AC42 VariBrute

Magnetic Drill Press

HEAVY DUTY
DRILLING & TAPPING
Variable Speed + Forward/Reverse

championcuttingtool.com

CHAMPION
CUTTING TOOL CORP

TECHNICAL DATA

Model		AC42
Power Input		1100 W
Voltage		110 - 120 V
No Load Speed		225 ~ 450 RPM
Max. Capacity	Cutters, Ø x Depth of Cut	1-1/2 x 2" (38 x 50 mm)
	Twist Drills	1" Diameter (1/2" Shank)
	Ø of Taps	3/4"
Magnetic Adhesion		3800 lb
Net Weight		29 lbs (13.15 kg)

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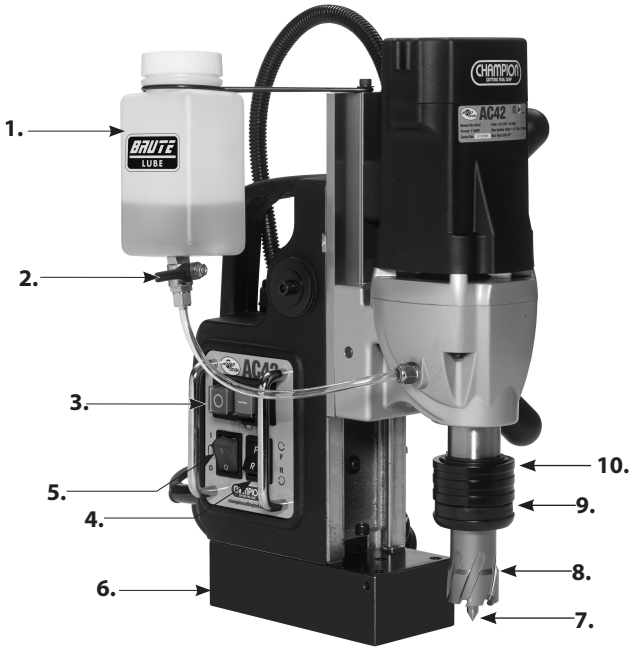
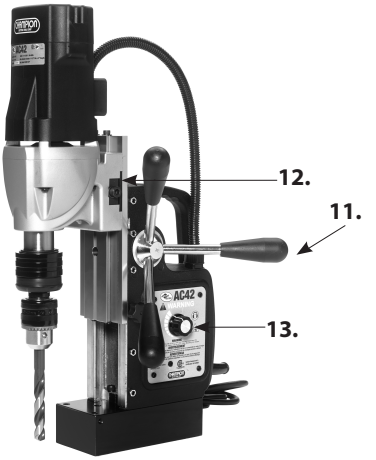




1/2" 3-Jaw
Drill Chuck / Adaptor

Tapping Collet /
Adaptor

1. Coolant Tank
2. Coolant Feed Tap
3. Motor Switch
4. Fwd / Reverse Switch
5. Magnet Switch
6. Magnet Base
7. Pilot Pin (sold separately)
8. Annular Cutter (sold separately)
9. Quick-Release Cutter Holder
10. Arbor
11. Handle
12. Slide Height Lock
13. Speed Control Dial

Accessories

* Wrench (M8), T-Wrench (M6), Hex Key (M2.5, M4), Chip Guard, Coolant Tank, Safety Strap, Drill Chuck / Adaptor, Tapping Collet

RotoBrute AC42 MAGNETIC DRILL PRESS SAFETY WARNINGS

WARNING Read all safety warnings, instructions, illustrations and specifications provided with this magnetic drill press. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury. **Save all warnings and instructions for future referenc**e.

For tools equipped with over load protection, when motor has shut down off due to over load, always run machine with no load for at least 3 minutes to reduce temperature before returning to operation to avoid burn out of the motor.

1) WORK AREA SAFETY

a. **Keep work area clean and well lit**. Cluttered or dark areas invite accidents.
b. **Do not operate magnetic drill press in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Power tools create sparks which may ignite the dust or fumes.
c. **Keep children and bystanders away while operating a magnetic drill press**. Distractions can cause you to lose control.
d. **Never leave the electric magnetic drill press unattended.** Only leave the machine when the tool in use has come to a complete standstill.

