8	Cil screw M4 x 20	1
9	Hopper Idler	1

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 LINEAR:
 ANGULAR:

FINISH:

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 EDGES

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REVISION

	NAME	SIGNATURE	DATE		
DRAWN	Yvo de Haas		23-02-14		
CHK'D					
APPV'D					
MFG					
Q.A					

TITLE:

Hopper subassembly idler

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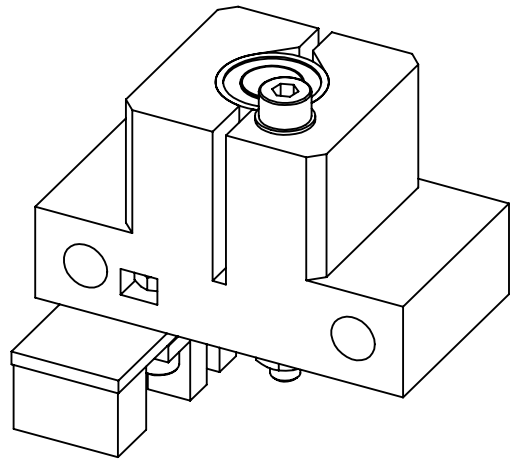
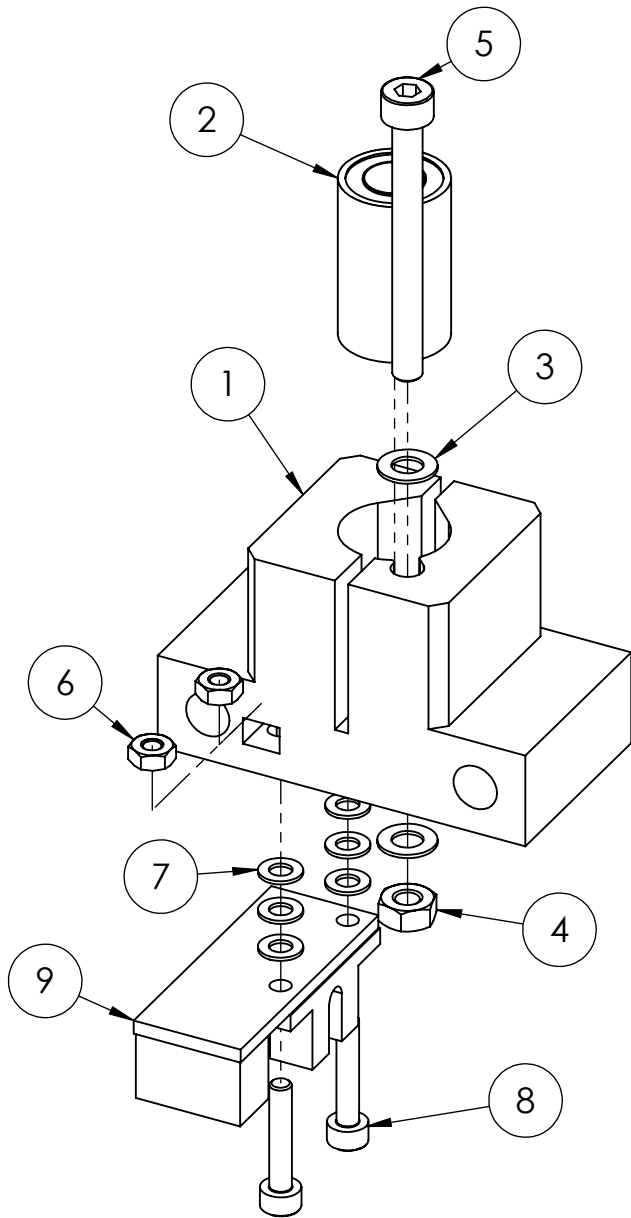
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Hopper LM8UU holder	1
2	Vitamins LM8UU bearing	1
3	Washer M4	2
4	Nut M4	1
5	Cil screw M4 x 40	1
6	Nut M3	2
7	Washer M3	6
8	Cil screw M3 x 16	2
9	Endstop	1

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MILLIMETERS
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 LINEAR:
 ANGULAR:

FINISH:

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 BREAK SHARP
 EDGES

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REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		21-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

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TITLE:

Hopper Subassembly linear
 guide with endstop

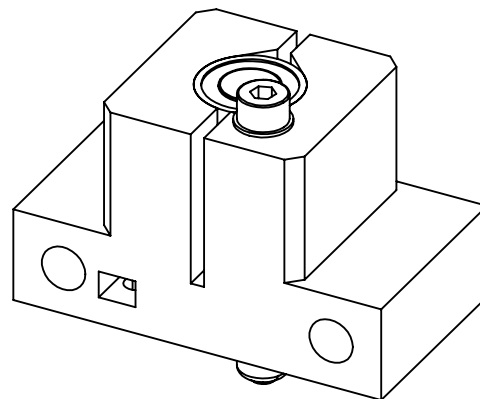
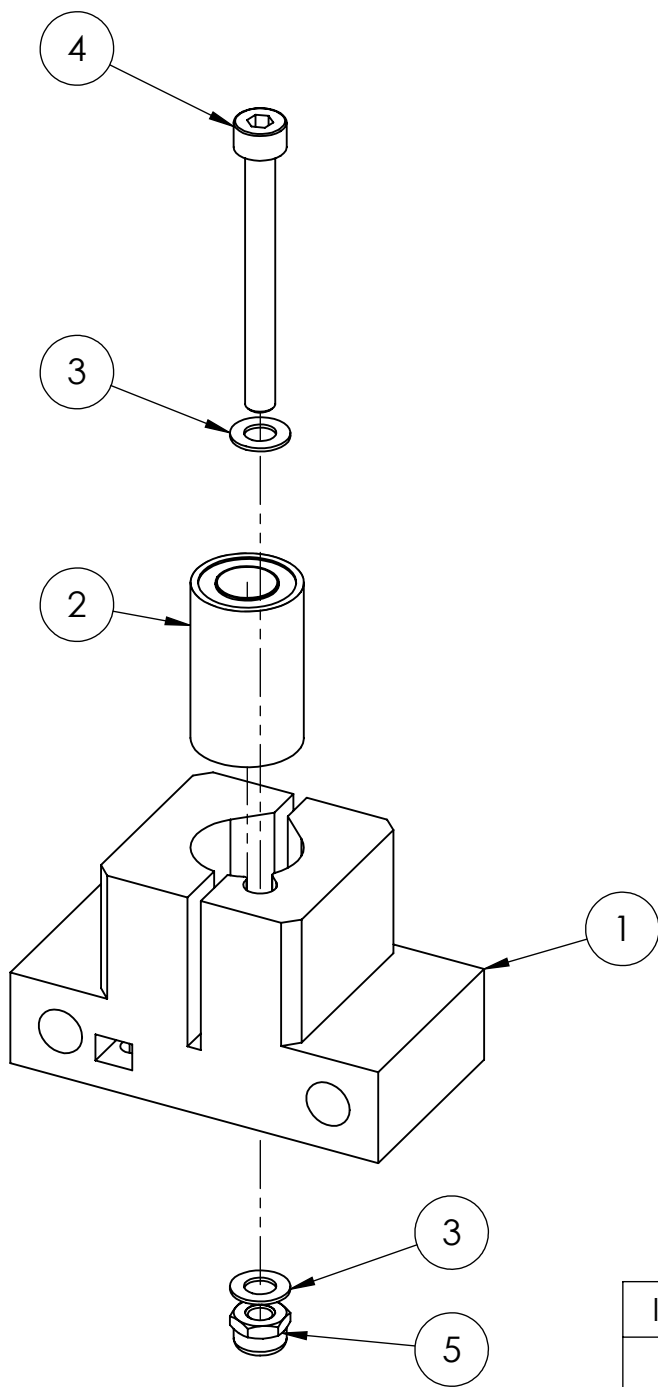
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Hopper LM8UU holder	1
2	Vitamins LM8UU bearing	1
3	Washer M4	2
4	Cil screw M4 x 40	1
5	Nut M4 selflocking	1

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

FINISH:

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BREAK SHARP
EDGES

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REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		21-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

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TITLE:

**Hopper Subassembly linear
guide WO endstop**

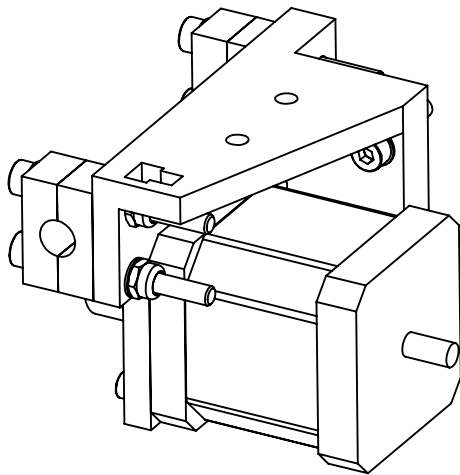
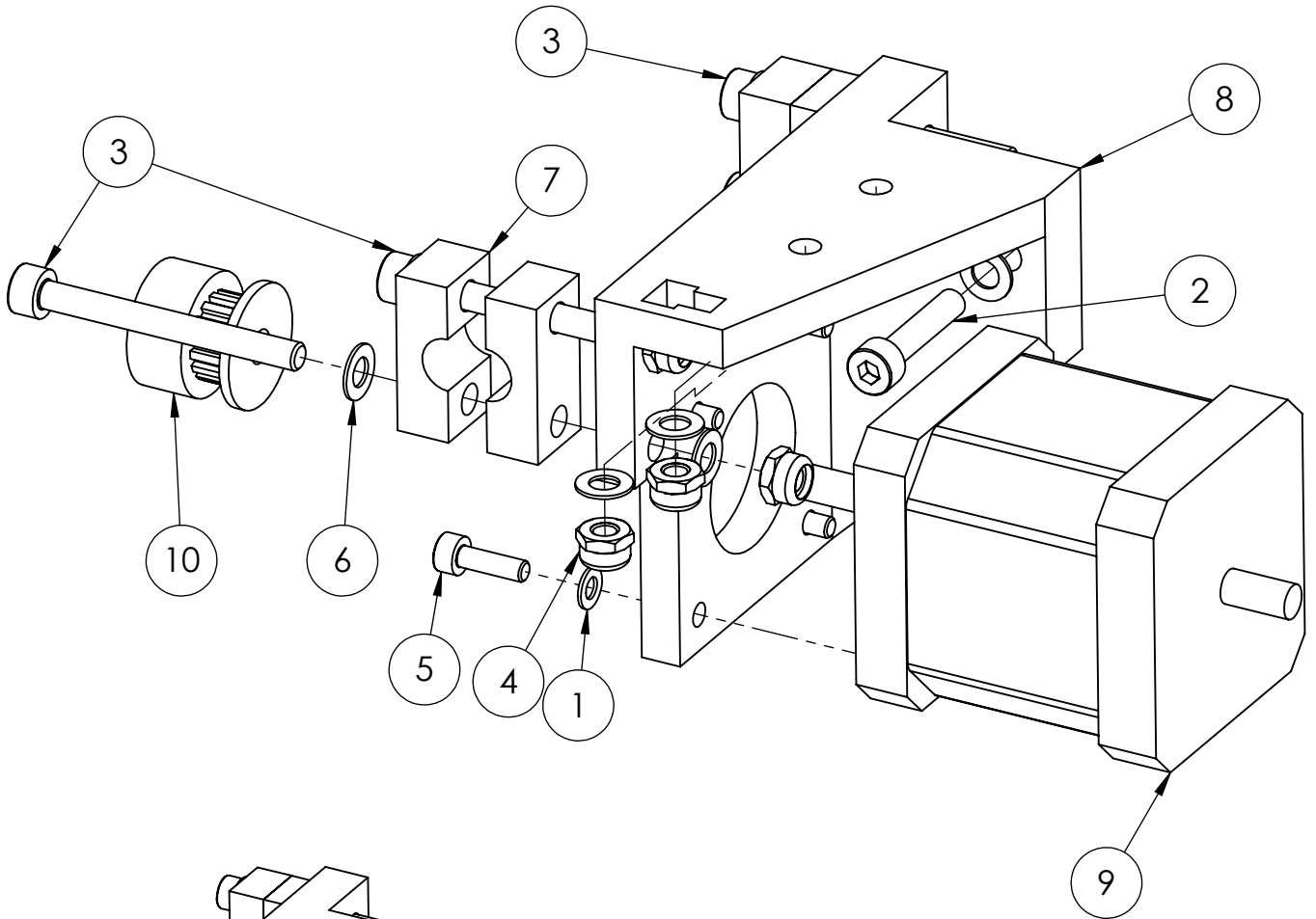
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Washer M3	4
2	Cil screw M4 x 20	1
3	Cil screw M4 x 40	4
4	Nut M4 selflocking	4
5	Cil screw M3 x 10	4
6	Washer M4	8
7	Hopper smooth rod clamp	4
8	Hopper motor holder	1
9	Motor Stepper NEMA17 double	1
10	T2.5 16T poelie	1

UNLESS OTHERWISE SPECIFIED:
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 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:

FINISH:

DEBUR AND
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 EDGES

DO NOT SCALE DRAWING

REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		23-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

TITLE:

Hopper subassembly
 motor holder

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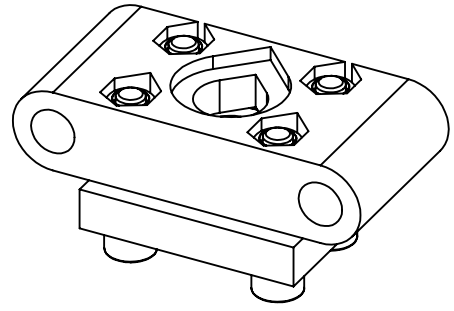
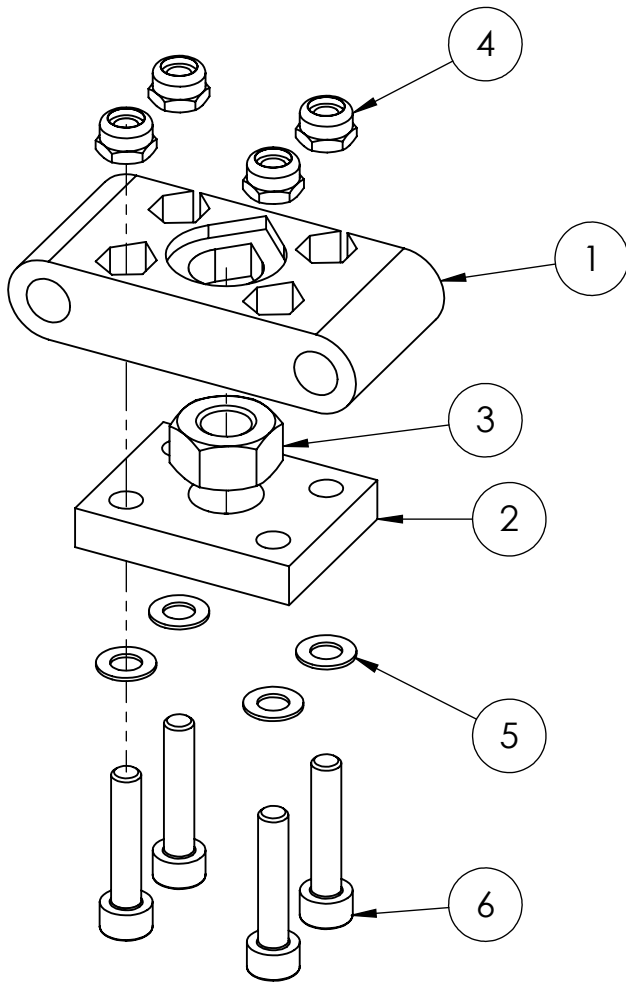
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Hopper Nut trap	1
2	Hopper Nut trap nut holder	1
3	Nut M8	1
4	Nut M4 selflocking	4
5	Washer M4	4
6	Cil screw M4 x 20	4

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 DIMENSIONS ARE IN MILLIMETERS
 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:

FINISH:

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 EDGES

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REVISION

	NAME	SIGNATURE	DATE	
DRAWN	Yvo de Haas		21-02-14	
CHK'D				
APPV'D				
MFG				
Q.A				

TITLE:

