Instruction Manual
M4P Pneumatically Operated Underpinner

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Instruction Manual
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Introduction

The Framers Corner M4P is a development from our best selling M3 Foot operated underpinner.

The M4P is pneumatically operated, easy to use and has a large capacity.

It shares our unique feature of the 'stay-locked' rebate clamp which ensures that the moulding is clamped throughout the underpinning cycle. It also shares the 'green light' which shows when the wedge is fully inserted.

The M4P is a heavy machine designed for a busy workshop where, perhaps, the underpinner is operated by more than one person. For instance it has a one piece table made from 15mm thick steel which is precision ground and chromed

Two new features are the mirror plate to help you see the front edge of the joint when underpinning and the LED light which has magnetic strips on the bottom, allowing it to be placed anywhere

With a maximum moulding height of 75mm and a maximum moulding width of 100mm, the M4P represents a step forward in affordable,pneumatically operated underpinners available anywhere today.

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2. Getting to know your M4P Pneumatic Underpinner

2.1 When you receive your M4 Underpinner
i. Unbox your Underpinner and place on a flat surface.
ii.Wipe off any grease or oil used for protection during storage and shipment.
iii. Fit the 4 feet to the base and make sure the machine sits level on the floor.
iv. Connect an air supply to the input nipple and use the regulator (phoyo 13) to set the pressure to 2.8 Atmospheres (80 psi)

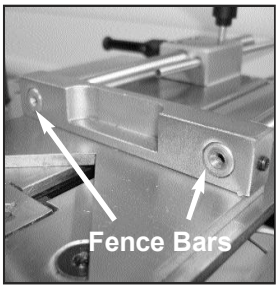


photo 2

2.2 Pneumatic operation
The perspex safety guard 29 should be fitted to the 2 vertical columns. This a safety device. When the guard is raised the pneumatics will not work.
The footpedal has 2 valves, one for the front clamp and one for the top clamp and wedge insertion.

photo 3

2.3 Fence Bars
For safe transport the Fence has been moved along the Fence Bars.
Using the allen key provided, slide the fence to the end of the bars and tighten the 2 grub screws. (photo 2)

2.4 Top Pressure Bar and Pressure Pads
2.4.1 The M4P comes with a threaded Top Pressure Bar, ***72*** which is locked in position by the spring loaded button ***76***. Push the button in to release and reposition the Vertical Bar.

photo 4

2.4.2 Note that the Top Pressure Arm should be positioned accurately to give support directly over the point where the wedge is inserted into the wood. (photo 4)

2.4.3 Two Neoprene pads are supplied. One is round and the other is angled. The Neoprene prevents damage to the moulding. (photo 3)


photo 5

2.5 Testing the pneumatic movement (without wedges)
Place 2 pieces of moulding against the fence.The distance between the moulding and the top pressure should be 5mm to 20mm. Lower the perspex guard to it's vertical condition and makesure it is covering the top pressure. Press the footpedal until the front clamp grips the moulding; press the footpedal completely to operate the top clamp and then the driver. (photo 5)

2.6 Fence

Check that the fence slides smoothly forwards and backwards. It is equipped with a front and a rear production stop
The front stop is set by the collar **61** which is fitted to the Right Hand Fence Bar **60** and the rear stop is set by the small diameter bar ***61***

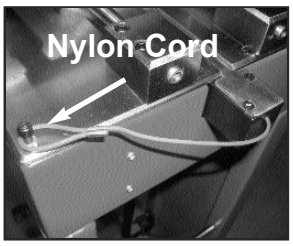


photo 6

2.7 Placing wedges in to the magazine and removing

2.7.1 The M4P will accept wedges 5mm, 7mm, 10mm, 12mm,and 15mm high but it is important that only ***Universal*** wedges are used. To access the wedge support **108**, a nylon cord is attached to the end of the wedge pusher **123**.This can be pulled and looped around the screw in the corner of the table so that both hands are free for placing the wedges in the magazine.(photo 6)

photo 7

2.7.2 To set the height, turn the yellow magazine knob on the right hand side of the machine so that the pointer on the knob is pointing to the correct section of the coloured label.
The knob will automatically stay in each position(photo 8)
When adjusted correctly the wedges will slide underneath the Magazine Cap with a small gap between the top of the wedges and the cap of about 0.5mm.
A wedge magnet (photo7) is provided for the easy removal of the wedges from the magazine