2) ELECTRICAL SAFETY

a. **Magnetic drill press plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock.
b. **Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
c. **Do not expose power tools to rain or wet conditions.** Water entering a magnetic drill press will increase the risk of electric shock.
d. **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the magnetic drill press. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.
e. **When operating a magnetic drill press outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
f. **If operating a magnetic drill press in a damp location is unavoidable, use a residual current device (RCD) protected supply.** Use of an RCD reduces the risk of electric shock.

3) PERSONAL SAFETY

a. **Stay alert, watch what you are doing and use common sense when operating a magnetic drill press. Do not use a magnetic drill press while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.
b. **Use personal protective equipment. Always wear eye protection.** Protective equipment such as a dust mask, non-skid safety shoes, hard hat or hearing protection used for appropriate conditions will reduce personal injuries.
c. **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.
d. **Remove any adjusting key or wrench before turning the magnetic drill press on.** A wrench or a key left attached to a rotating part of the magnetic dr l press may result in personal injury.

e. **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the magnetic drill press in unexpected situations.
f. **Dress properly. Do not wear loose clothing or jewelry. Keep your hair and clothing away from moving parts.** Loose clothes, jewelry or long hair can be caught in moving parts.
g. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.
h. **Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles.** A careless action can cause severe injury within a fraction of a second.

4) RotoBrute AC42 MAGNETIC DRILL PRESS USE AND CARE

a. **Do not force the magnetic drill press. Use the correct magnetic drill press for your application.** The correct magnetic drill press will do the job better and safer at the rate for which it was designed.
b. **Do not use the magnetic drill press if the switch does not turn it on and off.** Any magnetic drill press that cannot be controlled with the switch is dangerous and must be repaired.
c. **Disconnect the plug from the power source and/or remove the battery pack, if detachable, from the magnetic drill press before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the magnetic drill press accidentally.
d. **Store idle tool out of the reach of children and do not allow persons unfamiliar with the magnetic drill press or these instructions to operate the magnetic drill press.** Power tools are dangerous in the hands of untrained users.
e. **Maintain magnetic drill press and accessories. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the tool's operation. If damaged, have the magnetic drill press repaired before use.** Many accidents are caused by poorly maintained power tools.
f. **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
g. **Use the magnetic drill press, accessories and tools in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the magnetic drill press for operations different from those intended could result in a hazardous situation.
h. **Keep handles and grasping surfaces dry, clean and free from oil and grease.** Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

5) SERVICE

Have your magnetic drill press serviced at a qualified Champion Cutting Tool authorized repair center using only identical replacement parts. This will ensure that the safety of the magnetic drill press is maintained.

TERMINOLOGY USED IN THE MANUAL

1. **Warning: This term means that there is a risk of physical harm or death to the operator or people nearby.**
2. **Caution: This term means that there is a risk of damage to the machine, cutting tool or other equipment.**
3. **Note: These terms offer useful information relating to the operation of the machine or its maintenance.**

Symbols used in this manual

V……..volts
A……..amperes
Hz…….hertz
W…….watt
~……...alternating current
n_o……..no load speed
min^{-1}…….revolutions or reciprocation per minute


.....warning of general danger


….with electrical earth


.....read these instructions


.....always wear eye protection


.....always wear a dust mask.


.....always wear hearing protection


.....wear safety-approved hard hat


do not dispose of electric tools, accessories and packaging together with household waste material

RotoBrute AC42 MAGNETIC DRILL SAFETY WARNINGS

a. **The magnetic drill press must be secured.** A drill that is not properly secured may move or tip over and may result in personal injury.

b. **The workpiece must be clamped or secured to the workpiece support. Do not drill pieces that are too small to be clamped securely.** Holding the workpiece by hand during operation may result in personal injury.

c. **Do not wear loose gloves.** Gloves may be entangled by the rotating parts or chips, leading to personal injury.

d. **Keep your hands out of the drilling area while the tool is running.** Contact with rotating parts or chips may result in personal injury.