Hopper Subassembly Nut trap

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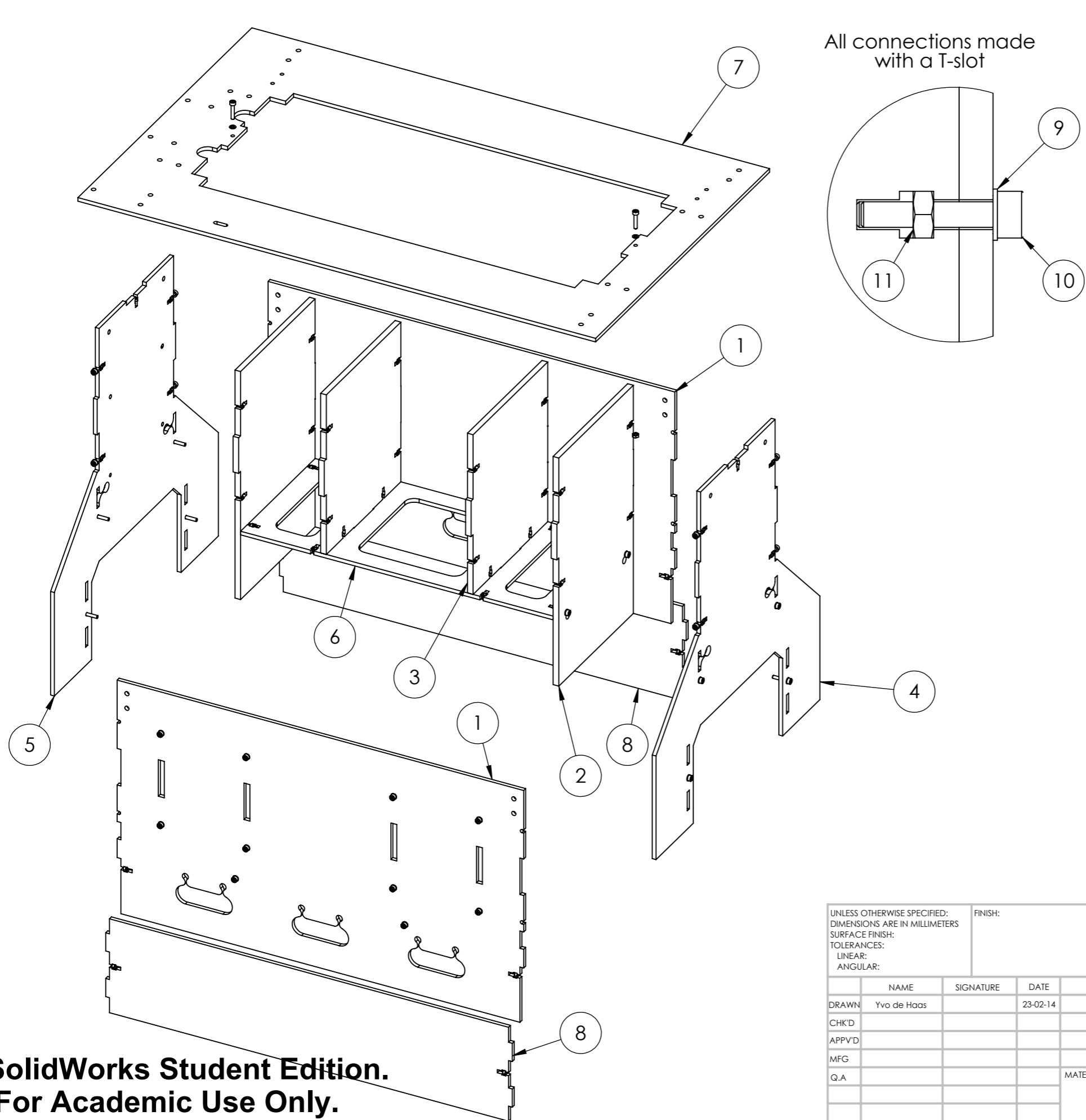
DWG NO.

A4

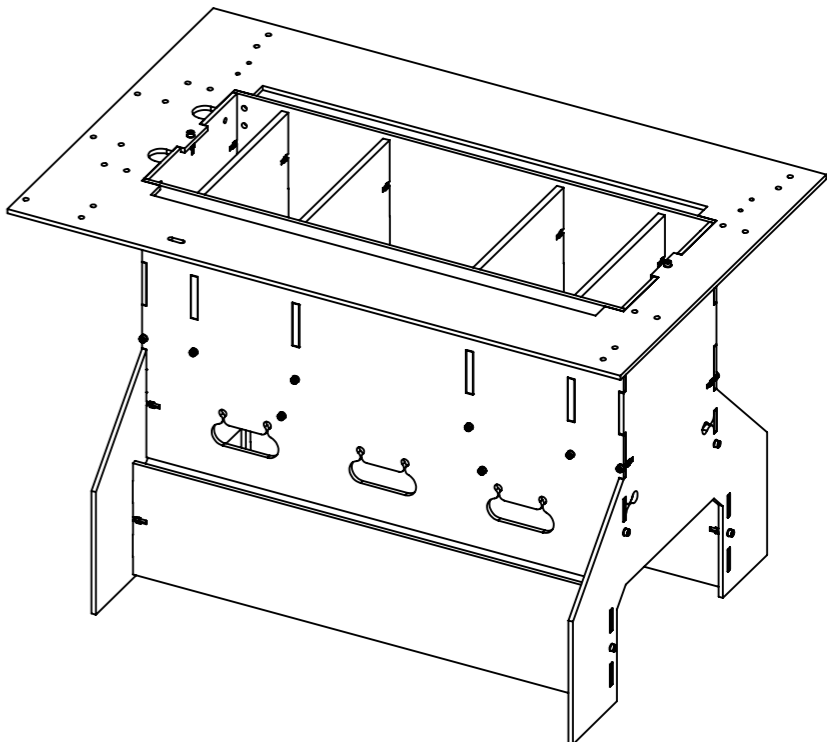
WEIGHT:

SCALE:1:1

SHEET 1 OF 1



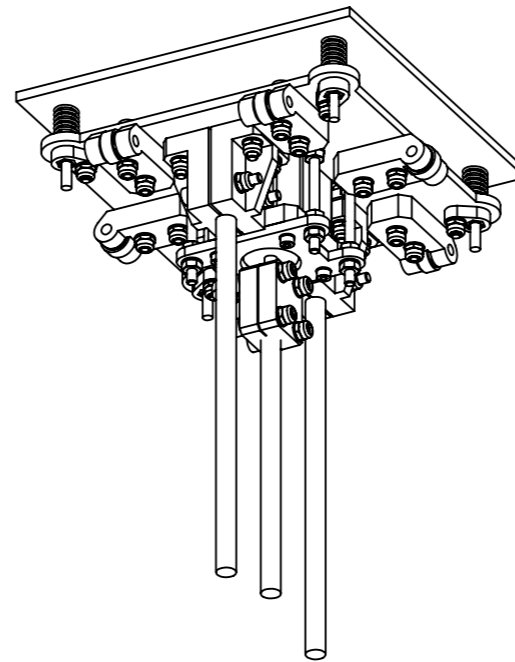
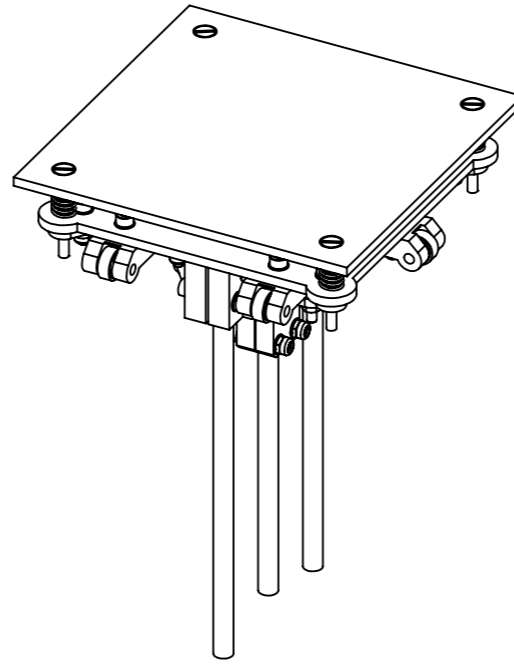
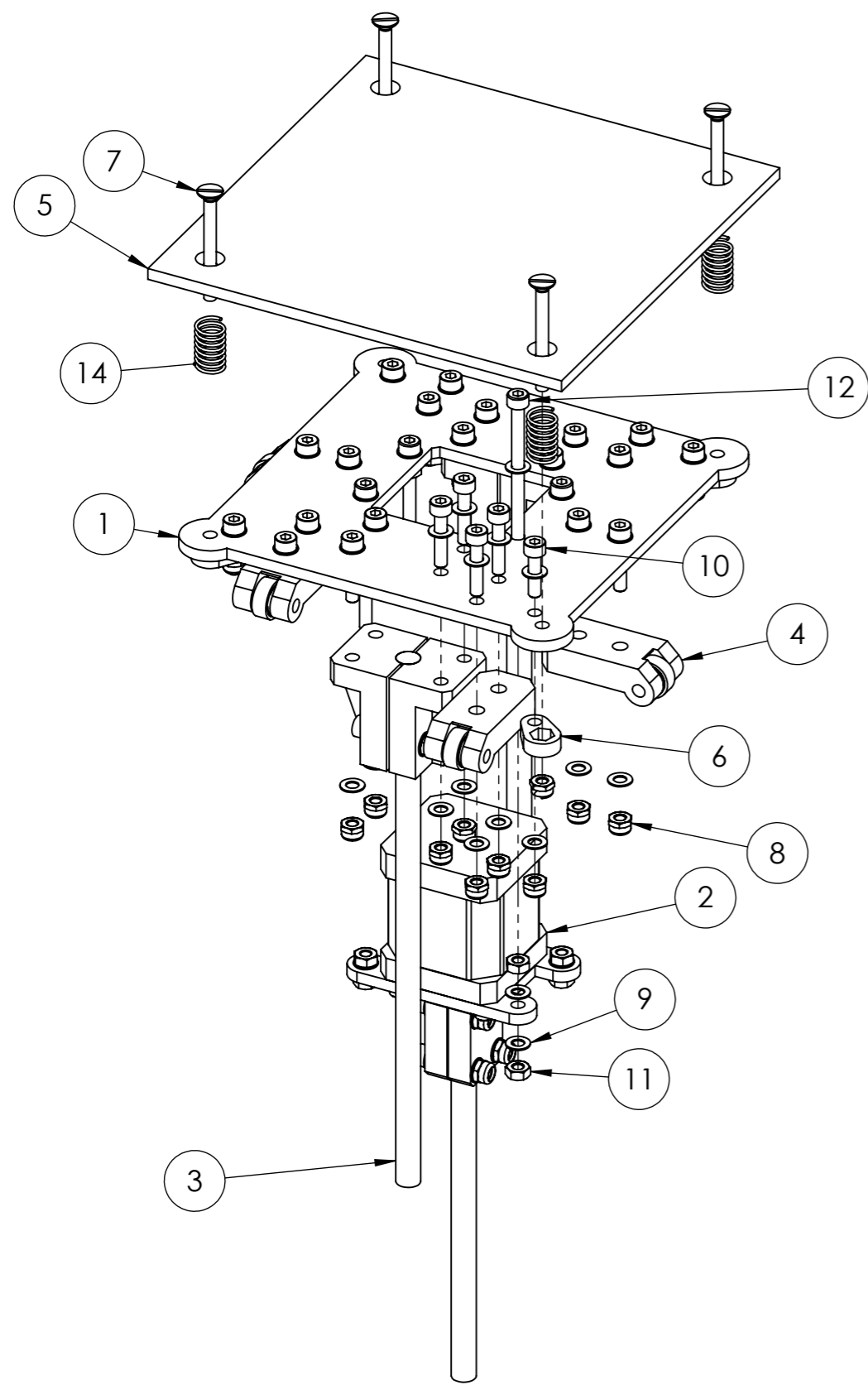
All connections made with a T-slot



ITEM NO.	PART NUMBER	QTY.
1	Hopper hopper side	2
2	Hopper hopper feedwall	2
3	Hopper hopper wall	2
4	Hopper hopper backwall	1
5	Hopper hopper backwall with megamount	1
6	Hopper Bottom brace	1
7	Hopper Top surface	1
8	Hopper hopper Legbrace	2
9	Washer M3	46
10	Cil screw M3 x 16	46
11	Nut M3	42

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:	DEBUR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION
DRAWN	Yvo de Haas	SIGNATURE	DATE	23-02-14		TITLE: Hopper subassembly sheetmetal hopper	
CHK'D						DWG NO.	A3
APPV'D						SCALE:1:4	SHEET 1 OF 1
MFG					MATERIAL:		
Q.A					WEIGHT:		

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ITEM NO.	PART NUMBER	QTY.
1	Piston Build frame	1
2	Piston Subassembly motor holder	1
3	Piston Subassembly smooth rod holder	2
4	Piston Subassembly Wallguide large	6
5	Piston Build surface	1
6	Piston Nut trap	4
7	Sunk screw M4 x 40	4
8	Nut M4 selflocking	28
9	Washer M4	64
10	Cil screw M4 x 16	4
11	Nut M4	12
12	Cil screw M4 x 50	4
13	Cil screw M4 x 20	20
14	Spring	4

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBUR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
DRAWN				NAME		SIGNATURE		DATE		TITLE:	
CHK'D				Yvo de Haas				23-02-14		Piston Build assembly	
APPV'D										DWG NO.	
MFG										A3	
Q.A										SCALE:1:2	
										SHEET 1 OF 2	
										WEIGHT:	

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ITEM NO.	PART NUMBER	QTY.
1	Piston Build frame	1
2	Piston Motor holder	1
3	Motor Stepper NEMA17	1
4	Washer M3	4
5	Cil screw M3 x 10	4
6	Washer M4	80
7	Nut M4 selflocking	36
8	Cil screw M4 x 20	24
9	Piston driver clamp	2
10	Piston Lead screw M8	1
11	Piston Smooth rod holder	4
12	Piston Guide smooth rod 8mm	2
13	Cil screw M4 x 30	4
14	Pistons wallguide	6
15	Vitamins 624 bearing	6
16	Piston Build surface	1
17	Piston Nut trap	4
18	Sunk screw M4 x 40	4
19	Cil screw M4 x 16	4
20	Nut M4	12
21	Cil screw M4 x 50	4
22	Spring	4

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FINISH:

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	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		23-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

