



BERNHARD

ROTA MASTER • RM4000

ROTA MASTER

RM4000 Automatic Rotary Blade Grinder



User's Guide & Instruction Manual

Please read this manual carefully before using the Rota Master.

This manual should be kept in a safe place so that it can be used for future reference.



ROTA MASTER

RM4000 Automatic Rotary Blade Grinder

Welcome to the Bernhard's Rotamaster 4000 (RM1000). If cared for and operated correctly this machine will give you years of good service.

This manual will enable you to obtain the best results from your Rotamaster so please read it thoroughly before using your machine.

If you have any service or operational issues please contact your distributor or phone our technical support hotline

Technical Helpline (USA only) 1-888 474 6348

Rest of World: UK Head Office, England (+44) 1788 811600

Email: support@bernhard.co.uk

Technical FAQs can be found on our web site: **www.bernhard.co.uk**

When ordering spare parts please quote the machine type and serial number.

THE MANUFACTURERS ACCEPT NO RESPONSIBILITY FOR ANY SITUATION ARISING FROM THE FITTING AND/OR USE OF NON-ORIGINAL SPARE PARTS.

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Please quote this serial number on all correspondence:

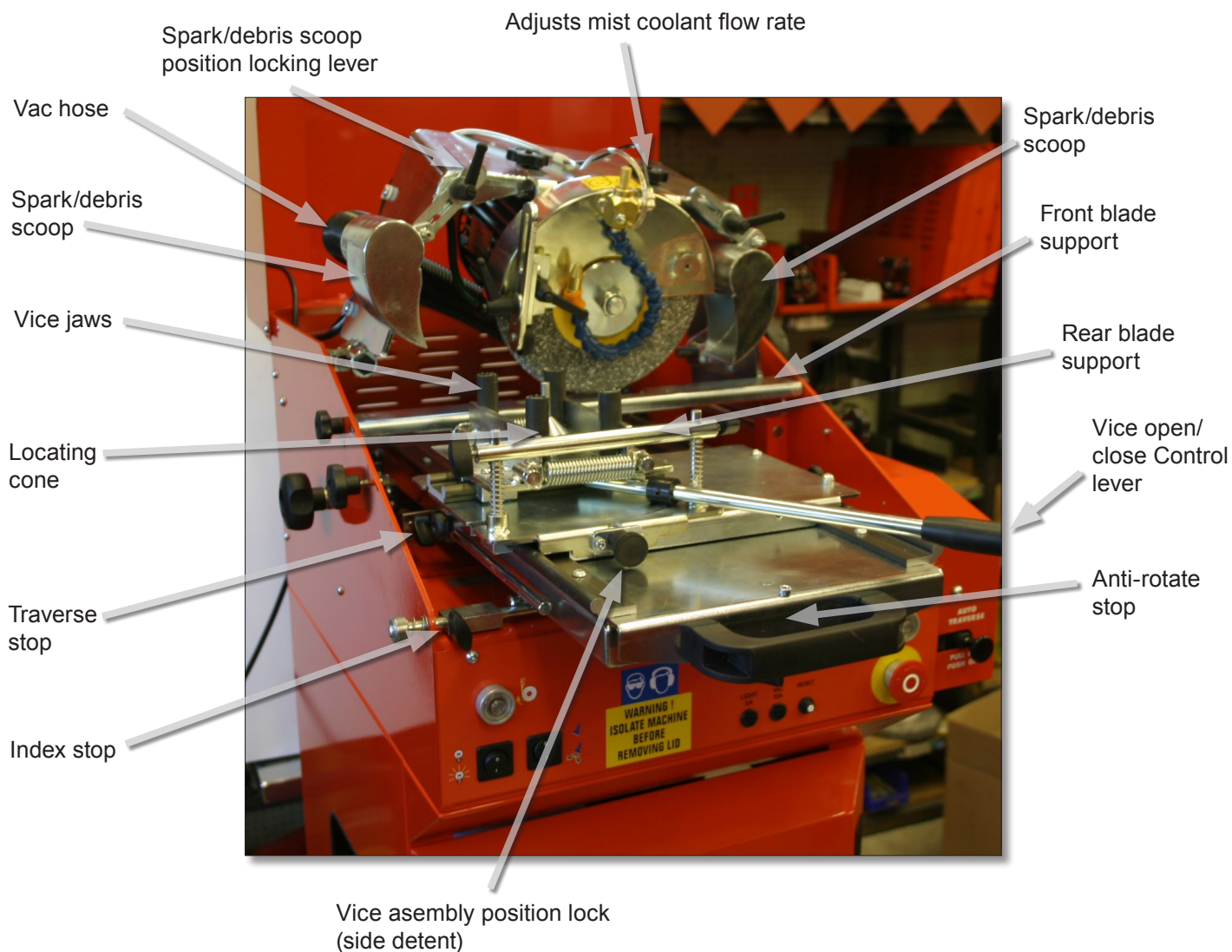
Serial #:

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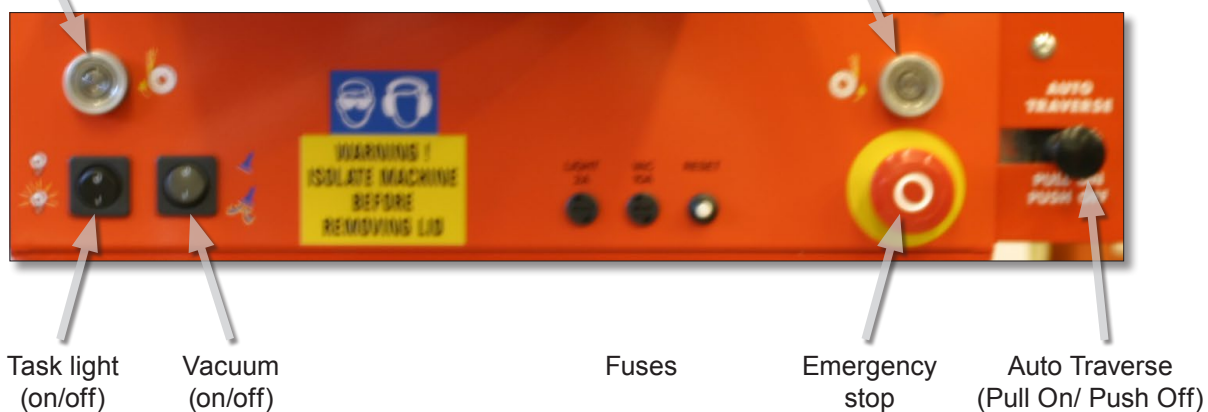
Email: info@bernhard.co.uk

USA Toll Free **1-888 GRIND IT** (1-888 474 6348)



Grind (clockwise)
Left side of stone

Grind (anti-clockwise)
Right side of stone





1. Safety

- 1.1 This machine is primarily designed for safe and accurate grinding of rotary mower blades. It should **not** be used for any other purpose.
- 1.2 This machine should be installed, operated and maintained by only competent personnel.
- 1.3 Before carrying out any work on the machine, other than actual grinding, **isolate** the **electrical power supply**
- 1.4 Always operate the machine with the guards in place. Always wear adequate eye, ear and breathing protection.
- 1.5 Only use grinding wheels recommended for this type of grinding unit, rated at the speed specified on the grinder identification plate.
- 1.6 Never leave rags or tools on the machine, or allow combustible materials to accumulate around the machine.
- 1.7 Always ensure that the unit to be ground is securely mounted on the machine with no loose components.
- 1.8 Always ensure that all electrical connections are sound, with cables safely routed.
- 1.9 **Stay alert.** Wear suitable clothing. Never operate the machine when tired or under the influence of alcohol or drugs.



2. Installation

- 2.1 Having removed the Rota-Master from its packing, the unit should be positioned in a well lit area, with good ventilation, on a flat and solid floor. If required the unit can be bolted to the floor for added stability.
- 2.2 Check that the vacuum unit in the cabinet base is turned on (secondary switch on the vac' unit) and that the hose is connected to the spark debris collector on the appropriate side of the grinding head.

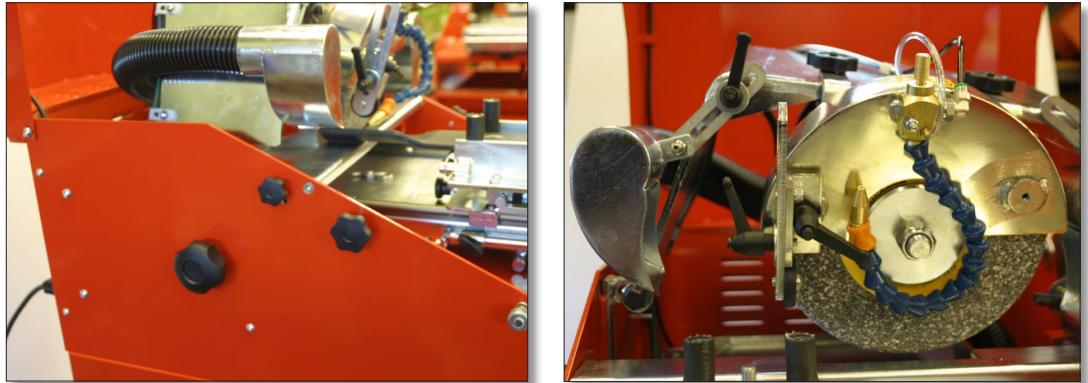


Fig: 2.2

- 2.3 Connect to a 230-240v 50 Hz mains power supply, *OR*,
In the USA, to a 220v 60 Hz mains supply with a 30A breaker.

