

RotabroachTM

PUMA MAGNETIC DRILLING MACHINE



FEATURING



Model No. SMARTPUMA1 & SMARTPUMA3

This machine (Serial No _____) is CE approved.

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**Thank you for purchasing our Smart Puma magnetic drill.
We would really like your feedback on the machine.**

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1) INTENDED USE

The intended use of this magnetic drill, is to drill holes in ferrous metals. The magnet is used to hold the drill in place whilst the drill is functioning. It is designed for use in fabrication, construction, railways, petrochemical and any other applications when drilling ferrous metal.

Any deviation from its intended use will not be covered by warranty.

2) GENERAL SAFETY RULES

WARNING! When using electric tools basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury, including the following.

Read all these instructions before attempting to operate the machine.

Remove the power supply before carrying out any adjustment, servicing or maintenance.

1. Keep work area clear - cluttered areas and benches invite injuries.
2. Consider work area environment;
 - Do not expose tools to rain.
 - Do not use tools in damp or wet locations.
 - Keep work area well lit (500 Lux recommended).
 - Do not use tools in the presence of flammable liquid or gases.
 - Ensure there is adequate space to gain access to the plug, mains and motor on/off switches.
3. Guard against electric shock:

Avoid body contact with earthed or ground surfaces (e.g. pipes, radiators, cookers and refrigerators). Electric safety can be further improved by using a high-sensitivity (30 mA/0.1s) residual current device (RCD).
4. Keep other persons away! DO NOT let untrained persons, especially children, touch the tool or the extension cord and keep them away from the work area.
5. Store idle tools when not in use. All tools should be stored in a dry locked-up place, out of reach of children.
6. Do not force the machine. It will do the job better and safer at the rate for which it was intended.
7. Use the right tool;
 - Do not force small tools to do the job of a heavy duty tool.
 - Do not use this tool for purposes not intended: e.g. do not use the magnetic drill to cut tree logs.
8. Dress properly;
 - Do not wear loose clothing or jewellery; they can be caught in moving parts.
 - Non-skid footwear is recommended when working outdoors.
 - Wear a protective hair covering to contain long hair. This will reduce the risk of entanglement.
9. Use protective equipment when using this machine;
 - Use safety glasses to prevent debris from damaging eyes.
 - Use ear defenders or ear plugs for hearing protection.
 - Use face or dust masks if cutting operations create dust.
 - Use protective gloves to prevent swarf or debris cutting the skin.
10. When using the drill, always ensure a safe operating distance from any swarf and do not reach into the cutting area, or near the cutter, when the machine is running.
11. Connect dust extraction and collecting equipment, if devices are provided, ensuring these are properly connected and used.
12. Do not abuse the cord; never pull the cord to disconnect it from the socket. Keep the cord away from heat, oil and sharp edges.
12. Secure work where possible, use clamps or a vice to hold the work. It is safer than using your hand.
13. Do not overreach! Keep proper footing and balance at all times.
14. Maintain tools with care;
 - Keep cutting tools sharp and clean for better and safer performance.
 - Regularly check the machine for any wear or damage.

- Ensure the machine is clean and free from debris prior to use.
 - Remove from the mains prior to any maintenance.
 - Follow instructions for lubricating and changing accessories.
 - Inspect tool cords periodically and if damaged have them repaired by an authorized Rotabroach service facility.
 - Inspect extension cords periodically and replace if damaged.
 - Keep handles dry, clean and free from oil and grease.
15. Disconnect tools when not in use, before servicing and when changing accessories such as cutters, disconnect tools from the power supply.
 16. Form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.
 17. Avoid unintentional starting. Ensure the magnet is OFF before plugging the machine in.
 18. Use extension leads only intended for outdoor use when the tool is used outdoors.
 19. **WARNING!** The vibration emissions during actual use can differ from the declared total value depending on the ways in which the tool is being used.
 20. Stay alert! Watch what you are doing, use common sense and do not operate the tool when you are tired. **DO NOT** operate the machine when under the influence of alcohol or ANY illegal substances.
 21. Check for damaged or missing parts before use of the tool; it should be carefully checked to determine that it will operate properly for its intended function.
 22. **Warning!** The use of any accessory or attachment, other than ones recommended in this instruction manual, may present a risk of personal injury.
 23. Have your machine repaired by a qualified Rotabroach technician.
This electric tool complies with the relevant safety rules. Qualified persons using original spare parts should only carry out repairs, otherwise this may result in considerable danger to the user.
 24. Never operate the machine if parts are missing or damaged.
 25. Never direct jets of water or flammable liquids over the drill.
 26. Operator must be physically able to handle the weight of the machine.
 27. Operator should be trained in the use of the machine.

Foreseeable Misuse

- During operation, failure to keep the cable away from the machine body, will result in the cable damaged by drill bit, causing electric conduction and other accidental injury.
- Before operation, when plugging the power source, failure to turn all the switches to position <off>, may result in accidental start-up from the machine, causing accidental injury.
- During suspended operation, failure to tie the safety belt to fasten the magnetic drill, when power failure or power down suddenly, causing magnetic drill to get out of the work surface and resulting in the accident.

Other risks

- During operation, wear loose clothing or jewellery, failure to wear protective hair covering to containing long hair, they can be caught in moving parts, may present an accidental injury.
- During operation, put in effort to push and press the machine, will result the magnet getting out of the work surface suddenly, causing accidental injury.
- Before mounting or removing the drill bit, failure to disconnect the supply, will result the accidental start-up, causing personal injury.

3) SPECIFICATION

Maximum hole cutting capacity in .2/.3C steel = 30mm dia. x 25mm deep
Arbor bore = 19.05mm (3/4") dia.

	Model	Voltage (V)(AC)	Normal Full Load	
				Watts (W)
	SMARTPUMA1	110V 50-60Hz		800
	SMARTPUMA3	230V 50-60Hz		800
Electro Magnet	Model	Voltage (V)(DC)	Normal Full Load	
			Amps (A)	Watts (W)
	SMARTPUMA1	110	0.45	45
	SMARTPUMA3	230	0.225	45
Total Normal Full Load (magnet + motor)				845
Overall Dimensions	Height (maximum extended)			410mm
	Height (minimum)			360mm
	Width (including Hand wheel)			170mm
	Length Overall (including Guard)			250mm
	Magnet Footprint			165mm x 80mm
Net Weight				11.20kgs
Stroke	With Arbor With Drill chuck			30mm max 65mm
No Load Speed	All voltages			600rpm
Tractive Force of Magnet at 20° C (25mm min. plate thickness) The use on any material less than 25mm thick will progressively reduce the magnetic performance. If possible substitute material should be positioned under the magnet and work piece to equate to a suitable material thickness. If this is not possible an alternative secure method of restraining the machine MUST be used.				8000N
Maximum hand/arm vibration magnitude (measured at handle during operation in accordance with ISO5349 using a 22mm dia. cutter through 13mm mild steel plate.				2.95 m/s ²
Estimate of vibration exposure. Operation 30 holes @ 1 minute/hole.				0.39 m/s ² A(8)
Average noise level during cutting at operators ear position.				L _{PA} Max. 88.3 dB(A) L _{WA} Max. 101.3dB(A)

Suitable only for a single phase 50-60 Hz A.C. power supply

DO NOT USE ON D.C. SUPPLY

Do not use your magnetic drill on the same structure when arc welding is in progress.
D.C. current will earth back through the magnet and cause irreparable damage.