TITLE: **Piston Build assembly (full BOM)**

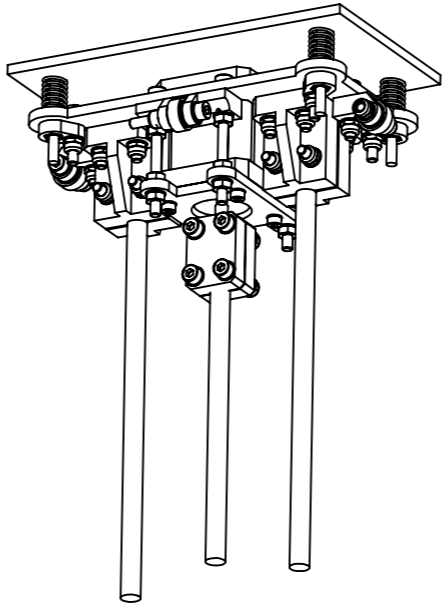
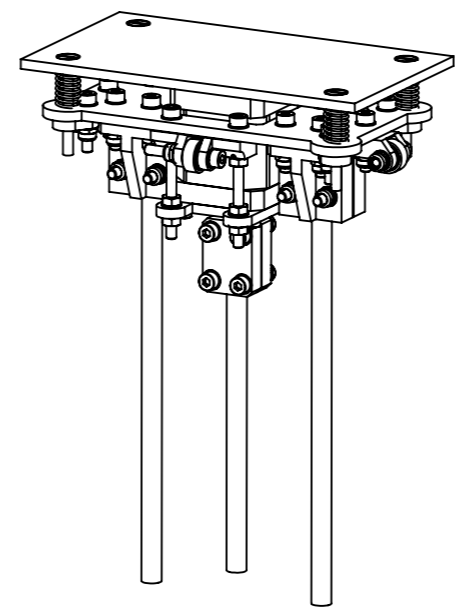
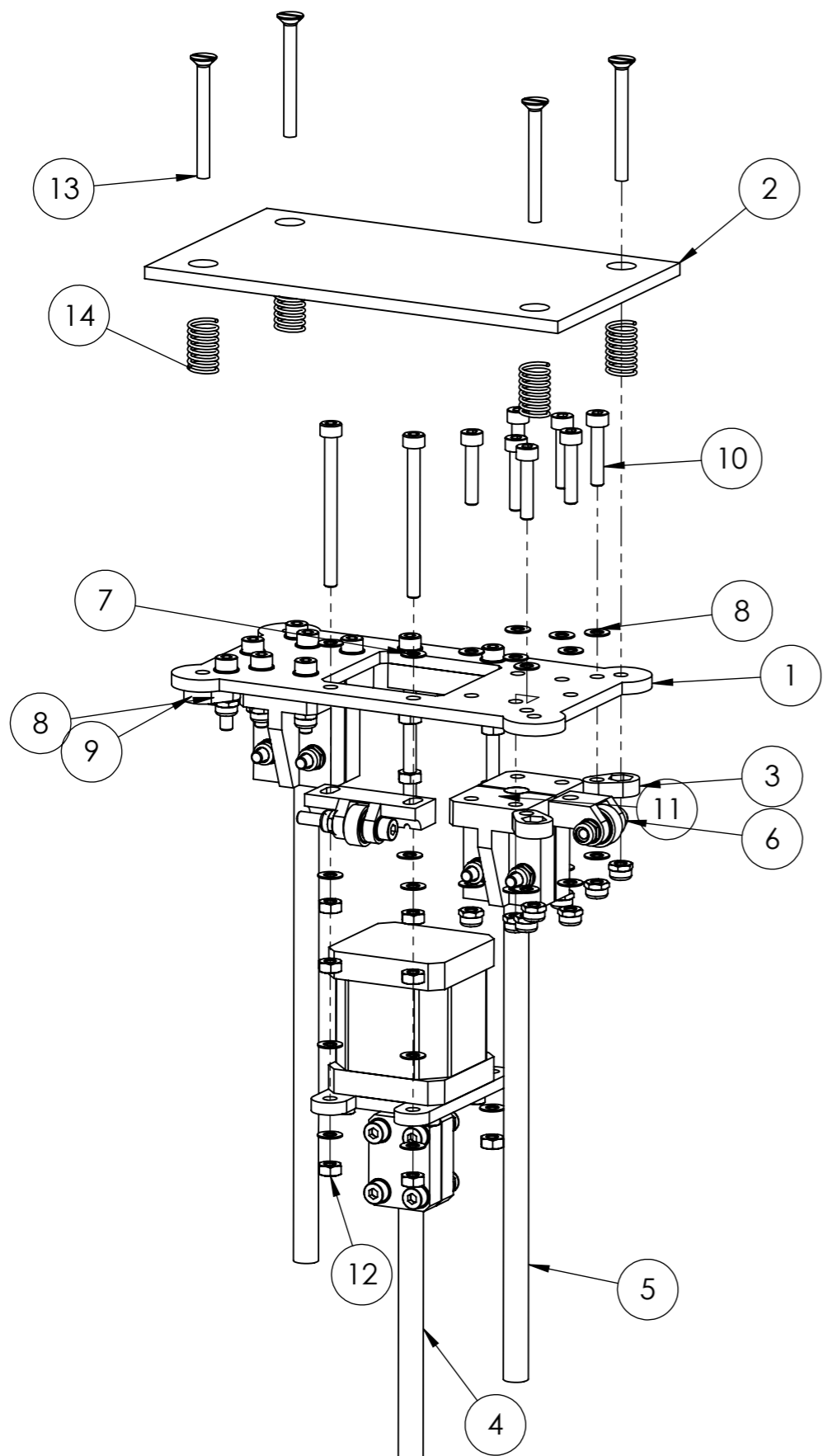
DWG. NO. _____

SCALE: 1:2

SHEET 2 OF 2

A4

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ITEM NO.	PART NUMBER	QTY.
1	Piston Feed frame	1
2	Piston Feed surface	1
3	Piston Nut trap	4
4	Piston Subassembly motor holder	1
5	Piston Subassembly smooth rod holder	2
6	Piston Subassembly Wallguide micro	2
7	Piston Subassembly Wallguide wide	2
8	Washer M4	44
9	Nut M4 selflocking	18
10	Cil screw M4 x 20	14
11	Cil screw M4 x 50	4
12	Nut M4	12
13	Sunk screw M4 x 40	4
14	Spring	4

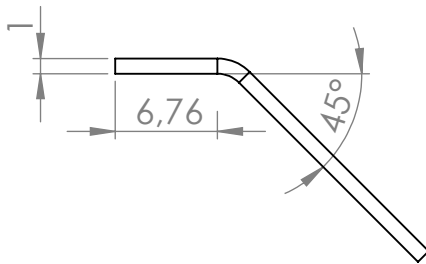
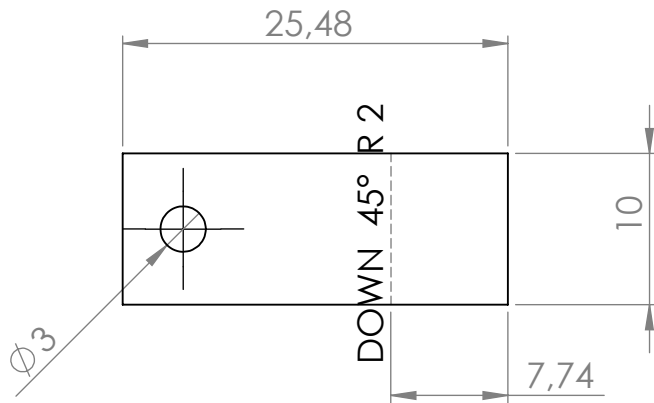
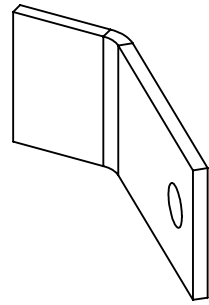
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NAME	SIGNATURE	DATE			TITLE: Piston Feed assembly	
DRAWN Yvo de Haas		21-02-14			DWG NO.	A3
CHK'D						
APPV'D						
MFG						
Q.A			MATERIAL:			
			WEIGHT:		SCALE:1:2	SHEET 1 OF 2

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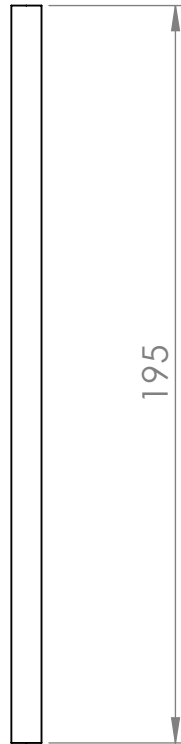
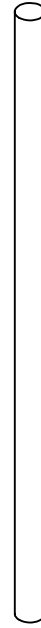
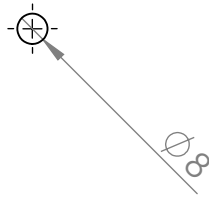
PART NUMBER	QTY.
Piston Feed frame	1
Piston Feed surface	1
Piston Nut trap	4
Piston Motor holder	1
Motor Stepper NEMA17	1
Washer M3	4
Cil screw M3 x 10	4
Washer M4	76
Nut M4 selflocking	30
Cil screw M4 x 20	20
Piston driver clamp	2
Piston Lead screw M8	1
Piston Smooth rod holder	4
Piston Guide smooth rod 8mm	2
Cil screw M4 x 30	6
Piston wallguide micro	2
Vitamins 624 bearing	4
Piston wallguide micro wide	2
Cil screw M4 x 50	4
Nut M4	12
Sunk screw M4 x 40	4
Spring	4

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NAME	SIGNATURE	DATE	TITLE:			
DRAWN Yvo de Haas		21-02-14	Piston Feed assembly			
CHK'D						
APPV'D						
MFG						
Q.A.			DWG. NO.		A4	
WEIGHT:			SCALE:1:2		SHEET 2 OF 2	

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DRAWN Yvo de Haas				SIGNATURE		DATE 23-02-14		<p style="text-align: center; font-size: 2em;">Piston flag</p>			
CHK'D											
APPV'D											
MFG											
Q.A											
<p style="text-align: center;">SolidWorks Student Edition. For Academic Use Only.</p>				MATERIAL		Auminum 1mm		DWG NO.		A4	
				WEIGHT:		SCALE:2:1		SHEET 1 OF 1			



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LINEAR:
ANGULAR:

FINISH:

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CHK'D					
APPV'D					
MFG					
Q.A					

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8mm steel smooth rod

WEIGHT:

TITLE:

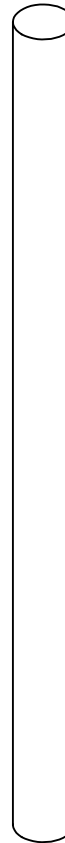
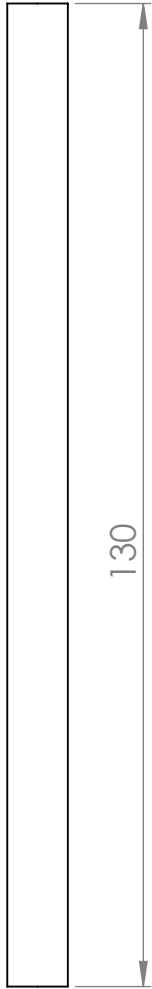
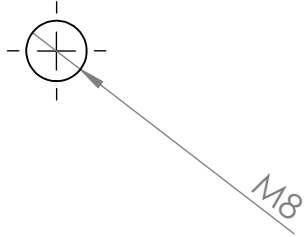
Piston Guide Smooth rod m8

DWG NO.

A4

SCALE:1:2

SHEET 1 OF 1



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REVISION

NAME	SIGNATURE	DATE		
DRAWN Yvo de Haas		22-02-14		
CHK'D				
APPV'D				
MFG				
Q.A				
		WEIGHT:		

TITLE:

Piston Lead screw M8

DWG NO.

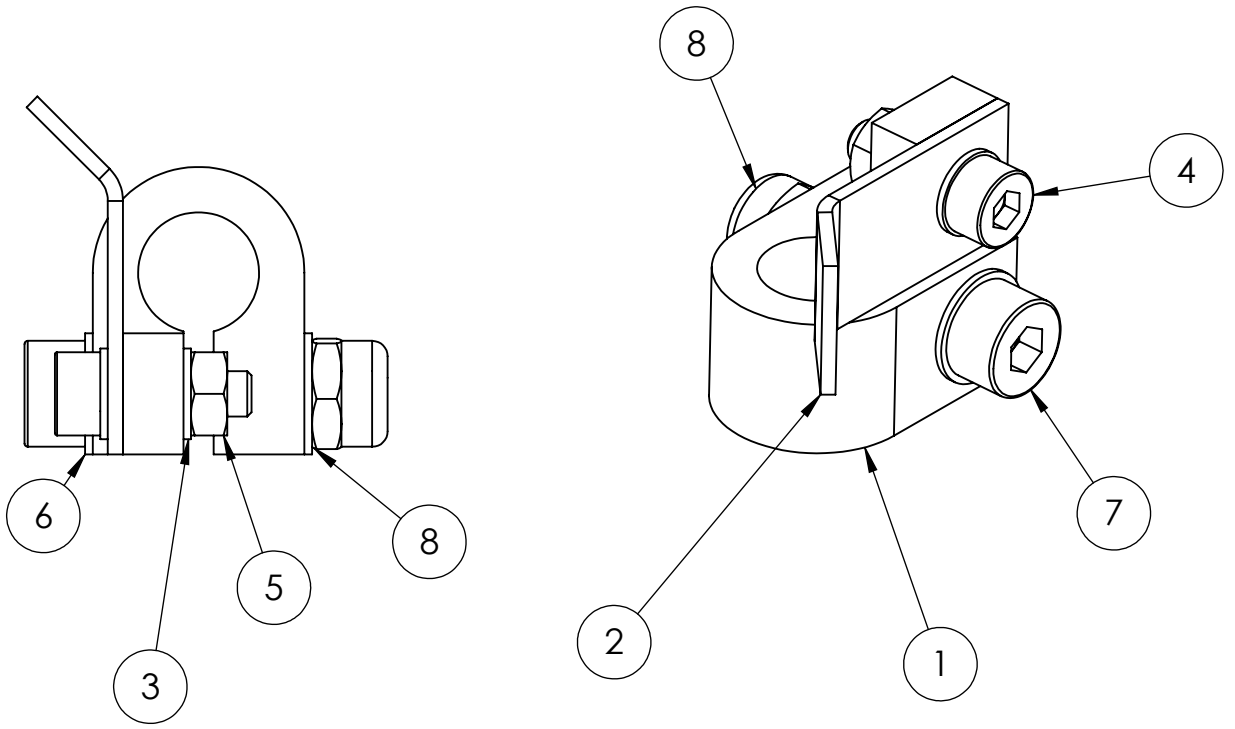
A4

SCALE:1:1

SHEET 1 OF 1

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M8 steel threaded rod



ITEM NO.	PART NUMBER	QTY.
1	Piston Flag holder	1
2	Piston Flag	1
3	Washer M3	2
4	Cil screw M3 x 10	1
5	Nut M3	1
6	Washer M4	2
7	Cil screw M4 x 20	1
8	Nut M4 selflocking	1

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REVISION

	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		23-02-14
CHK'D			
APPV'D			
MFG			
Q.A			
WEIGHT:			

TITLE:

Piston Subassembly flag

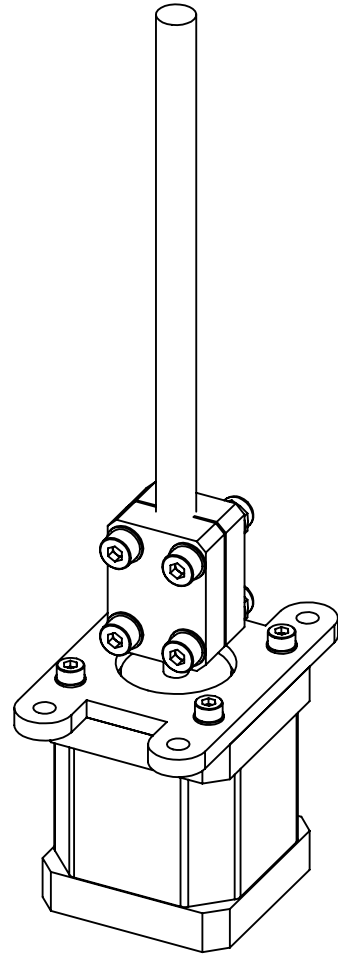
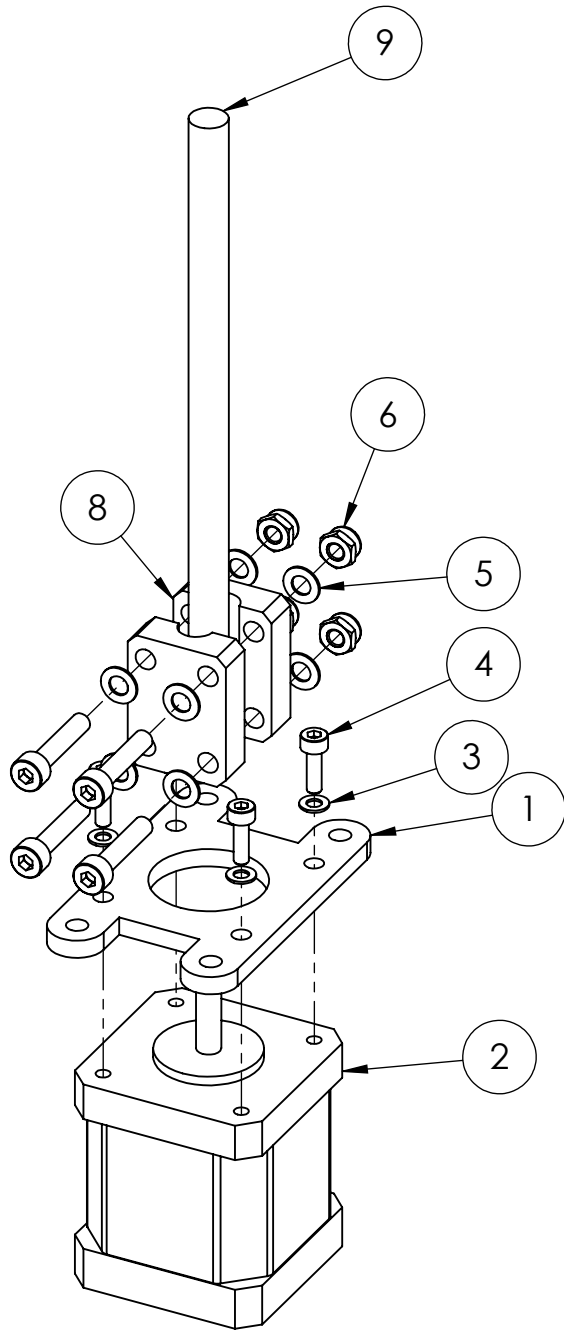
DWG NO.