A step-up transformer from 110-120v is available at extra cost to machines in USA/ Canada.



2. Installation (Continued)

- 2.4 Connect to the workshop air supply, set regulator (on right hand side control panel) to 85 – 90 psi (~ 6 bar)



Air
regulator

Air supply
connector

Cross (in-feed) of carriage

Fig: 2.4

- 2.5 Fill the coolant reservoir with clean water (or water with a ¼ capful of rust inhibitor added).



Fig: 2.5 Interior of cabinet:
Coolant and vacuum unit



3. Setting Up

3.1 Blade Preparation

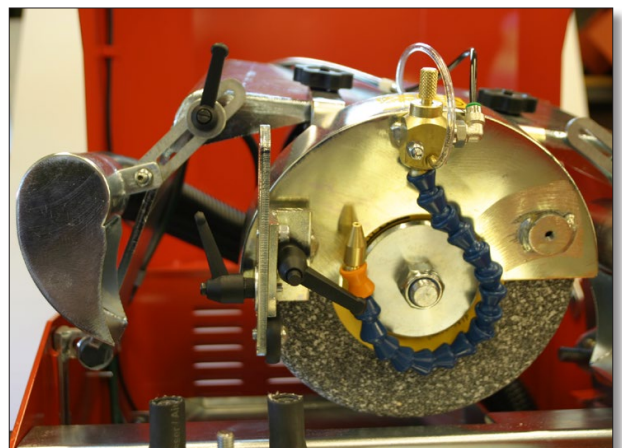
- 3.1.1 **Clean** the blade. Remove dirt, debris and surface rust from the cutting area of the blade. Typically use a stiff wire brush.
- 3.1.2 Carefully examine the blade for **cracks**. If any cracks are observed **SCRAP THE BLADE – DO NOT ATTEMPT TO SHARPEN IT** as cracks can lead to breakages, flying debris and potential injury.
- 3.1.3 Check the blade for straightness. If a blade is bent **DO NOT SHARPEN IT. DO NOT STRAIGHTEN A BENT BLADE** so that it may be sharpened. This could unduly stress the blade and lead to breakage at some point in the future.

3.2 Blade Mounting

- 3.2.1 Switch on the task light.
- 3.2.2 Determine the cutting direction of the blade (**clockwise** or **counter-clockwise**)
A **clockwise** rotating blade should be sharpened on the **left-hand** side of the grinding stone.
A **counter-clockwise** rotating blade should be sharpened on the **right-hand** side of the grinding stone.



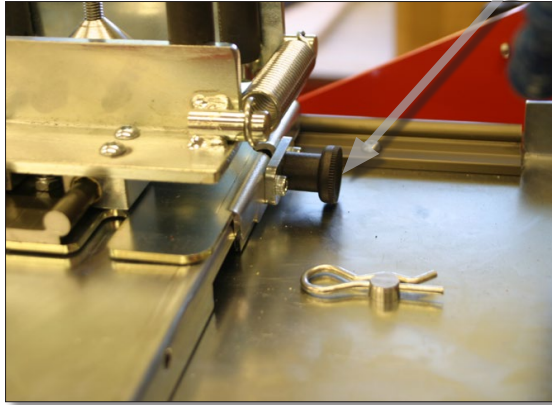
- 3.2.3 If not yet done, connect the vacuum hose to the spark/debris scoop on the side of the grind stone guard where blade grinding is to take place.





3. Setting Up (*Continued*)

- 3.2.4 Position the blade mounting vice on the appropriate side of the carriage by pulling the detent plungers and sliding the vice across the carriage saddle until they snap back into their locations.



- 3.2.5 Loosen the locking knobs to allow free movement of the rear support.

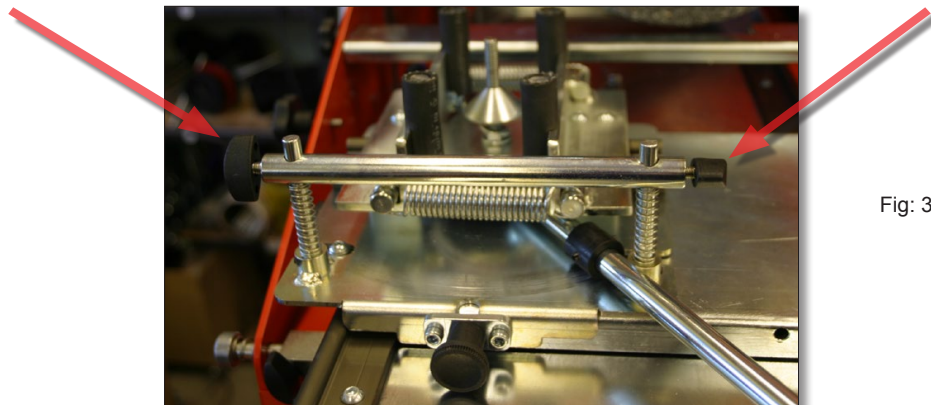


Fig: 3.2.5

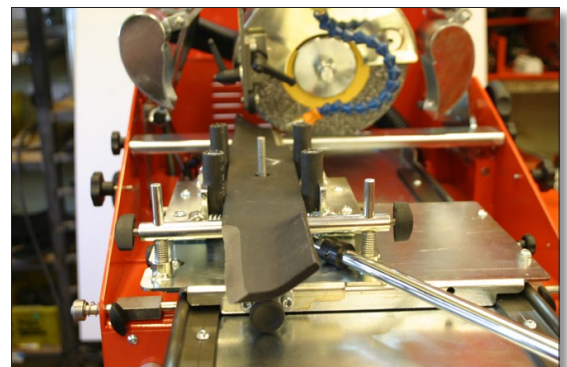
- 3.2.6 Open the, spring loaded, vice jaws and position the blade over the central location cone.

Rest the front of the blade on the rest adjacent to the grindstone and push the blade down, against the spring pressure support of the cone and rear blade support, until the edge to be ground is horizontal.

Release the control lever and clamp the blade between the clamp pins of the vice.

Tighten the locking knobs on the rear blade support, so that the blade angler is maintained when grinding the opposite end of the blade.

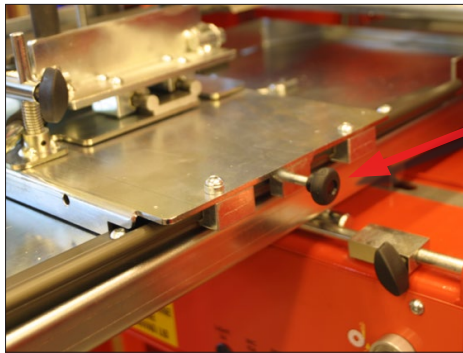
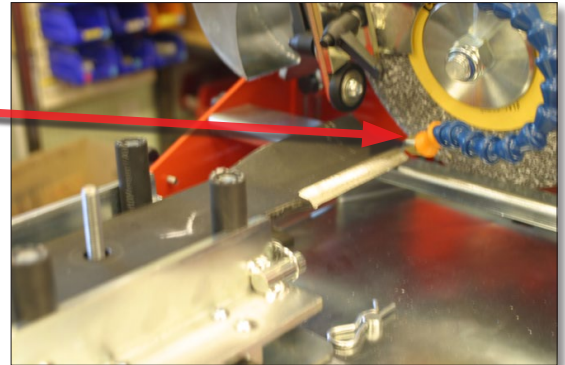
NOTE: Always grind the worst end (most worn/damaged) of the blade first.



