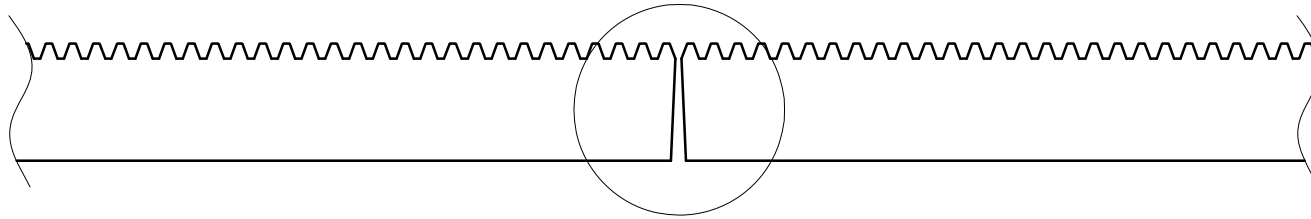
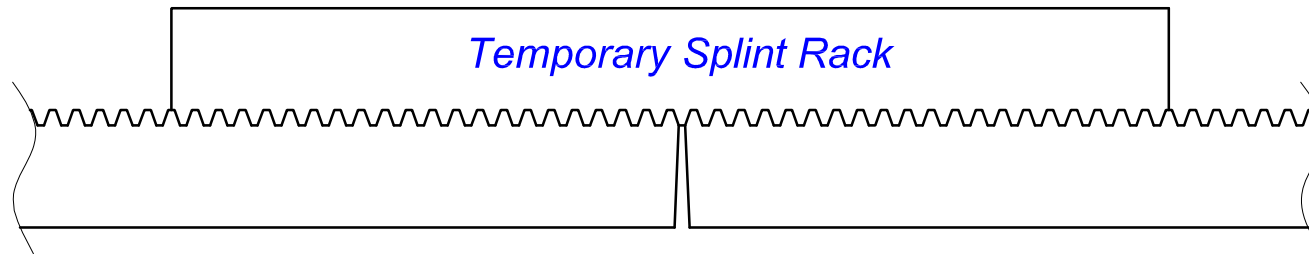
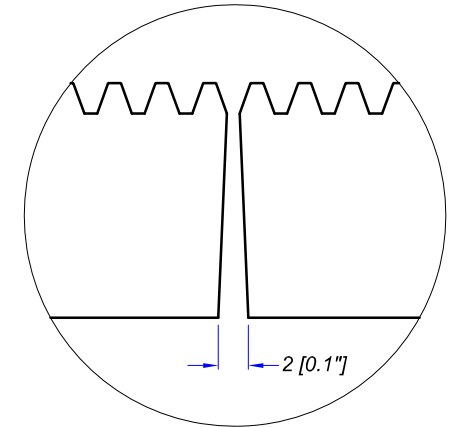


Drill 2x $\text{Ø}8\text{mm}$ [$\frac{5}{16}"$] holes through the ends

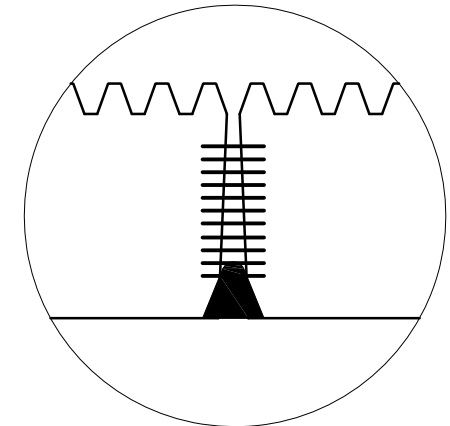
Higher drawing/s:	10 10 200 A 10 20 200 A	1:1			
			First issue	01-11-06	A
			Description of change	Date (d-m-y)	Rev.
Material:	Title X&Y RACKS - DRILLED				
 www.mechmate.com		Drawing Number		Process	Revision
		M2 10 110		D	A



1. Prepare approx. 2mm [0.1"] gap at butting ends without marking the flanks of the last teeth. (Work in the "root" only)



2. Clamp another long piece of rack across the joint as a "splint".
CAREFULLY weld the joint to within 3mm [$\frac{1}{8}$ "] of the splint. Do NOT try to weld in the joint of the root when the splint is removed. Grind the welds flush with the original surface.



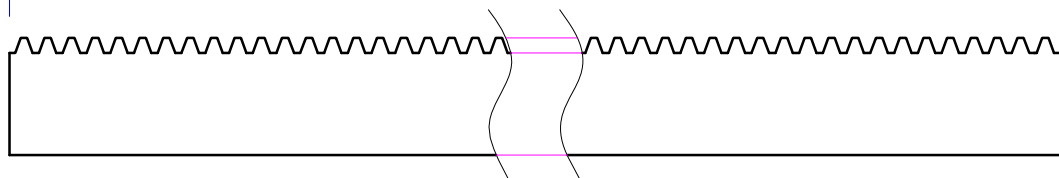
Final Lengths:

X-Rack:

$$X + 200 [+7.9"]$$

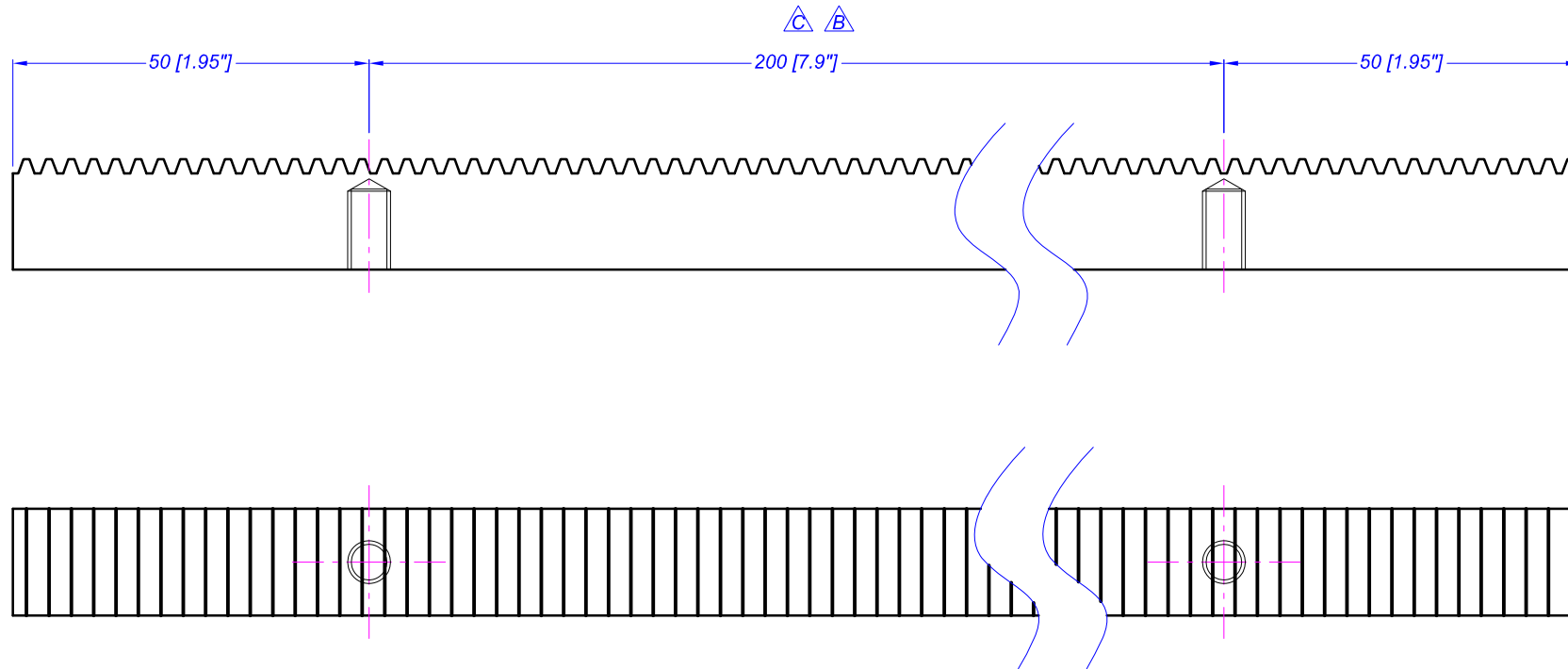
Y-Rack:

$$Y + 170 [+6.7"]$$



PUCHASED "BLANK" RACKS:
 METRIC: Module 1, 20° pressure/flank angle, 15mm x 15mm Square
 INCH: Diametral pitch (DP) 20, 20° pressure angle, $\frac{1}{2}$ " X $\frac{1}{2}$ " Square

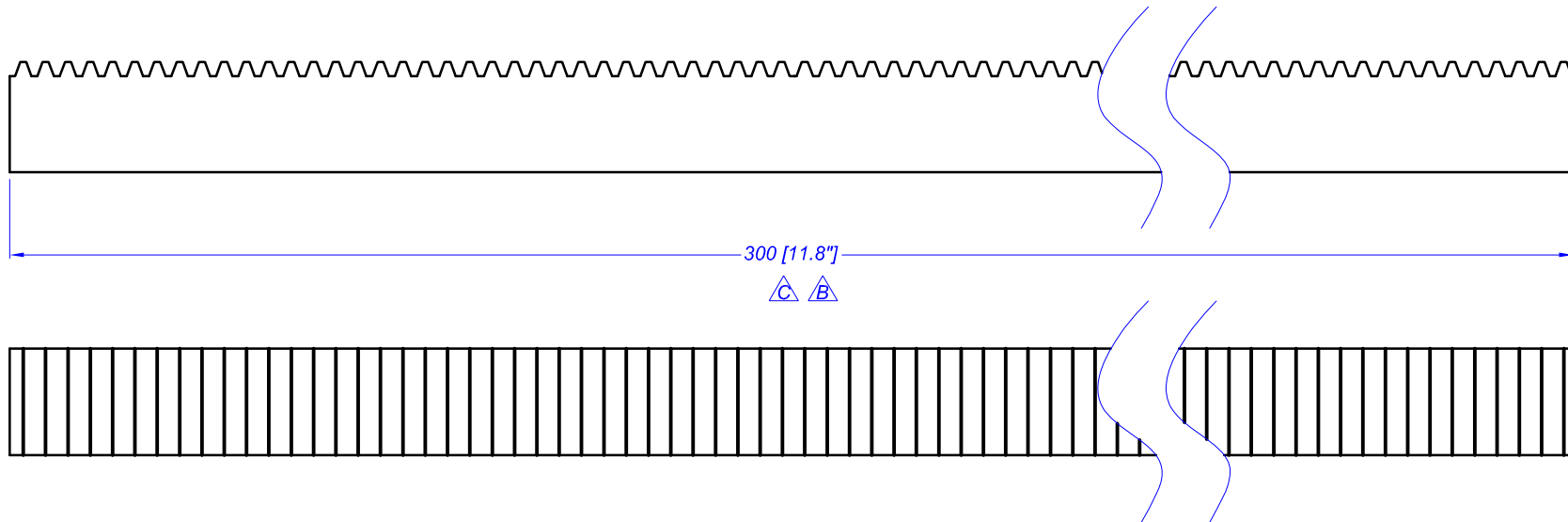
Higher drawing/s:	M2 10 110 D	1:1			
			First issue	01-11-06	A
			Description of change	Date (d-m-y)	Rev.
Material:	STEEL GEAR RACK		Title		
 www.mechmate.com			RACKS - WELDED & CUT TO LENGTH		
			Drawing Number	Process	Revision
			M2 10 110	W	A