A4

SCALE:2:1

SHEET 1 OF 1

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ITEM NO.	PART NUMBER	QTY.
1	Piston Motor holder	1
2	Motor Stepper NEMA17	1
3	Washer M3	4
4	Cil screw M3 x 10	4
5	Washer M4	8
6	Nut M4 selflocking	4
7	Cil screw M4 x 20	4
8	Piston driver clamp	2
9	Piston Lead screw M8	1

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	NAME	SIGNATURE	DATE
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APPV'D			
MFG			
Q.A			

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TITLE:

**Piston Subassembly
Motor holder**

DWG NO.

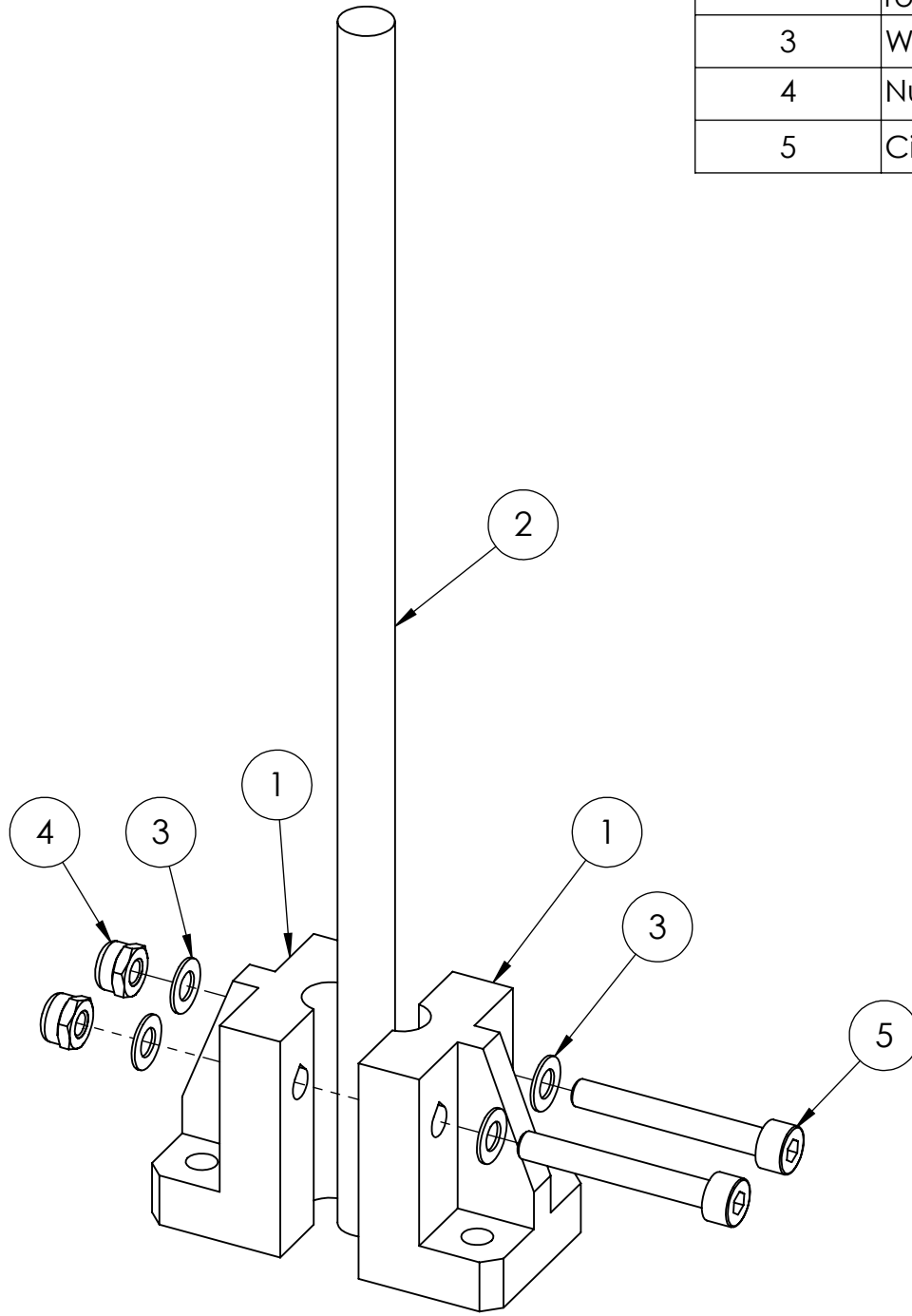
A4

WEIGHT:

SCALE:1:1.5

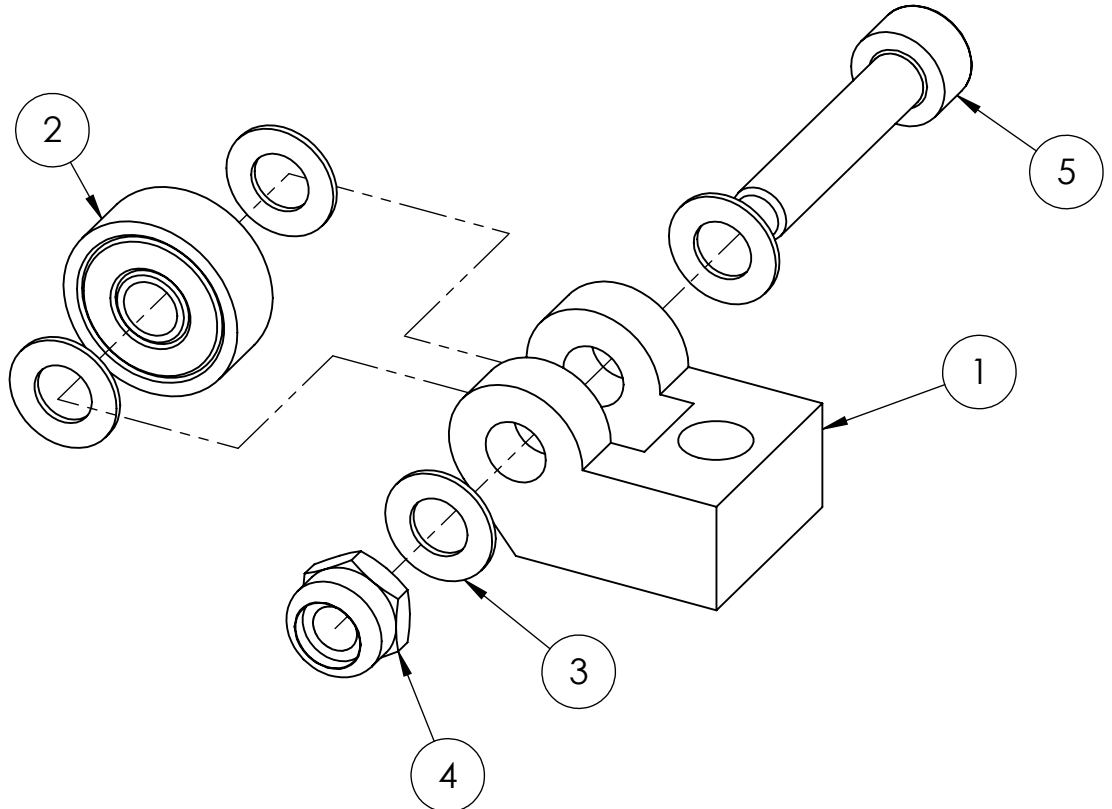
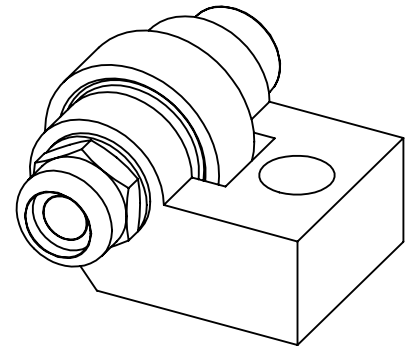
SHEET 1 OF 1

ITEM NO.	PART NUMBER	QTY.
1	Piston Smooth rod holder	2
2	Piston Guide smooth rod 8mm	1
3	Washer M4	4
4	Nut M4 selflocking	2
5	Cil screw M4 x 30	2



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NAME						SIGNATURE						DATE						TITLE: Piston Subassembly smooth rod holder											
DRAWN						Yvo de Haas						21-02-14																	
CHK'D																													
APPV'D																													
MFG																													
Q.A																		DWG NO.						A4					
												WEIGHT:						SCALE:1:1						SHEET 1 OF 1					

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ITEM NO.	PART NUMBER	QTY.
1	Piston wallguide micro	1
2	Vitamins 624 bearing	1
3	Washer M4	4
4	Nut M4 selflocking	1
5	Cil screw M4 x 20	1

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 TOLERANCES:
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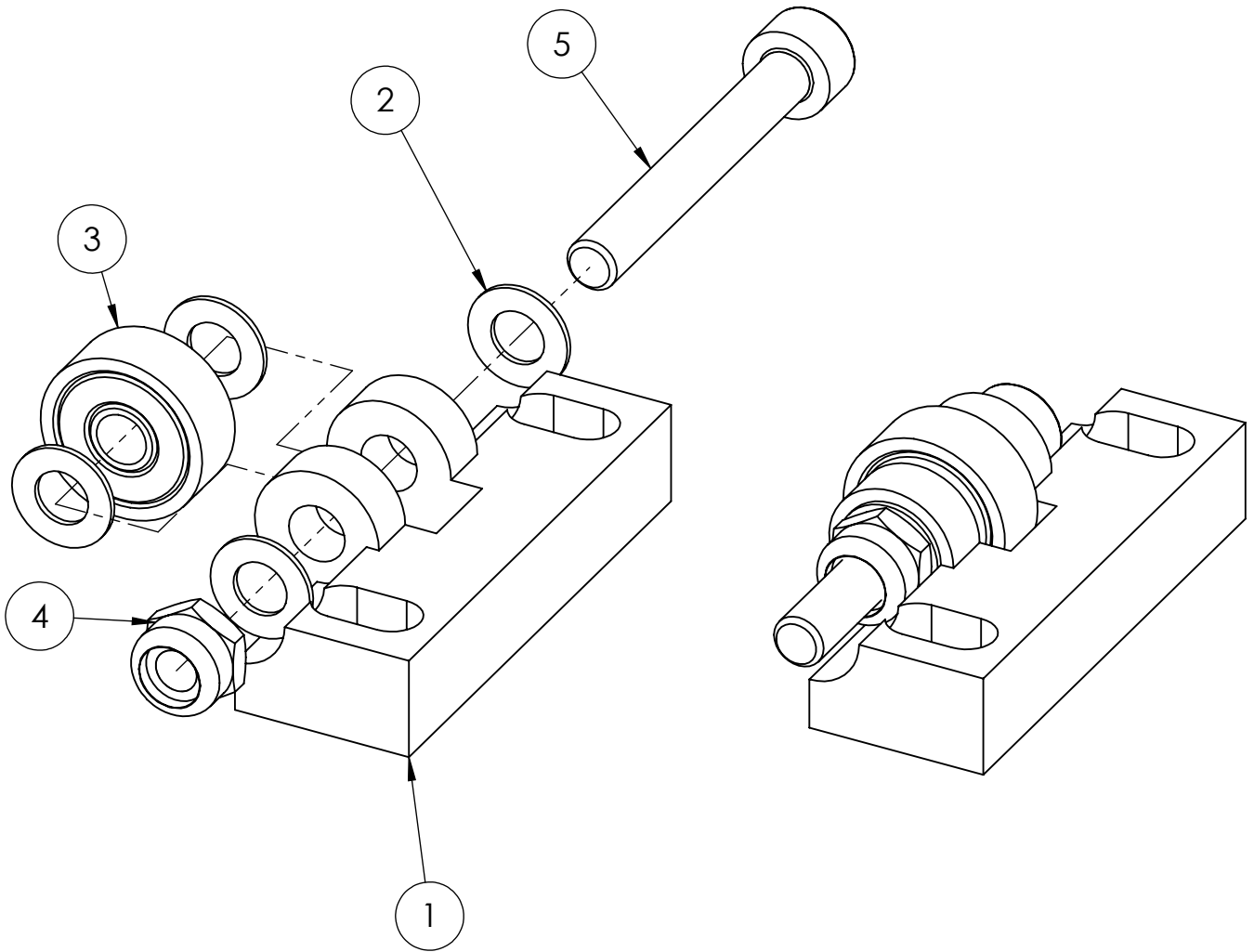
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REVISION

NAME	SIGNATURE	DATE
DRAWN: Yvo de Haas		21-02-14
CHK'D		
APPV'D		
MFG		
Q.A		

TITLE: <h1>Piston Subassembly Waalguide micro</h1>	
DWG. NO.	A4
WEIGHT:	SHEET 1 OF 1
SCALE: 2:1	

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ITEM NO.	PART NUMBER	QTY.
1	Piston wallguide micro wide	1
2	Washer M4	4
3	Vitamins 624 bearing	1
4	Nut M4 selflocking	1
5	Cil screw M4 x 30	1

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 SURFACE FINISH:
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FINISH:

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	NAME	SIGNATURE	DATE
DRAWN	Yvo de Haas		21-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

TITLE:

Piston Subassembly
 Wallguide wide

DWG NO.