e. **Make sure the accessory is rotating before feeding into the workpiece.** Otherwise the accessory may become jammed in the workpiece, causing unexpected movement of the workpiece and personal injury.

f. **When the accessory is jammed, stop applying downward pressure and switch off the tool. Investigate and take corrective actions to eliminate the cause of the jam.** Jamming can cause unexpected movement of the workpiece and personal injury.

g. **Avoid generating long chips by regularly interrupting downward pressure.** Sharp metal chips may cause entanglement and personal injuries.

h. **Never remove chips from the drilling area while the tool is running. To remove chips, move the accessory away from the workpiece, switch off the tool, and wait for the accessory to stop moving. Use tools such as a brush or hook to remove chips.** Contact with rotating parts or chips may result in personal injury.

i. **Accessories with speed ratings must be rated at least equal to the maximum speed marked on the magnetic drill press.** Accessories running faster than their rated speed can break and fly apart.

MAGNETIC DRILL SPECIFIC SAFETY WARNINGS AND CAUTIONS

a. **Always use safety strap.** Mounting can release.

b. **WARNING: While operating, only hold the crank handles, not any other part of the machine.** Placing the hand on the machine may result in an electric shock in the event of a voltage leak or if the machine cuts its own power supply cable.

c. **Always ensure that the work piece is a minimum of 13mm (1/2 in.) thick. If it is not, then use a piece of steel plate at least 12mm thick and larger than the magnet, below the work piece, to supplement the magnetic adhesion.** The magnet's adhesion depends on the thickness of the work piece.
d. **Do not operate the machine on a workpiece while it is being welded.** This may lead to damage to the machine and/or personal injury.
e. **Never position machine on a work piece between the electrode and the ground of any arc type welder.** The welder's current will ground through the earth wire in the machine's power supply cable, causing it damage.
f. **Do not exceed 90 degrees from horizontal.** It is hazardous to use the drill upside-down.
g. **Always ensure that the magnet is clean and free of rust and scale.** Metal chips and other debris will hamper magnetic adhesion.
h. **Always use the tool alone on the receptacle.** Other units used on the same receptacle could cause uneven voltage that could lead to the magnet releasing.
i. **Ensure that the magnet has properly adhered to the work piece before beginning drilling.** Proper magnet adhesion is essential for safe drilling.
j. **Do not operate with dull or damaged cutting tools.** This may overload the motor.
k. **Avoid operating annular cutters without cutting fluid.** Always check fluid level before operating. Annular cutters require cutting fluid for proper operation and long life.
l. **Protect the motor. Never allow cutting fluid, water, or other contaminants to enter the motor.** This could lead to electric shock or motor damage.
m. **When drilling stacked work materials, always stop to clear the slug after the first layer is drilled.** The loose slug will interfere with proper drilling.
n. **CAUTION: Never attempt to use machine with incorrect current or abnormally low voltage.** Incorrect voltage could lead to motor damage.
o. **This machine is not intended for production-line type use.**

MAGNET BASE DUTY CYCLE

Do not leave the magnet base activated continuously for more than 60 minutes. If the magnet base is overheated, allow it to cool for 30 minutes before continuing.

CAUTION: Turn the magnet base off when not in use. Leaving the magnet base on continuously will damage it.

ASSEMBLY

Coolant tank assembly required. First attach clear tube to the bottom of the coolant tank. To do this, first loosen the nut and slide nut onto the tube. Then slide tube onto the nipple. Then tighten the nut. Slide tank hanger over the screw on the upper right hand side of slide and tighten. Finally insert the other end of the tube into the quick-release connector in the gearbox. Just directly push in to install. **(To remove, first firmly push the red collar of the connector and pull the tube out.)** Cutting coolant fluid is always required when using annular cutters. Open tank cover and fill. Check coolant fluid level often. Keep coolant tap closed when not in use.

Chip guard must be used. To attach the chip guard, use the supplied butterfly bolts to bolt to the magnet. It is not necessary to remove guard to clean chips. Simply raise guard to its upper position.
Safety Strap must be used. Loop strap around the workpiece, feed strap throught the power tool's handle, and tighten strap using the ratchet mechanism.