Drill & Tap 2x M6mm [1/4"] holes 10mm deep

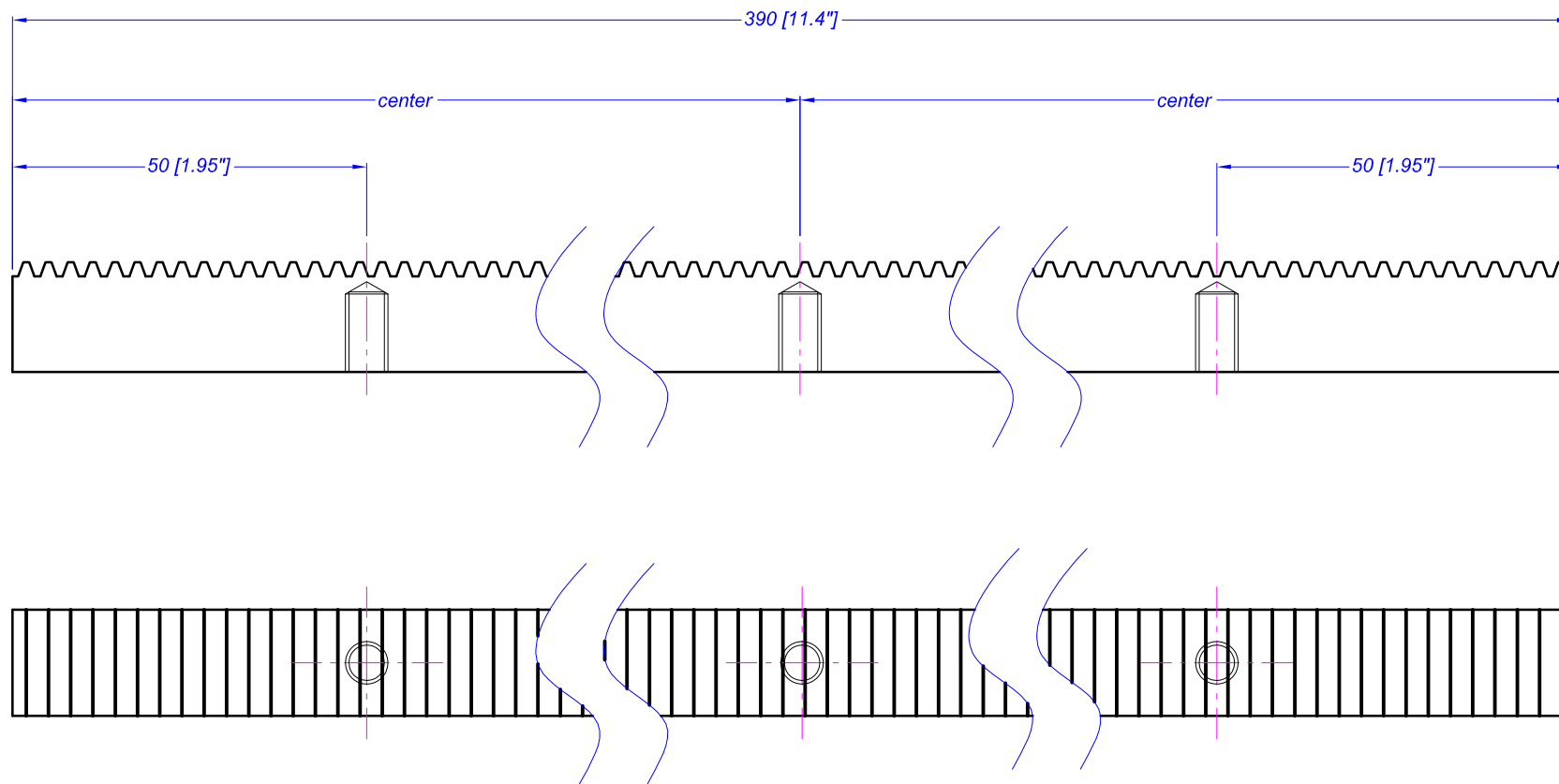
OPTION

Higher drawing/s:	10 40 000 A	1:1	Lengthen by 60mm	10-10-07	B
			Lengthen further 20mm	29-06-08	C
			Description of change	Date (d-m-y)	Rev.
Material:			Title		
MechMate		250mm [10"] Z-RACK - DRILLED & TAPPED			
www.mechmate.com		Drawing Number		Process	Revision
		M2 10 120		D	C



OPTION

Higher drawing/s:	M2 10 120 D	1:1	Lengthen by 60mm	10-10-07	B
			Lengthen by further 20mm	29-06-08	C
			Description of change	Date (d-m-y)	Rev.
Material:			Title		
MechMate www.mechmate.com			250mm [10"] Z-RACK - SAWN		
Drawing Number			Process	Revision	
M2 10 120			S	C	

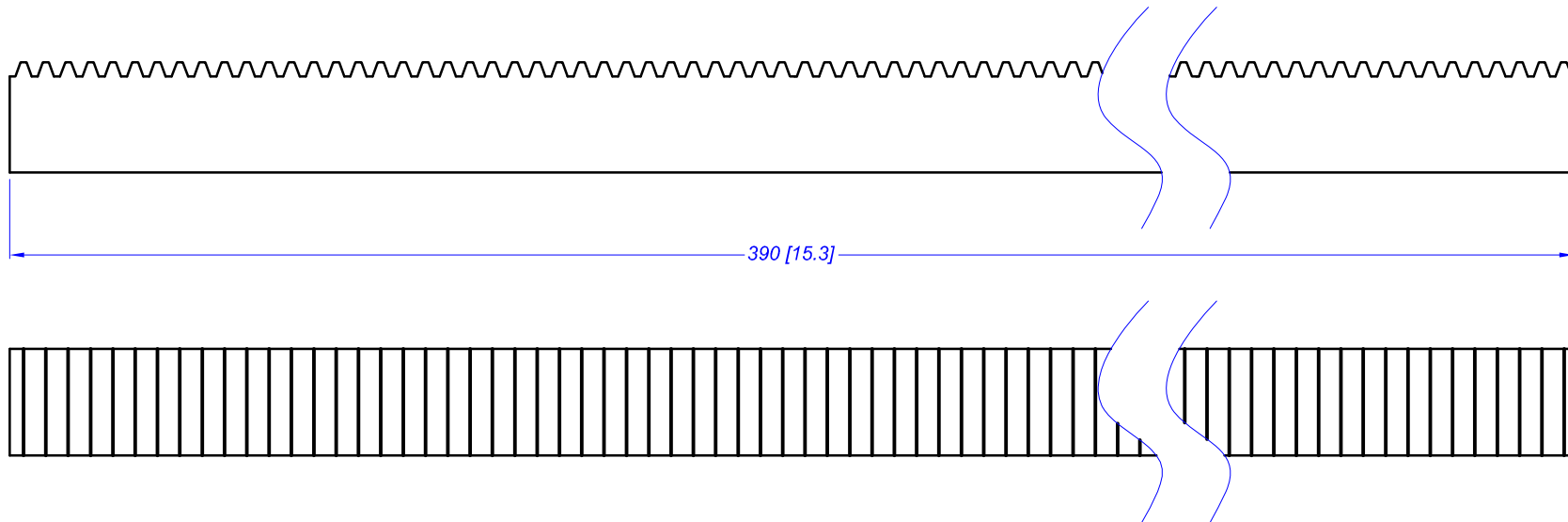


Drill & Tap 2x M6mm [1/4"] holes 10mm deep

OPTION

Higher drawing/s:	10 40 014 A	1:1		
			First issue	10-10-07 A
			Description of change	Date (d-m-y) Rev.
Material:	Title			
	350mm [14"] Z-RACK - DRILLED & TAPPED			
Drawing Number		Process	Revision	
M2 10 124		D	A	

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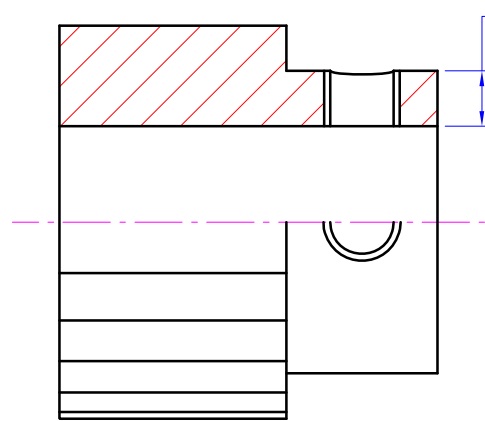


OPTION

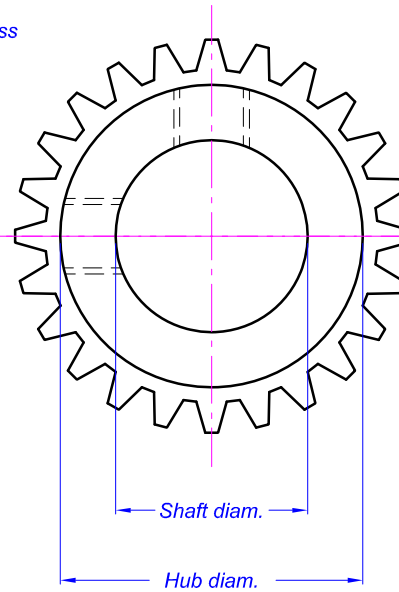
Higher drawing/s:	M2 10 124 D	1:1		
			First issue	10-10-07 A
			Description of change	Date (d-m-y) Rev.
Material:			Title	
			350mm [14"] Z-RACK - SAWN	
	Drawing Number	Process	Revision	
	M2 10 124	S	A	

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No Collar



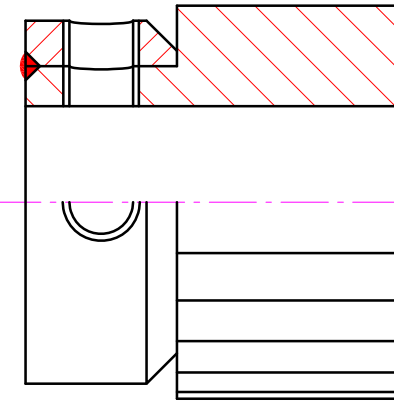
Wall thickness



Welded on collar

OPTION

Small TIG weld



1. Check the "wall thickness" that will remain after the gear is bored out to fit the motor/gearbox shaft. If the wall thickness is less than 3.5mm [0.15"] then a reinforcing collar must be pressed and welded on before any machining. Rather choose a gear with more teeth and a bigger hub diameter.
2. Bore out the pinion to fit the shaft precisely, making sure that the bore is concentric and parallel.
3. Drill and tap 2 grub-screw holes at right-angles to each other. M5 or M6 [$\frac{3}{16}$ " or $\frac{1}{4}$ " UNC]
4. Remove all burrs BEFORE hardening.

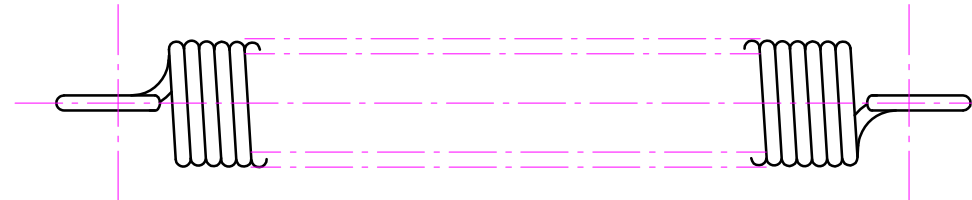
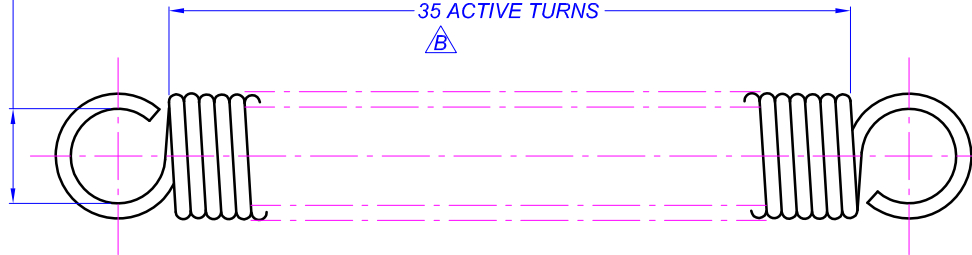
Higher process:	M2 30 110 H (Hardening)	2:1 			
			First issue	01-11-06	A
Material:			Description of change	Date (d-m-y)	Rev.
 www.mechmate.com			Title PINION GEARS - MACHINED		
			Drawing Number M2 30 110	Process T	Revision A

Ø13 [0.5"] EYE INSIDE DIAM.

35 ACTIVE TURNS

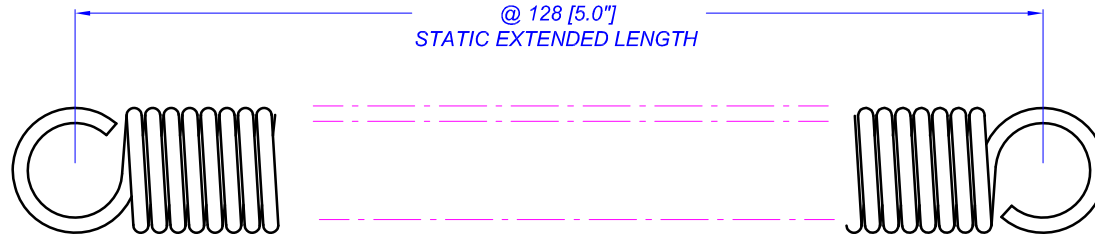


Ø16 [0.6"]
OUTSIDE DIAM.