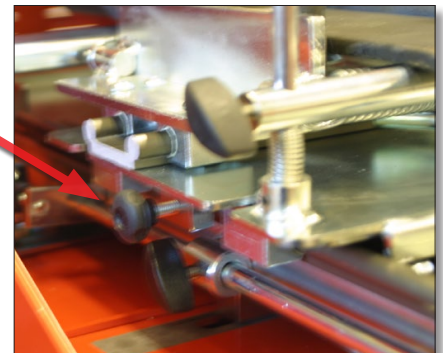


3. Setting Up (*Continued*)

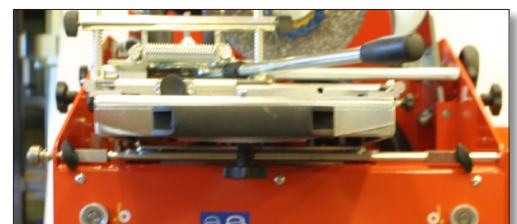
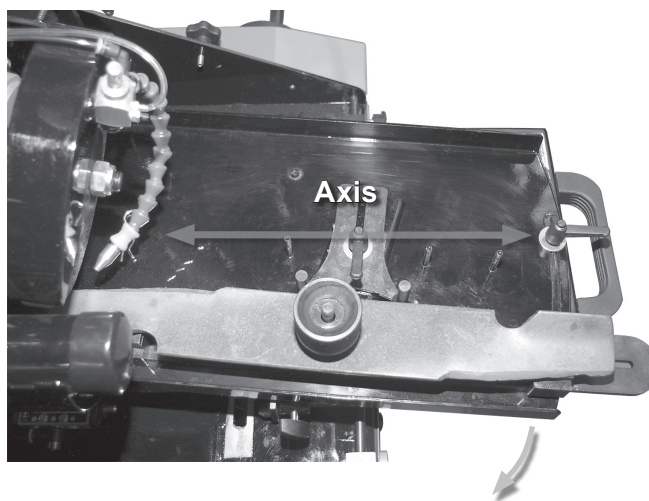
- 3.2.7 Pull the carriage to its 'fully out' position, then slide the vice assembly along the top of the carriage so that the tip of the blade is around $\frac{1}{4}$ " (6mm) clear of the grindstone.



Lock the vice assembly in position with one (or both) of the locking knobs.



- 3.2.8 Loosen the locking knob and rotate pivoting top tray (complete with support and blade assembly), to approximately align the edge to be ground with the carriage axis (stone edge) and lightly tighten the locking knob.

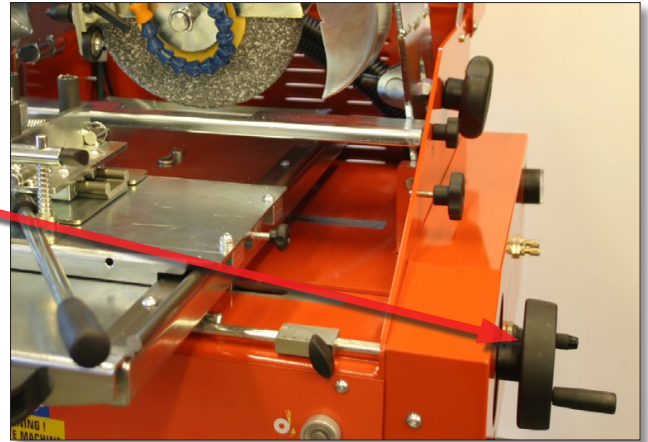


Rotate tray so that the blade edge* aligns with carriage axis
(*Stone edge)

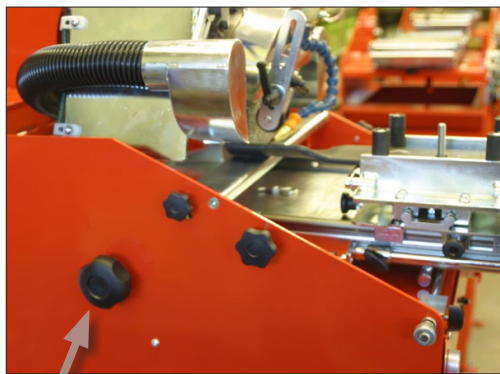


3. Setting Up (*Continued*)

- 3.2.9 Slide the carriage in and wind it across with the feed handwheel on the right hand side of the machine, until the blade edge is close to the grind stone.



- 3.2.10 Loosen locking knob on the left hand side of the grinding head and adjust the height of the grind stone so that it contacts the blade at the angle to be ground.



Locking knob

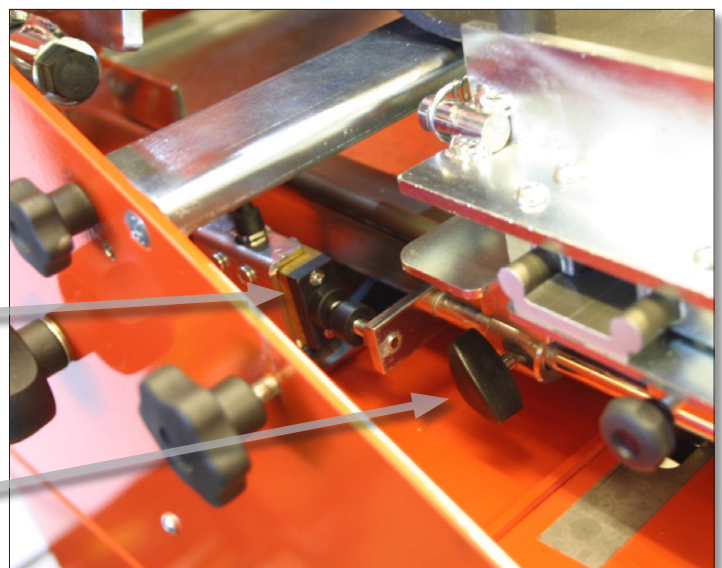


Height/angle adjust:
clockwise raises grindstone,
counter-clockwise lowers grind stone

- 3.2.11 Move the carriage in to the desired depth of cut (length of blade cutting edge), slide depth stop in until it pushes the traverse reverse valve contact home, and lock it in position with the wing knob.

Traverse reversing valve

Locking wing knob

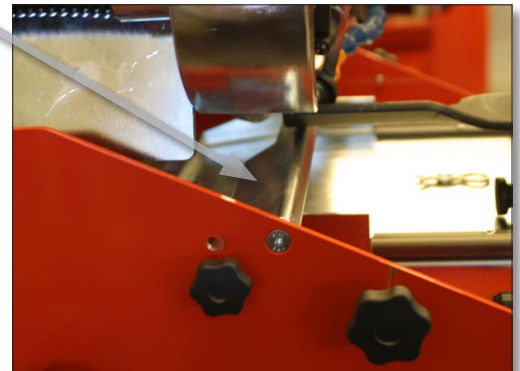
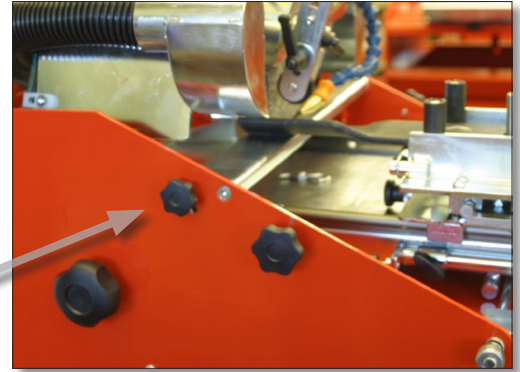




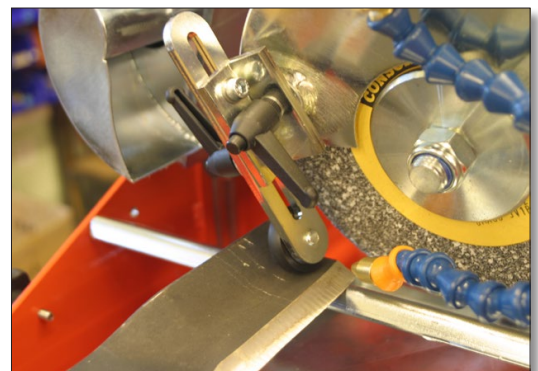
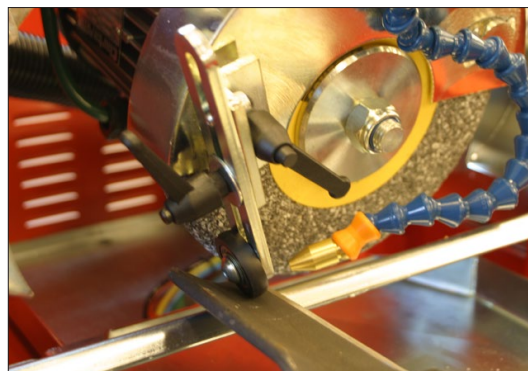
3. Setting Up (*Continued*)

If the blade to be ground has a curved shape, so that the tip drops away from the horizontal section about the mounting point, the setup should be changed slightly.

- 3.2.12 Undo the locking knob on each side of the front blade support and re-position the support so that it presents a narrow radiused contact area over which the blade can drop.



- 3.2.13 Adjust the roller/follower against the blade, trapping it between follower and support so that the blade is held to follow a consistent path past the grindstone.





4. Grinding the Blade

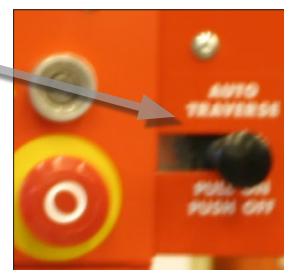
- 4.1 Ensure that the blade is positioned correctly, clear of the grind stone and that the support assembly is securely clamped in place. Ensure that the debris/spark catcher is correctly positioned (just clearing the blade as low as possible to ensure any mist coolant drips into the pivoting tray).
- 4.2 Move the feed carriage to it's fully out position.
- 4.3 Switch on the vacuum unit.
- 4.4 Press the relevant start button to select the correct direction of grind stone rotation for the blade (the grind stone should rotate upwards against the blade cutting edge).