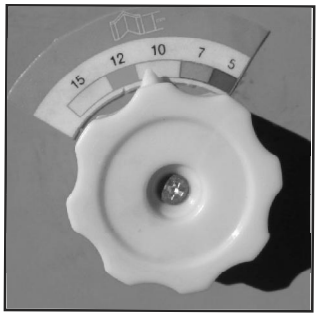


photo 8

2.8 Clamping

2.8.1 Place 2 pieces of moulding against the fence.
Position the Front Clamp ***83*** on the Clamp Block ***87***There are a series of holes in the Clamp Bar to suit the width of the moulding being joined. (photo 9) Set the appropriate hole on the screw in the Clamp Block ***87***

2.8.2 Press the button **76** to release the Top Clamp and set it to between 5mm and 20mm above the moulding

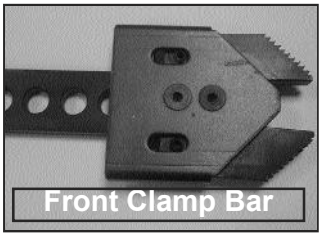


photo 9

2.8.3 Note that the Front Clamp ***83*** has 2 self adjusting jaws which take up any variation in the thickness of the moulding.

2.9 Wedge positions

2.9.1 Wedges can be inserted anywhere along the joint face but choosing the wedge position is important. If the wedge position is too near the outside edge it will open the outside of the joint. If it is too near the inside edge then it will open the inside of the joint.
The correct wedge positions are obtained by trial and error and experience. They will also depend upon the shape of the Moulding.

photo 10

2.9.2. Wedges can be inserted singly or on top each other, which is known as 'stacking' This is particularly useful when joining high mouldings.
However, when 'stacking' wedges it is very important that the moulding does not move at all. A very small amount of movement will result in the wedges being inserted behind each other rather than on top of each other.
The unique 'stay-locked' clamp of the M4P underpinner ensures that the moulding being joined is held locked. In addition the Fence block has a locking handle (photo 11) which locks the fence bar in position for stacking,.

photo 11

2.10 Production Stops
2.10.1 Two production stops are provided on the M4 underpinner.
The rear production stop, which is for the wedge inserted near the outside edge of the frame, is fence stop bar ***61*** which slides through the Left Hand Fence Block **65** and is locked in position by the handle in the top of the Left Hand Fence Block. (photo 12)

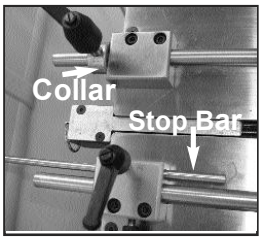


photo 12

2.10.2 The front production stop is the fence stop collar ***62***, which slides along the Fence Bar ***60*** and is locked in position on the bar by a handle (photo 12)

3. Maintenance Maintenance of your M4P Underpinner is essential but easy.

3.1 Adhesive build up
Daily make sure that there is no glue build up around the Driver, the Driver Cap and the Driver Nosepiece **125.** A spanner is provided for the removal of the Driver Cap. Use a light oil weekly in the magazine head.

photo 13

3.2 Lubricate weekly
Keep the top of your machine clean, a light silicon spray will help.
The general machine can also be cleaned and lubricated weekly with a silicone spray to keep it looking as new.

3.3 Pneumatics
3.3.1 Drain the Water filter weekly by pressing the pin valve at the bottom of the Filter. (see photo 13)

3.3.2 Check that there is oil in the Lubricator, a light oil as used on sewing machines. This oil lubricates the pneumatic valves.

3.3.3 Check for airleaks, these cause your compresor to work too hard and can cause valves to fail.

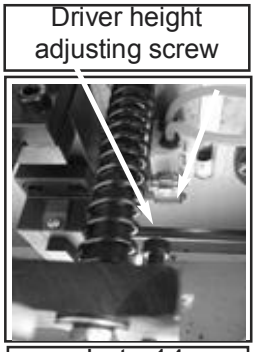


photo 14

3.4.Setting the driver height to adjust the depth of the wedge
Although this is factory set, it is possible to adjust the depth that the wedge is driven into the moulding. A setting screw **48** is fitted to the Driver Plate **45**.(photo 14) Loosen this and adjust as required

3.5 Fitting a new Driver
i. This is relatively simple. Undo the grub screw ***91***in the Driver Holder ***49.*** The Driver can now be lifted out through the top of the magazine head.
Slide the new Driver into position and lock it in the Driver Holder.(photo 15)

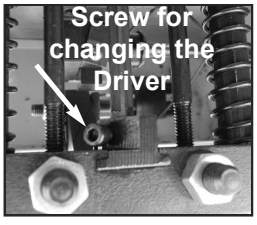


photo 15

4. Setting up your M4 Underpinner

4.1 Mitre your 4 pieces of moulding to be joined together making sure that the angle of cut is very accurate and the mitred surface is as smooth as possible.