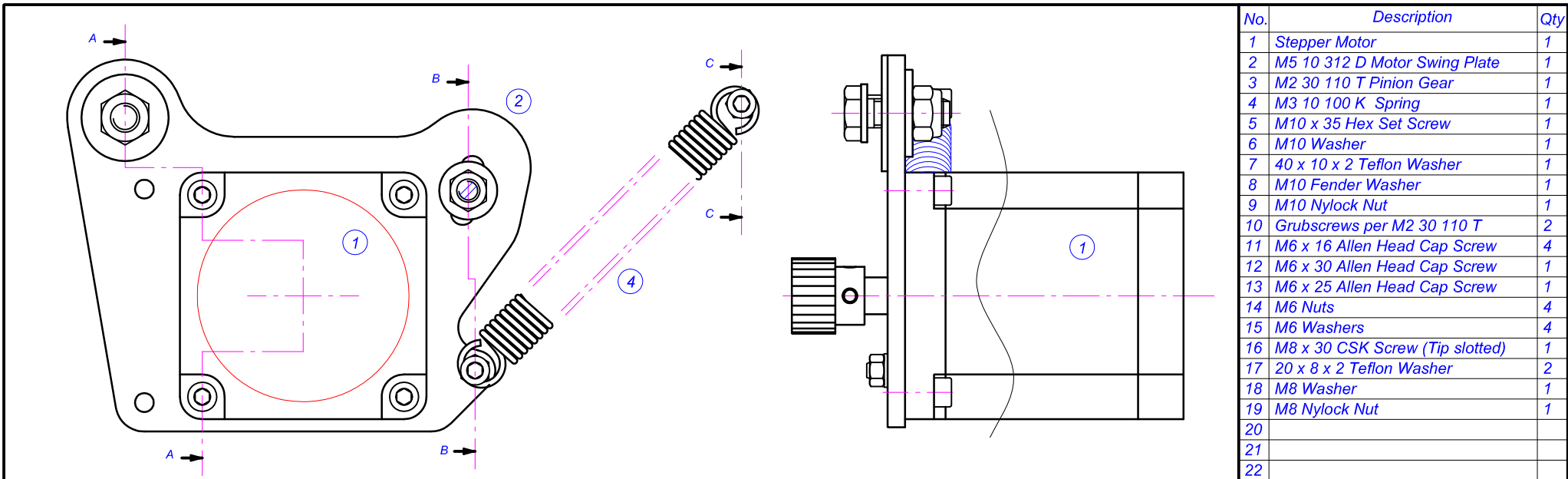
2.0mm STEEL SPRING WIRE
DIN 2076-D or ASTM A228 or BS 5216

12kg [25 lbs] approx.
@ 128 [5.0"]
STATIC EXTENDED LENGTH

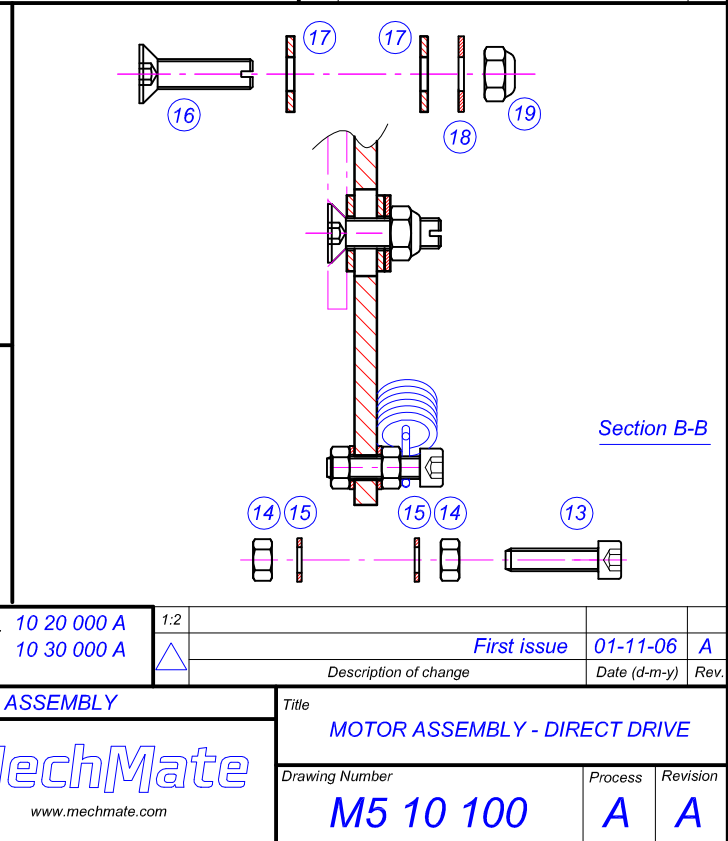
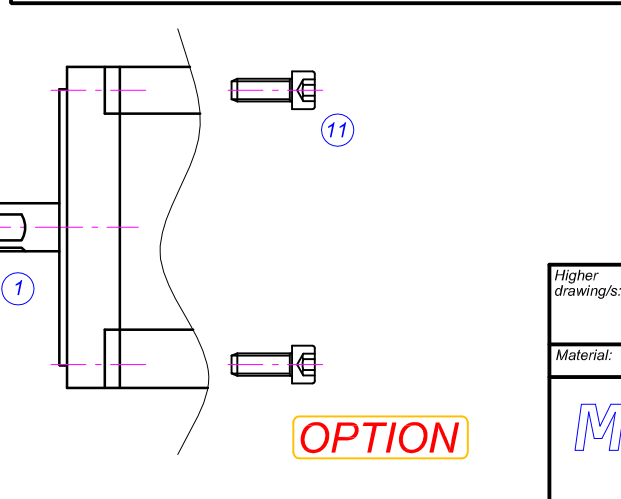
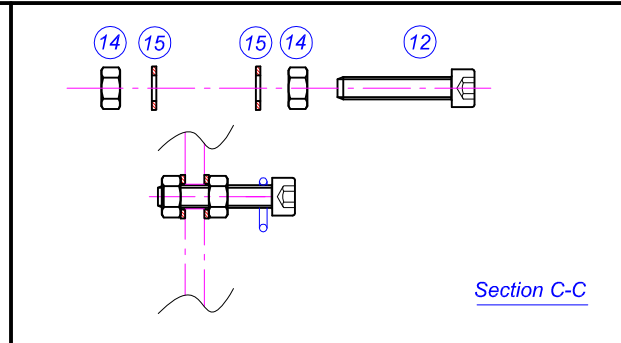
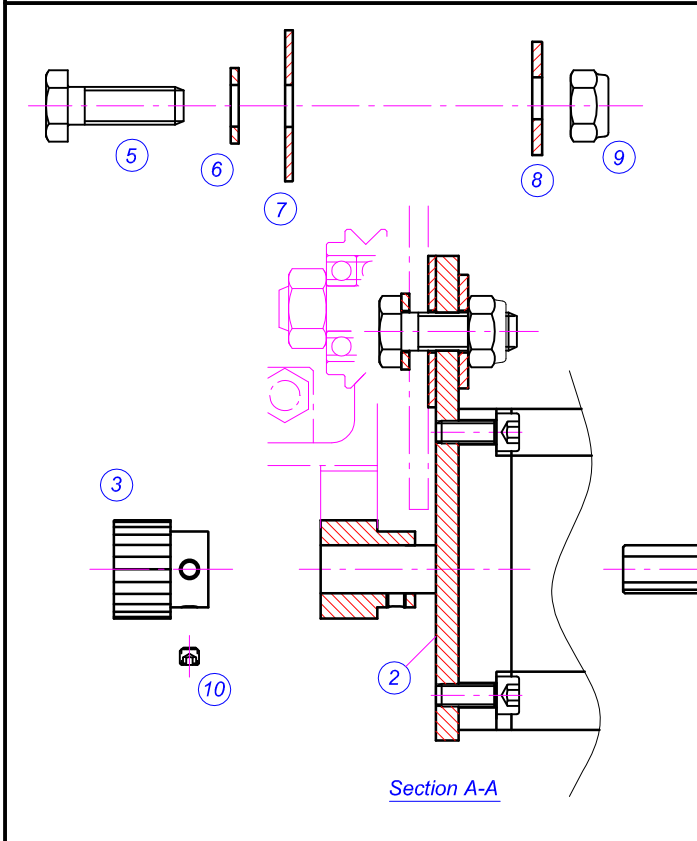


Higher drawing/s:	M5 10 --- A	1:1	Reduced number of active turns	22-11-06	B
			First issue	20-10-06	A
			Description of change	Date (d-m-y)	Rev.
Material:	2mm SPRING WIRE		Title		
			MOTOR SPRING		
Drawing Number		Process	Revision		
M3 10 100		K	B		

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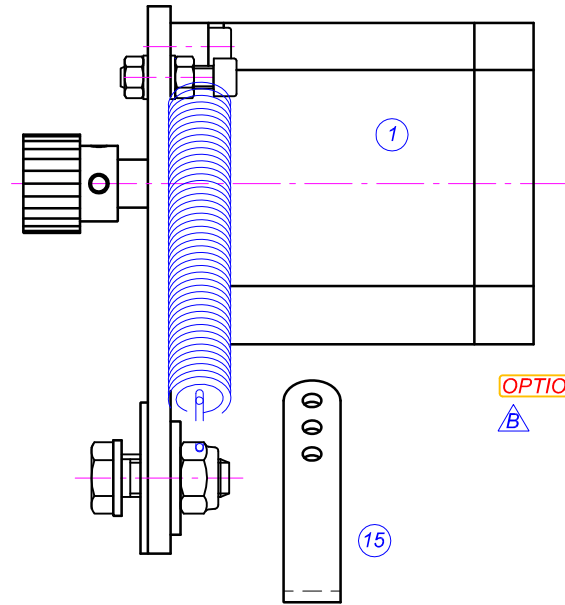
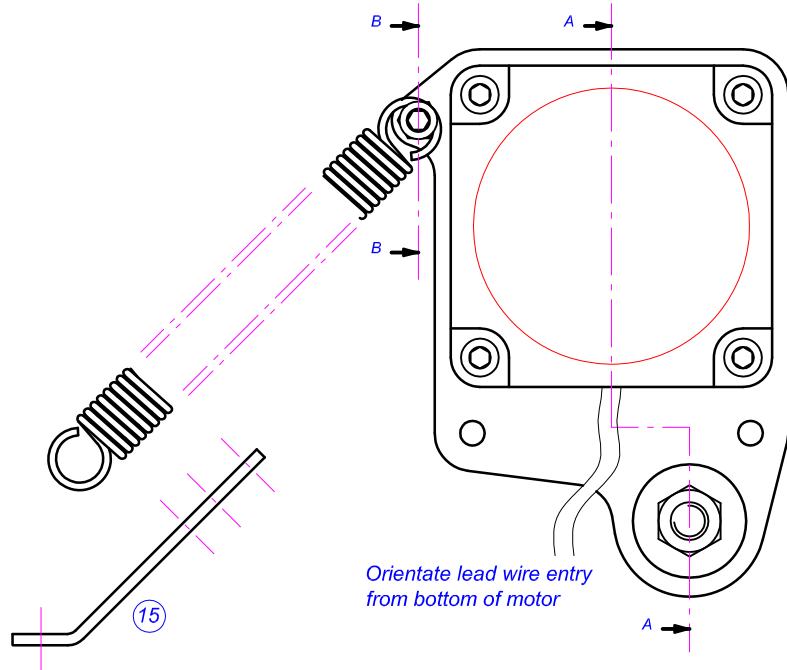
No.	Description	Qty
1	Stepper Motor	1
2	M5 10 312 D Motor Swing Plate	1
3	M2 30 110 T Pinion Gear	1
4	M3 10 100 K Spring	1
5	M10 x 35 Hex Set Screw	1
6	M10 Washer	1
7	40 x 10 x 2 Teflon Washer	1
8	M10 Fender Washer	1
9	M10 Nylock Nut	1
10	Grubscrews per M2 30 110 T	2
11	M6 x 16 Allen Head Cap Screw	4
12	M6 x 30 Allen Head Cap Screw	1
13	M6 x 25 Allen Head Cap Screw	1
14	M6 Nuts	4
15	M6 Washers	4
16	M8 x 30 CSK Screw (Tip slotted)	1
17	20 x 8 x 2 Teflon Washer	2
18	M8 Washer	1
19	M8 Nylock Nut	1
20		
21		
22		