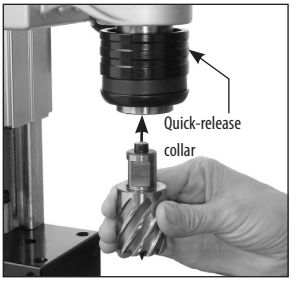
ADJUSTING THE SLIDE HEIGHT

Adjustable slide height allows the operator to quickly change the height position of the motor head on the slide. This is useful when switching between twist drills and annular cutters, for example. For annular cutters, use the lowest position possible for best stability. For twist drills, raise the motor head to allow enough clearance for the twist drill to be mounted.

To adjust:

1. Using the T-handle hex wrench, loosen the socket cap screw on the Slide Height Lock. (It's helpful to give it tap to allow it to release).
2. Slide the motor head to the desired position.
3. Tighten the Slide Height Lock.

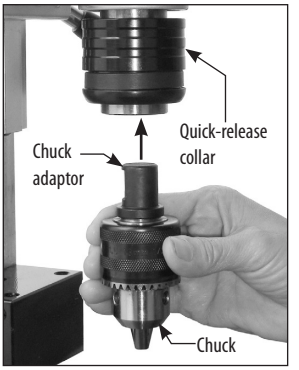
MOUNTING ANNULAR CUTTERS



CAUTION: Never use a cutting tool that is larger than the maximum rated capacity of the machine.

Push up on the quick-release collar. Insert the cutter with pilot pin and turn until the flat meets the locking pin. When the flat meets the locking pin, the collar will snap down. Double check to ensure that it is fully locked.

TWIST DRILLS

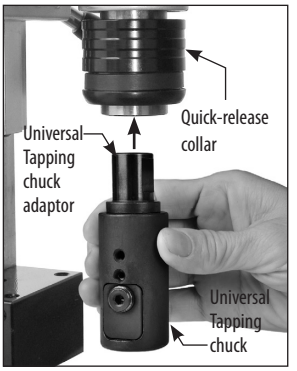


1. Push up on the Quick-Release Collar. Insert the Drill / Chuck Adaptor into the Tool Holder and turn until the Quick-Release Collar snaps down.
2. Always double check to ensure that the Quick-Release Tool Holder is fully locked.
3. Insert the twist drill into the Chuck and tighten with the chuck key.

TAPPING

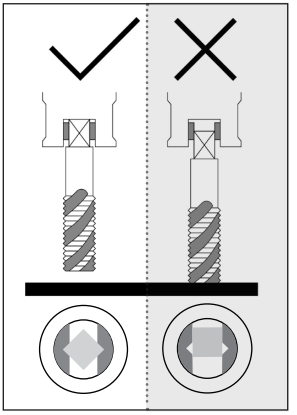
CAUTION: Never use a cutting tool which is larger than the maximum rated capacity of the machine.

CAUTION: Always follow the tap manufacturer's recommendation for selecting the correct size hole for tapping.



1. For tapping, use the universal tap chuck.
2. To insert the universal tap chuck, push up on the Quick-Release Collar and insert the shank into the coupling.
3. Use the key to turn it to open its jaws enough to fit the square of the tap. Ensure that the corners of the square are properly located in the jaws. Then use the key to securely tighten the chuck.

NOTE: Make sure that the tap is inserted as deeply as possible into the jaws. An improperly seated tap will run off center and could result in damage to the jaws or tap.



SPEED CONTROL DIAL

The Speed Control Dial is used to reduce the speed and power of the motor for tapping operations. Only use the speed control when tapping. For drilling operations, always keep the Speed Control Dial at its maximum setting.

CAUTION: Do not use the Speed Control Dial to reduce speed when drilling. The reduced speed may lead to motor overheating and insufficient torque.