WARNING: THIS APPLIANCE MUST BE EARTHED!

NB: ANY MODIFICATIONS TO THIS MACHINE WILL INVALIDATE THE GUARANTEE

	List of Contents with Magnetic Drill Unit	Check List
RD4329	Safety Strap	YES/NO
RD4088	4mm A/F Tee Handled Hexagon Key	YES/NO

4) OPERATING INSTRUCTIONS

READ BEFORE USING THE MACHINE

- When using electrical tools, basic safety precautions should always be followed to reduce the risk of electric shock, fire, and personal injury.
- Ensure the magnet is OFF before plugging in the machine.
- Do NOT use in wet or damp conditions. Failure to do so may result in personal injury.
- Do NOT use in the presence of flammable liquids, gases or in high risk environments. Failure to do so may result in personal injury.
- BEFORE activating the machine, inspect all electrical supply cables (including extension leads), and replace if damaged. DO NOT use if there are any signs of damage.
- Only use extension cables approved for site conditions.
- BEFORE activating the machine, ALWAYS check the correct function of all operational systems, switches, magnet etc.
- BEFORE operating, the machine MUST be securely restrained to a fixed independent feature (by using safety strap RD4329, or other means) to reduce the potential free movement, should the magnet become detached from the work piece. Failure to do so may result in personal injury.
- ALWAYS wear approved eye protectors, ear defenders and recommended PPE at ALL times when operating the machine.
- Disconnect from power source when changing cutters or working on the machine.
- Cutters and swarf are sharp, ALWAYS ensure that hands are adequately protected when changing cutters or removing swarf. Use a tool or brush where necessary to remove any swarf or the cutter from the arbor.
- Before operating the machine, ALWAYS ensure cutter-retaining screws are secured tightly.
- Regularly clear the work area and machine of swarf and dirt, paying particular attention to the underside of the magnet base.
- ALWAYS remove tie, rings, watches and any loose adornments that might entangle with the rotating machinery before operating.
- ALWAYS ensure that long hair is securely enclosed by an approved restraint before operating the machine.
- Should the cutter become stuck in the work piece, stop the motor immediately to prevent personal injury. Disconnect from power source and turn arbor to and fro. DO NOT ATTEMPT TO FREE THE CUTTER BY SWITCHING THE MOTOR ON AND OFF. Wear safety gloves to remove the cutter from the arbor.
- If the machine is accidentally dropped, ALWAYS thoroughly examine the machine for signs of damage and check that it functions correctly BEFORE resuming drilling.
- Regularly inspect the machine and check for any damaged or loose parts.
- ALWAYS ensure when using the machine in an inverted position that only the minimum amount of coolant is used and that care is taken to ensure that coolant does not enter the motor unit.
- Cutting tools may shatter, ALWAYS position the guard over the cutter before activating the machine. Failure to do so may result in personal injury.
- On completion of the cut, a slug will be ejected. DO NOT operate the machine as the ejected slug may cause injury.
- When not in use ALWAYS store the machine in a safe and secure location.
- ALWAYS ensure that approved ROTABROACH™ agents conduct repairs.

OPERATION

- Keep the inside of the cutter clear of swarf. It restricts the operating depth of the cutter.
- Ensure that the coolant bottle contains sufficient cutting oil to complete the required operating duration. Refill as required.
- Occasionally depress the pilot to ensure cutting fluid is being correctly metered.
- To start the machine follow the control panel operation instructions.
- ALWAYS switch off the motor by depressing the RED stop button. DO NOT switch off the motor by turning the magnet switch to zero.
- Apply light pressure when commencing the cut of a hole until the cutter is introduced into the work surface. Pressure can then be increased sufficiently to load the motor. Excessive pressure is undesirable, it does not increase the speed of penetration and will cause the safety overload protection device to stop the motor, (the motor can be restarted by operating the motor start button), and may cause excessive heat which may result in inconsistent slug ejection
- Always ensure that the slug has been ejected from the previous hole before commencing to cut the next.
- If the slug sticks in the cutter, move the machine to a flat surface, switch on the magnet and gently bring the cutter down to make contact with the surface. This will usually straighten a cocked slug and allow it to eject normally.
- Apply a small amount of light oil lubricant regularly to the slide and arbor support bearing.
- Cutter breakage is usually caused by insecure anchorage, a loosely fitting slide or a worn bearing in the arbor support. (Refer to routine maintenance instructions).
- Only use approved cutting fluid. Rotabroach cutting fluid has been specially formulated to maximise the cutters performance. It is available in 1 litre (RD208) and 5 litre (RD229).

EXTENSION CABLE SELECTION

The machines are factory fitted with a 3 metre length of cable having three, 1.5mm² conductors, LIVE, NEUTRAL and EARTH. If it becomes necessary to fit an extension cable from the power source, care must be taken in using a cable of adequate capacity. Failure to do so will result in a loss of traction by the magnet and a reduction of power from the motor.

Assuming a normal AC supply of the correct voltage, it is recommended that the following extension lengths shall not be exceeded:

For 110v supply: 3.5metres of 3 core x 1.5mm²

For 230v supply: 26 metres of 3 core x 1.5mm² or 17metres of 3 core x 1.0mm²

5) CUTSMART FEATURE

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'CutSmart' is a new feature from Rotabroach.

Designed to help you to get the best out of your machine. It does this by way of a visual indicator. The visual indicator shows when you are using the drill correctly within its specification this is done by way of a Tri colour LED to the Right of the magnet on LED.

During operation if you are drilling correctly this will stay **GREEN**. However as you put more pressure onto the drill increasing its workload above its correct operation the LED will start to change colour to **ORANGE**. This indicates that you are putting more wear on the machine and the cutter which will eventually cause damage to your machine. If further pressure is put on the machine the LED will eventually turn **RED** and the motor will cut off and will not be allowed to be turned back on for approximately 5 seconds. This is a safety feature to protect you and the machine from damage.