Left hand button = clockwise stone rotation, clockwise rotating blade, blade ground on left hand side of grind stone.

Right hand button = counter-clockwise stone rotation, counter-clockwise rotating blade, blade ground on right hand side of grind stone.

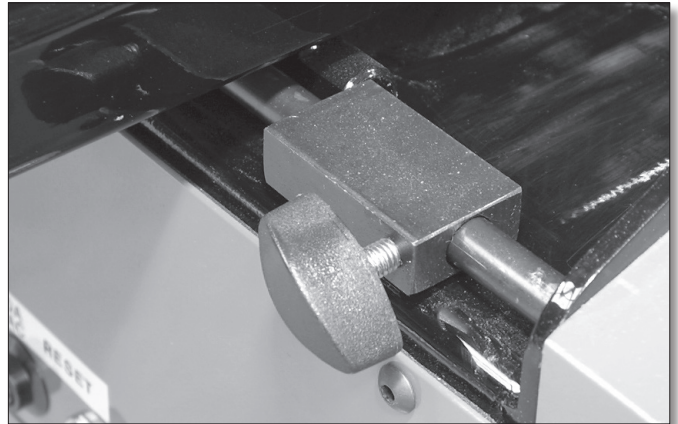
- 4.5 Push the carriage in manually and with the feed hand wheel on the right of the machine, bring the blade across to contact the grind stone.
- 4.6 Manually move the traverse in and out, whilst (if necessary) pivoting the top tray (complete with mounted blade) to set even stone contact along the length of the edge to be ground.
- 4.7 Fully tighten the locking knob on the pivoting top tray.
- 4.8 Pull traverse control knob at the front right hand side of the machine to engage automatic traverse of blade past grind stone. The mist coolant starts automatically.





4. Grinding the Blade (*Continued*)

- 4.9 Position the infeed stop close to the side of the carriage (on the side in which in-feed is to occur). Estimate the amount of infeed travel required to finish sharpen the edge and set the gap between stop and carriage the same.

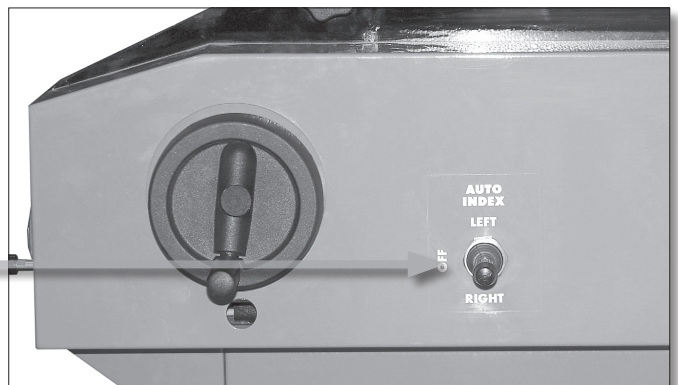


- 4.10 Apply a light cut to the blade.

- 4.11 Engage the automatic infeed using the lever on the control panel to the right of the machine.

Down = feed to the right
(grinding a blade to the left of the stone).

Up = feed to the left
(grinding a blade to the right of the stone).

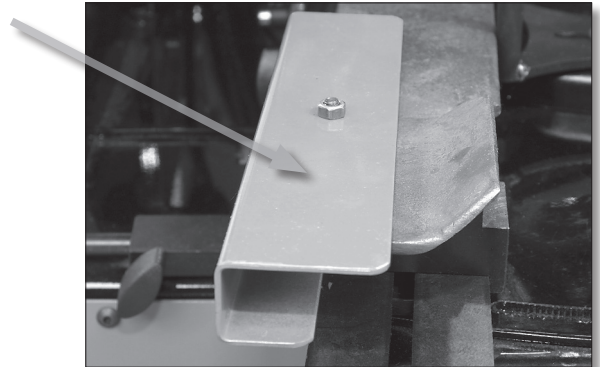


- 4.12 When the carriage reaches the stop, the infeed will cease and the carriage will continue to traverse in and out past the grind stone until stopped by the operator.
- 4.13 Push in control knob to disengage auto traverse and mist coolant, stop the traverse with the carriage in the out position.
Move the control lever to the central position to disengage the infeed.
Back the blade away from the stone.
- 4.14 Switch off the grind stone motor and the vacuum.
- 4.15 Undo the “quick” nut, reverse the blade on the support and re-secure.



4. Grinding the Blade (*Continued*)

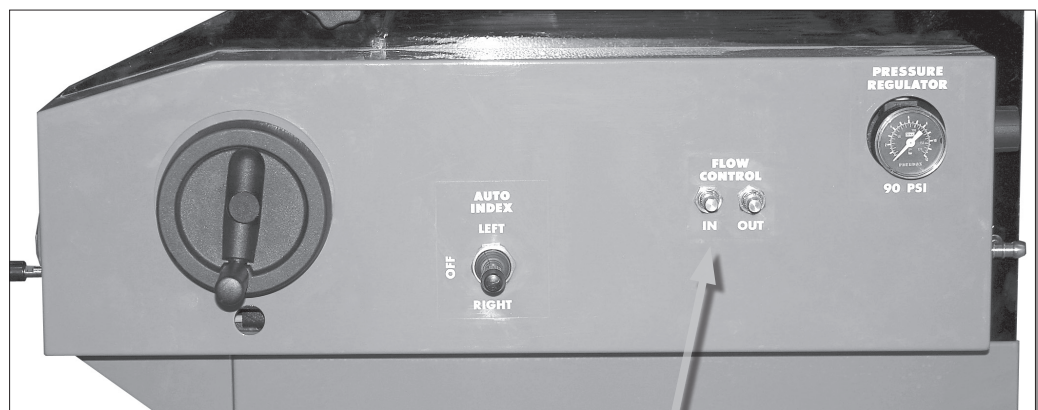
- 4.16 Place the magnetically retained “hot guard” over the edge just completed.



- 4.17 Grind the opposite end of the blade as before, until the infeed stop is reached.
- 4.18 Both ends should now be ground the same, post grind' balancing should be minimised.

Flow Controls:

These may be used to adjust the speed of movement of the carriage. These do not generally require adjustment from the factory settings



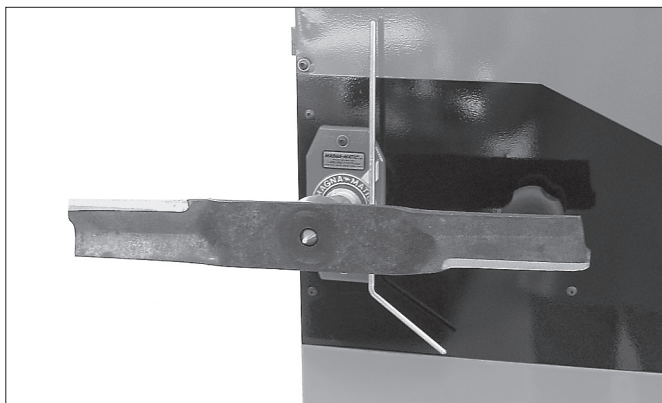
Flow controls



5. Blade Balancing

(The balancer can be bolted to the left hand side of the unit as shown, tapped holes are provided in the chassis, or to some other suitable rigid location in the workshop)

- 5.1 Position the blade centre over the cone of the balancer and slide the magnetic holder to the back of the blade to support it (Blade MUST be clean).
- 5.2 Rotate the blade to a horizontal attitude, then carefully release it. If one end of the blade drops, indicating that end is heavier, the blade is out of balance.
- 5.3 Replace the blade on the machine and remove more material from the cutting edge at the heavy end. Re-check on the balancer (and re-grind as necessary) until balance is achieved.





6. Cleaning

DO NOT SWITCH ON THE GRIND STONE MOTOR WHEN THE GRINDER HOOD IS TILTED BACK (OPEN).

- 6.1 Loosen the two securing knobs and tilt back the hub.
- 6.2 Remove the vacuum hose from the dust collector on top of the grinding head.
- 6.3 Switch on the vacuum and use the hose to clean up debris not collected during grinding.
- 6.4 Switch off the vacuum and re-connect the hose to the dust collector as before.
- 6.5 Close the hood and secure with the locking knobs.

NOTE: Regularly remove the vacuum unit from the base cabinet and empty it, replacing the filter as necessary, since efficiency drops dramatically with clogged filters.