4.2 Decide what height of wedge you are going to use and set the Yellow magazine knob to suit. ***(See 2.6.2*)**

4.3. Place one piece of moulding against the left hand fence so that the end cut is lined up with the centre of the Driver Cap. Decide where you would like to insert the wedges and set the front and back production stops. ***(See 2.9.2)***
IIt is possible to insert wedges between these stops.(photo16)

Setting the production stops

photo 16

4.4. To set the Front Clamp, place 2 pieces of moulding against the fence and set the Clamp so that when the foot pedal is pressed, approximately half way, the clamp grips the moulding firmly.

Fence Mirror

photo 17

5. Making a frame

5.1. Spread a quick setting adhesive on one end of a long piece and the adjoining end of short piece of moulding

5.2 Position the mouldings against the fence plate **69**. Align the the two adjoining faces. Use the mirror plate on the fence bracket to check the alignment.

5.3. Move to the front or back wedge position.

5.4 Press the pneumatic footpedal approximately half way and the clamp will grip the mouldings. If you are happy with the alignment then press the footpedal fully down to insert the wedge. Remove your foot from the footpedal. If you wish to insert more wedges in the same position (stacking|) then release the footpedal halfway and press it again

LED Magnetic Light

photo 18

5.5 When stacking wedges on top of each other, lock the fence by using the Fence Locking Screw (photo 11)

5.6. Move to the other stop position and then to any other position and insert the required wedges.

5.7. Release the footpedal completely and go to the next corner to be joined

5.8. Note Your M4 is supplied with an LED light with magnetic strips on the base. Position this light so that it shines on themoulding being joined or on the mirror plate in the centre of the fence bracket **67**.

6. Understanding your pneumatics

6.1. Setting the speed of the Front Clamp

Ideally we set it to go slowly in to the moulding so as not to disturb the positioning and then to return quickly.
On one end of the cyliinder is a speed adjuster.Screw it all the way in and the clamp will not move at all, unscrew it slowly and the clamp will begin to move. This is factory set.(see photo 19)

photo 19

6.2. The footpedal

This contains an actuating lever with 2 adjustable screws. One screw operates the valve controlling the front clamp and the other controls the valve for the main cylinder. They have been adjusted so that there is a 'dwell' time between the operation of the front clamp and the operation of the main cylinder. This makes it easier to check the alignment of the moulding once clamped but before the wedges are inserted. They are factory set.
(photo 20)

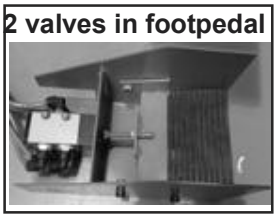


photo 20

6.3. Pneumatic cycle

This is controlled by an 'Impulse valve' (see photo 21). ***<u>This is a delicate setting and should not be altered unless the pneumatic cycle is not working properly.</u>***
Proper adustment gives a complete pneumatic cycle of the Top Pressure and Driver and also the fastest.
If you decide to adjust this setting then do it in small amounts and make sure you are able to go back to the original setting if necessary

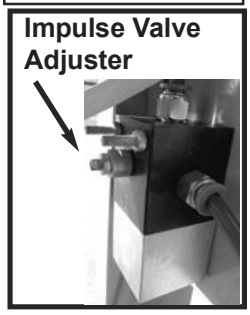


photo 21

6.4 Driver return valve

When a wedge is fully inserted, a screw on the Driver Push Plate 11-1 contacts the Driver return valve to send it down again. There is no adjustment on the valve itself but the screw that makes contact with it can be adjusted in case the wedge is being inserted either too much or too little. (see photo 22)

photo 22

6.5 Pneumatic Circuit

This is shown on page 15.

photo 23

M4P Parts List No.1 - General Layout

Part No.	Part Description
1	Pressure Regulator/Lubricator Unit
2	Mounting Bracket
3	2 x Nuts
4	2 x Socket Head Screws
5	Feet
6	Pneumatic Panel
7	Floorstand
8	4 x Nut
9	4 x Washer
10	2 x Socket Head Screws
11	2 x Washers
12	Main Body
13	Screw
14	Wedge Height Adjusting Knob
15	Clamp Support
16	4 x Socket Head Screws
17	Table Unit (see separate parts list and drawing)
18	10 x Socket Head Screw
19	4 x Socket Head Screws
20	2 x Socket Head Screws
21	Bracket for safety switch
22	Pneumatic safety switch
23	2 x Socket Head Screws
24	2 x Pivot Block
25	Left Hand Pillar
26	Right Hand Pillar
27	2 x bracket for safety guard
28	2 x Knob
29	Safety Guard
30	2 x Socket Head Screws
31	Tool Tray
32	Left Hand Extension Table
33	6 x Socket Head Screws
34	6 x washers
35	Right Hand Extension Table
36	4 x Socket Head Screws
37	Spanner
38	Wedge Magnet
39	Footpedal