Ideally to get the most out of your machine you need to keep the LED green when drilling. If it starts to turn orange release some pressure.

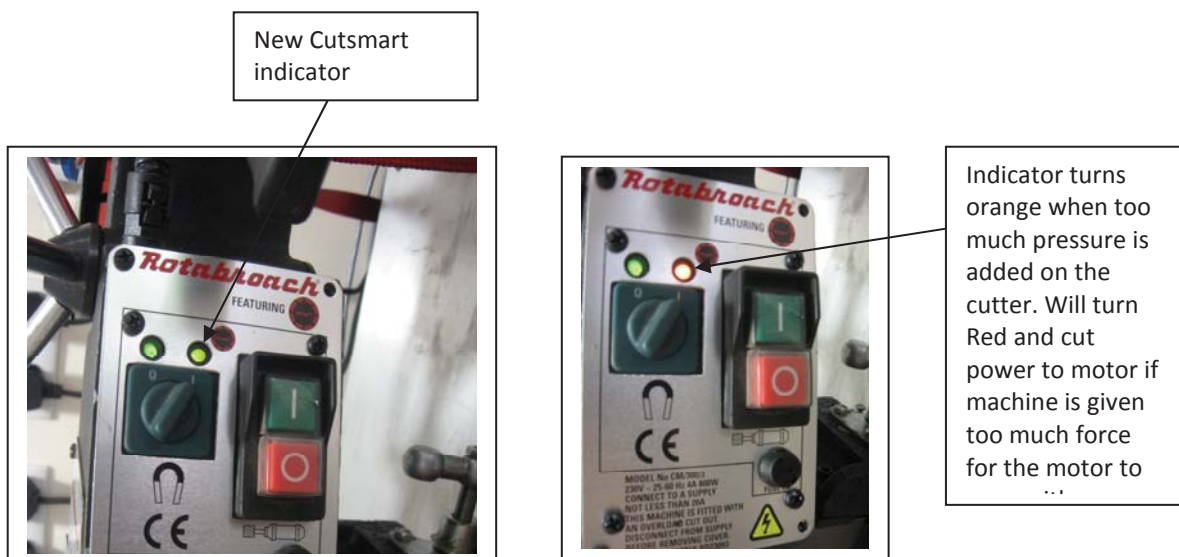
The panels are set to cut off when the machine reaches the following currents.

110V panel – approximately 17 amps

230V panel – approximately 10 amps

The magnet is also protected by a 2A fuse

Care must be taken when handling the PCB as they are static sensitive please ensure you are earthed. As the PCB contains some delicate components please do not flash test this equipment.



6) MOUNTING OF CUTTERS

(See exploded view of complete machine)

The machine has been made to accept cutters having 19.05mm (3/4") dia. shanks.

The following procedure is to be used when mounting cutters.

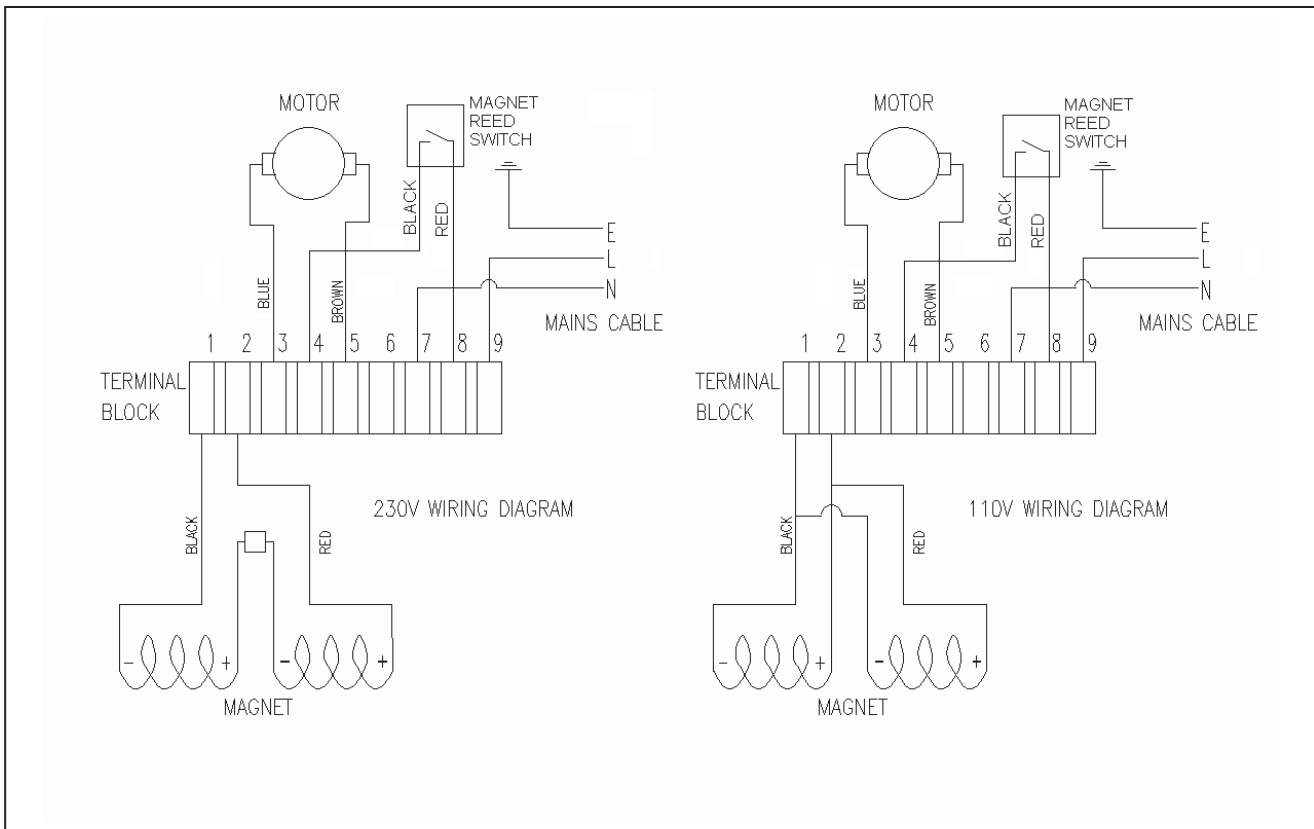
- Lay the machine on its side with feed handles uppermost, ensuring arbor is wound down to its lowest point to enable access to socket screws #12.5.
- Take appropriate pilot and place through hole in shank of cutter. Insert shank of cutter into 3/4" dia. bore of arbor, ensuring alignment of two drive flats with socket screws #12.5.
- Tighten both screws using hexagon key RD4088.