REVERSING SWITCH

The Reversing Switch has 3 positions:

1. The position marked (F) is for forward rotation, which is the standard direction for all drilling operations. Always leave the switch in this position when not tapping.
2. The position marked (R) is for reverse rotation, which is only used for removing the tap from the hole.
3. The central position between (F) and (R), which is unmarked, is for neutral. In the neutral position the motor will not turn, even though its switch is still turned on. This is only used to allow the spindle to stop rotating before reversing the rotation direction.

WARNING: When the motor is switched on with the Reversing Switch in its neutral position, the machine will not turn but will be "live", and as soon as either forward or reverse is selected, the arbor will begin turning! Take due care to avoid unexpected or unintentional starts.

Tapping Operations:

1. Once the correctly sized hole is drilled, mount the tap in the arbor and lubricate the tap with a suitable cutting fluid.
2. Turn the Speed Control Dial down to a low setting. (This will reduce the torque applied to the tap and will make the tapping operation more controllable at the same time).
3. Ensure that the Reversing Switch is set to the forward (F) position.
4. Carefully center the tap on the hole and turn the magnet on.
5. Start the motor and feed the tap into the hole, allowing the tap to feed at its own pace, a light guiding hand on the handle is sufficient.

CAUTION: Do not allow the tap to bottom out.

6. As soon as the hole is tapped, turn the Reversing Switch to its central (neutral) position and wait long enough to allow the spindle to come to a complete stop.

CAUTION: Always allow the spindle to stop completely before changing its direction of rotation. Immediately reversing rotation, without stopping first, will cause damage to the motor.

7. Once the spindle has completely stopped, turn the Reversing Switch to the Reverse (R) position to remove the tap from the hole.
8. After shutting off the motor, remember to return the Reversing Switch back to the forward (F) position.

OPERATION-GENERAL

WARNING: Always ensure that the magnet is adhered properly to the work piece before beginning drilling.

NOTE: If mounting to a curved surface beam, mount the machine parallel to the curve in the work piece.

WARNING: Avoid operating at more than 90 degrees from horizontal. When drilling at such an angle take precautions to prevent cutting coolant from entering the motor. Brutelube wax lubricant should be used.

CAUTION: Machine is equipped with a reversing switch. Always ensure that direction of rotation is correct before operating. Operating in the wrong direction could result in damage to the cutter.

1. First fit tool into arbor and line up with intended center of cut. Then switch magnet on.
2. Press green motor on button to start motor. Use the crank handle to feed to work. Always use very light pressure when beginning the cut and just as the tool is breaking through. The crank handle offers tremendous leverage; so do not use too much force. Allow the cutting tool to determine the pace. With experience, the operator will be able to determine the best pace to feed to the work. There should be some degree of audible slowing of the motor but not bogging in the cut. Correct cutting speed with a properly sharp annular cutter will produce long unbroken chips, which produce a birds nest shaped bundle of chips around the cut.

NOTE: Always ensure that the cutting tool is sharp. A dull cutter will produce finer / smaller chips.

WARNING: ALWAYS clear chips when there is too much build-up. Excessive chip build-up could result in a jammed cutter or other hazardous situation.

WARNING: The slug ejects at end of cut and is very hot. Always provide a method of catching the slug, since the ejected slug may cause injury to people below.

Note: Lock the slide lock on the side of the machine in the fully raised position when at rest to prevent the slide from accidentally slamming down - remember to unlock it again before commencing drilling.

CAUTION: Never attempt to cut half-circles or to stitch drill (drill overlapping holes) with a Carbide Tipped cutter. This may destroy the cutter.

CAUTION: Never attempt to re enter a half-finished cut if the magnet has been turned off and the machine shifted in the interim. This may destroy the cutter.

MAINTENANCE

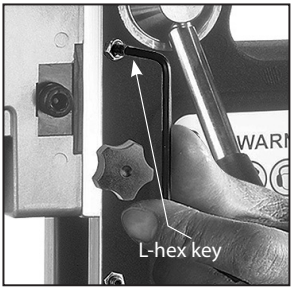
WARNING: All repairs must be entrusted to an authorized service center. Incorrectly performed repairs could lead to injury or death.

Every 50 hours of operation blow compressed air through the motor while running at no load to clean out accumulated dust. (If operating in especially dusty conditions, perform this operation more often.)