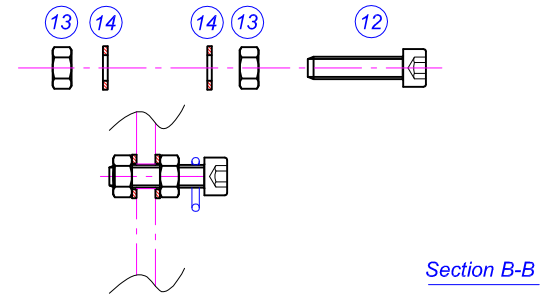
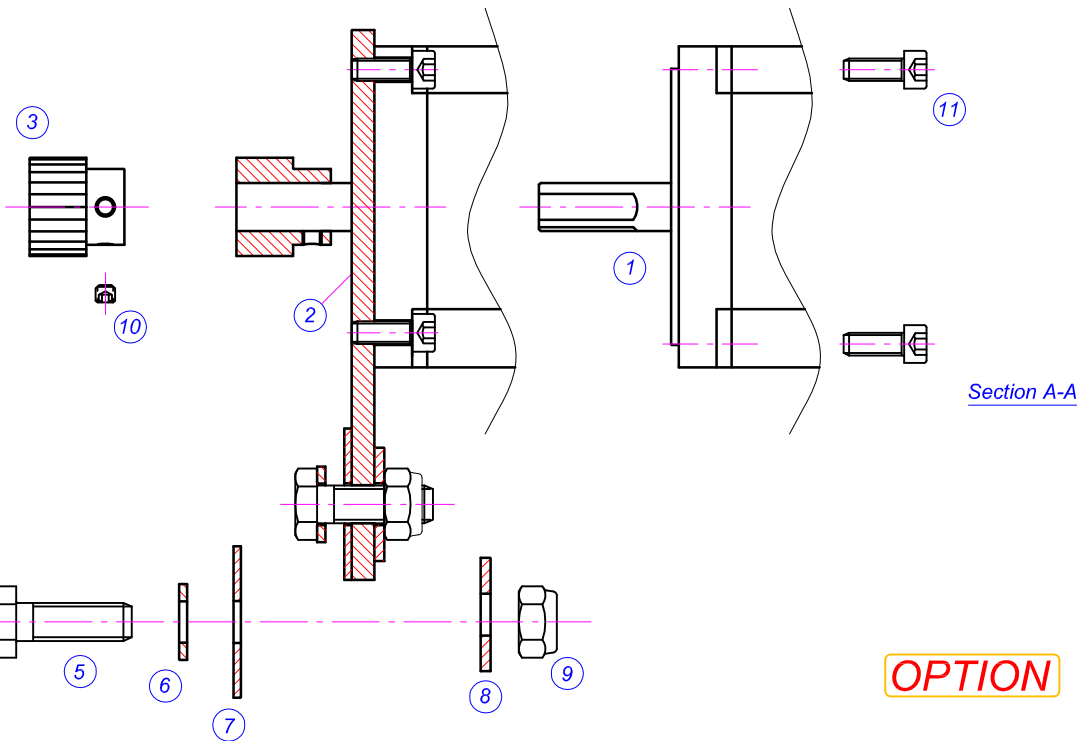
OPTION

Higher drawing/s:	10 20 000 A 10 30 000 A	1:2		
			First issue	01-11-06 A
			Description of change	Date (d-m-y) Rev.
Material:	ASSEMBLY		Title	
			MOTOR ASSEMBLY - DIRECT DRIVE	
			Drawing Number	Process Revision
			M5 10 100	A A

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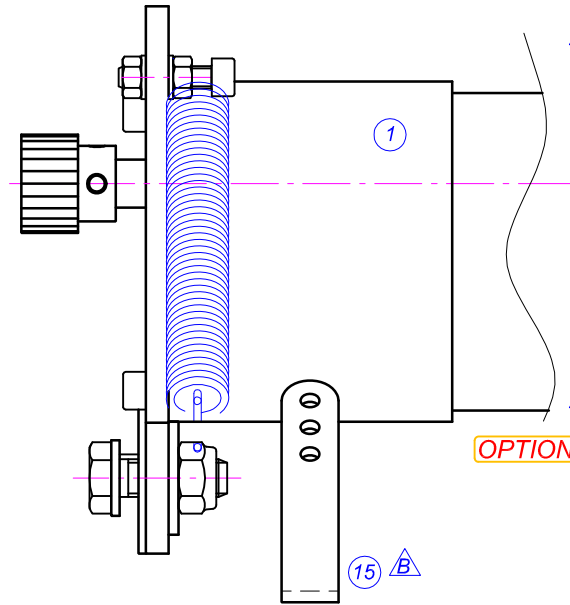
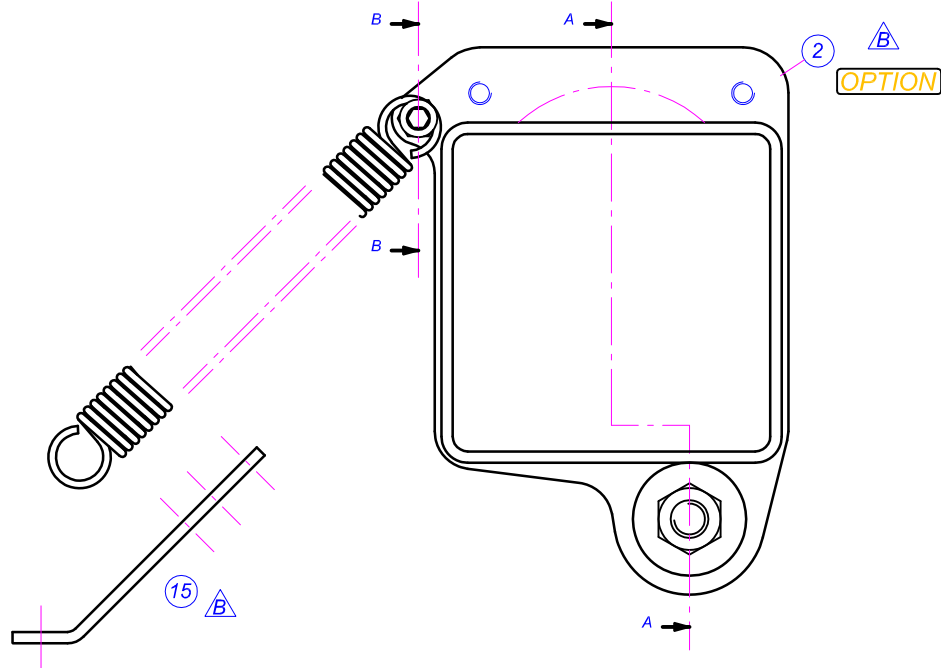


No.	Description	Qty
1	Stepper Motor	1
2	M5 10 322 D Motor Swing Plate	1
3	M2 30 110 T Pinion Gear	1
4	M3 10 100 K Spring	1
5	M10 x 35 Hex Set Screw	1
6	M10 Washer	1
7	40 x 10 x 2 Teflon Washer	1
8	M10 Fender Washer	1
9	M10 Nylock Nut	1
10	Grubscrews per M2 30 110 T	2
11	M6 x 16 Allen Head Cap Screw	4
12	M6 x 25 Allen Head Cap Screw	1
13	M6 Nuts	2
14	M6 Washers	2
15	10 40 386 D SPRING ANCHOR or 10 40 387 B SPRING ANCHOR	1

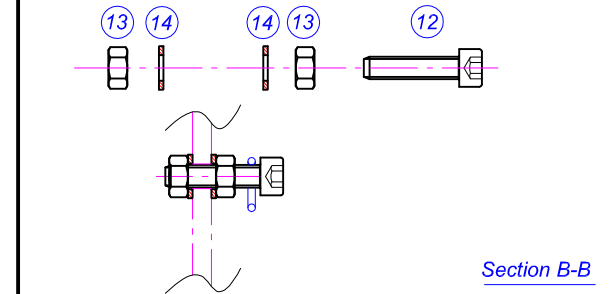
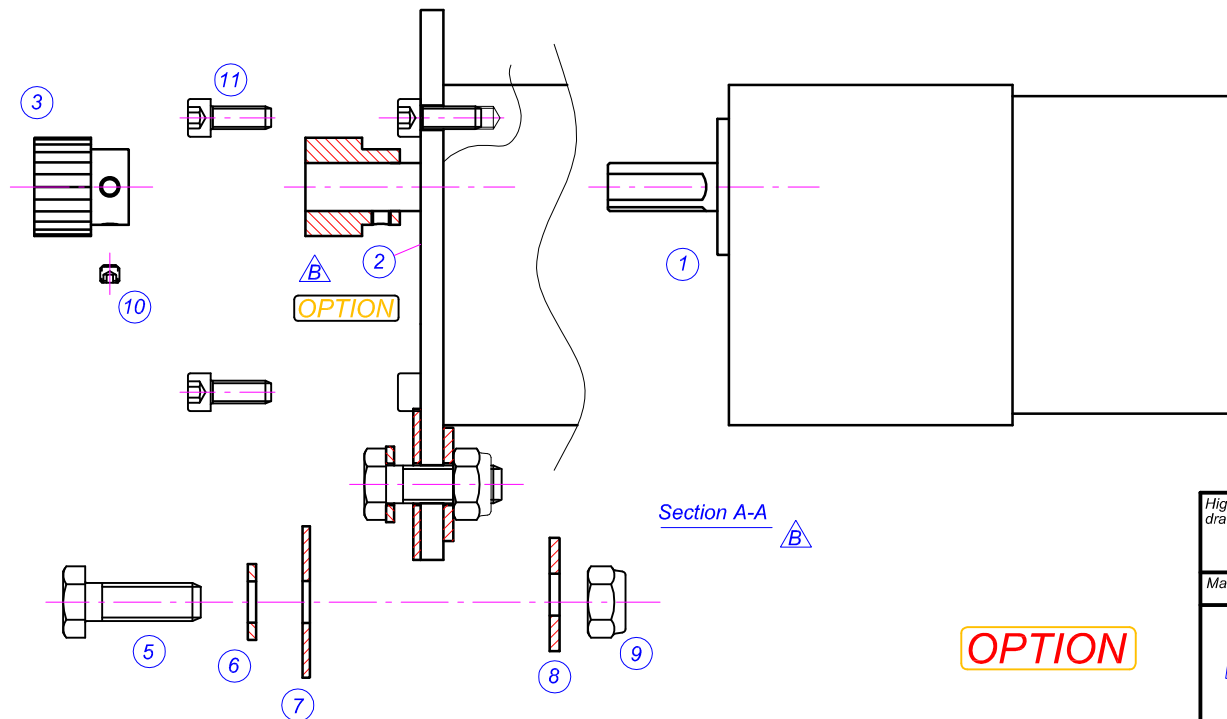


OPTION

Higher drawing/s:	10 40 000 A	1:2	Optional lasered anchor plate	29-06-08	B
			First issue	21-11-06	A
			Description of change	Date (d-m-y)	Rev.
Material:	ASSEMBLY		Title		
	MechMate		Z-MOTOR ASSEMBLY - DIRECT DRIVE		
	www.mechmate.com		Drawing Number	Process	Revision
			M5 10 150	A	B

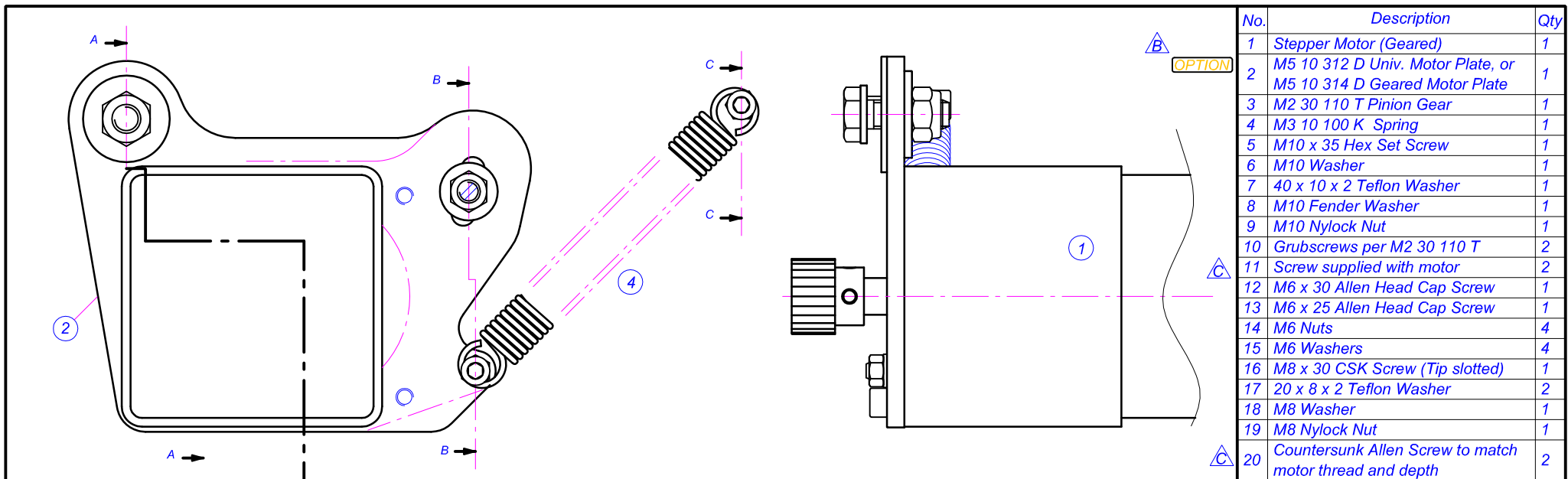


No.	Description	Qty
1	Geared Stepper Motor	1
2	M5 10 322 D Univ. Motor Plate, or M5 10 324 D Geared Motor Plate	1
3	M2 30 110 T Pinion Gear	1
4	M3 10 100 K Spring	1
5	M10 x 35 Hex Set Screw	1
6	M10 Washer	1
7	40 x 10 x 2 Teflon Washer	1
8	M10 Fender Washer	1
9	M10 Nylock Nut	1
10	Grubscrews per M2 30 110 T	2
11	M6 x 16 Allen Head Cap Screw	4
12	M6 x 25 Allen Head Cap Screw	1
13	M6 Nuts	2
14	M6 Washers	2
15	10 40 386 D Spring Anchor, or 10 40 387 B Spring Anchor	1