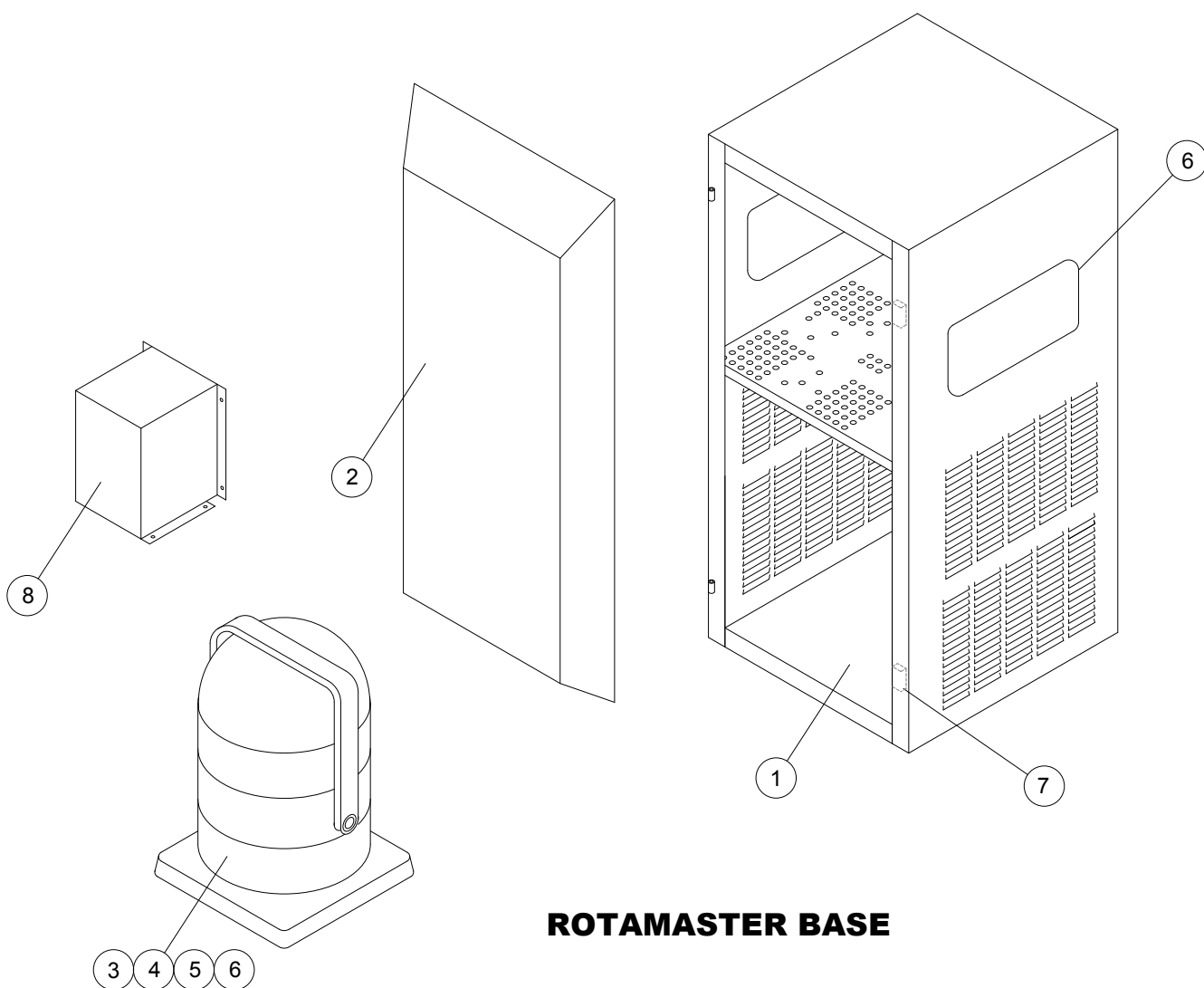
The surface of the filter can be blown clean with a compressed air gun many times before replacement is necessary, provided that cleaning occurs on a regular basis (**Ensure that safety spectacles/goggles are worn when blowing off a filter**).



7. Parts List

ROTAMASTER BASE

Ref #	Name of Part	Qty.	Part #
1	Rotormaster Cabinet	1	06381
2	Door	1	06358
3	Vacuum	1	06027
4	Vacuum Hose 2.2m	1	06782
5	Vacuum Filter	1	PC220 or Karcher
6	Cabinet Aperture Trim 800mm	1	04207
7	Door Magnet	2	06704
8	Auto Transformer (110-220v Optional Extra)	1	08033

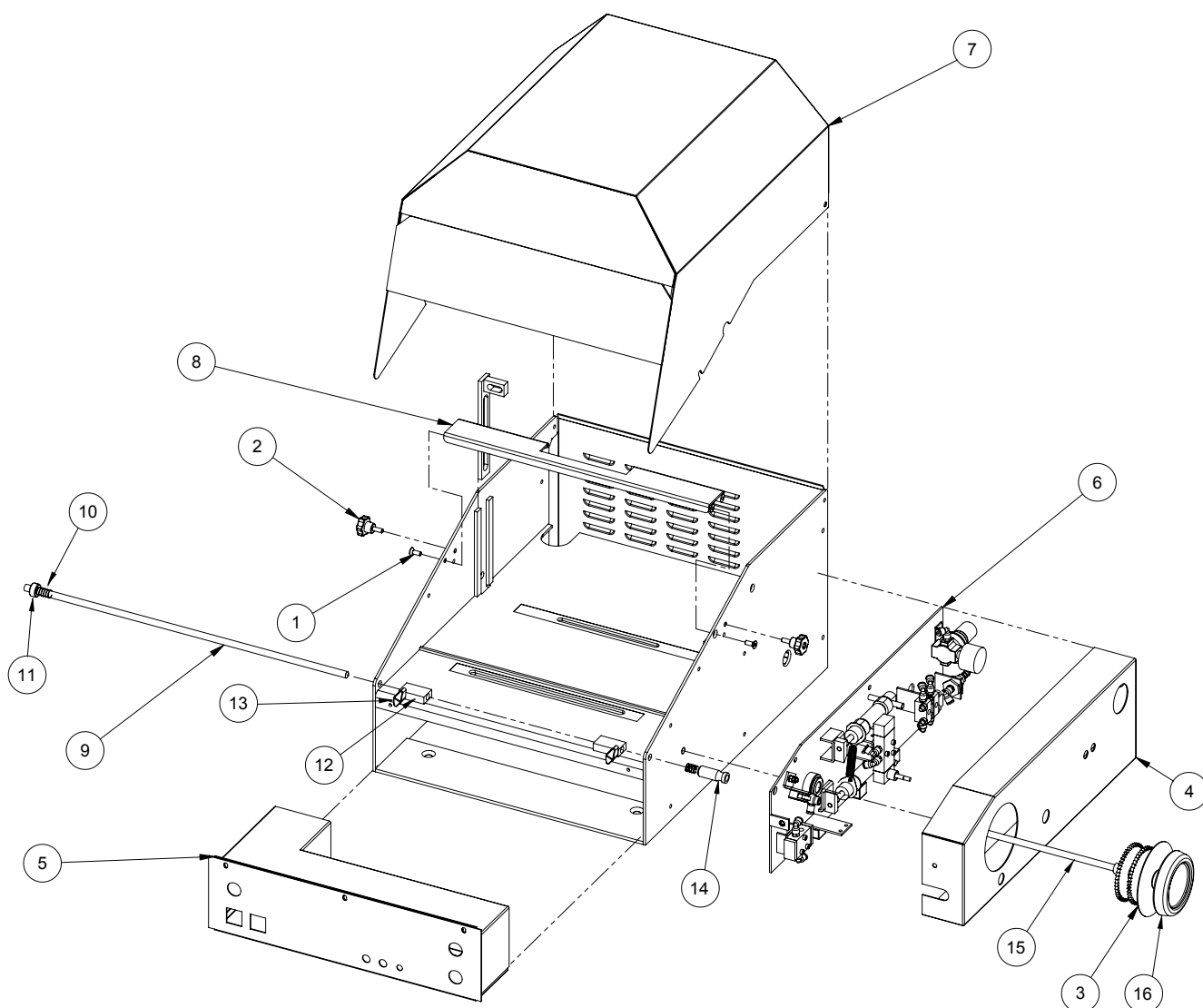




7. Parts List (Continued)

ROTAMASTER CHASSIS

Ref #	Name of Part	Qty.	Part #
1	6 x 1.0 x 16 Socket FCHS - 16N.....	2	
2	M6 x 16 Flower (6 Lobe) knob	2	06167
3	Index Ratchet Assembly	1	09562
4	Pneumatic Cover Panel.....	1	06463
5	Electric Panel Fabrication Assembly	1	06964
6	Pneumatic Panel Assembly	1	
7	Hood	1	06355
8	Front Blade Support Fabrication.....	1	03420
9	Lateral Traverse (In-feed) Stop Rod	1	09131
10	Spring	2	06792
11	Collar	1	09006
12	Lateral Traverse (In-feed) Stop	2	04330
13	M6 Lobed Knob.....	2	06126
14	Microswitch Cam.....	1	09234
15	Feedscrew	1	09192
16	Handwheel	1	06185