1. Keep the machine clean and free of chips.
2. Check for loose fittings and tighten as needed.
3. Ensure that the ventilation slots are clear so that motor can be cooled normally. Blow low-pressure compressed air through the ventilation slots with the motor running to keep motor clean.

THE GIBS (DOVETAIL SLIDES)

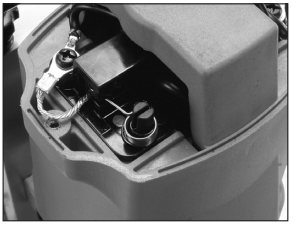
The gibs require adjustment if too loose. To adjust, loosen the lock nuts and adjust the adjustor screws evenly while moving the handle up and down. Adjust so that there is no free play, without any binding anywhere in its range of travel. Then retighten the lock nuts. Periodically check, lubricate, and adjust as needed.



CARBON BRUSHES

Carbon brushes are a normal wear parts and must be replaced when they reach their wear limit.

Caution: Always replace the brushes as a pair.

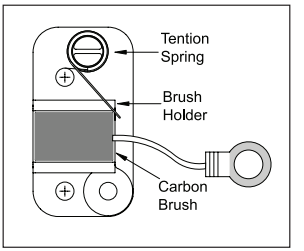


To replace:

1. Remove the 4 screws and remove the motor tail cover.
2. Using pliers rotate the brush spring out of the way and slide the old carbon brush out of the brush holder.

3. Unscrew the screw to remove the brush lead. The old carbon brush may now be lifted away.
4. Install a new brush. Installation is the reverse of removal.
5. Replace the motor tail cover.

Due to the brush design, if the magnetic drill press stops unexpectedly, always check the carbon brushes. The brush design stops the machine before the carbon brushes are finished and protects the motor.



MAGNET TROUBLESHOOTING

Full magnet performance is absolutely essential for magnetic drill operation.
If the magnet works, but does not hold well, it is likely that one of the coils has failed. If the magnet does not work at all, it is likely to be a failed rectifier. (It is highly unlikely that both magnet coils would fail at the same time)

NOTE: A faulty magnet coil can also damage the rectifier, so whenever there is a magnet problem, BOTH the magnet coils and rectifier must be checked.

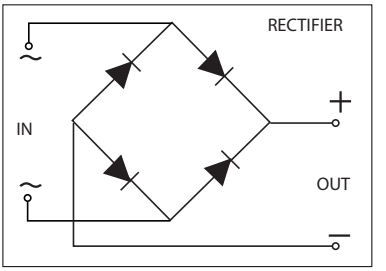
WARNING: Never attempt to operate a magnetic drill with a faulty magnet!

CHECKING THE MAGNET (authorized repair centers / qualified technicians only)

If the magnet is not working well, it must be checked. Separate the wires of each indiviual coil and test the resistance of each coil separately. (note that 110V models are wired in parallel and 230V models are wired in series) The resistance of the coils of different sizes of magnets varies, but it should be in the region of hundreds of ohms. Most importantly, both coils must have very nearly the same resistance. If one of the coils has zero resistance, it means that it is shorted. If one of the coils has infinite resistance, it means that the circuit is broken. If either coil has a problem, the magnet must be replaced. A faulty magnet may also cause damage to the rectifier. Also check the rectifier when replacing a faulty magnet. (see below)