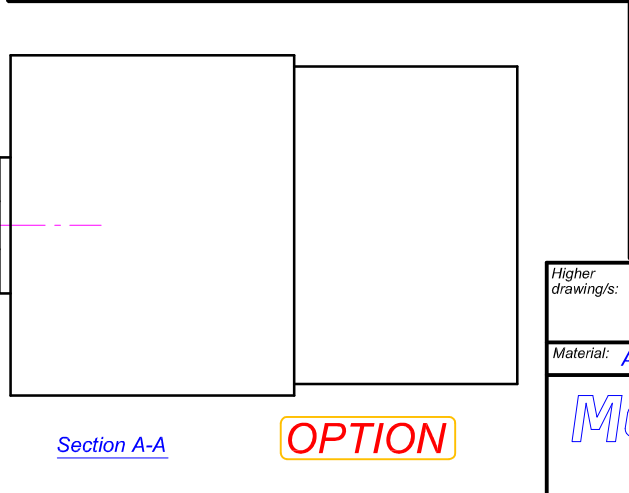
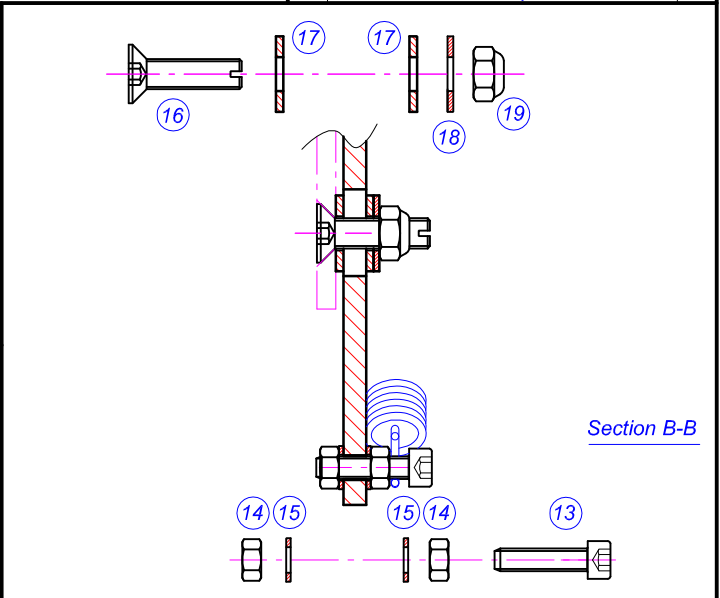
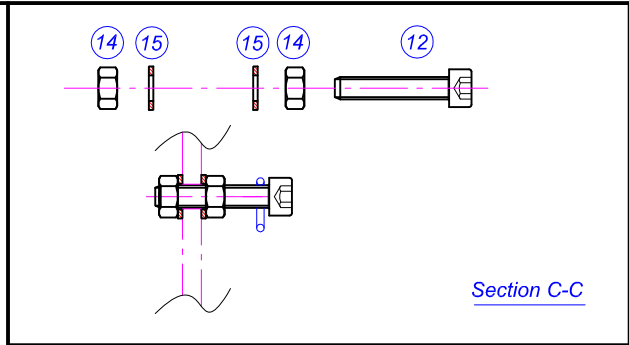
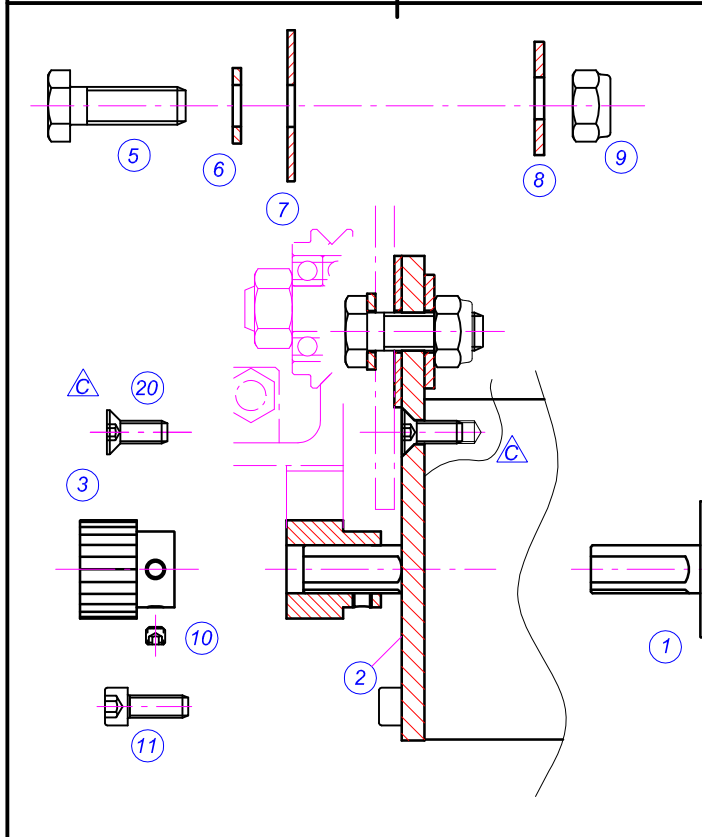


OPTION

Higher drawing/s:	10 40 000 A	1:2	Small corrections	27-06-08	B
			First issue	17-10-07	A
			Description of change	Date (d-m-y)	Rev.
Material:	ASSEMBLY		Title		
MechMate www.mechmate.com			Z-MOTOR ASSEMBLY - GEARED DRIVE		
Drawing Number		Process	Revision		
M5 10 160		A	B		



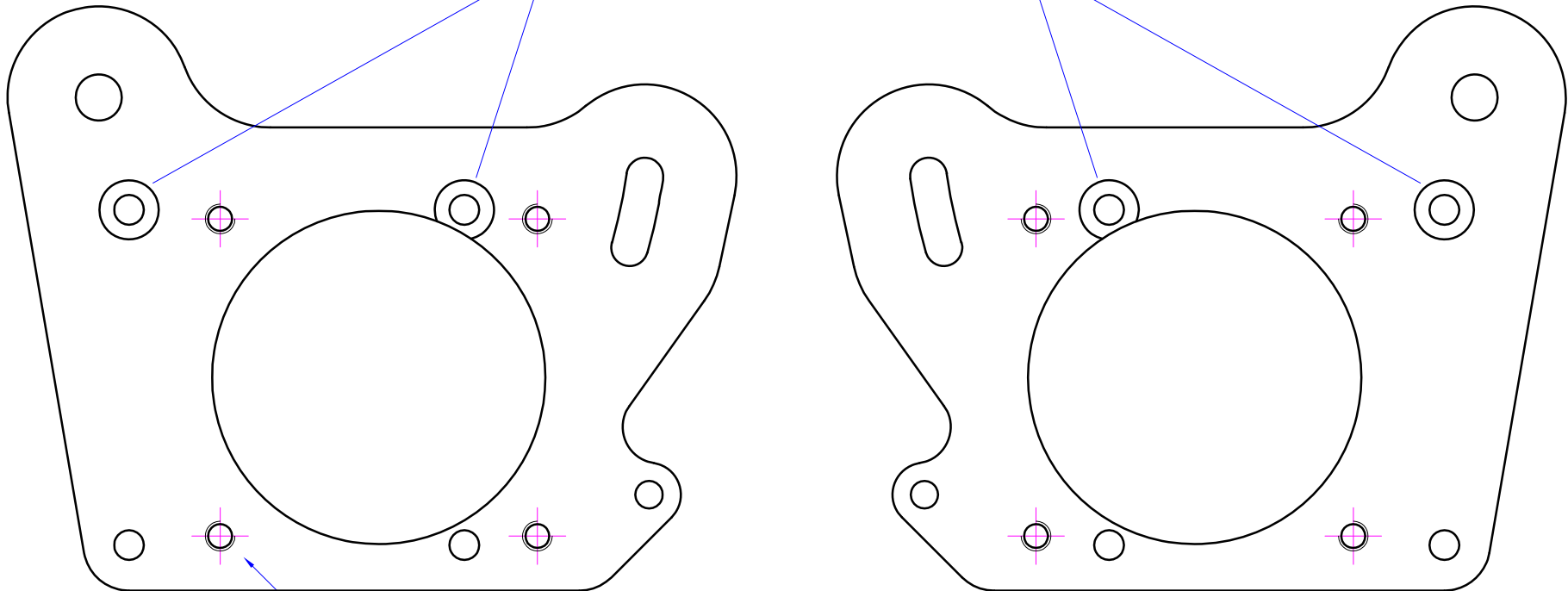
No.	Description	Qty
1	Stepper Motor (Geared)	1
2	M5 10 312 D Univ. Motor Plate, or M5 10 314 D Geared Motor Plate	1
3	M2 30 110 T Pinion Gear	1
4	M3 10 100 K Spring	1
5	M10 x 35 Hex Set Screw	1
6	M10 Washer	1
7	40 x 10 x 2 Teflon Washer	1
8	M10 Fender Washer	1
9	M10 Nylock Nut	1
10	Grubscrews per M2 30 110 T	2
11	Screw supplied with motor	2
12	M6 x 30 Allen Head Cap Screw	1
13	M6 x 25 Allen Head Cap Screw	1
14	M6 Nuts	4
15	M6 Washers	4
16	M8 x 30 CSK Screw (Tip slotted)	1
17	20 x 8 x 2 Teflon Washer	2
18	M8 Washer	1
19	M8 Nylock Nut	1
20	Countersunk Allen Screw to match motor thread and depth	2



Higher drawing/s:	10 20 000 A 10 30 000 A	1:2	Optional motor plate	17-10-07	B
		△	Countersunk screws for motor mounting	27-06-08	C
Description of change				Date (d-m-y)	Rev.
Material: ASSEMBLY		Title: MOTOR ASSEMBLY - GEARED DRIVE			
MechMate www.mechmate.com		Drawing Number: M5 10 200		Process: A	Revision: C

B For geared motors, countersink 2 upper motor mounting screw holes, from the side facing the Carrier Plates (1020451, 1020452 & 1030450, where applicable due to options taken).

It is possible that all 3 plates are not countersunk from the same side.

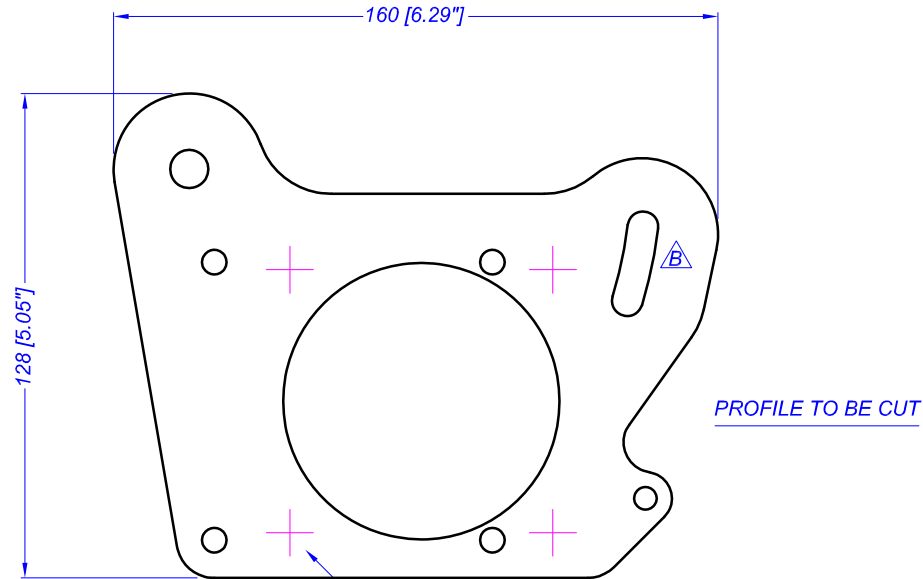


DRILL & TAP M6 [1/4"]
THREADS 4 PLACES

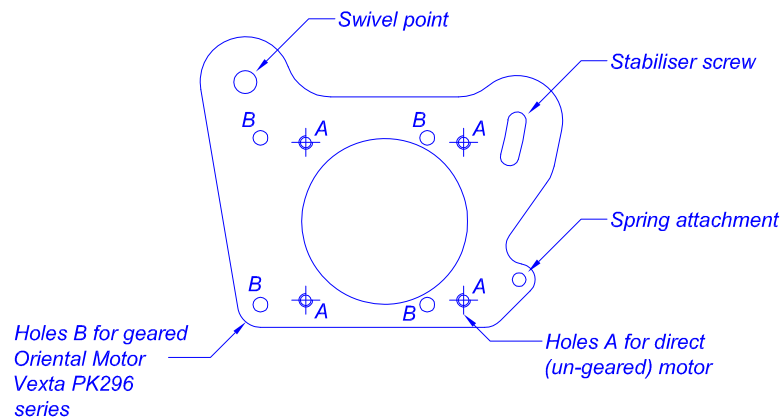
Higher drawing/s:	M5 10 000 A	1:1	Countersinks for geared motors	27-06-08	B
			First issue	14-07-06	A
			Description of change	Date (d-m-y)	Rev.
Material:	6mm STEEL 300MPa		Title		
			UNIVERSAL MOTOR PLATE - DRILLED		
Drawing Number			Process	Revision	
M5 10 312			D	B	

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SUPPLY THIS DRAWING IN .dxf FORMAT TO THE CNC LASER CUTTING COMPANY FOR REMAINDER OF DIMENSIONS. THE TWO GIVEN DIMENSIONS ARE TO CHECK SCALE.