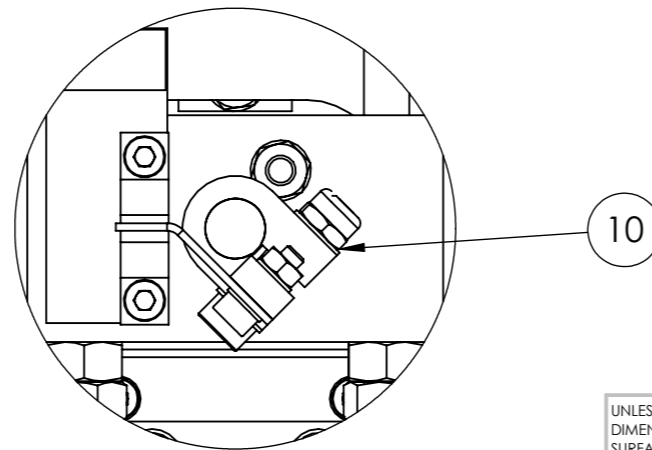
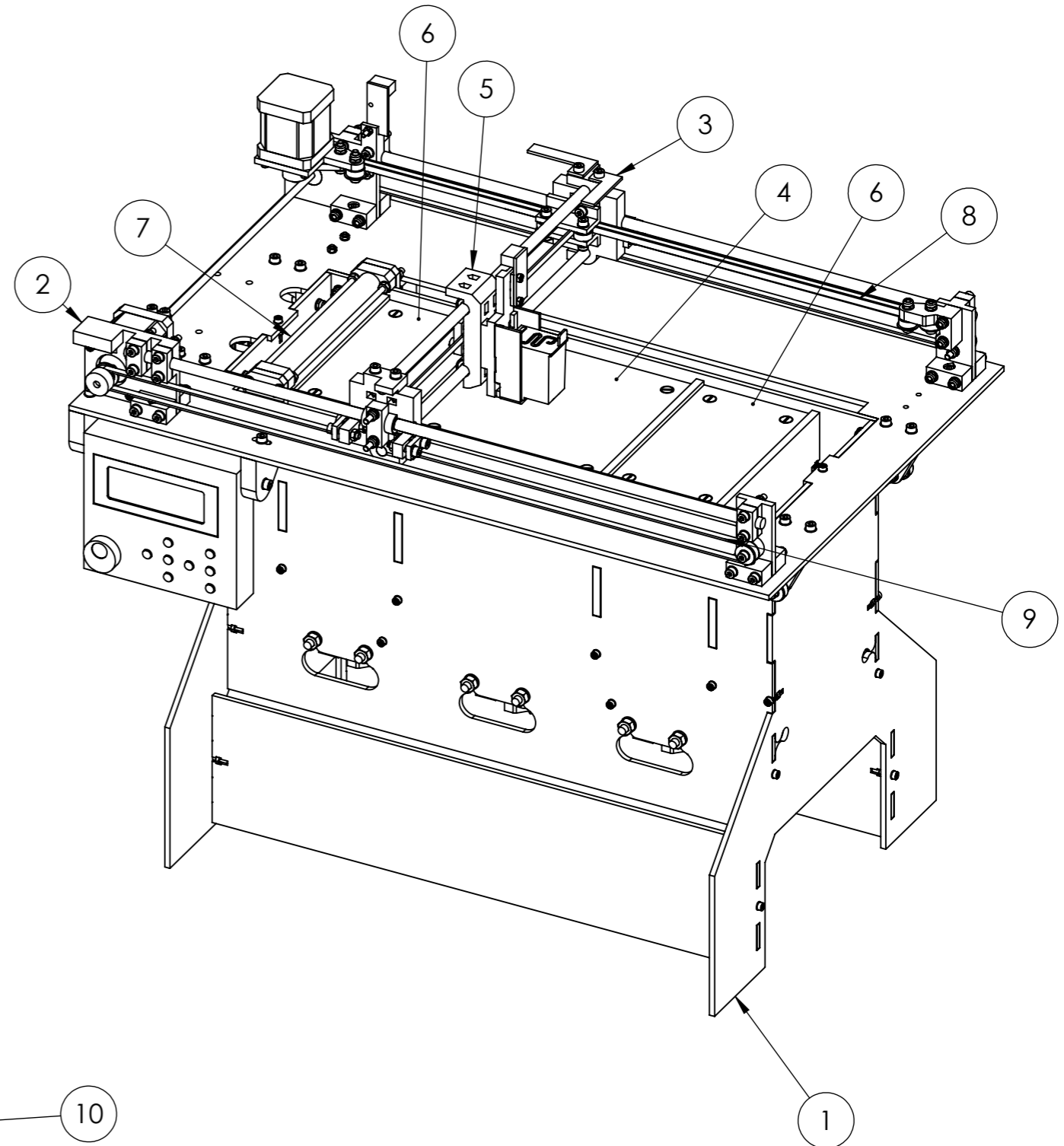
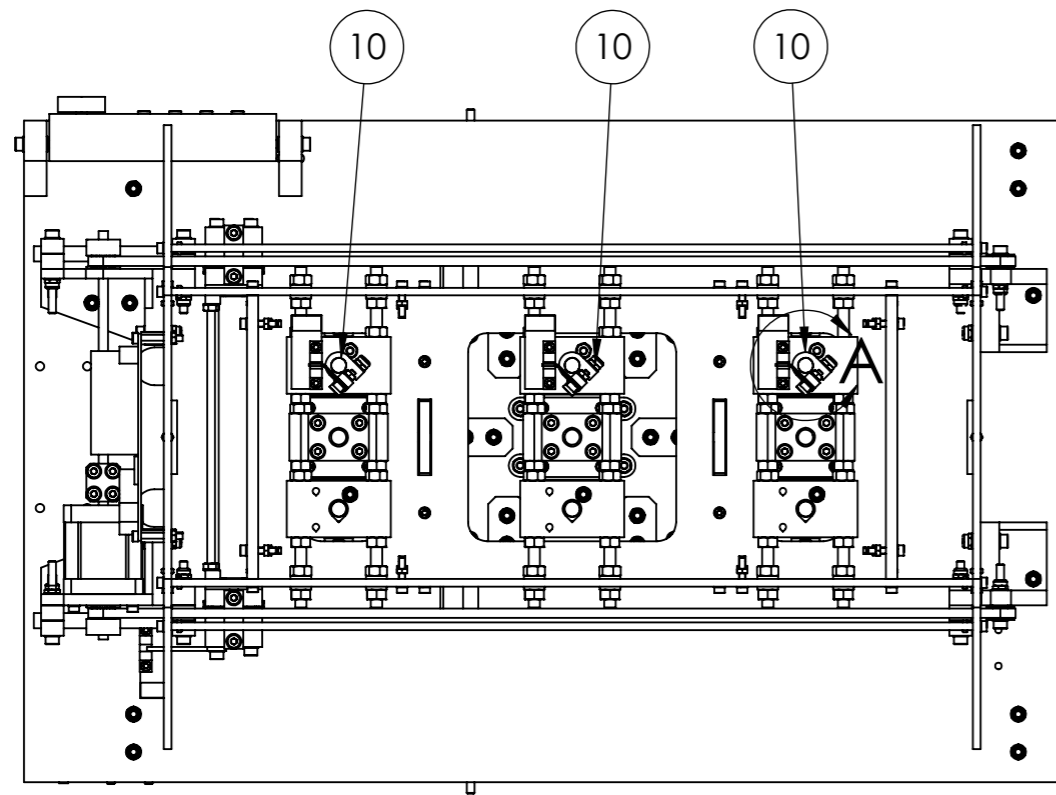
A4

WEIGHT:

SCALE:2:1

SHEET 1 OF 1

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DETAIL A
SCALE 1 : 1

ITEM NO.	PART NUMBER	QTY.
1	Hopper sheetmetal assembly	1
2	X-axis assembly	1
3	Y-axis assembly	1
4	Piston Build assembly	1
5	Carriage assembly	1
6	Piston Feed assembly	2
7	Spreader assembly	1
8	X-axis Y-axis belt	1
9	X-axis belt	2
10	Flag assembly	3

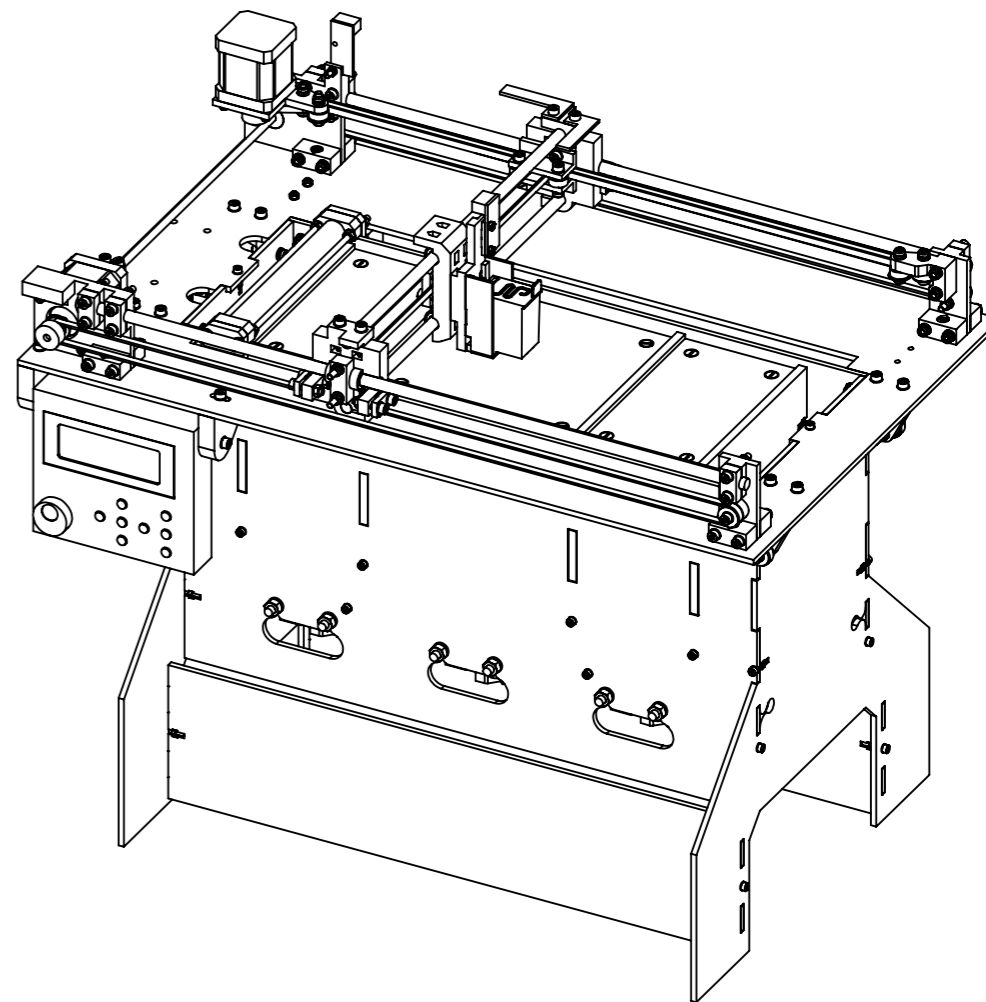
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DRAWN Yvo de Haas			SIGNATURE		DATE 23-02-14		TITLE: Plan B assembly					
CHK'D			APPV'D		MFG		Q.A		MATERIAL:		DWG NO.	
									WEIGHT:		SCALE:1:4	
											SHEET 1 OF 1	
											A3	

PART NUMBER	QTY.
Hopper hopper side	2
Hopper hopper feedwall	2
Hopper hopper wall	2
Hopper hopper backwall	1
Hopper hopper backwall with megamount	1
Hopper Bottom brace	1
Hopper Top surface	1
Hopper hopper Legbrace	2
Washer M3	116
Cil screw M3 x 16	55
Nut M3	60
Endstop	6
Hopper M6 rod	6
Hopper motor holder	1
Hopper rod clamp	1
Hopper Idler	1
Hopper GUI Corner holder	2
Vitamins 625 bearing	2
Motor Stepper NEMA17 double	2
Hopper 5mm axel	1
Hopper Idler mirror	1
Hopper smooth rod clamp	12
Hopper smooth rod	2
Hopper LM8UU holder	6
Vitamins LM8UU bearing	12
Washer M4	471
Nut M4	65
Cil screw M4 x 40	32
Nut M4 selflocking	207
Hopper Nut trap	3
Hopper Nut trap nut holder	3
Nut M8	3
Cil screw M4 x 20	130
Hopper GUI holder	1
Hopper GUI button	8
Knob	1
Hopper Rotary	1

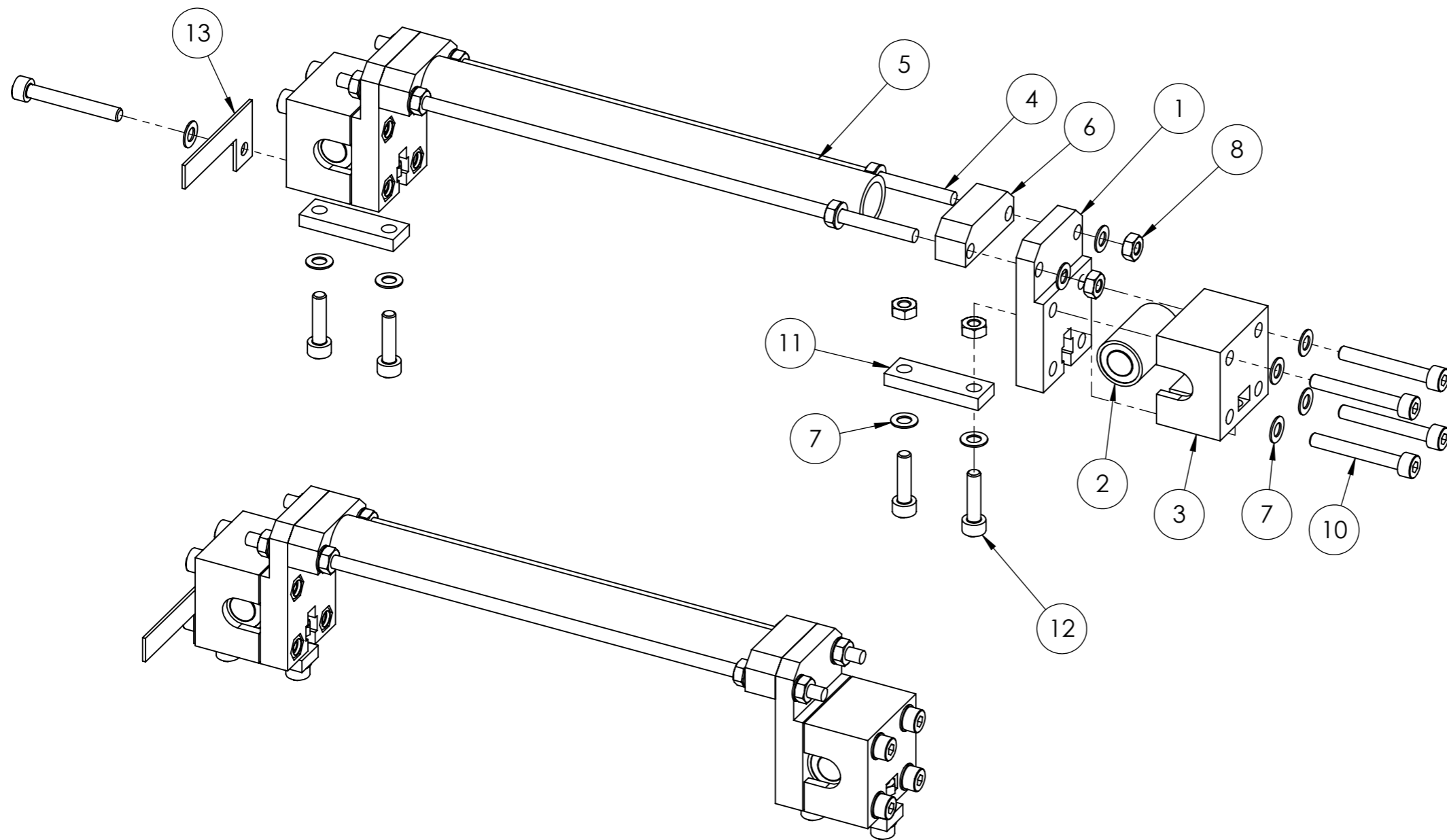
PART NUMBER	QTY.
Cil screw M3 x 10	40
driver clamp	4
Fender washer M5	10
Vitamins 624 bearing	25
Cil screw M4 x 30	44
T2.5 16T poelie	5
Washer M6	24
Nut M6	59
M3 hexagonal spacer post	4
Megatronics	1
X-axis Motor holder	1
X-axis Holder coupler	8
X-axis Rod holder	6
X-axis driver holder	1
X-axis Idler	2
X-axis Y-axis Idler	1
5mm X-axis axel	1
X-axis Smooth rod	2
X-axis Y-axis motor holder	1
Motor Stepper NEMA17	4
Y-axis Smooth rod	2
Y-axis Belt Idler 2	1
Y-axis Belt Idler 1	1
Y-axis LM8UU clamp	2
Y-axis frame block	2
Y-axis Carriage Flag	1
Y-axis X-axis Flag	1
Cil screw M4 x 16	10
Y-axis Belt clamp	4
Y-axis Belt Return	1
Piston Build frame	1
Piston Motor holder	3
Piston driver clamp	6
Piston Lead screw M8	3
Piston Smooth rod holder	12
Piston Guide smooth rod 8mm	6
Pistons wallguide	6
Piston Build surface	1
Piston Nut trap	12
Link screw M4 x 40	12

PART NUMBER	QTY.
Cil screw M4 x 50	12
carriage carrier	1
carriage Cartridge adapter	1
carriage Belt clamp	2
Cartridge carrier	1
C6602A	1
Piston Feed frame	2
Piston Feed surface	2
Piston wallguide micro	4
Piston wallguide micro wide	4
Spring	12
Spreader Frame	2
Spreader LM8UU clamp	2
Spreader M4 threaded rod	2
Spreader spreader	1
Spreader Holder	2
Spreader Belt clamp	2
Spreader Flag	1
X-axis Y-axis belt	1
X-axis belt	2
Hopper spreader belt	2
Piston Flag holder	3
Piston Flag	3