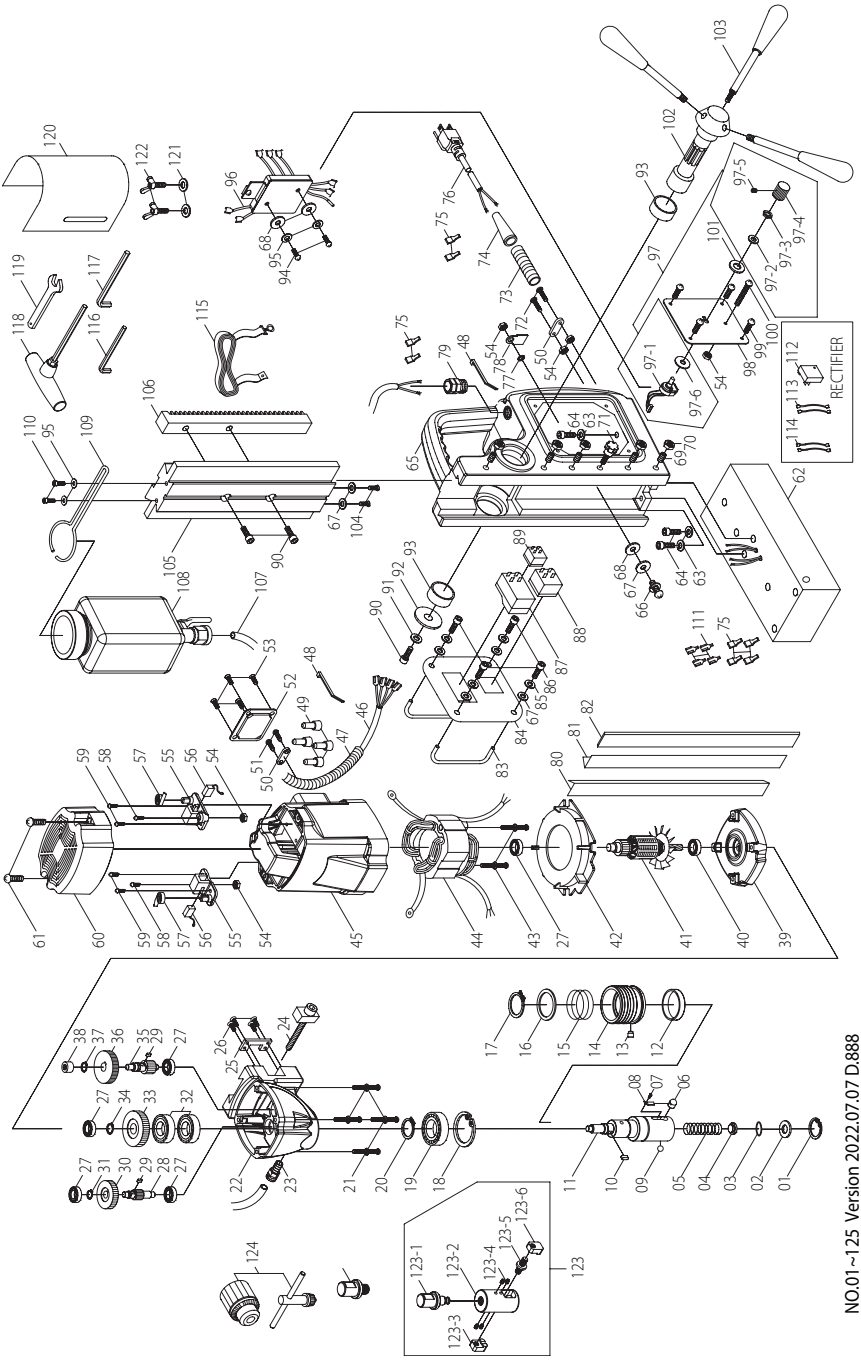
CHECKING THE RECTIFIER (authorized repair centers / qualified technicians only)

The rectifier takes the AC household current and converts it to DC to power the magnet. If it fails, the magnet coils will not receive power.
Disconnect the rectifier and test the resistance of both circuits of the rectifier between the AC and the DC sides. Note that polarity matters, so you can only take a reading if test probes are oriented correctly. Each side will be the opposite of the other. Both circuits should have very nearly the same resistance reading. If one of the circuits has zero resistance, it means that it is shorted. If one of the circuits has infinite resistance, it means that the circuit is broken.



If the replacement of the power supply cord is necessary, this has to be done by the authorized repair center in order to avoid a safety hazard.