ALWAYS DISCONNECT MACHINE FROM POWER SOURCE.

7) REMEDIES FOR HOLE MAKING PROBLEMS

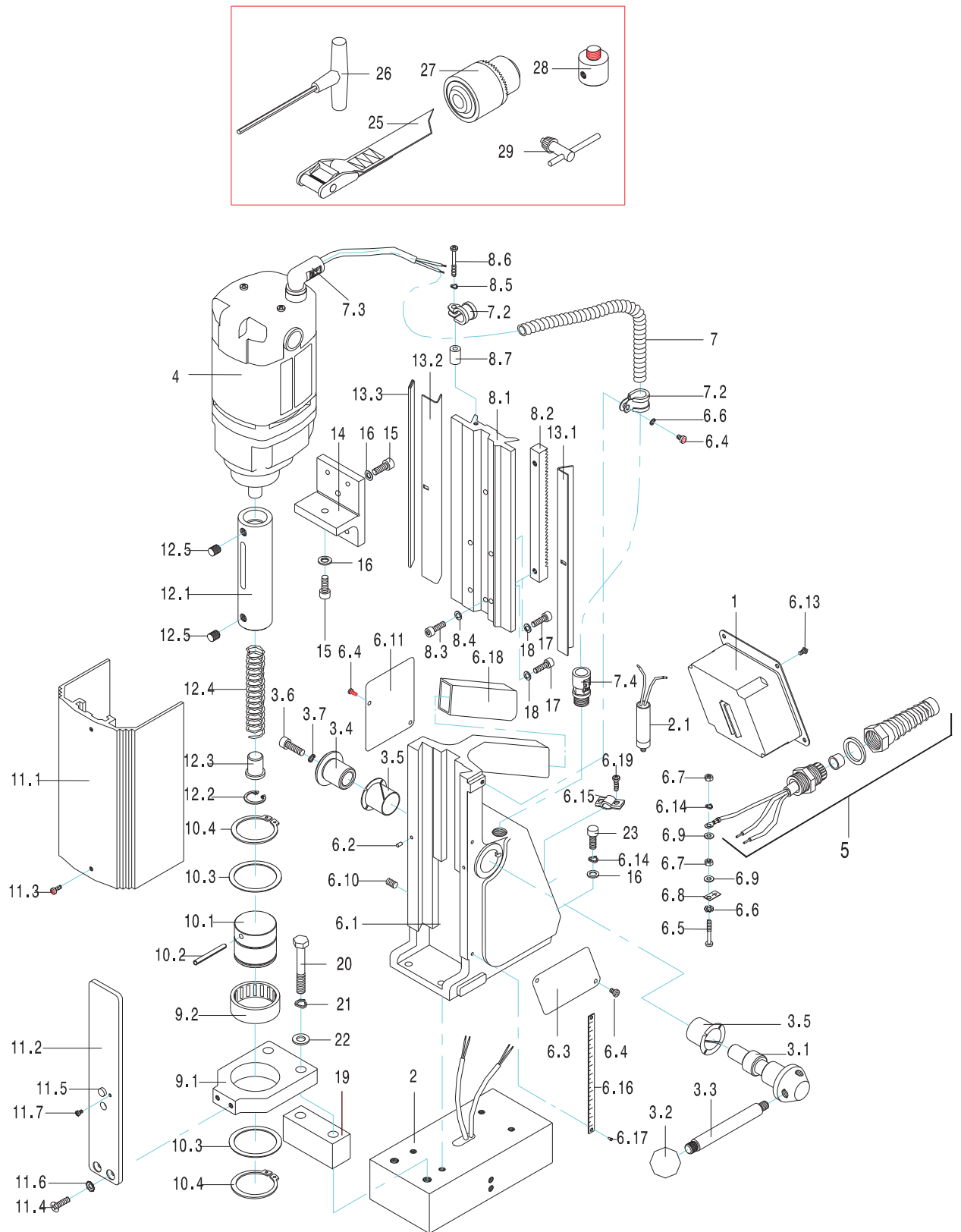
<i>Problem</i>	<i>Cause</i>	<i>Remedy</i>
1) Magnetic base won't hold effectively	Material being cut may be too thin for efficient holding. Swarf or dirt under magnet. Irregularity on magnet contact or work-piece. Insufficient current going to magnet during drilling cycles.	Attach an additional piece of metal under work-piece where magnet will be located, or mechanically clamp magnetic base to work-piece. Clean magnet. Use extreme care; file any imperfections flush to surface. Confirm power supply and output from control unit, check supply cable.
2) Cutter skips out of centre-punch mark at initiation of cut	Magnetic base is not holding effectively. Worn arbor bushing and/or ejector collar. Too much feed pressure at start of cut. Cutter is dull, worn, chipped or incorrectly sharpened. Poor centre-punch mark; weak pilot spring; pilot not centred in centre-punch mark. Worn or bent pilot, worn pilot hole. Loose bolts on motor bushing support bracket, main casting or loose gib adjusting set screws.	See causes and remedies above. Replace! Only a few thousandths wear permissible. New arbor bushing is needed. Light pressure only is needed until a groove is cut. The groove then serves as a stabilizer. Replace or re-sharpen. Sharpening service is available. Improve centre-punch and/or replace worn parts Replace part or parts Adjust where necessary
3) Excessive drilling pressure required	Incorrectly re-sharpened, worn or chipped cutter. Coming down on swarf lying on surface of work-piece. Gibs out of adjustment or lack of lubrication. Swarf accumulated (packed) inside cutter.	Re-sharpen or replace. Take care not to start a cut on swarf. Adjust setscrews, and lubricate. Clear cutter.
4) Excessive cutter breakage	Steel swarf or dirt under cutter. Incorrectly re-sharpened or worn cutter. Cutter skipping. Slide-ways need adjustment. Cutter not attached tightly to arbor. Insufficient use of cutting oil or unsuitable type of oil.	Remove cutter, clean part thoroughly and replace. Always have a new cutter on hand to refer to for correct tooth geometry, together with instruction sheet. See causes and remedies (2). Tighten sideways. Retighten. Inject oil of light viscosity into the coolant-inducing ring and check that oil is being metered into cutter when pilot is depressed. If not, check pilot groove and arbor internally for dirt or apply oil externally. (Even a small amount of oil is very effective).
5) Excessive cutter wear	See cause and remedy above Incorrectly re-sharpened cutter. Insufficient or spasmodic cutting pressure.	Refer to instructions and a new cutter for proper tooth geometry. Use sufficient steady pressure to slow the drill down. This will result in optimum cutting speed and chip load.