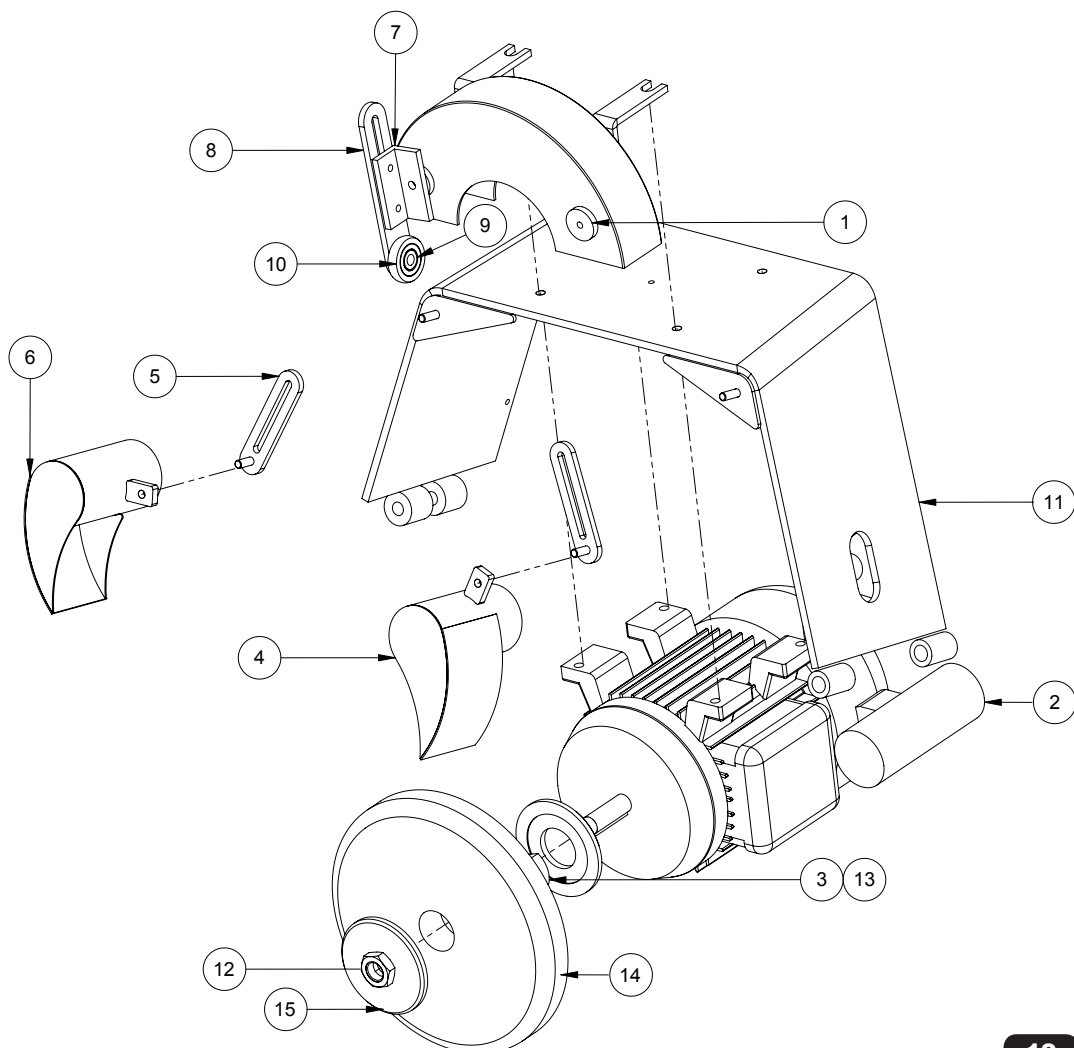




7. Parts List (Continued)

MOTOR AND GUARD

Ref #	Name of Part	Qty.	Part #
1	Stone Guard Fabrication	1	03410
2	Main Motor 220v, 50Hz / 60Hz	1	06025
3	Grinding Wheel Assembly.....	1	
4	Dust Scoop LEFT	1	03412
5	Dust Scoop Bracket	2	04351
6	Dust Scoop RIGHT	1	03413
	Dust Scoop Nylock Nut (not shown)	2	05517
	Dust Scoop Washer (not shown)	2	05320
7	Blade Support Bearing Angle	1	03414
8	Blade Support Bearing Slide	1	03415
	Blade Support Kip Lever (not shown)	1	06128
	Blade Support Washer (not shown)	1	05337
9	Bearing	1	07723
10	Nylon Roller	1	03416
11	Motor Mounting Plate Fabrication	1	03408
12	Nylock Nut M16	1	05524
	Vacuum Hose Reducing Bush (not shown).....	1	03477
13	Grinding Wheel Shaft.....	1	09230
	Rear Washer	1	09185
14	Grind Stone	1	06510
15	Grind Wheel Shaft Washer	1	09185

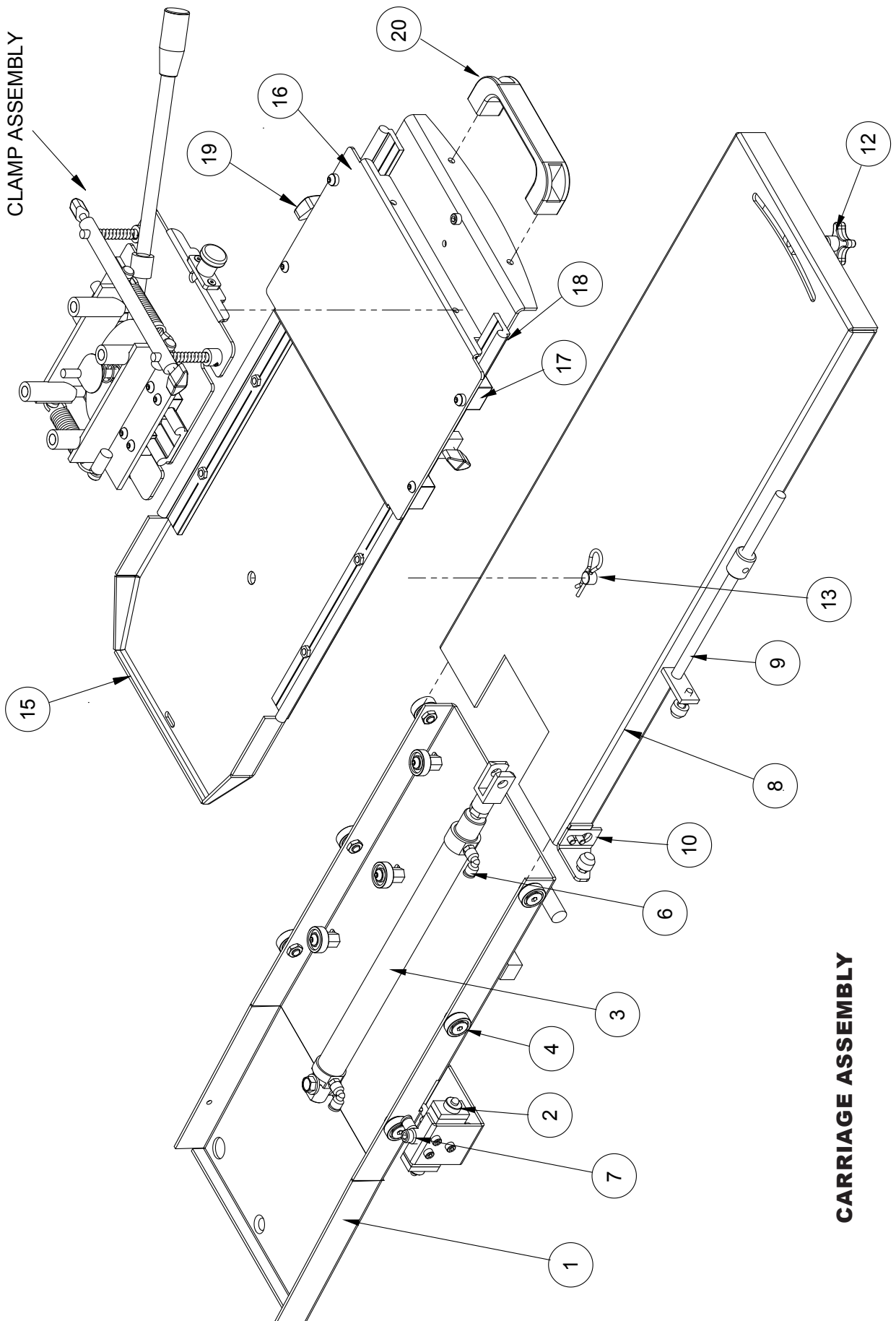




7. Parts List *(Continued)*

CARRIAGE ASSEMBLY

Ref #	Name of Part	Qty.	Part #
1	Carriage Lower.....	1	03449
2	5/2 Traverse Direction Valve.....	1	06865
3	Pneumatic Cylinder 25 X250	1	06777
4	Bearing 628zz	9	07723
5	Bearing Pillar	3	
6	Elbow 1/8" Bsp -4mm	2	06780
7	Banjo Fitting 1/8"bsp - 4mm	1	
8	Carriage-Upper	1	03421
9	Front ("In") Traverse Stop Assy	1	03471
10	Rear ("Out") Traverse Stop Assy	1	03451
11	Nylon Spacer Boss (Not Shown).....	1	03444
12	Lobed Knob (Locks Pivoting Tray)	1	07723
13	R'clip	1	06728
14	Wing Knob- M6 Male (Not Shown)	1	06129
15	Pivoting Top Tray.....	1	03407
16	Slide Tray.....	1	03423
17	Bearing Block	4	03346
18	Slide Rail	2	03422
19	Wing Knob- M6 Male	2	06129
20	Bridge Handle.....	1	06108