ENGRAVE CENTER MARKS FOR DRILLING & TAPPING THREADS



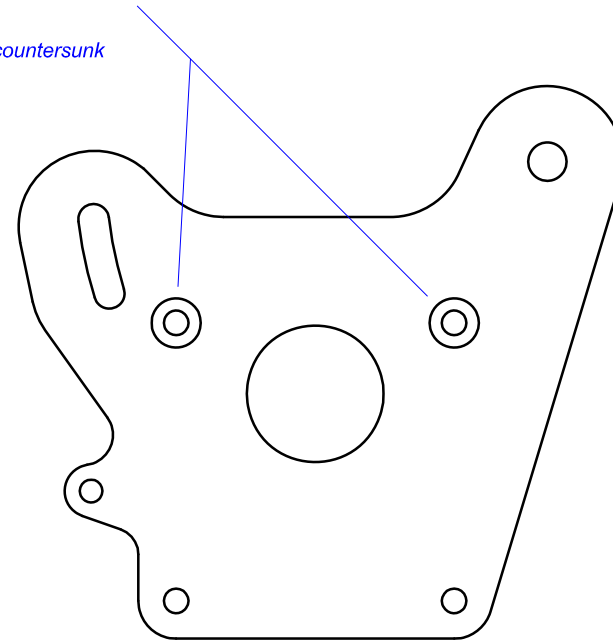
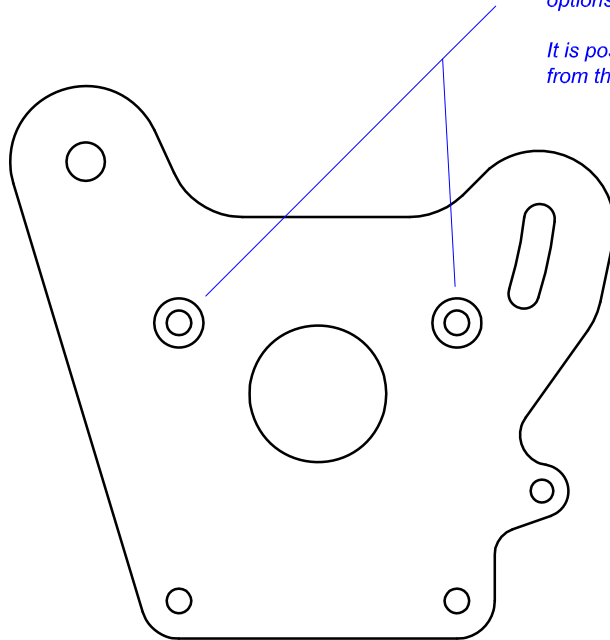
EXPLANATION OF HOLES - DO NOT CUT THIS PROFILE

OPTION



Higher drawing/s:	M5 10 312 D	1:2	Lengthen slot 2mm either side	5-12-06	B
			First issue	14-07-06	A
			Description of change	Date (d-m-y)	Rev.
Material:	6mm [1/4"] STEEL 300MPa		Title		
MechMate			MOTOR SWINGPLATE - PROFILE CUT		
www.mechmate.com			Drawing Number	Process	Revision
			M5 10 312	P	B

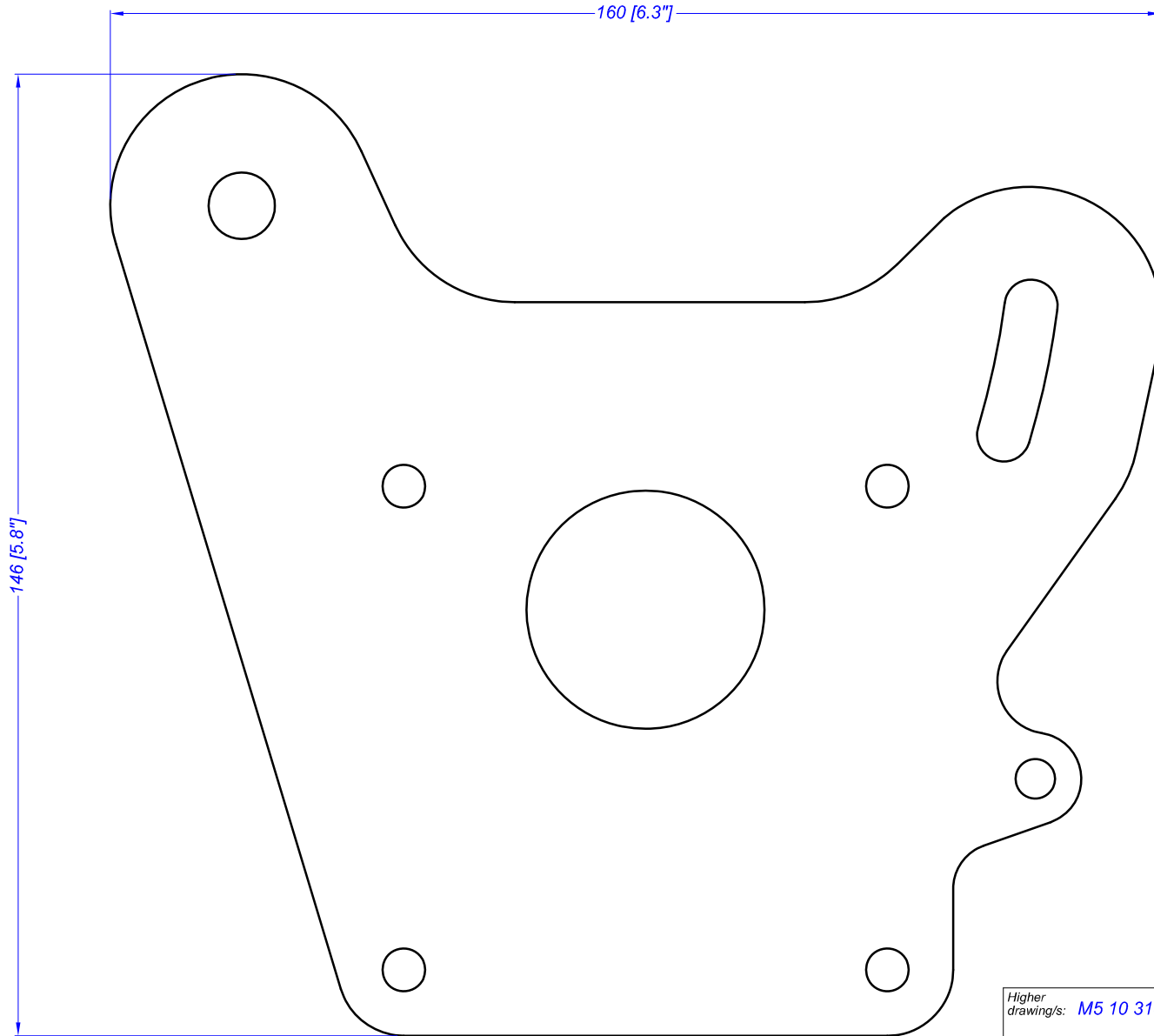
Countersink 2 upper motor mounting screw holes, from the side facing the Carrier Plates (1020451, 1020452 & 1030450, where applicable due to options taken).

It is possible that all 3 plates are not countersunk from the same side.



OPTION

Higher drawing/s: M5 10 200 A	1:1			
		First issue	27-06-08	A
		Description of change	Date (d-m-y)	Rev.
Material: 6mm [1/4"] STEEL 300MPa	Title: GEARED MOTOR PLATE - CSK DRILLED			
 www.mechmate.com	Drawing Number		Process	Revision
	M5 10 314		D	A

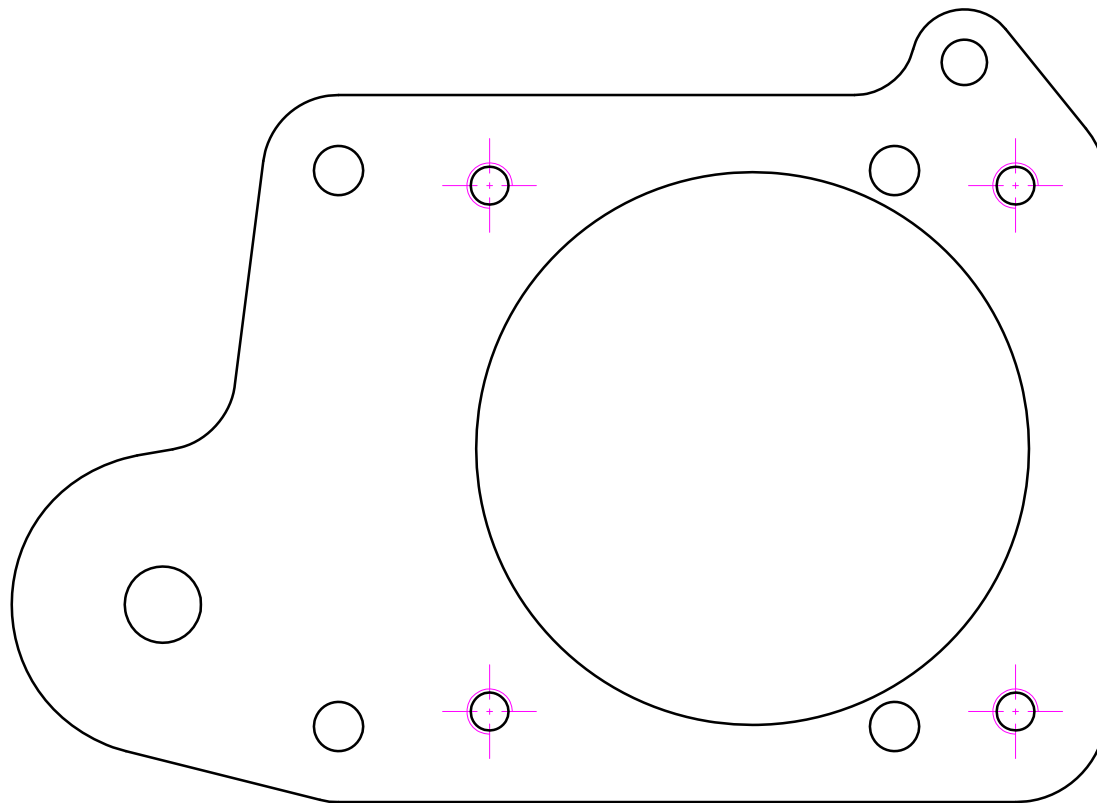


SUPPLY THIS DRAWING IN .dxf FORMAT TO THE CNC LASER CUTTING COMPANY FOR REMAINDER OF DIMENSIONS. THE TWO GIVEN DIMENSIONS ARE TO CHECK SCALE.