8) WIRING DIAGRAM



No	Function	Wire Colour
1	Magnet 1- (110v & 230v Magnet)	Black
2	Magnet 2+ (110v & 230v Magnet)	Red
3	Motor	Blue
4	Magnet reed switch	Black
5	Motor	Brown
6	N/C	
7	Mains (Neutral)	Blue
8	Magnet reed switch	Red
9	Mains (Live)	Brown

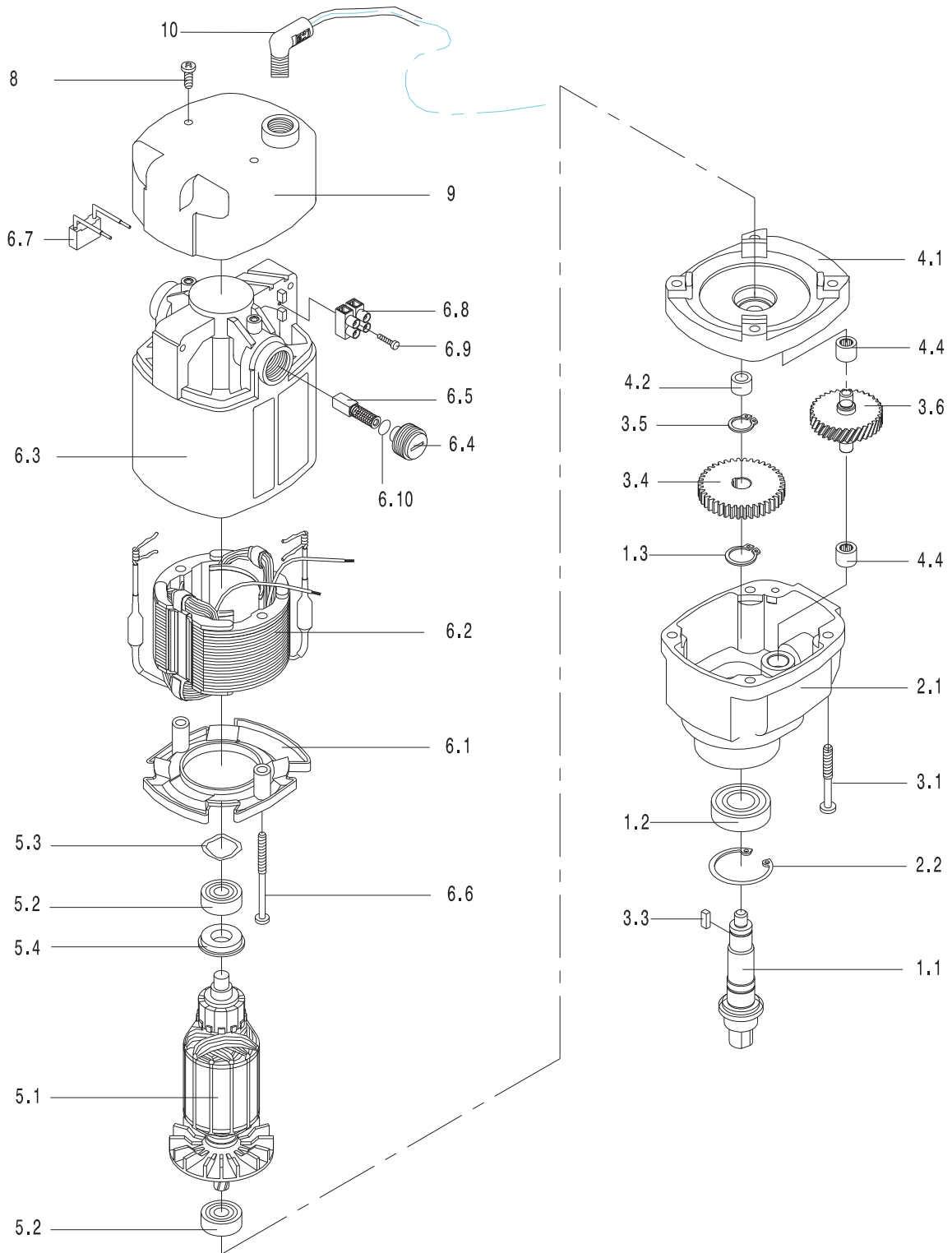
9) EXPLODED DIAGRAM OF MACHINE



Component parts list for Rotabroach Puma CM/300/1 & CM/300/3 From serial number 107621