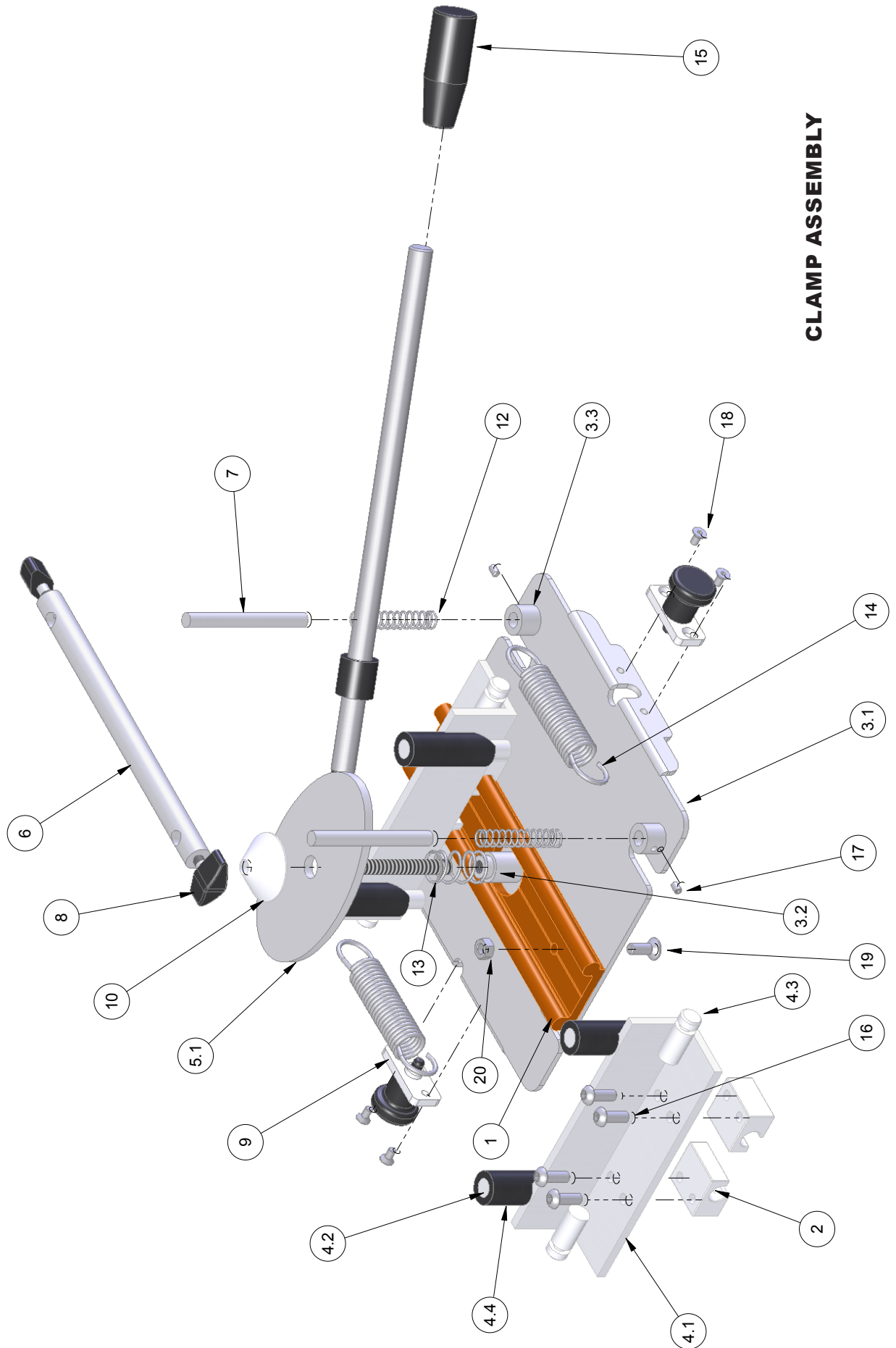
7. Parts List (Continued)

CLAMP ASSEMBLY

Ref #	Part #	Name of Part	Qty.
1	03430	Double Slide Rail	1
2	03346	DryLin Bearing	4
3	03429	Top slide table fabrication	1
3.1	03426	Top slide table	1
3.2	03428	Cam location boss	1
3.3	03427	Rear blade support boss	2
4	03434	Slide angle fabrication	2
4.1	03431	Slide angle	1
4.2	03432	Clamp contact pin	2
4.3	03457	Clamp Spring Holders	2
4.4	03438	Rubber sleeve	2
5	03437	Cam disc fabrication	1
5.1	03435	Cam disc	1
5.2	09070	Mounting Bar Lever	1
5.3	03458	Clamp Handle Support Boss	1
6	03440	Rear blade support bar	1
7	03439	Rear blade support pillar	2
8	06129	Wing Knob M6x15	2
9	03443	Index plunger	2
10	03441	Centre Cone	1
11	03442	Cam stud	1
12	03446	Rear blade support Spring	2
13	03448	Centre cone Spring	1
14	03447	Blade Clamping Spring	2
15	03445	Self Fixing Handle	1
16		Socket button head cap screw M6 x 1 x 16	8
17		Hex Socket SS --C Grub screw M4 x 0.7 x 6	2
18		Socket CSK head screw M4 x 0.7 x 8	4
19		Socket CSK head screw M6 x 1 x 16	2
20		Hex nut M6 x 1	2



CLAMP ASSEMBLY

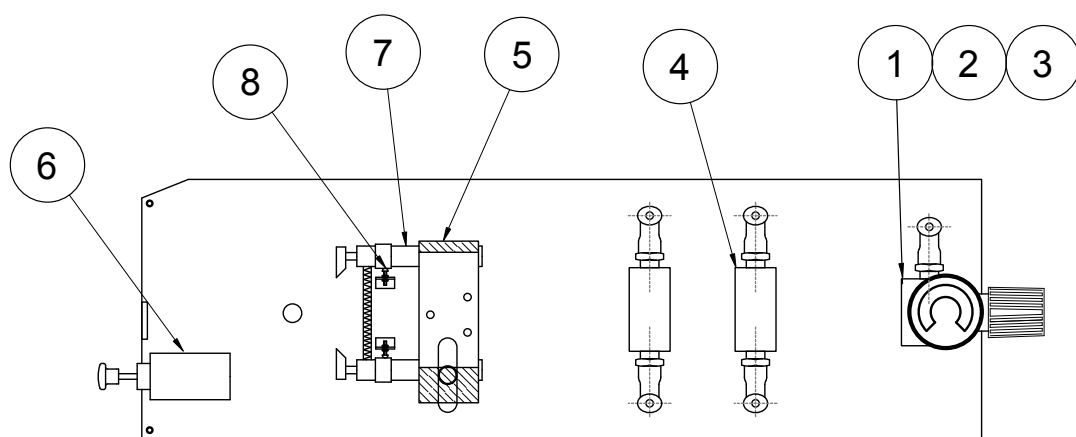




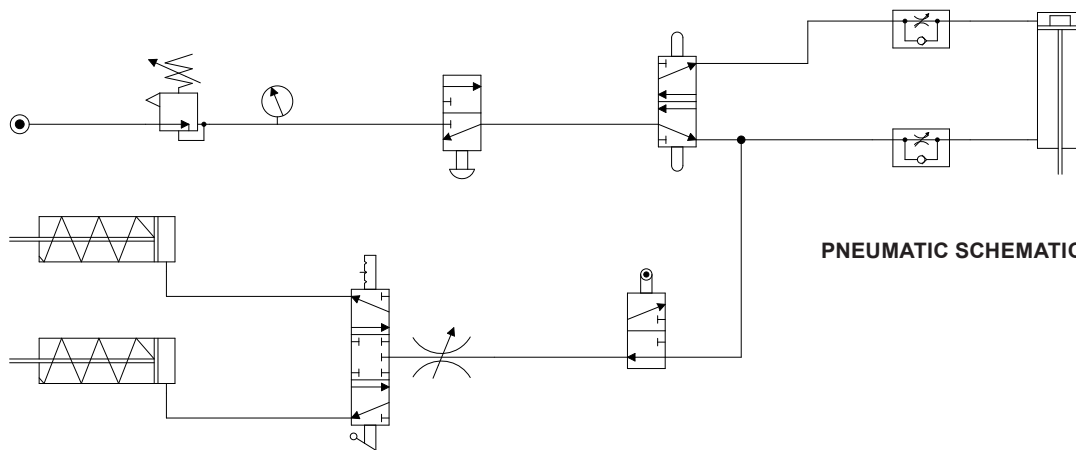
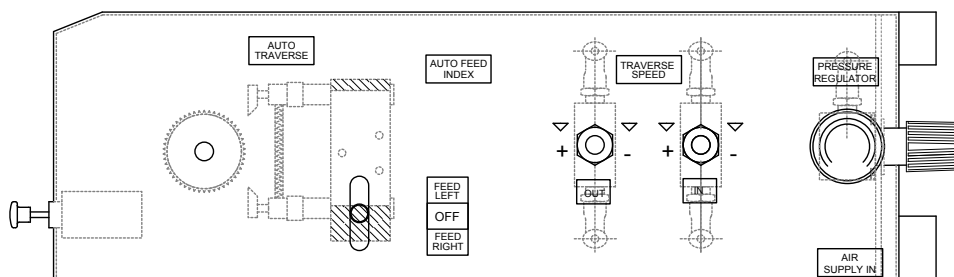
7. Parts List (Continued)