OPTION


Higher drawing/s: M5 10 314 D	1:1	Orientate motor wire entry bottom	09-11-07	B
		First issue	06-10-07	A
		Description of change	Date (d-m-y)	Rev.
Material: 6mm [1/4"] STEEL 300MPa	Title: GEARED MOTOR PLATE - PROFILE CUT			
Drawing Number		Process	Revision	
M5 10 314		P	B	

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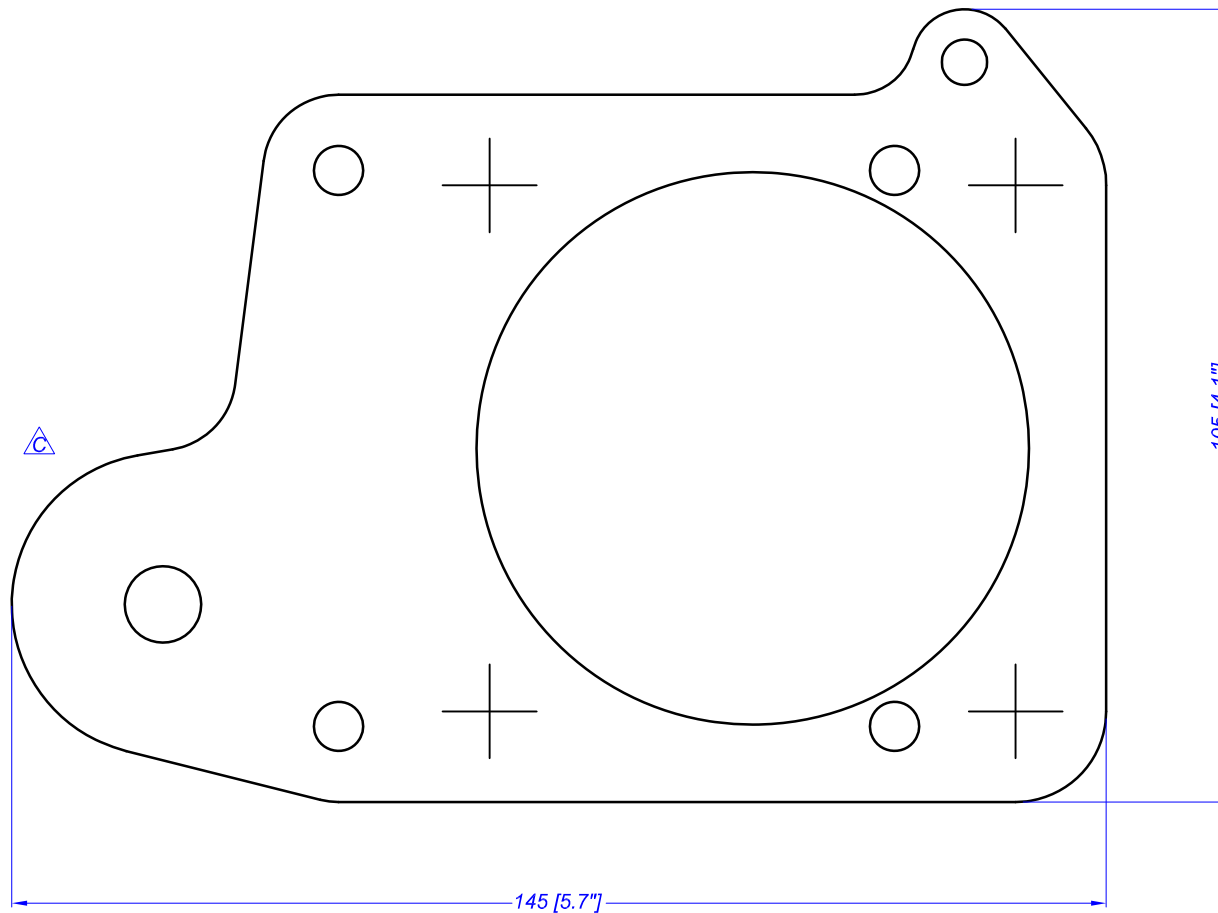


DRILL & TAP M6 AT 4 PLACES

OPTION

Higher drawing/s:	M5 10 150 A	1:1		
			First Issue	24-11-06 A
			Description of change	Date (d-m-y) Rev.
Material:	6mm STEEL 300MPa		Title	
			Z-MOTOR PLATE - DRILLED & TAPPED	
	Drawing Number		Process	Revision
	M5 10 322		D	A

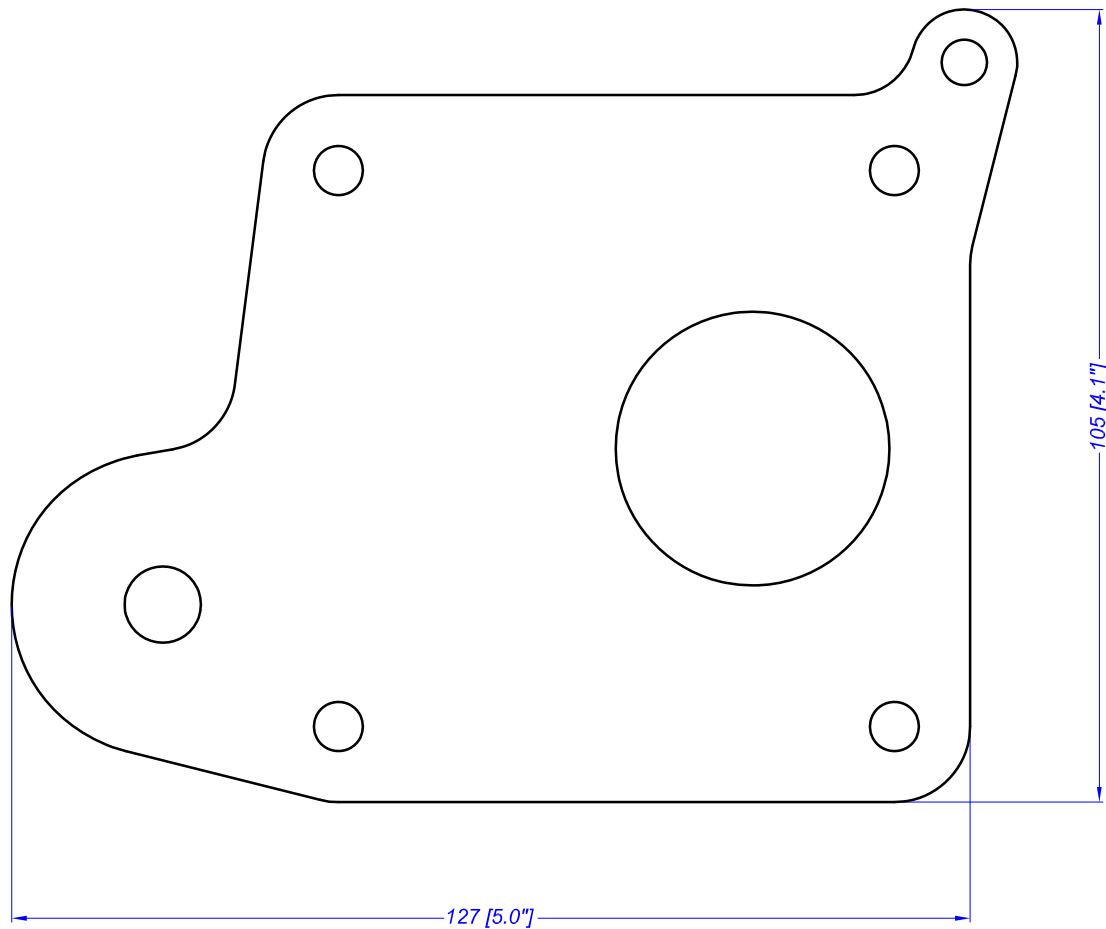
MechMate
www.mechmate.com





OPTION

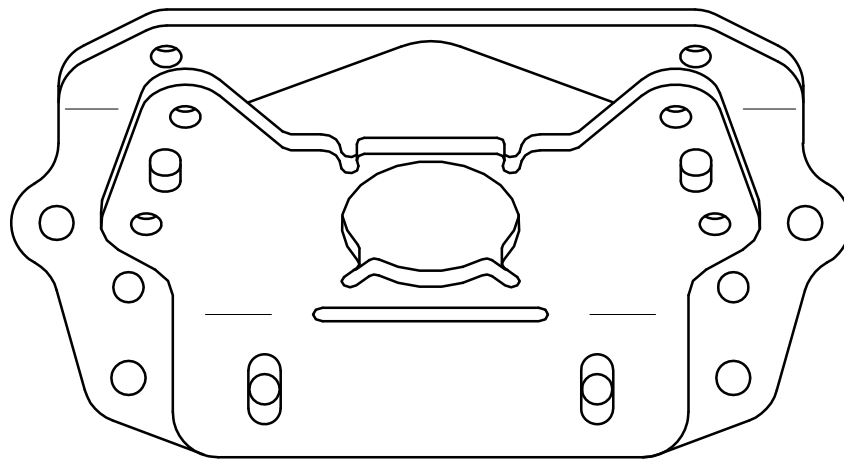
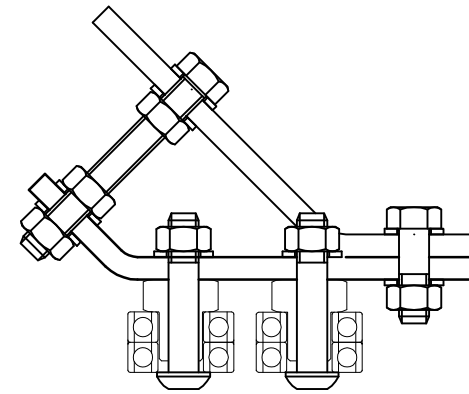
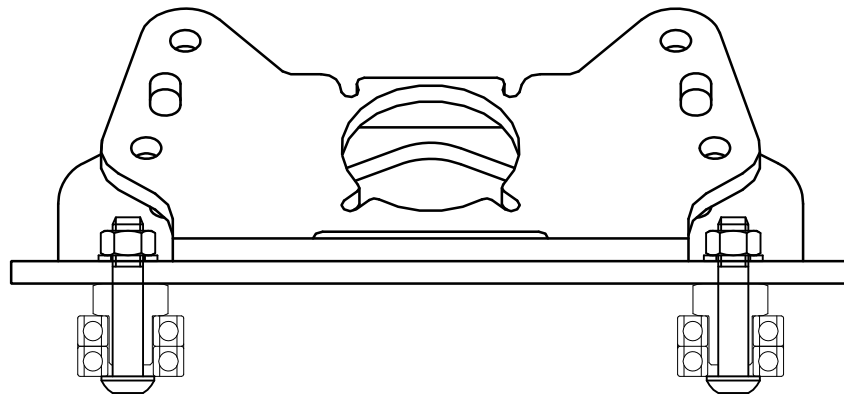
Higher drawing/s:	M5 10 322 D	1:1	Moved hinge point - lower motor	21-11-06	C
			Moved hinge point - bolt to miss rack	19-11-06	B
			Description of change	Date (d-m-y)	Rev.
Material:	6mm STEEL 300MPa		Title		
			UNIV. Z-MOTOR PLATE - PROFILE CUT		
	Drawing Number		Process	Revision	
	M5 10 322		P	C	


MechMate
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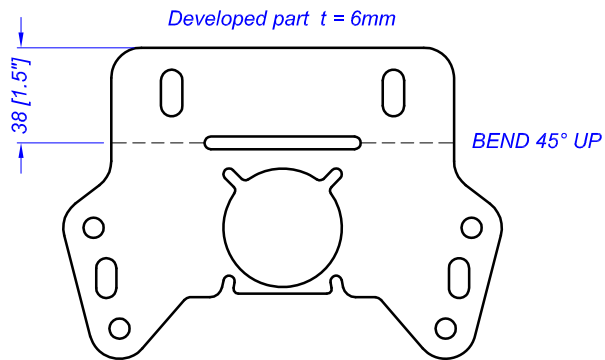
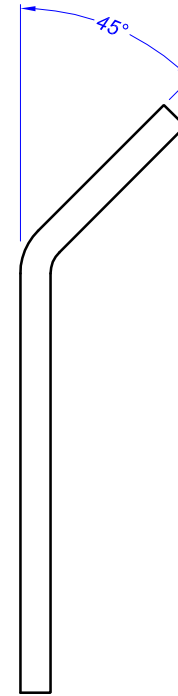
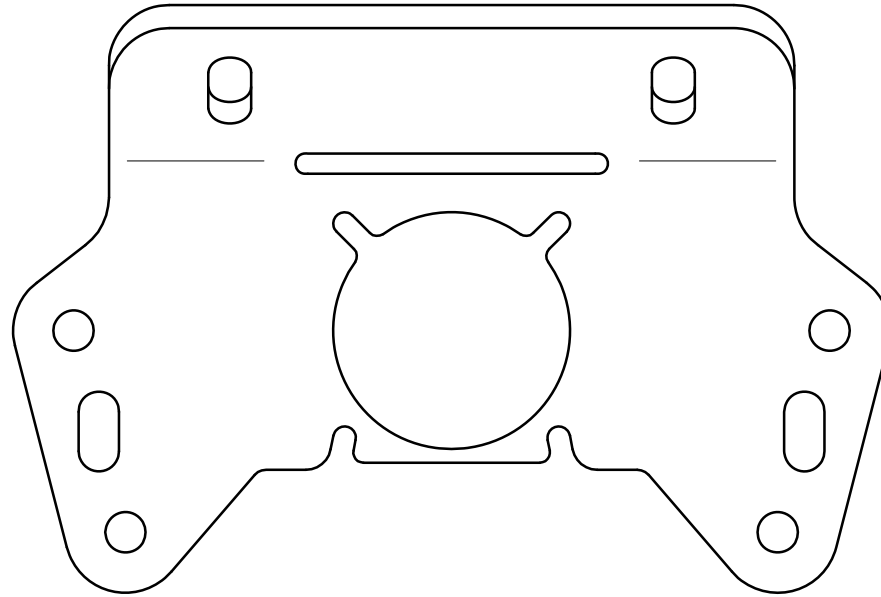