Item	Part number	Discription	Quantity	Item	Part number	Discription	Quantity
1	RD23094	Control panel assembly 110v.	1	8.6	RD43093	Screw.	1
1	RD23095	Control panel assembly 230v.	1	8.7	RD43116	Spacer block	1
2	RD23081	Magnet assembly 110v.	1	9	RD23014	Bearing bracket assembly.	1
2	RD23083	Magnet assembly 230v.	1	9.1	RD33099	Bearing bracket.	1
2.1	RD45606	Protection Switch	1	9.2	RD4518	Bearing	1
3	RD23008	Capstan assembly.	1	10	RD23015	Arbor sleeve assembly.	1
3.1	RD33088	Capstan spindle.	1	9	RD23014	Bearing bracket assembly.	1
3.2	RD43091	Capstan ball.	3	10.1	RD33100	Ejector sleeve.	1
3.3	RD33089	Capstan arm.	3	10.2	RA353	Pin.	1
3.4	RD33090	Capstan pinion sleeve.	1	10.3	RD4519	Thrust washer.	2
3.5	RD33092	Bearing.	2	10.4	RD43084	Circlip.	2
3.6	RD4098	M6 Socket head cap screw.	1	11	RD23016	Guard assembly.	1
3.7	RD4207	M6 Spring washer.	1	11.1	RD33101	Guard.	1
4	RD23064	Motor & Gearbox assy 110v.	1	11.2	RD33102	Guard bracket	1
4	RD23065	Motor & Gearbox assy 230v.	1	11.3	RD43092	Screw.	2
5	RD23009	Mains cable assembly 110v.	1	11.4	RD43096	Screw.	2
5	RD23012	Mains cable assembly 230v.	1	11.5	RD43097	Ball plunger	2
6	RD23003	Housing assembly.	1	11.6	RD43098	Shakeproof washer.	1
6.1	RD33094	Housing.	1	11.7	RD4252	M3 screw	1
6.2	RD4102	Tension pin.	2	12	RD23019	Arbor assembly.	1
6.3	RD33077	Logo plate.	1	12.1	RD33137	Arbor spindle.	1
6.4	RD4077	Screw.	4	12.2	RD4056	Circlip.	1
6.5	RD43093	Screw.	1	12.3	RA354	Button.	1
6.6	RD4069	Shakeproof washer.	1	12.4	RD3319	Spring.	1
6.7	RD4068	Nut.	2	12.5	RD4066	M8 Socket screw.	4
6.8	RD43094	Earth tag.	1	13	RD23018	Gib strip assembly	1
6.9	RD4070	Washer.	1	13.1	RD33103	Fixed gib strip	1
6.10	RD4312	Screw.	4	13.2	RD33104	Adjustable gib strip	1
6.11	RD4302	Information plate.	1	13.3	RD33105	Gib support strip	1
6.13	RD4077	M4 x 8 Pan head	1	14	RD33106	Motor support bracket.	1
6.14	RD43113	M4 spring washer	1	15	RD4157	M6 Socket head screw.	2
6.15	RD43117	Mains cable clamp	1	16	RD4096	M6 Shakeproof washer.	2
6.16	RD33145	Depth Guage	1	17	RD4091	M5 Socket head screw.	4
6.17	RD33146	Rivet	1	18	RD4092	M5 Shakeproof washer.	4
6.18	RD33144	Rubber Handle	1	19	RD33107	Bearing spacer.	1
6.19	RD43093	Screw	2	20	RD4319	M8 Bolt	2
7	RD23010	Motor supply cable assembly.	1	21	RD4079	M8 Shakeproof washer	2
7.1	RD33095	Cable assembly.	1	22	RD4078	M8 Washer	2
7.2	RD43095	cable clip.	2	23	RD4098	M6 Socket head cap screw.	2
7.3	RD43346	Motor cable elbow	1	24	RD4095	M6 Washer.	2
7.4	RD43112	Connector	1	25	RD4329	Safety Strap	1
8	RD23004	Slide assembly	1	26	RD4088	4mm Allen Key	1
8.1	RD33096	Slide.	1	27	RD43099	13mm Drill Chuck	1
8.2	RD33097	Rack.	1	28	RD33153	Drill Chuck Adaptor	1
8.3	RD4325	M5 socket head screw.	2	29	RD33154	Drill Chuck Key	1
8.4	RD4092	M5 Shakeproof washer.	2				
8.5	RD4069	Shakeproof washer.	1				

10) EXPLODED DIAGRAM OF MOTOR AND GEARBOX (From serial No 106991 and greater)

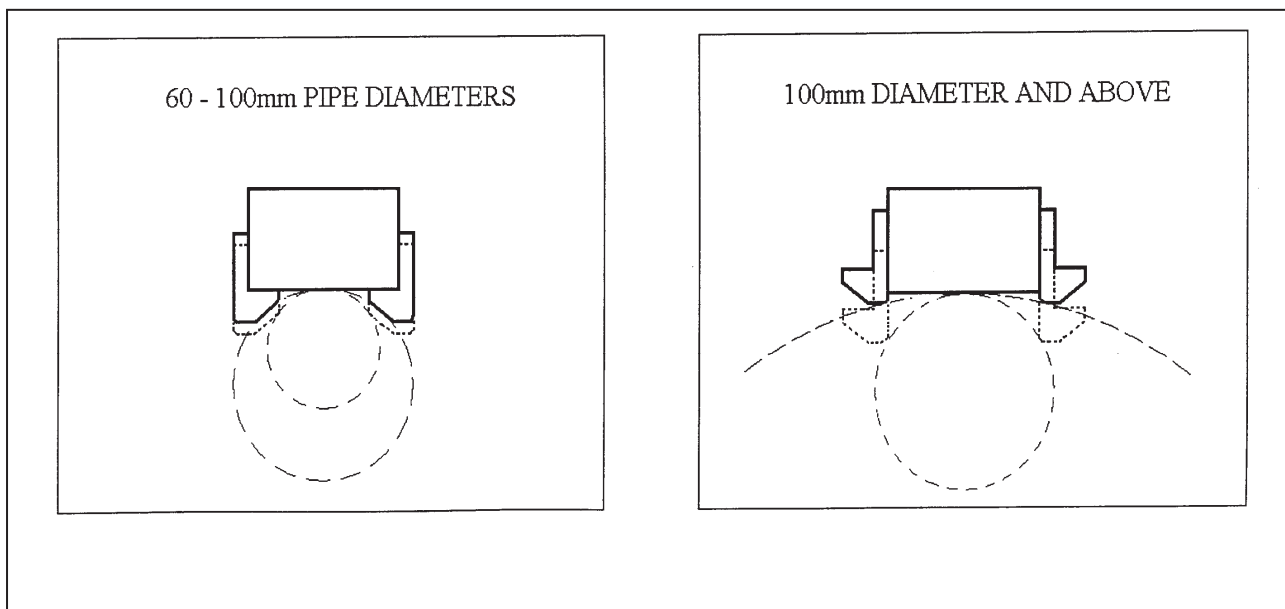


Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	RD23020	Output shaft assembly.	1	6.2	RD33111	Field coil 110v.	1
1.1*	RD33139	Output shaft.	1	6.3	RD33085/B	Motor casing.	1
1.2	RM304210	Bearing.	1	6.4	RD33086	Brush end cap.	1
1.3	RM22876	Circlip.	1	6.5	RM297640	Carbon Brush assy 110v.	2
2	RD23024/B	Gearbox Housing assembly.	1	6.6	RD43089	Screw.	2
2.1	RD33081/B	Gearbox Housing.	1	6.7	RD43118	Capacitor	1
2.2	RM22876	Circlip.	1	6.8	RD43119	Terminal	1
3	RD23001/B	Gearbox assembly.	1	6.9	RD43120	Screw.	4
1	RD23020	Output shaft assembly.	1	6.10	RD43121	Brush cover spring	1
2	RD23006/B	Gearbox Housing assembly.	1	6	RD23023/B	Motor case assembly 230v	1
3.1	RD43085	Screw.	4	6.1	RD33084	Field coil baffle.	1
3.3*	RD33128	Key	1	6.2	RD33113	Field coil 230v.	1
3.4	RD33082	Final drive gear.	1	6.3	RD33085/B	Motor casing.	1
3.5	RD43087	Circlip	1	6.4	RD33086	Brush end cap.	2
3.6	RD33083	Intermediate gear.	1	6.5	RM297630	Carbon Brush assy 230v.	2
4	RD23007/B	Inner Gear plate assembly.	1	6.6	RD43089	Screw.	2
4.1	RD23007	Inner Gear plate.	1	6.7	RD43118	Capacitor	1
4.2	RD43088	Ph Bz Bearing.	1	6.8	RD43119	Terminal	1
4.4	RM22880	Needle Bearing.	2	6.9	RD43120	Screw.	4
5	RD23011	Armature assembly 110v	1	6.10	RD43121	Brush cover spring	2
5.1	RD33091	Armature 110v	1	7	RD23031	Motor assembly 110v	1
5.2	RM17134	Bearing.	2	5	RD23011	Armature assembly 110v	1
5.3	RD43122	Washer	3	6	RD23021/B	Motor case assembly 110v	1
5.4	RD43123	Dust proof Ring	1	9	RD33087/B	Motor end cap	1
5	RD23013	Armature assembly 230v	1	8	RD43090	Screw.	2
5.1	RD33093	Armature 230v	1	7	RD23033	Motor assembly 230v	1
5.2	RM17134	Bearing.	2	5	RD23013	Armature assembly 230v	1
5.3	RD43122	Washer	3	6	RD33113	Field coil 230v.	1
5.4	RD43123	Dust proof ring	1	8	RD43090	Screw.	2
6	RD23021/B	Motor case assembly 110v	1	9	RD33087	Motor End Cap	1
6.1	RD33084	Field coil baffle.	1	10	RD43346	Motor Cable elbow	1