M4P Parts List No.2 - Operating Head Layout

Part No.	Part Description
40	Main Cylinder
41	2 x Socket Head Screws
42	Cylinder Mounting Plate
43	Nut
44	Washer
45	Driver Plate
46	6 x Socket Head Screws
47	Nut
48	Wedge Height Adjusting Screw
49	Driver Holder
50	2 x Bearing Housing
51	Driver
52	Guide for Driver Plate
53	Wedge Height Pneumatic Valve
54	Magazine (see seperate parts list and drawing)
55	2 x Socket Head Screws
56	Bracket for Pneumatic Valve
57	Table
58	2 x Countersunk Screws
59	Right Hand Fence Block
60	2 x Fence Bars
61	Rear Stop Bar
62	Front Stop Collar
63	Locking Handle
64	4 x Socket Head Screws
65	Left Hand Fence Block
66	Mirror Plate
67	Fence Bracket
68	2 x Grub Screws
69	Fence Plate
70	2 x Socket Head Screws
71	Adjustable Handle
72	Top Pressure Spindle and knob
73	Washer
74	Top Pressure Bridge
75	Spring
76	Top Pressure Spindle Lock
77	2 x Vertical Bars
78	Top Pressue Pads (1 x round, 1 x angled)
79	Return Collar
80	Grubscrew
81	2 x Countrersunk screw
82	2 x Countersunk screw
83	Front Clamp Unit (see separate list and drawing)
84	Front Clamp Pneumatic Cylinder
85	Location pin for top pressure unit
86	Locking Nut for cylinder
87	Block for Top Clamp
88	Grub Screw
89	Front Clamp Steady
90	Steady Bar for Front Clamp
91	Grubscrew
92	4 x Socket Head Screw
93	4 x Washer

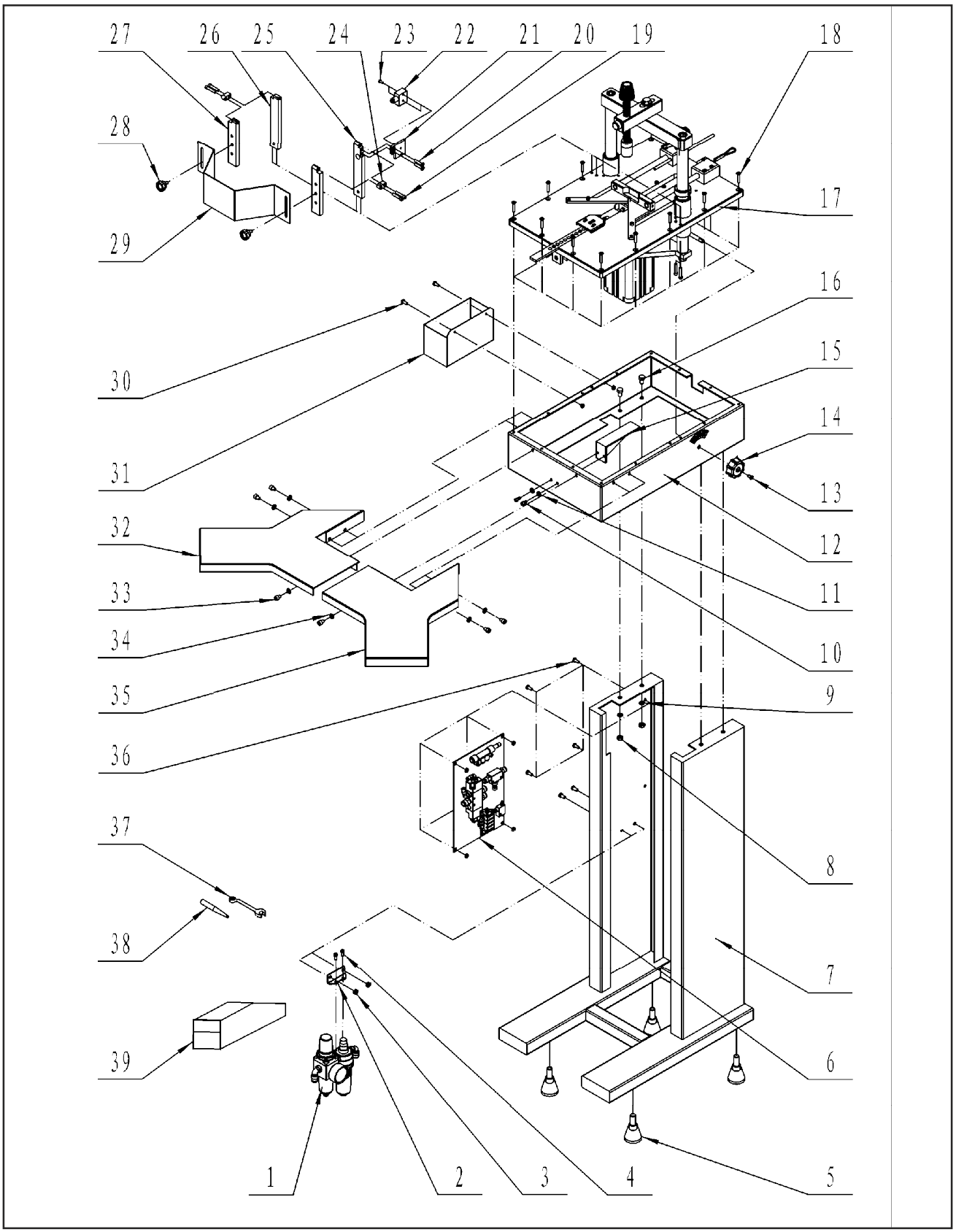
M4P Parts List No.3 - Front Clamp Layout