PNEUMATICS

Ref #	Name of Part	Qty.	Part #
1	Pressure Regulator	1	06866
2	Gauge 40mm dia.....	1	06867
3	Pressure Regulator Bracket.....	1	06868
4	Flow Control Valve	2	06869
5	5/3 Valve, Lever Control.....	1	06871
6	3/2 Valve, on/off	1	06870
7	Pneumatic Cylinder, 20 bore x 15	2	06893
8	Cylinder Adjustment Stop.....	2	



PNEUMATIC PANEL



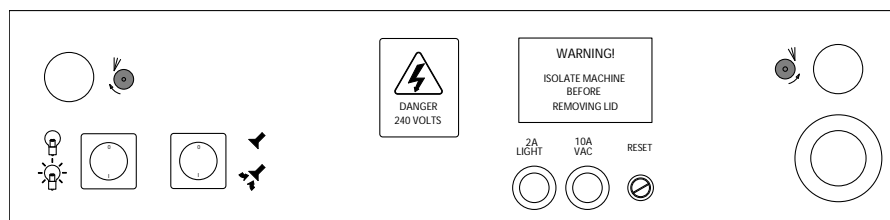
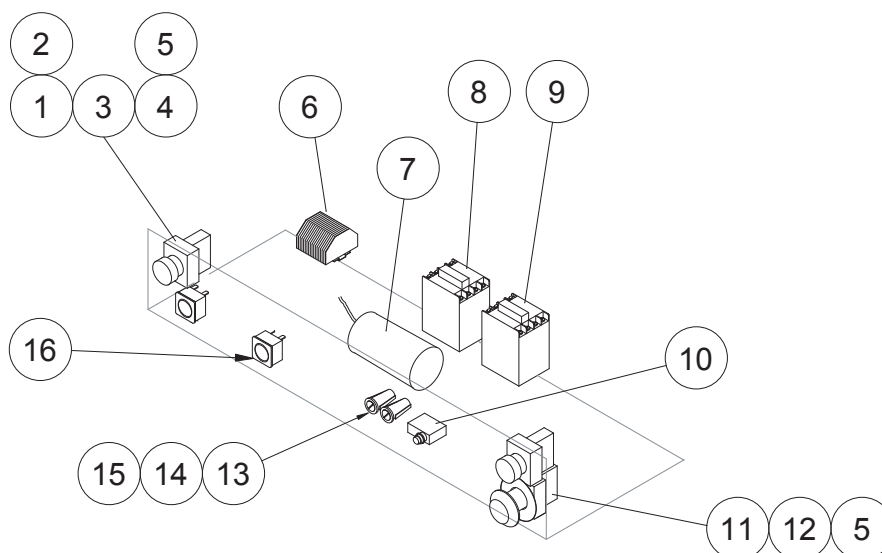
PNEUMATIC SCHEMATIC



7. Parts List (Continued)

ELECTRICS

Ref #	Name of Part	Qty.	Part #
1	Push-button Clear B4D11	2	08040
2	Contact Block B3T10.....	2	08039
3	Lamp Holder B3F	2	08036
4	Neon Lamp 230v.....	2	08022
5	Connector B3M	3	08037
6	Terminal Block.....	1	08160
7	Capacitor 220v	1	08207
8	Contactor K209A10	1	08063
9	Reversing Contactor K209A01	1	08062
10	Reset 10amp	1	08156
11	Emergency Stop Button B434	1	08073
12	Contact Block B3T01	1	08038
13	Fuseholder.....	2	08081
14	Fuse 2amp x 20.....	1	08085
15	Fuse 10amp x 20.....	1	08153
16	Square Rocker Switch.....	2	08155



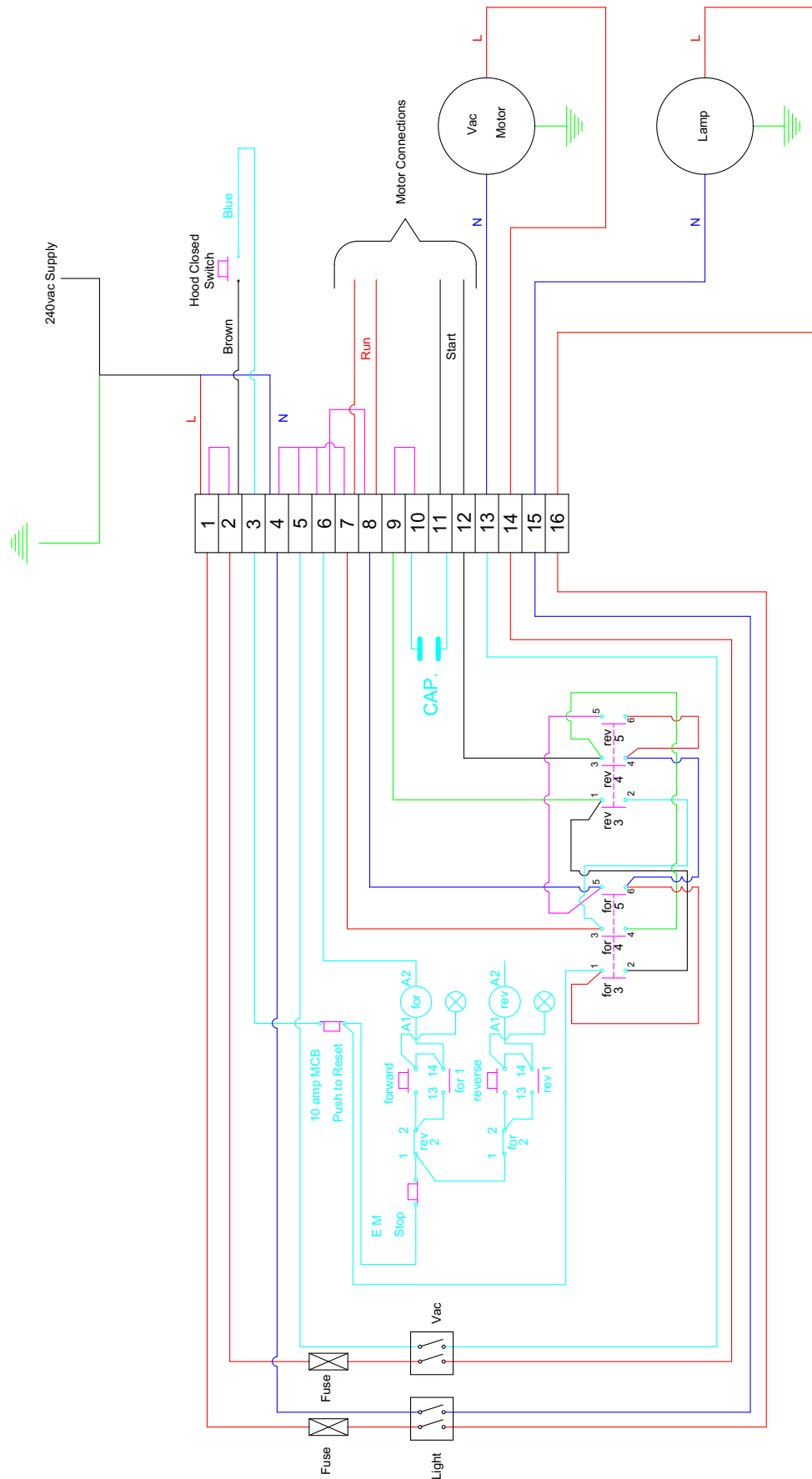
FRONT



BACK



8. Wiring Diagram





BERNHARD

If you have any service or operational issues please contact your distributor or phone our technical support hotline

Technical Helpline (USA only) 1-888 474 6348

Rest of World: UK Head Office, England (+44) 1788 811600

Email: techsupport@bernhard.co.uk

Technical FAQs can be found on our web site: **www.bernhard.co.uk**

When ordering spare parts please quote the machine type and serial number.

THE MANUFACTURERS ACCEPT NO RESPONSIBILITY FOR ANY SITUATION ARISING FROM THE FITTING AND/OR USE OF NON-ORIGINAL SPARE PARTS.

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