11) PIPE ADAPTOR KIT RD2311

FITTING INSTRUCTIONS

- Dependent upon the size of the pipe to be cut (see illustrations) attach adjustable angle plates RD3328 with cap screws RD4325 and washers RD4205 (4 off each) to the magnet sides. Do not tighten.
- Locate the machine on the centreline pipe taking care that the magnet is in line with the longitudinal axis of the pipe.
- Switch on the magnet and move the sliding plates down to the outside diameter of the pipe. Tighten the screws on both sides by hand then check once again that the full length of the moving plates is touching the pipe at the front and back, fasten the plate securely. Feed the safety strap through the lugs at the front of the housing, around the pipe and pull tight.
- When cutting the hole DO NOT use excessive pressure but rather let the cutter ease into the cutting surface.



12) CHUCK CONVERSION

- To remove the arbour lay the machine on its side.
- Unscrew the two grub screws at the top of the arbor
- Some early machines will only have spanner flats on the arbor.
- When the arbor has become detached from the spindle this can then be removed
- Remove the arbour support bracket and guard with the arbour retained.
- Mount the chuck using the chuck adaptor RD33153.
- Replacing the chuck is the reverse sequence.

13) MAINTENANCE

In order to 'get the best life' out of your Rotabroach™ machine always keep in good working order.

A number of items must always be checked on Rotabroach™ machines.

Always before starting any job make sure the machine is in good working order and that there are no damaged or loose parts. Any loose parts must be tightened.

Before proceeding with any maintenance work be certain that the power supply is disconnected.

Description	Every operation	1 week	1 Month
Visual check of machine for damage	X		
Operation of machine	X		
Check brush wear		X	
Check magnetic base	X		
Check alignment of the machine			X
Check grease			X
Check Armature			X

Visually check the machine for damage.

Machine must be checked before operation for any signs of damage that will affect the operation of the machine. Particular notice must be taken of the mains cable, if the machine appears to be damaged it should not be used failure to do so may cause injury or death.

Check operation of the machine.

The machines operation must be checked to ensure that all components are working correctly.

Machine Brushes - should be checked to make sure there is no abnormal wear present this should be checked at least once a week if used frequently. If the brush has worn more than 2/3 the original length the brushes should be changed. Failure to do so may cause damage to the machine.

Magnetic base – before every operation the magnetic base should be checked to make sure that the base is flat and there is no damage present. An uneven magnet base will cause the magnet not to hold as efficiently and may cause injury to the operator.

Adjustment of slide and bearing bracket Alignment.

An essential requirement of the machine is that the slide can move in a smooth and controlled manner, free of lateral movement and vibration.

This situation can be maintained by periodic adjustment of the slide and is accomplished in the following manner:

1. Place the machine in an upright position and, by means of the capstan, raise the slide to its highest position. Clean the brass gib strips and apply a small amount of light machine oil to the wear surfaces.
2. Now lower the slide back to its lowest position. Bring the slide into the centre of the dovetail slide housing and loosen screws thus allowing free movement of the arbor support bracket.
3. Commencing with the middle screws, gently feed in all the screws until slight resistance is encountered.
4. Operate the slide up and down a few times to test the movement and make any further necessary adjustments. Try to ensure that all the screws are exerting a uniform pressure on the slide from top to bottom. A perfectly adjusted slide will operate freely up and down without any sideways movement.
5. Now raise the slide to its highest position. Slightly undo the arbor bearing bracket and, using fingers only, tighten the screws.
6. Place the machine on a steel plate, connect to supply and switch on magnet. Start up the motor. If the arbor is incorrectly aligned, the arbor support bracket will be seen to oscillate. Make any necessary further adjustments to the bracket to ensure correct alignment of the spindle and finally tighten the screws using a spanner. Lastly tighten the arbor bearing bracket.

Check machines grease.

The gearbox grease should be checked once a month to ensure all moving components are covered to prevent wear. The grease should be changed at least once a year to ensure you gain the best from the machine.

Check Armature of the machine.

This should be checked at least 1 per month to check that there are visual signs of damage to the body or to the commutator. Some signs of wear will be seen on the commutator over a period of time this is normal as this is the part that comes in contact with the brushes but any signs of abnormal damage and the part should be replaced.