OPTION

Higher drawing/s: M5 10 150 A	1:1		
		First issue	06-10-07 A
Material: 6mm [1/4\"] STEEL 300MPa		Description of change	Date (d-m-y) Rev.
 www.mechmate.com		Title GEARED Z-MOTOR PLATE - PROFILE CUT	
		Drawing Number M5 10 324	Process Revision P A



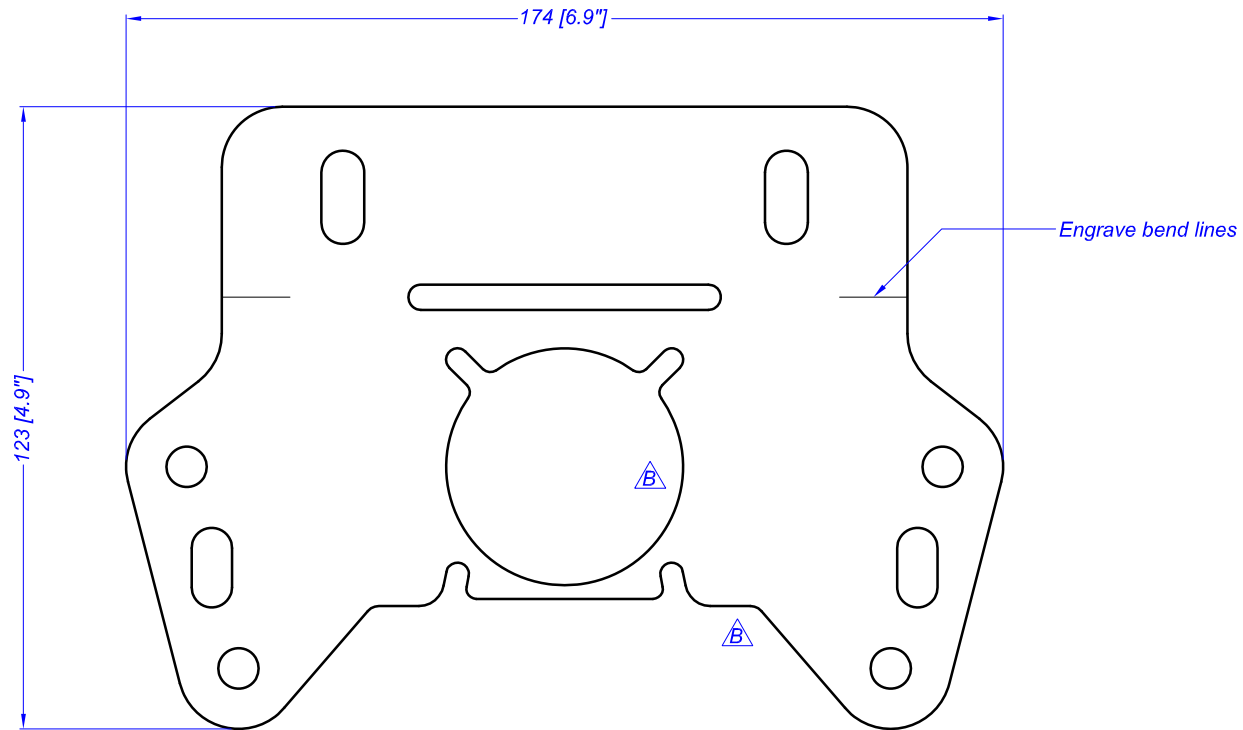
Higher drawing/s:	1:2			
	△	First issue	06-11-07	A
		Description of change	Date (d-m-y)	Rev.
Material: Assembly	Title: GRIND HEAD - ASSEMBLY			
 www.mechmate.com	Drawing Number		Process	Revision
	M6 10 100		A	A



OPTION

Higher drawing/s:	M6 10 100 A	1:1.5		
			First issue	07-11-07 A
			Description of change	Date (d-m-y) Rev.
Material:	6mm [1/4\"] STEEL 300MPa	Title		
		GRIND HEAD TOP PLATE - BEND		
Drawing Number		Process	Revision	
M6 10 115		B	A	

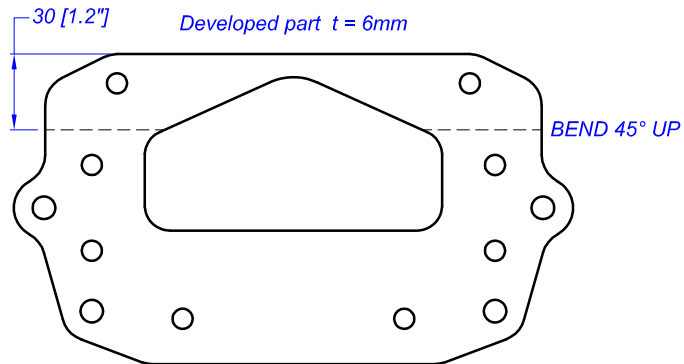
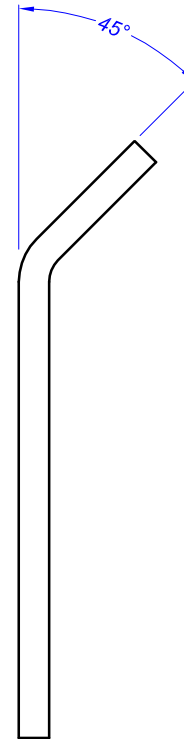
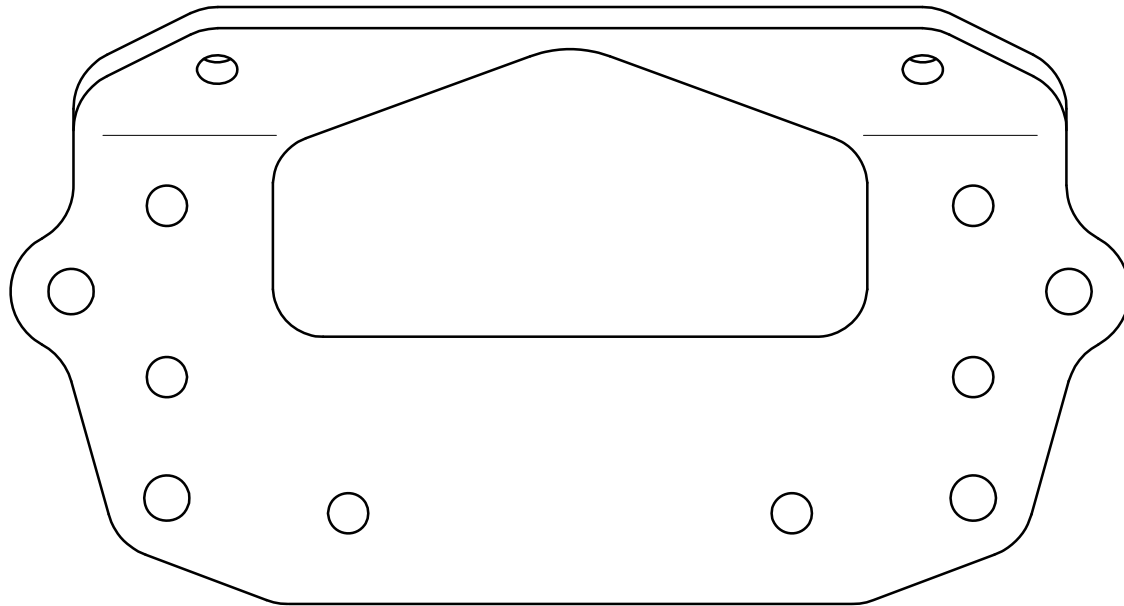
MechMate
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OPTION

Higher drawing/s:	M6 10 115 B	1:1.5	Enlarged grinder hole	17-06-08	B
			First issue	07-11-07	A
			Description of change	Date (d-m-y)	Rev.
Material:	6mm [1/4"] STEEL 300MPa		Title		
			GRIND HEAD TOP PLATE - PROFILE		
	Drawing Number		Process	Revision	
	M6 10 115		P	B	

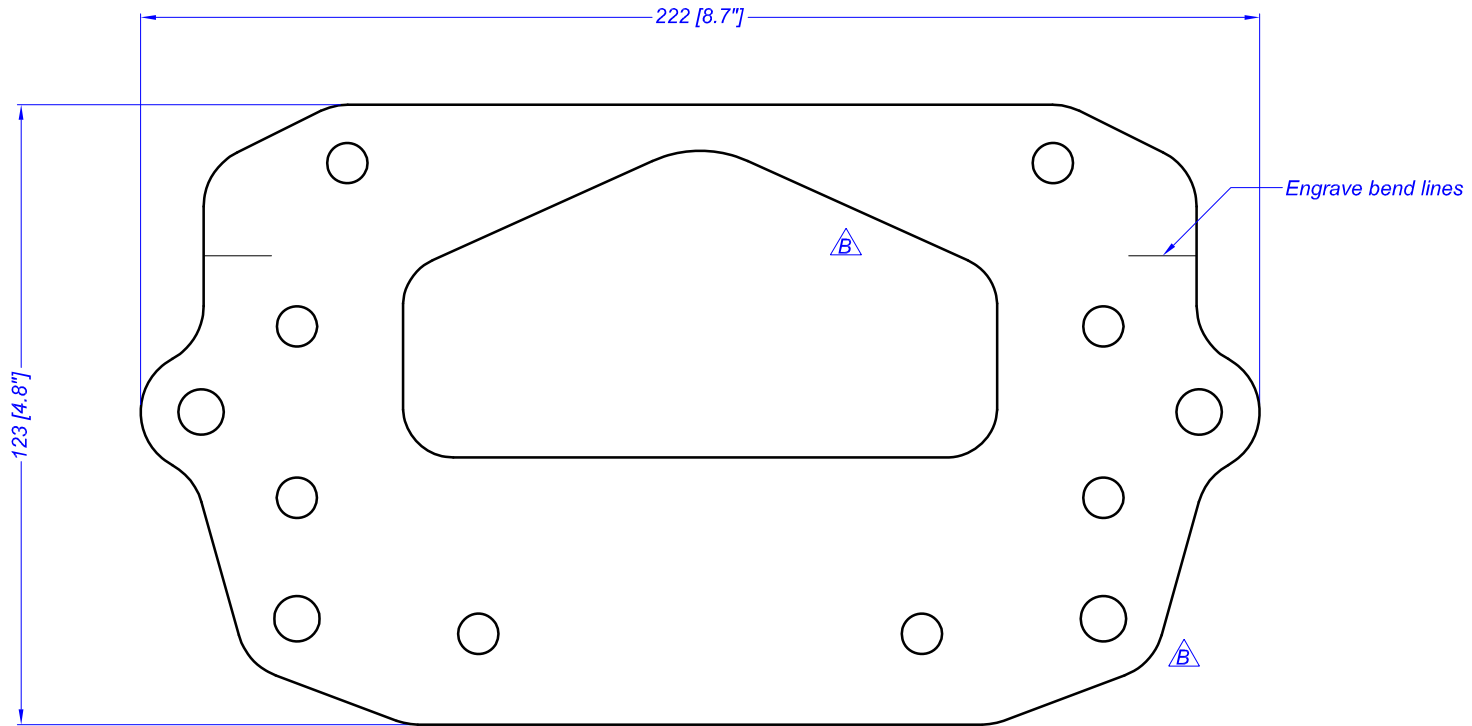
MechMate
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OPTION

Higher drawing/s:	M6 10 100 A	1:1.5			
			First issue	07-11-07	A
			Description of change	Date (d-m-y)	Rev.
Material:	6mm [1/4"] STEEL 300MPa		Title		
			GRIND HEAD BOTTOM PLATE - PROFILE		
			Drawing Number	Process	Revision
			M6 10 116	B	A

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OPTION

Higher drawing/s:	M6 10 116 B	1:1.5	Add handle points, simplify	27-06-08	B
			First issue	07-11-07	A
			Description of change	Date (d-m-y)	Rev.
Material:	6mm [1/4"] STEEL 300MPa		Title		
			GRIND HEAD BOTTOM PLATE - PROFILE		
	Drawing Number		Process	Revision	
	M6 10 116		P	B	

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