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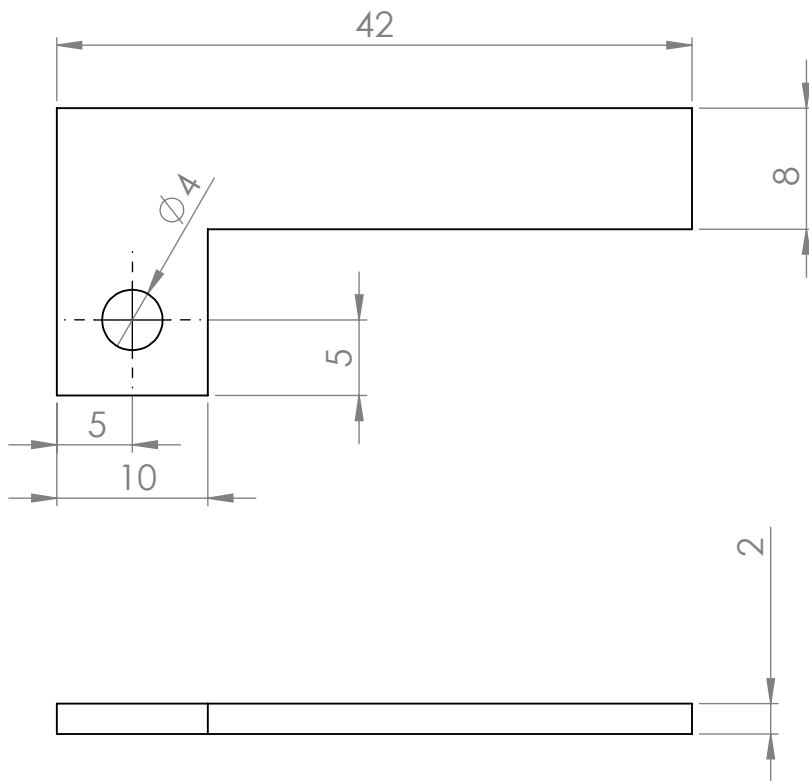
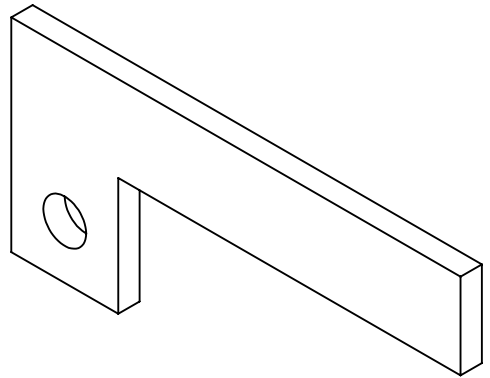
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DRAWN				NAME		SIGNATURE		DATE		TITLE:	
CHK'D				Yvo de Haas				22-02-14		<h1>Plan B BOM</h1>	
APPV'D											
MFG											
Q.A											
								MATERIAL:		DWG NO.	
								WEIGHT:		SCALE:1:5	
										SHEET 1 OF 1	
										A3	



ITEM NO.	PART NUMBER	QTY.
1	Spreader Frame	2
2	Vitamins LM8UU bearing	2
3	Spreader LM8UU clamp	2
4	Spreader M4 threaded rod	2
5	Spreader spreader	1
6	Spreader Holder	2
7	Washer M4	20
8	Nut M4	12
9	Nut M4 selflocking	8
10	Cil screw M4 x 30	8
11	Spreader Belt clamp	2
12	Cil screw M4 x 16	4
13	Spreader Flag	1

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NAME	SIGNATURE	DATE					TITLE: Spreader assembly				
DRAWN	Yvo de Haas	21-02-14					DWG NO.				
CHK'D							A3				
APPV'D							SCALE:1:1.5				
MFG							SHEET 1 OF 1				
Q.A							WEIGHT:				

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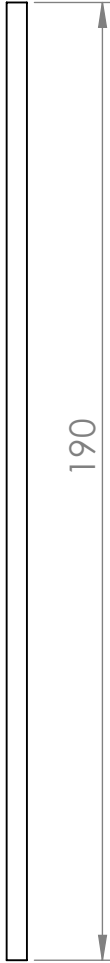
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	NAME	SIGNATURE	DATE		
DRAWN	Yvo de Haas		23-02-14		
CHK'D					
APPV'D					
MFG					
Q.A					

TITLE:	<h1>Spreader Flag</h1>	
DWG NO.		
WEIGHT:	SCALE:2:1	SHEET 1 OF 1

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 Aluminum 2mm



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FINISH:

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BREAK SHARP
EDGES

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REVISION

	NAME	SIGNATURE	DATE		
DRAWN	Yvo de Haas		22-02-14		
CHK'D					
APPV'D					
MFG					
Q.A					

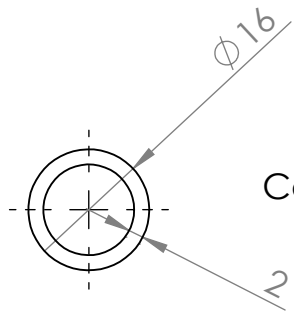
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M4 steel threaded rod

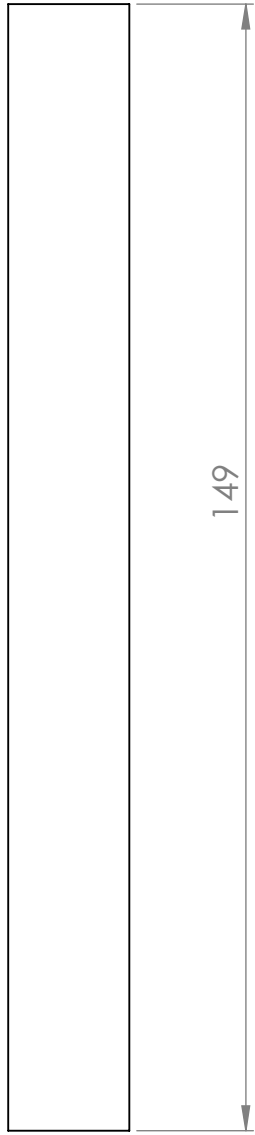
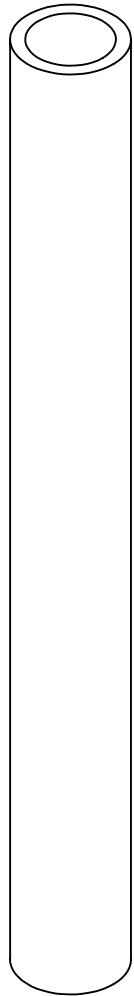
TITLE:
Spreader M4 threaded rod

DWG NO. A4

WEIGHT: SCALE:1:1.5 SHEET 1 OF 1



Can also be thinner tube



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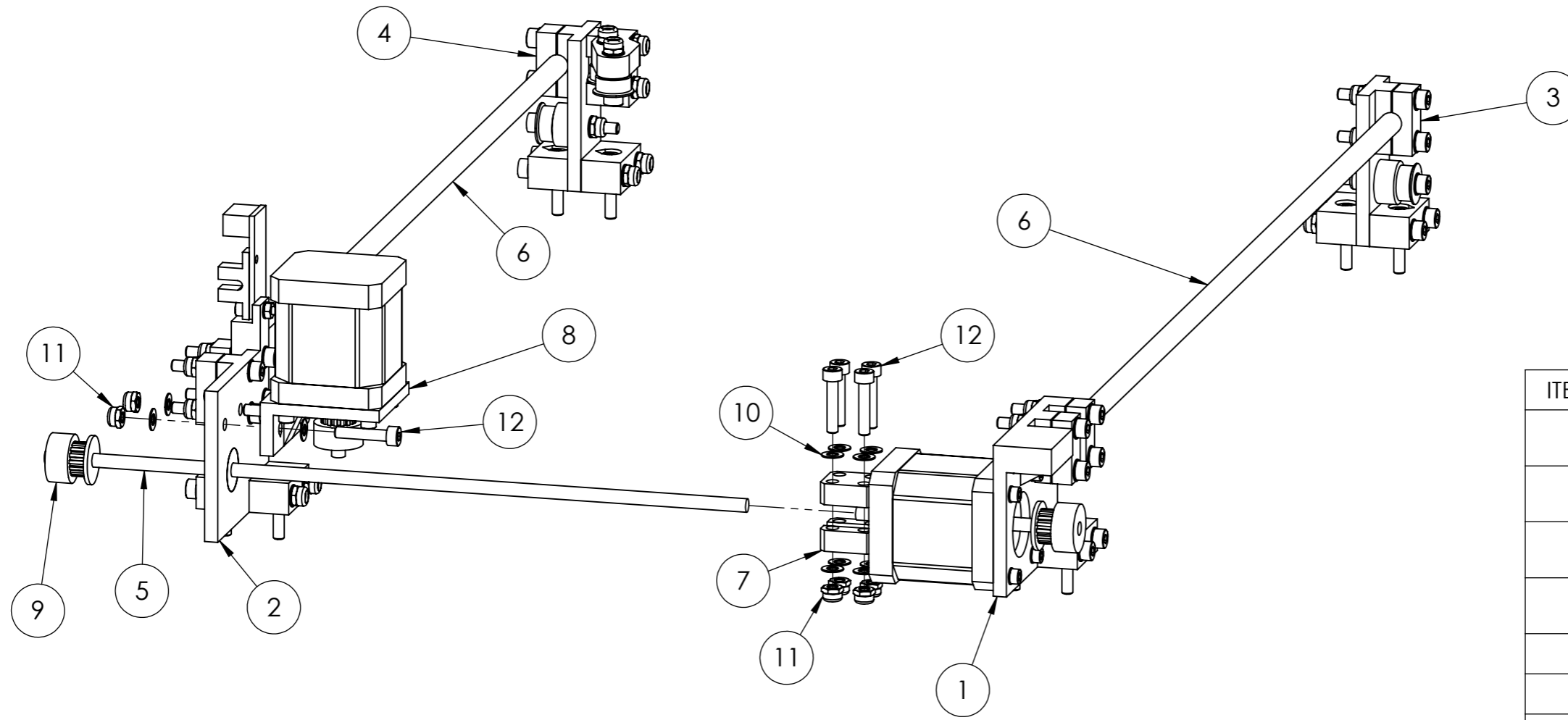
REVISION

	NAME	SIGNATURE	DATE		
DRAWN	Yvo de Haas		22-02-14		
CHK'D					
APPV'D					
MFG					
Q.A					

TITLE:	
<h1>Spreader spreader</h1>	
DWG NO.	A4
SCALE: 1:1	SHEET 1 OF 1

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Aluminum tube 16x2

WEIGHT:



ITEM NO.	PART NUMBER	QTY.
1	X-axis subassembly Motor holder	1
2	X-axis subassembly Driver holder	1
3	X-axis subassembly X-idler 1	1
4	X-axis subassembly X-idler 2	1
5	5mm X-axis axel	1
6	X-axis Smooth rod	2
7	driver clamp	2
8	X-axis subassembly Y-axis motor holder	1
9	T2.5 16T poelie	1
10	Washer M4	12
11	Nut M4 selflocking	6
12	Cil screw M4 x 20	6

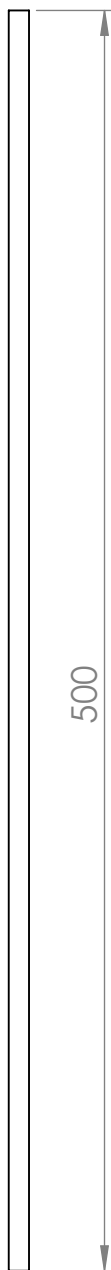
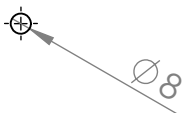
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBUR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
DRAWN				NAME		SIGNATURE		DATE		TITLE:	
CHK'D				Yvo de Haas				23-02-14		X-axis assembly	
APPV'D											
MFG											
Q.A											
								MATERIAL:		DWG NO.	
								WEIGHT:		SCALE:1:2	
										SHEET 1 OF 2	
										A3	

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PART NUMBER	QTY.
X-axis Motor holder	1
X-axis Holder coupler	8
Motor Stepper NEMA17 double	1
X-axis Rod holder	6
T2.5 16T poelie	3
Cil screw M4 x 20	18
Washer M3	8
Cil screw M3 x 10	7
Washer M4	76
Cil screw M4 x 40	10
Nut M4 selflocking	32
Cil screw M4 x 30	12
X-axis driver holder	1
Endstop	1
Cil screw M3 x 16	1
Nut M3	1
Vitamins 625 bearing	1
X-axis Idler	2
Vitamins 624 bearing	6
Fender washer M5	6
X-axis Y-axis Idler	1
5mm X-axis axel	1
X-axis Smooth rod	2
driver clamp	2
X-axis Y-axis motor holder	1
Motor Stepper NEMA17	1

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NAME		SIGNATURE		DATE		<p style="text-align: center; font-size: 2em; font-weight: bold;">X-axis assembly (full BOM)</p>			
DRAWN		Yvo de Haas		23-02-14					
CHK'D									
APPV'D									
MFG									
Q.A						DWG. NO.		A4	
						WEIGHT:		SCALE:1:2	
								SHEET 2 OF 2	

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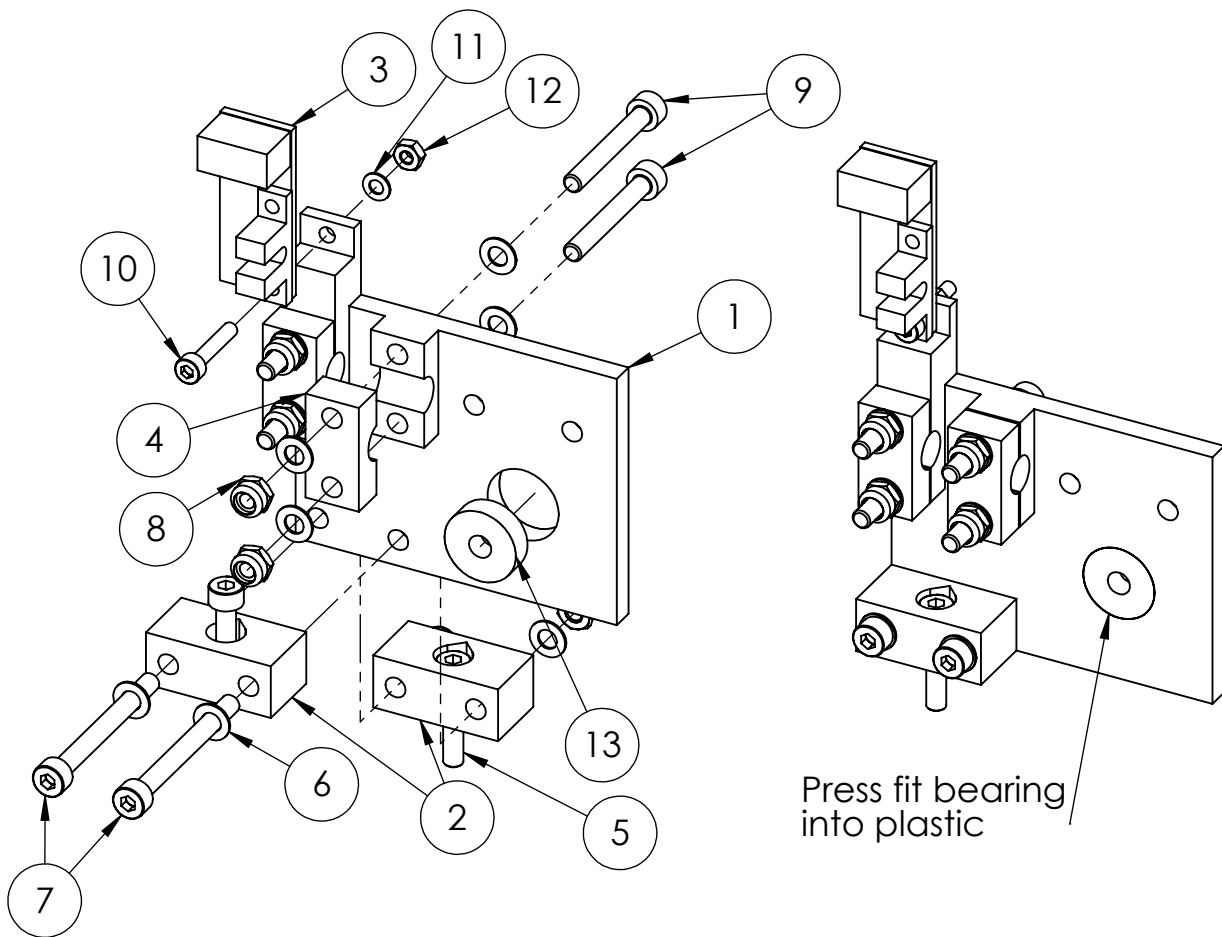
REVISION