14) TROUBLE SHOOTING

Magnet and motor do not function	<ul style="list-style-type: none"> - The magnet switch is not connected to the power supply - Damaged or defective wiring - Defective fuse - Defective magnet switch - Defective Control Unit - Defective power supply
Magnet does function, the motor does not	<ul style="list-style-type: none"> - Damaged or defective wiring - Carbon brushes are stuck or worn out - Defective magnet switch - Defective On / off switch - Defective Control Unit - Defective armature and/or field - Defective magnet protective switch
Magnet does not function, the motor does	<ul style="list-style-type: none"> - Defective magnet - Defective Control Unit
Hole cutters break quickly, holes are bigger than the hole cutter	<ul style="list-style-type: none"> - Play in the guide - Bent spindle - Defective Magnet causing movement - Shaft extending from the motor is bent - Uneven work surface causing lack of magnetic adhesion. - Bent pilot
Motor running roughly and/or seizing up	<ul style="list-style-type: none"> - Bent spindle - Shaft extending from the motor is bent - Triangular guide not mounted straight - Dirt between spindle and triangular guide
Motor making a rattling sound	<ul style="list-style-type: none"> - Gear bearing (bottom of the armature) worn out - Gear(s) worn out - No grease in gear box
Motor humming, big sparks and motor has no force	<ul style="list-style-type: none"> - Armature burned - Field burned - Carbon brushes worn out
Motor does not start or fails.	<ul style="list-style-type: none"> - Damaged or defective wiring - Dirt in sensor of Speed Control Unit - Defective Speed Control Unit - Defective speed control or its wiring - Defective or loose magnet on top of armature - Damaged or defective brushes
Guiding takes a great deal of effort	<ul style="list-style-type: none"> - Guide is set too tight - Guide is dry - Guide/gear- rack/rotation system dirty or damaged
Insufficient magnetic force	<ul style="list-style-type: none"> - Damaged or defective wiring - Bottom of magnet not clean and dry - Bottom of magnet not flat - Work piece is not bare metal - Work piece is not flat - Work piece is too thin less than 10mm - Defective Control Unit - Defective magnet
Motor only runs at maximum rpm	<ul style="list-style-type: none"> - Defective speed switch - Damaged / defective wiring - Defective Control Unit
Frame under voltage	<ul style="list-style-type: none"> - Damaged / defective wiring - Defective magnet - Motor seriously dirty
Fuse blows when magnet switch is turned on	<ul style="list-style-type: none"> - Damaged or defective wiring - Wrong value fuse - Defective magnet switch - Defective Control Unit - Defective magnet
Fuse blows when motor is started up	<ul style="list-style-type: none"> - Damaged or defective wiring - Wrong value fuse - Motor running roughly - Defective Armature and / or Field - Carbon brushes worn out - Defective Control Unit
Rotation system free stroke too long	<ul style="list-style-type: none"> - Loose or defective gear-rack - Defective rotation system

15) CUTTER SELECTION, SPEEDS AND FEEDS

Material	Material hardness	Cutter
Mild and Free cutting steels	<700N/mm ²	SRC or SRCL
Mild and Free cutting steels	<850N/mm ²	SRCV or SRCVL
Steel angle and joists	<700N/mm ²	SRC or SRCL
Steel angle and joists	<850N/mm ²	SRCV or SRCVL
Plate and sheet steel	<700N/mm ²	SRC or SRCL
Plate and sheet steel	<850N/mm ²	SRCV or SRCVL
Aluminium	<700N/mm ²	SRC or SRCL
Aluminium	<850N/mm ²	SRCV or SRCVL
Brass	<700N/mm ²	SRC or SRCL
Brass	<850N/mm ²	SRCV or SRCVL
Cast iron	<700N/mm ²	SRC or SRCL
Cast iron	<850N/mm ²	SRCV or SRCVL
Stainless Steel	<700N/mm ²	SRC or SRCL
Stainless Steel	<850N/mm ²	SRCV or SRCVL
Stainless Steel	>850N/mm ²	CWC, CWCL or CWCX or SCRWC
Rail track	>850N/mm ²	CWC, CWCL or CWCX or SCRWC
Tool Steel	>850N/mm ²	CWC, CWCL or CWCX or SCRWC
Die steel	>850N/mm ²	CWC, CWCL or CWCX or SCRWC

The data listed below is for reference purposes only, and indicate potential starting conditions. It is the responsibility of the site operation manager to determine correct application requirements.

Material to be cut	Cutting surface speed Meters/min	Cutter diameter/Material/RPM relationship															
		13		14		18		22		30		50		65			
		Lower	Upper	L	U	L	U	L	U	L	U	L	U	L	U		
Aluminium	60 - 90	1469	2203	1364	2046	1061	1591	868	1302	637	955	382	573	294	441		
Brass & Bronze	40 - 50	979	1224	909	1137	707	884	579	723	424	530	255	318	196	245		
Iron: cast(soft)	30 - 50	734	1224	682	1137	530	884	434	723	318	530	191	318	147	245		
cast(hard)	15 - 21	367	514	341	477	265	371	217	304	159	223	95	134	73	103		
cast(malleable)	15 - 30	367	734	341	682	265	530	217	434	159	318	95	191	73	147		
Steel: mild	24 - 30	588	734	546	682	424	530	347	434	255	318	153	191	118	147		
high tensile	3 - 5	73	122	68	114	53	88	43	72	32	53	19	32	15	24		
stainless (free cutting)	15 - 18	367	441	341	409	265	318	217	260	159	191	95	115	73	88		
stainless (heat resisting)	6 - 13	26	318	136	296	106	230	87	188	64	138	38	83	29	64		

These are only starting points. They will vary with application and work piece condition.

Material or Application Type	Feed Per Tooth (mm)
Thin Walled Workpieces Oblique Entry / Curved Surfaces Semi-Circles / Fragile Setups	.0254 / .0508 (.0762 FPT with Work Hardening Materials)
Soft / Gummy Materials	.1016 / .127
Typical / Average Applications	.0762 / .1016
Deep Holes	.1016 / .127

Difficult-to-machine materials will require reduced feed rates.



WARRANTY STATEMENT

Rotabroach™ warrants its machines to be free from faulty materials, or workmanship under normal use for a period of 6 months from initial date of purchase and 90 days for all other parts (excluding cutters), provided that the warranty registration card (or online registration) has been completed and returned to Rotabroach™, or its designated distributor within a period of (30) days from the purchase date, failure to do so will void the warranty. If the stated is adhered to Rotabroach™ will repair or replace (at its option) without charge any faulty items returned.

This Warranty does not cover:

1. Components that are subject to natural wear and tear caused by the use in accordance with the operators instructions
2. Defects in the tool caused by non-compliance with the operating instructions, improper use, abnormal environment conditions, inappropriate operating conditions overload or insufficient servicing or maintenance.
3. Defects caused by using accessories, components or spare parts other than original Rotabroach™ parts.
4. Tools to which changes or additions have been made.
5. Electrical components are subject to manufacturer's warranty.

Your online registration can be submitted on www.rotabroach.co.uk

The warranty claim must be lodged within the warranty period. This requires the submission or sending of the **complete** tool in question with the original sales receipt which must indicate the purchase date of the product. A complaint form must also be submitted prior to the return.

This can be found online at www.rotabroach.co.uk Failure to complete this form will result in the delay of your claim. All goods returned defective must be returned pre-paid to Rotabroach™, in no event shall Rotabroach™ be liable for subsequent direct, or indirect loss or damage.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, (EXPRESSED OR IMPLIED) INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ROTABROACH™ RESERVE THE RIGHT TO MAKE IMPROVEMENTS AND MODIFICATIONS TO DESIGN WITHOUT PRIOR NOTICE

Known and Trusted Worldwide for Quality, Performance and Reliability