Part No.	Part Description
94	Front Clamp Bar
95	Jaw Pivot
96	M6 Socket Head Screw
97	2 x Jaws
98	2 x M4 Socket Head Screws
99	2 x M4 Countersunk Screws
100	Jaw Cover
101	Centre Piece for Jaw

M4P Parts List No.4 - Magazine Layout

Part No.	Part Description
102	Change Shaft
103	Nut
104	4 x Socket Head Screws
105	Right Hand Housing
106	Pinion
107	Rack
108	Wedge Platform
109	Magazine Cord
110	Right Hand Magazine Side
111	Nut
112	Rear Spring Cover
113	End Plate
114	Socket Head Screw
115	4 x Socket Head Screws
116	2 x Countersunk Screws
117	Top Plate
118	Left Hand Magazine Slide
119	Spring
120	Front Spring Cover
121	Countersunk Screw
122	Countersunk Screw
123	Wedge Pusher
124	Driver Support
125	Nosepiece
126	6 x Socket Head Screws
127	2 x Socket Head Screws
128	4 x Socket Head Screws
129	Left Hand Housing
130	Drive Pin
131	End Spring
132	Socket Head Screw
133	Pin
134	Ball

M4P Parts Drawing No.1
General Layout



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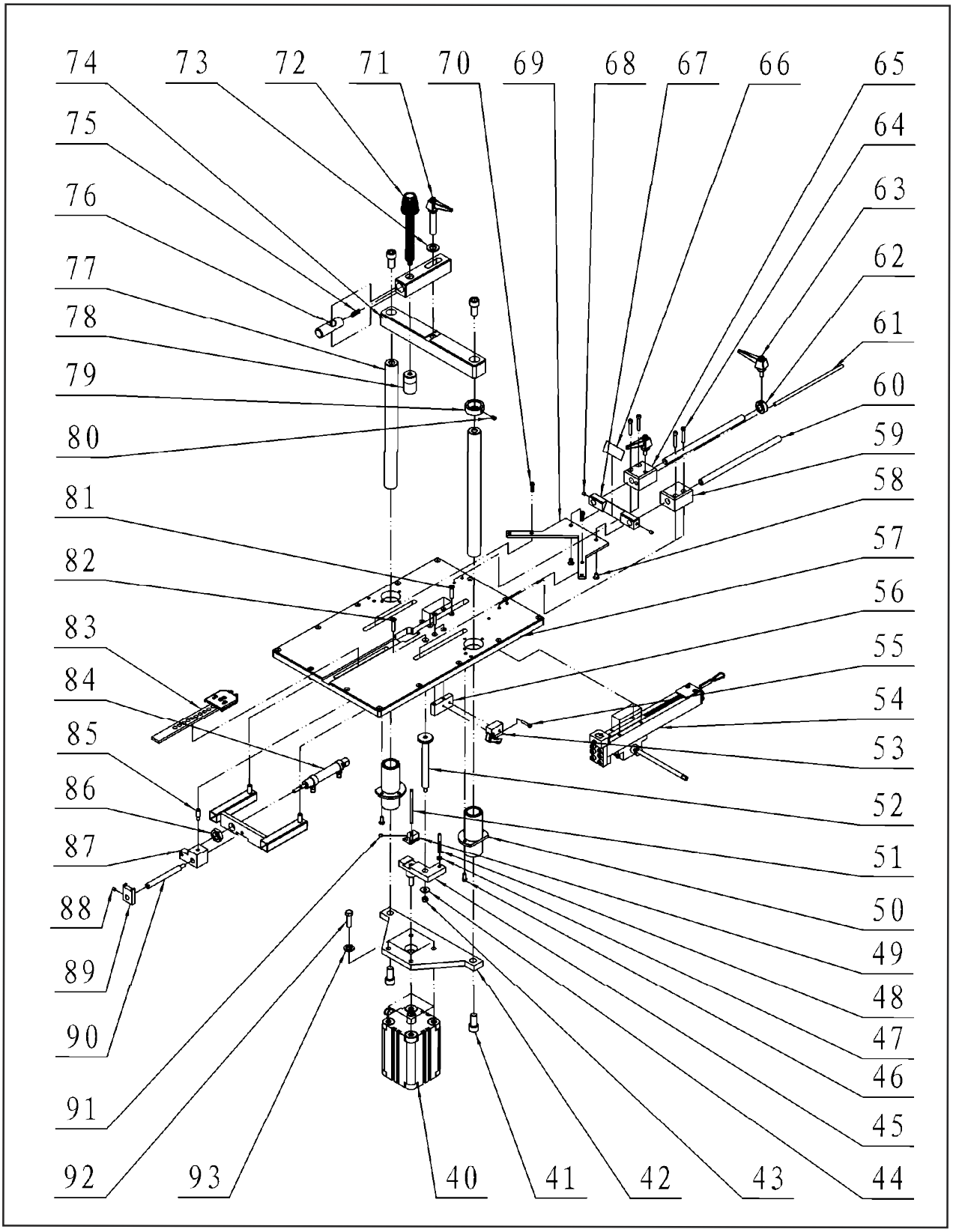
M4P Parts Drawing No.2
Operating Head Layout