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DRAWN	Yvo de Haas		22-02-14		
CHK'D					
APPV'D					
MFG					
Q.A					

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8mm steel smooth rod

TITLE:	X-axis smooth rod	
DWG NO.	X-axis Smooth rod	A4
WEIGHT:	SCALE:1:3	SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	X-axis driver holder	1
2	X-axis Holder coupler	2
3	Endstop	1
4	X-axis Rod holder	2
5	Cil screw M4 x 20	2
6	Washer M4	12
7	Cil screw M4 x 40	2
8	Nut M4 selflocking	6
9	Cil screw M4 x 30	4
10	Cil screw M3 x 16	1
11	Washer M3	1
12	Nut M3	1
13	Vitamins 625 bearing	1

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CHK'D			
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MFG			
Q.A			

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TITLE:

**X-axis subassembly
 Driver holder**

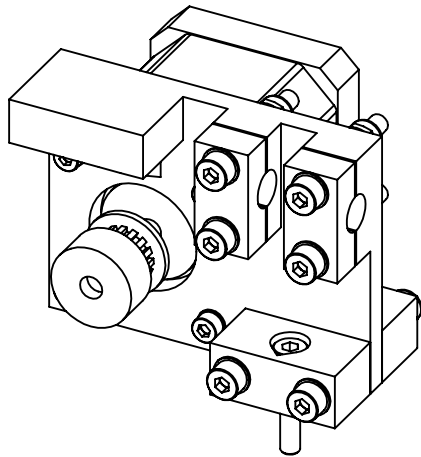
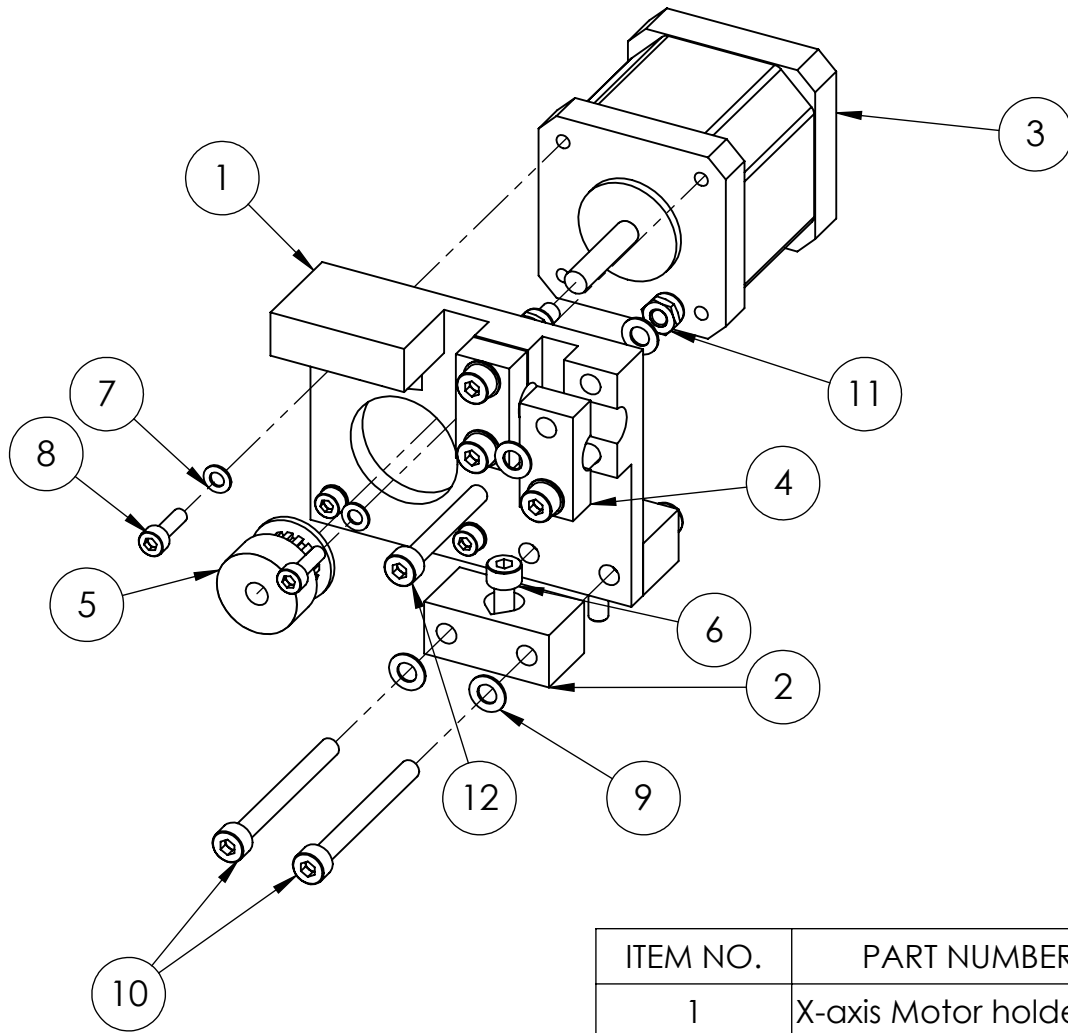
DWG NO.

A4

WEIGHT:

SCALE:1:1.5

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	X-axis Motor holder	1
2	X-axis Holder coupler	2
3	Motor Stepper NEMA17 double	1
4	X-axis Rod holder	2
5	T2.5 16T poelie	1
6	Cil screw M4 x 20	2
7	Washer M3	4
8	Cil screw M3 x 10	4
9	Washer M4	12
10	Cil screw M4 x 40	2
11	Nut M4 selflocking	6
12	Cil screw M4 x 30	4

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LINEAR:
ANGULAR:

FINISH:

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EDGES

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CHK'D			
APPV'D			
MFG			
Q.A			

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TITLE:

**X-axis subassembly
Motor holder**

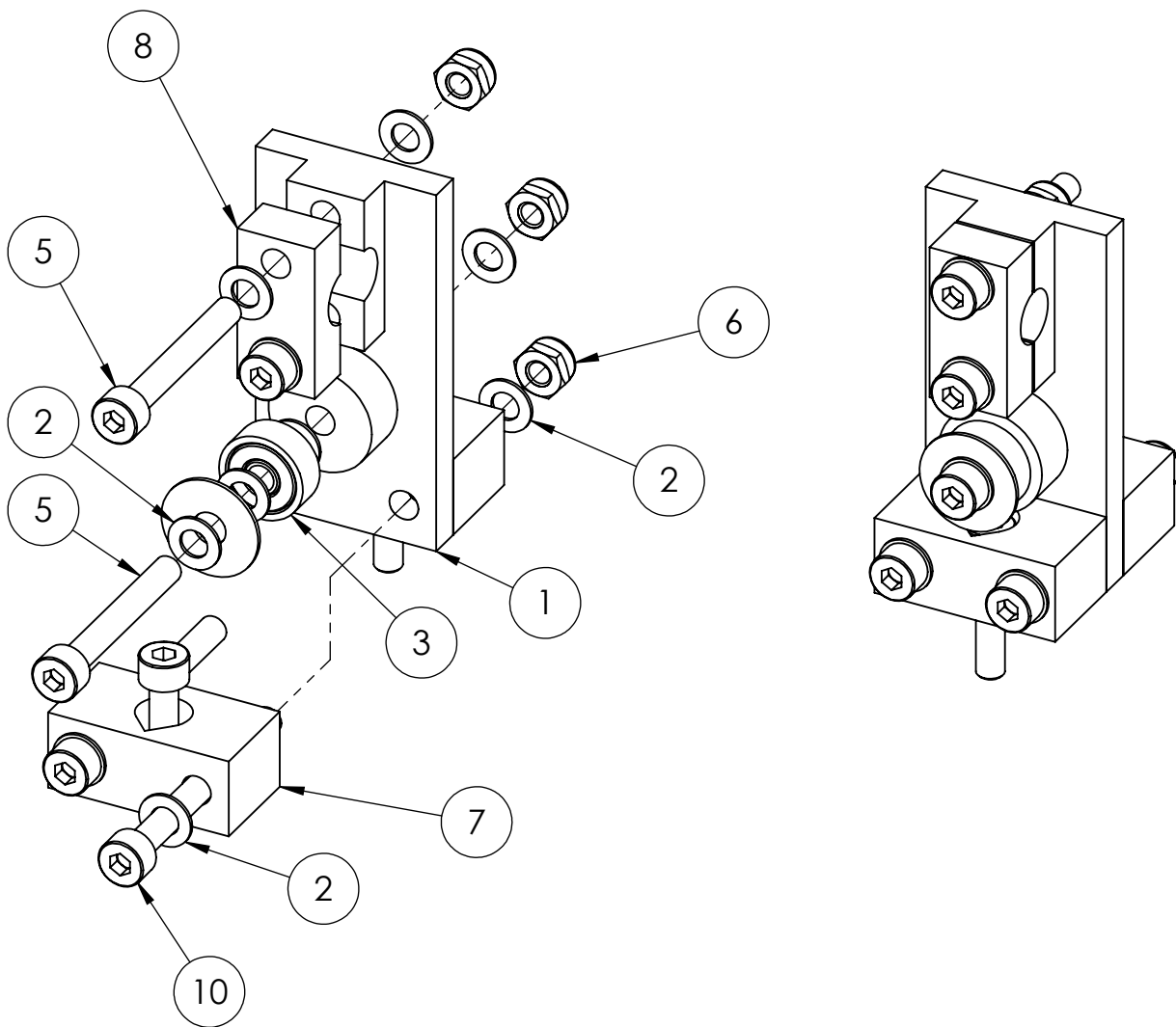
DWG NO.

A4

WEIGHT:

SCALE:1:1.5

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	X-axis Idler	1
2	Washer M4	12
3	Vitamins 624 bearing	1
4	Fender washer M5	1
5	Cil screw M4 x 30	3
6	Nut M4 selflocking	5
7	X-axis Holder coupler	2
8	X-axis Rod holder	1
9	Cil screw M4 x 20	2
10	Cil screw M4 x 40	2

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APPV'D			
MFG			
Q.A			

TITLE:

X-axis subassembly
 X-idler

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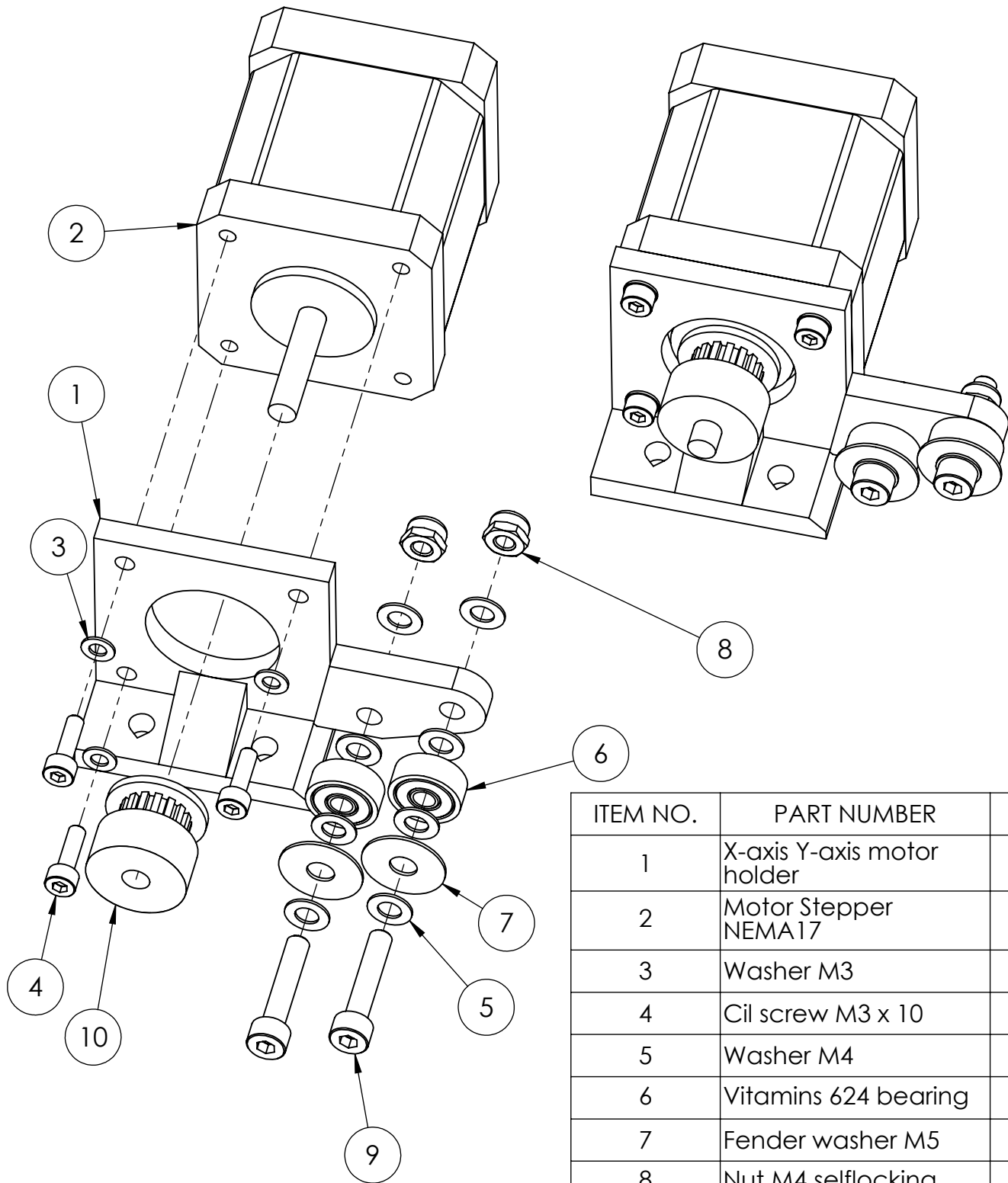
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	X-axis Y-axis motor holder	1
2	Motor Stepper NEMA17	1
3	Washer M3	3
4	Cil screw M3 x 10	3
5	Washer M4	8
6	Vitamins 624 bearing	2
7	Fender washer M5	2
8	Nut M4 selflocking	2
9	Cil screw M4 x 20	2
10	T2.5 16T poelie	1

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LINEAR:
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DRAWN	Yvo de Haas		22-02-14
CHK'D			
APPV'D			
MFG			
Q.A			

TITLE:

X-axis Subassembly Y-axis motor holder

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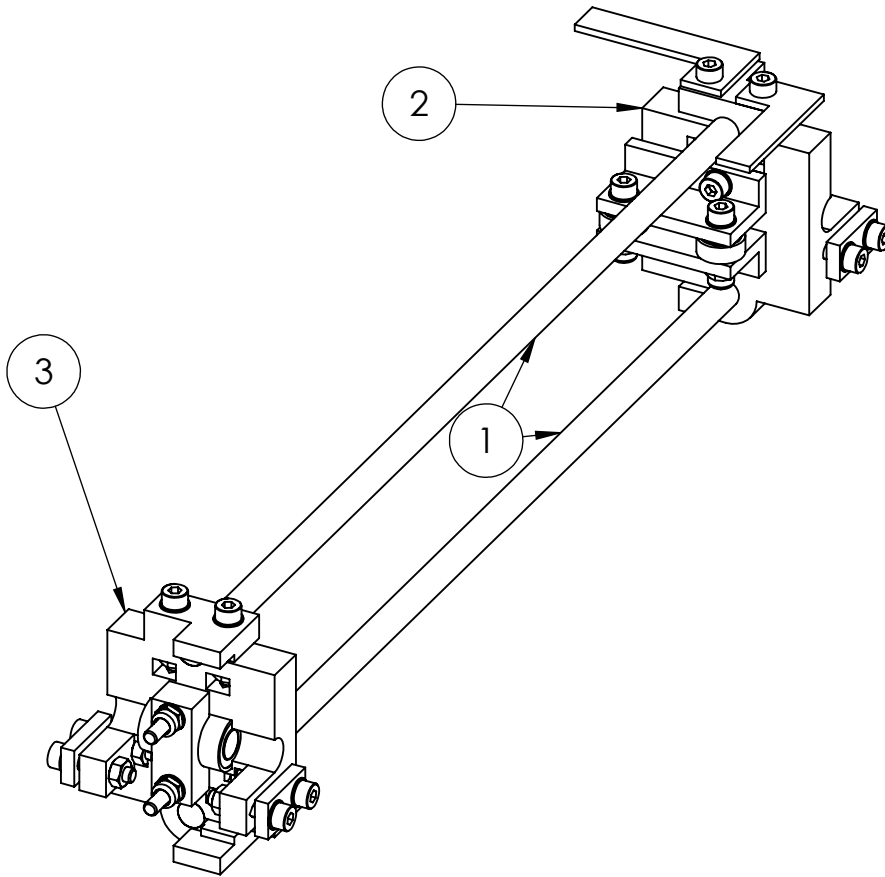
DWG NO.

A4

WEIGHT:

SCALE:1:1

SHEET 1 OF 1



PART NUMBER	QTY.
Y-axis Smooth rod	2
Y-axis Belt Idler 2	1
Y-axis Belt Idler 1	1
Vitamins 624 bearing	3
Washer M4	30
Cil screw M4 x 20	15
Nut M4 selflocking	7
Vitamins LM8UU bearing	2
Y-axis LM8UU clamp	2
Y-axis frame block	2
Y-axis Carriage Flag	1
Y-axis X-axis Flag	1
Cil screw M4 x 40	4
Nut M4	14
Cil screw M4 x 16	2
Y-axis Belt clamp	4
Y-axis Belt Return	1

ITEM NO.	PART NUMBER	QTY.
1	Y-axis Smooth rod	2
2	Y-axis subassembly belt idler	1
3	Y-axis subassembly frame return	1

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APPV'D			
MFG			
Q.A			
			WEIGHT:

TITLE:

Y-axis assembly

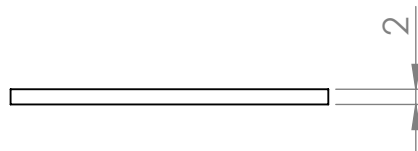
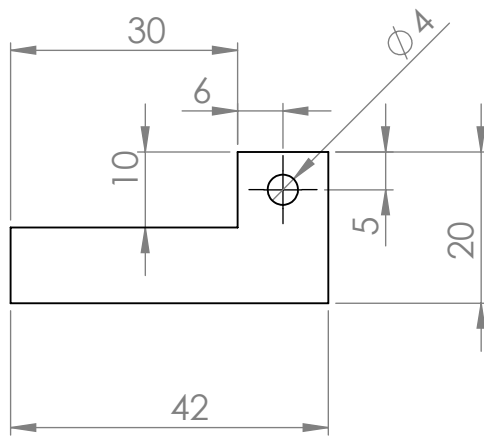
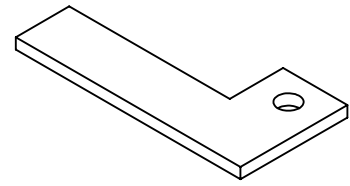
DWG NO.

A4

SCALE:1:2

SHEET 1 OF 1

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NAME	SIGNATURE	DATE
DRAWN Yvo de Haas		23-02-14
CHK'D		
APPV'D		
MFG		
Q.A		
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WEIGHT:		

TITLE:

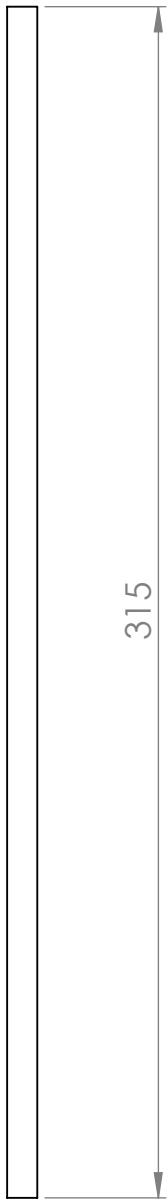
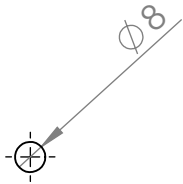
Y-axis Carriage Flag

DWG NO.

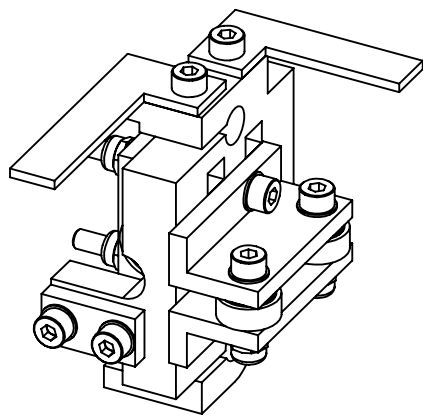
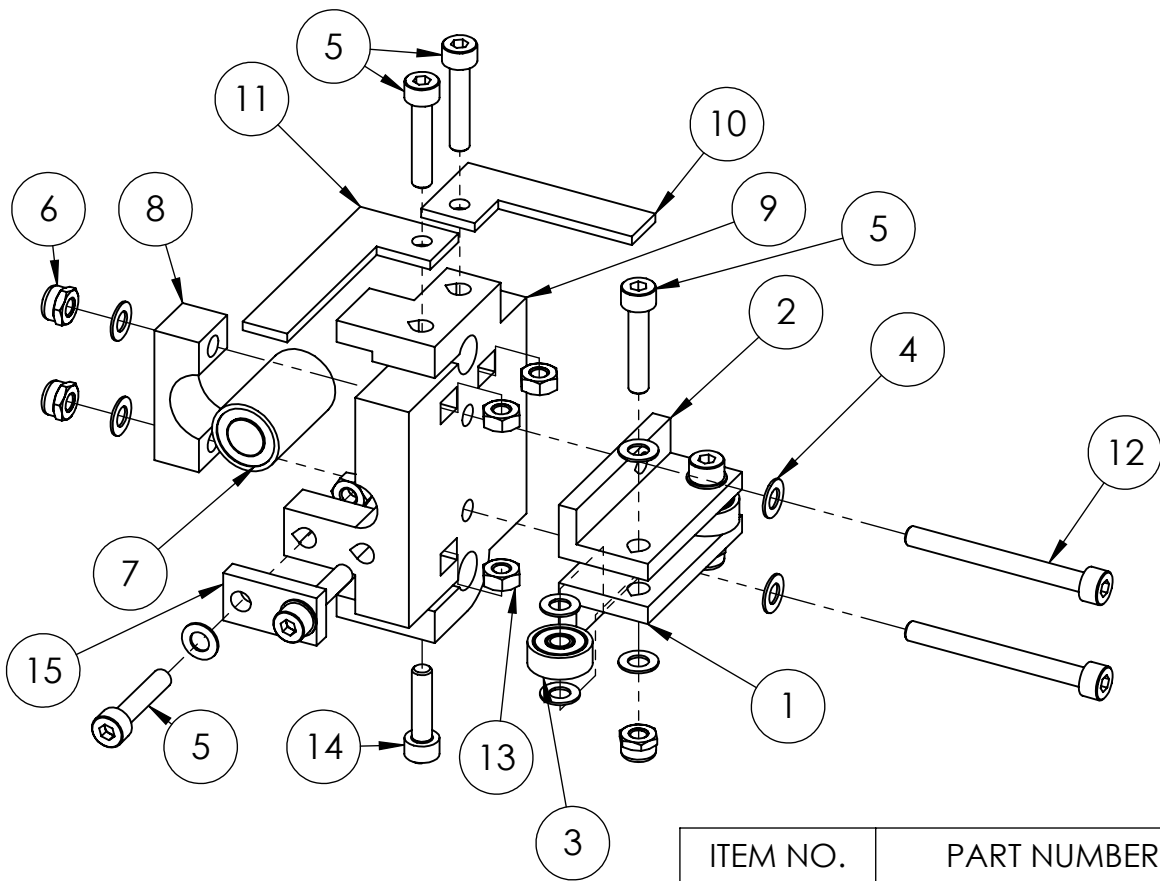
A4

SCALE:1:1

SHEET 1 OF 1



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SolidWorks Student Edition. For Academic Use Only.						TITLE:					
DRAWN	Yvo de Haas	SIGNATURE	DATE	22-02-14	Y-axis Smooth rod						
CHK'D											
APPV'D											
MFG											
Q.A					DWG NO.						
				8mm Steel smooth rod						A4	
				WEIGHT:				SCALE:1:2		SHEET 1 OF 1	



ITEM NO.	PART NUMBER	QTY.
1	Y-axis Belt Idler 2	1
2	Y-axis Belt Idler 1	1
3	Vitamins 624 bearing	2
4	Washer M4	16
5	Cil screw M4 x 20	8
6	Nut M4 selflocking	4
7	Vitamins LM8UU bearing	1
8	Y-axis LM8UU clamp	1
9	Y-axis frame block	1
10	Y-axis Carriage Flag	1
11	Y-axis X-axis Flag	1
12	Cil screw M4 x 40	2
13	Nut M4	7
14	Cil screw M4 x 16	1
15	Y-axis Belt clamp	2

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APPV'D			
MFG			
Q.A			

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TITLE:

Y-axis subassembly
 belt idler

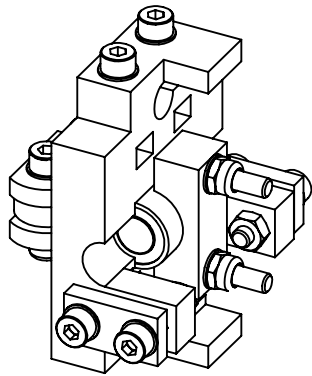
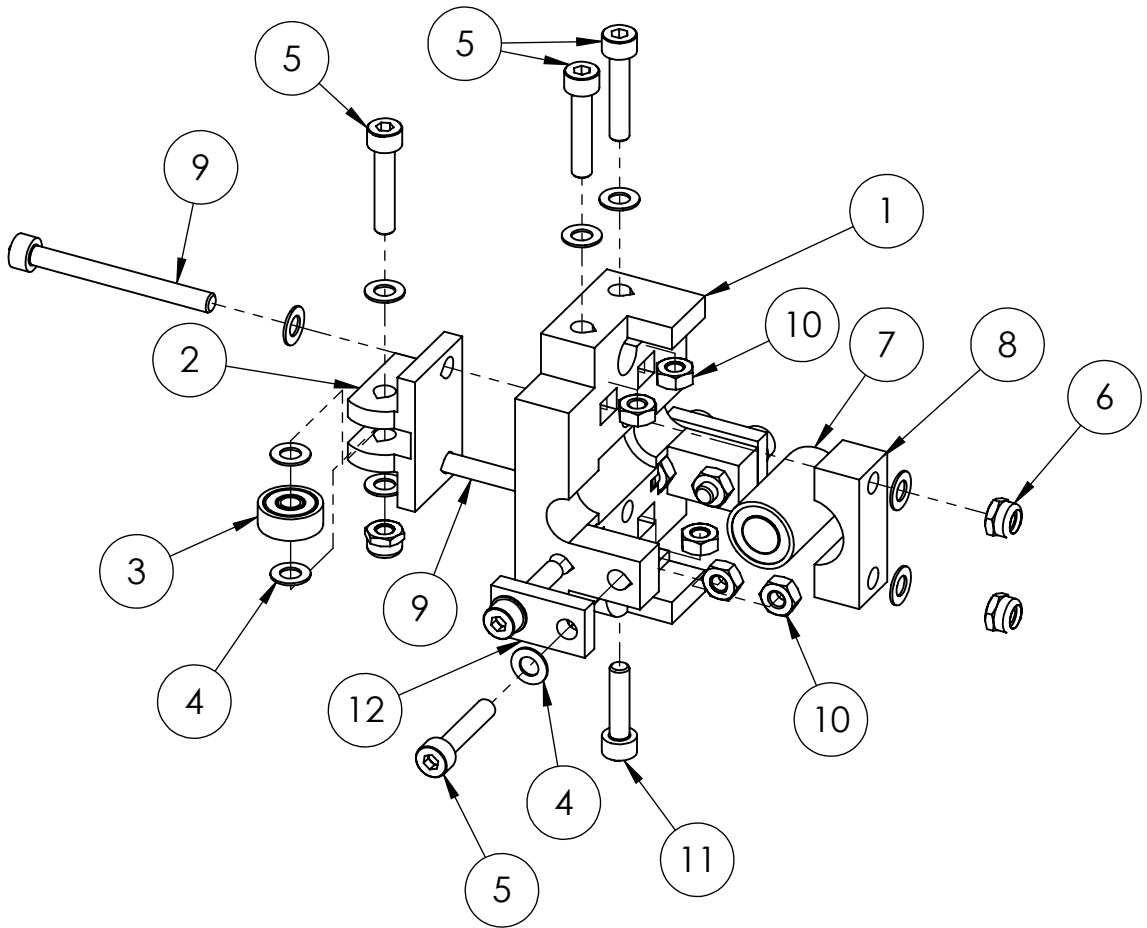
DWG NO.

A4

WEIGHT:

SCALE:1:1.5

SHEET 1 OF 1



ITEM NO.	PART NUMBER	QTY.
1	Y-axis frame block	1
2	Y-axis Belt Return	1
3	Vitamins 624 bearing	1
4	Washer M4	14
5	Cil screw M4 x 20	7
6	Nut M4 selflocking	3
7	Vitamins LM8UU bearing	1
8	Y-axis LM8UU clamp	1
9	Cil screw M4 x 40	2
10	Nut M4	7
11	Cil screw M4 x 16	1
12	Y-axis Belt clamp	2

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APPV'D			
MFG			
Q.A			

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TITLE:

**Y-axis subassembly
 Frame return**

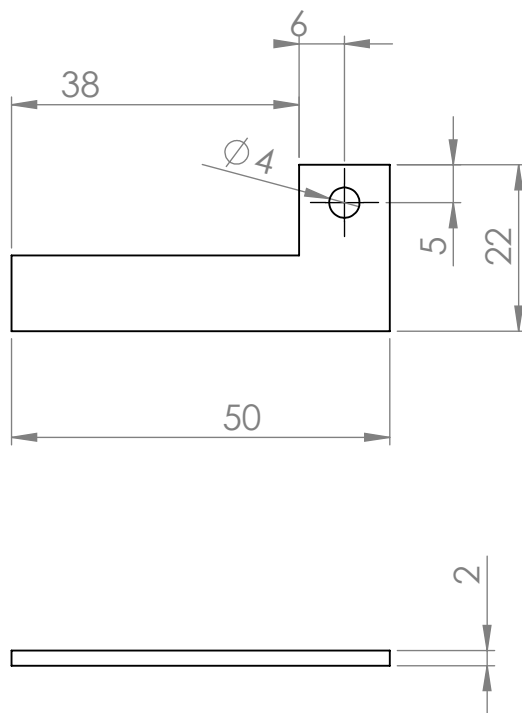
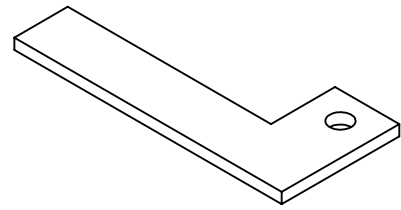
DWG NO.

A4

WEIGHT:

SCALE:1:1.5

SHEET 1 OF 1



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CHK'D			
APPV'D			
MFG			
Q.A			
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WEIGHT:			

TITLE:	Y-axis X-axis Flag	
DWG NO.		A4
SCALE: 1:1		SHEET 1 OF 1