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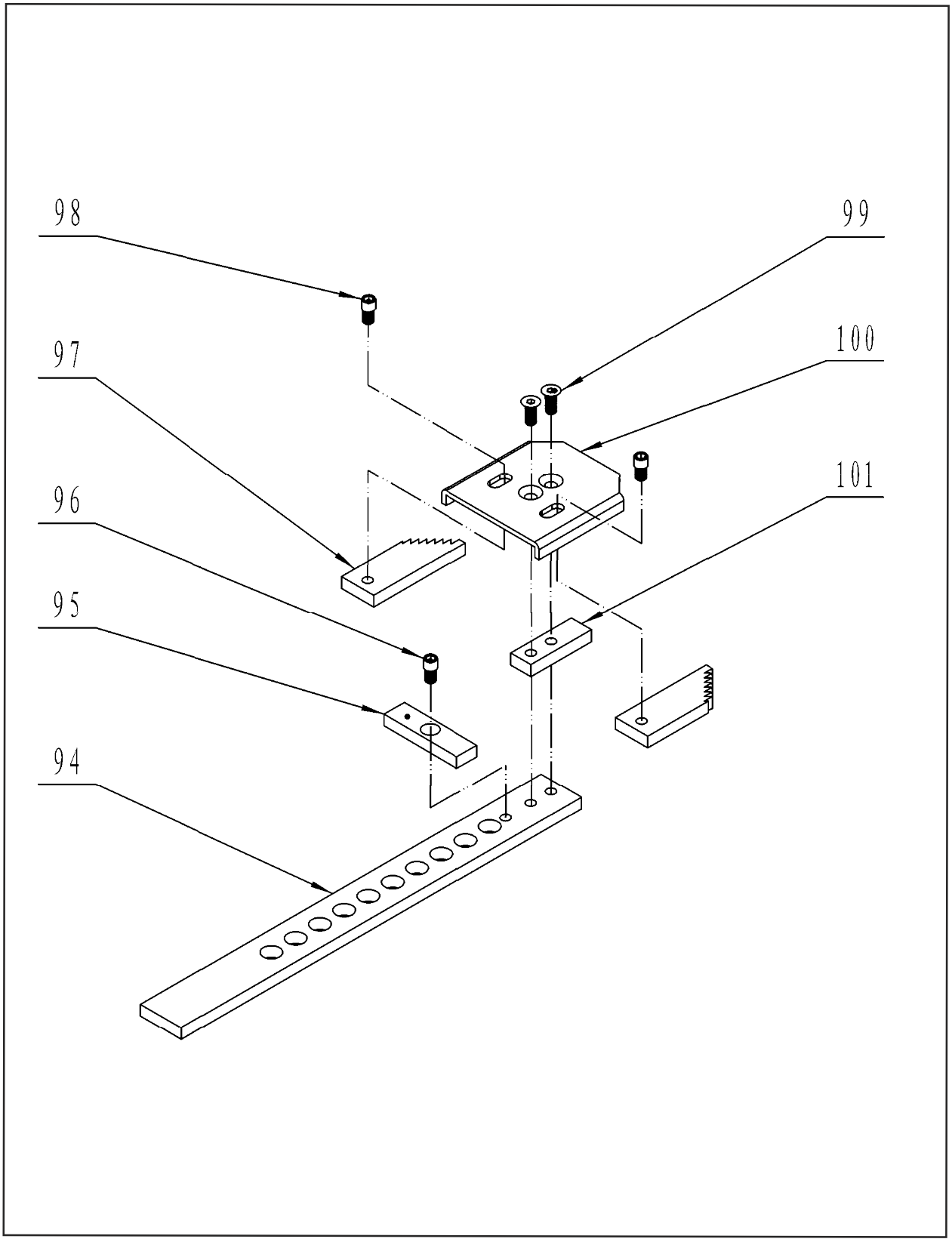
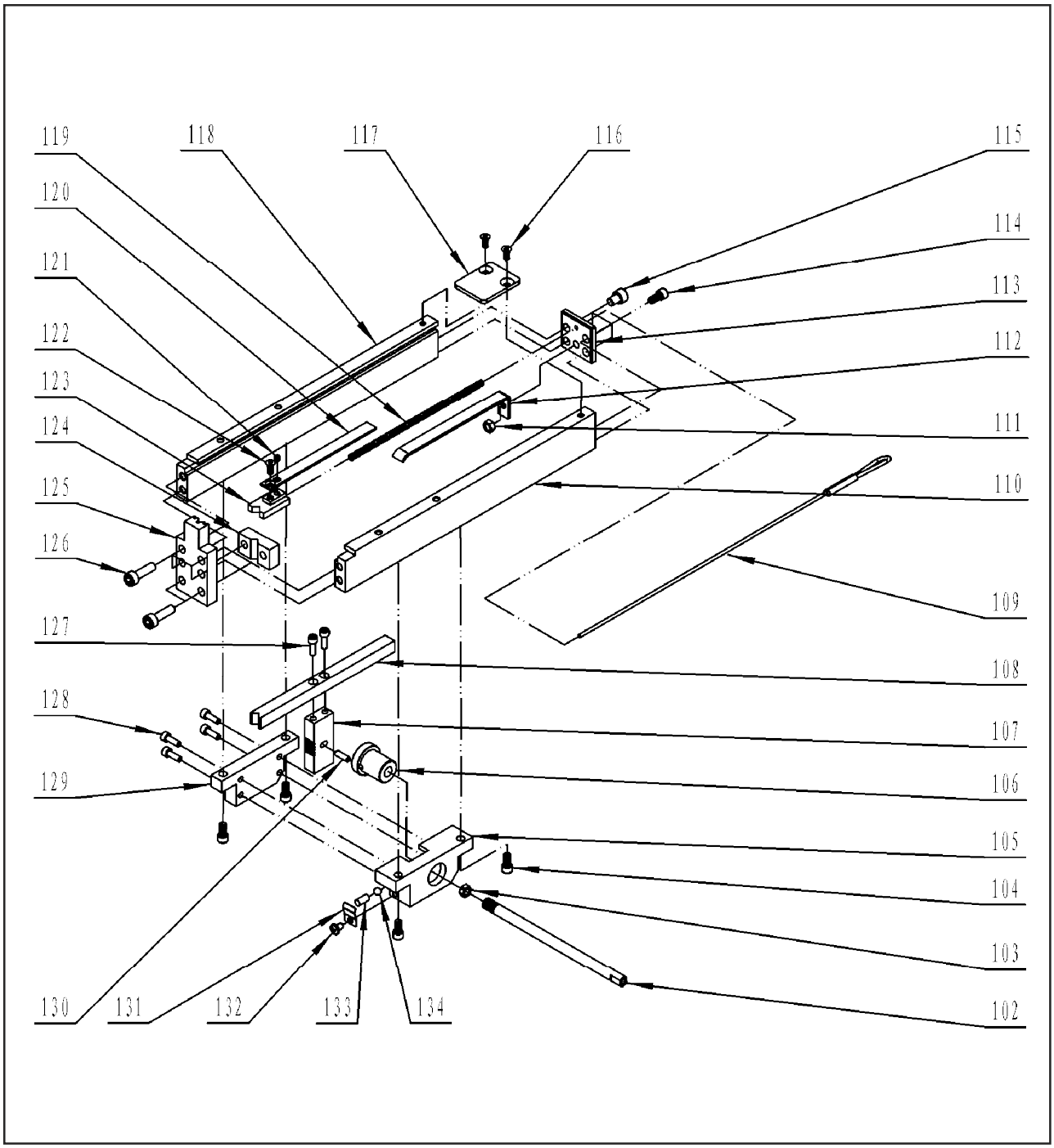
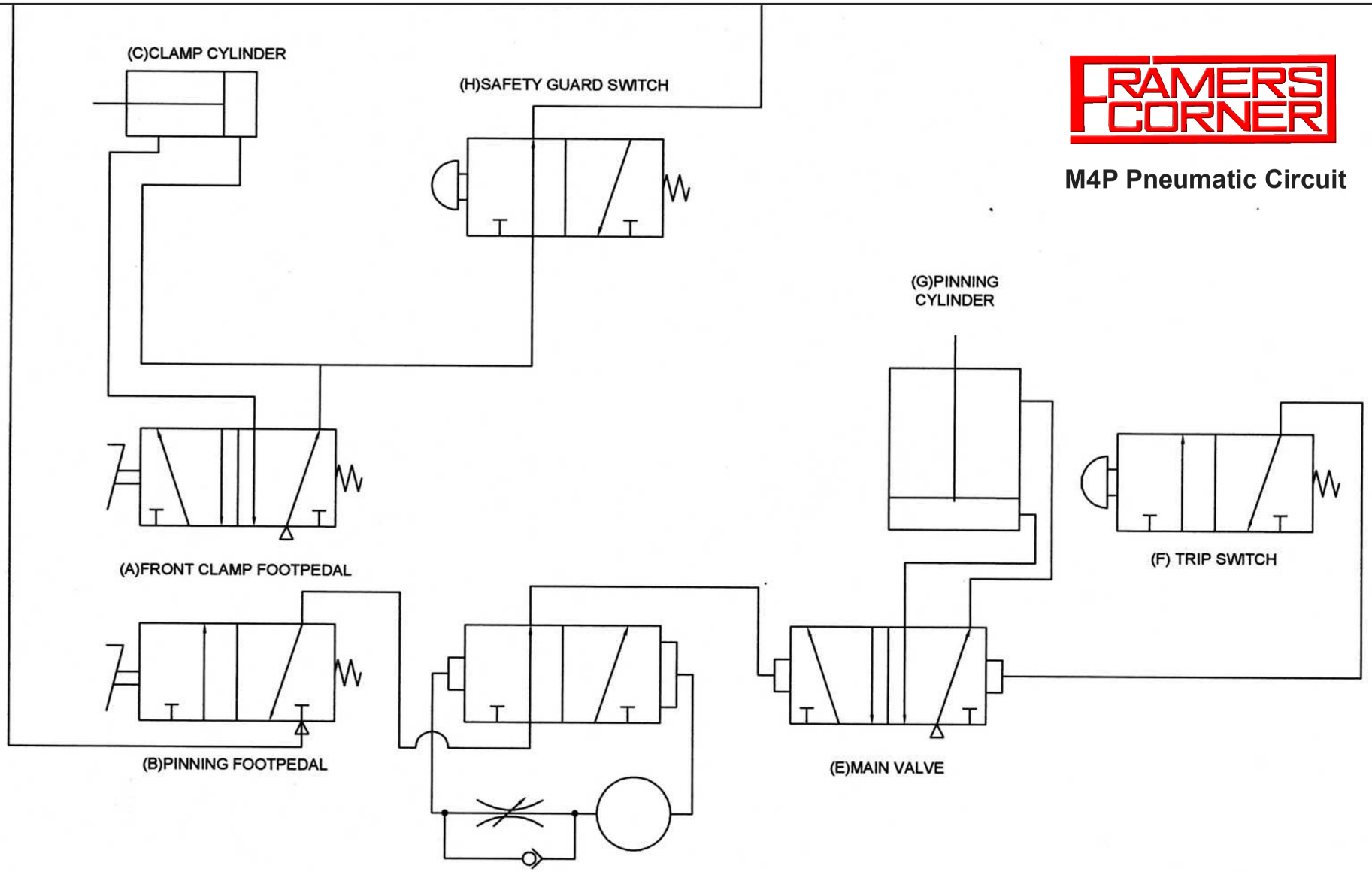
M4P Parts Drawing No. 3
Front Clamp Layout



M4P Parts Drawing No.4
Magazine Layout



M4P Pneumatic Circuit



TOLERANCES	DESCRIPTION : PNEUMATIC DRAWING FOR M4P			
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1 DECIMAL : +/- 0.1	MATERIAL :		DRAWING # : UP1236	
2 DECIMAL : +/- 0.01	FINISH :		DRAWN BY : AJC	Framers Corner