EXPLODED VIEW



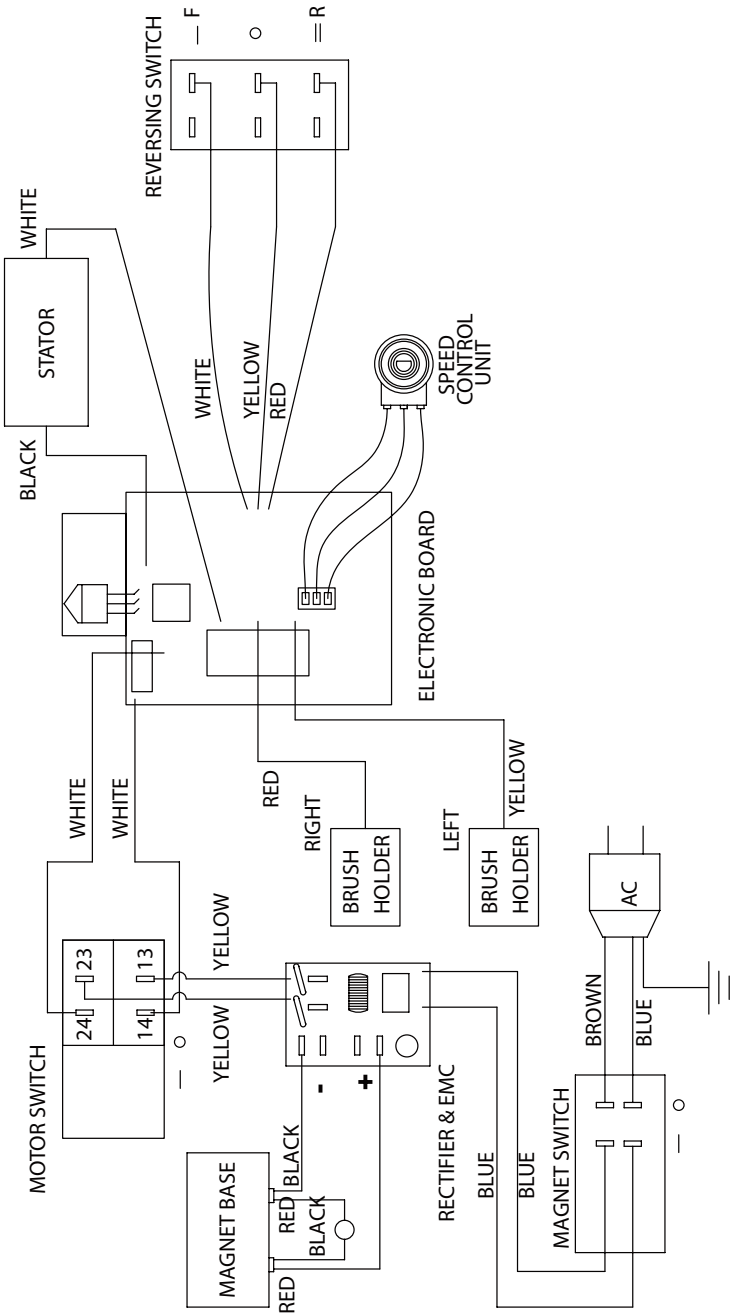
PARTS LIST

#	Part Name	Part #	QTY	#	Part Name	Part #	QTY
1	INTERNAL CIRCLIP (R-19)	AC5001	1	39	GEAR PLATE	AC5049	1
2	FLAT WASHER (Ø10xØ18.5x0.8)	AC4202	1	40	BALL BEARING (6001)	AC5050	1
3	O-RING (Ø12x4)	AC5003	1	41	ARMATURE (110V-73x42x45)	AC4241	1
4	WATER SEAL (Ø12x15)	AC5004	1	42	FAN SHROUD	AC50141	1
5	SPRING (Ø1.2xØ10.1xØ12.5x12Tx85L)	AC5005	1	43	PANHEAD TAPPING SCREW (M5x60)	AC5052	2
6	LOCK PIN (12.3MM)	AC5006	1	44	STATOR (110V-73x42x45)	AC4244	1
7	PANHEAD MACHINE SCREW (M3-0.5 x 4)	AC4207	1	45	MOTOR HOUSING	AC4245	1
8	LOCK PIN SPRING	AC5008	1	46	WIRE LEADS	AC4246	1
9	CHECK BALL (Ø8)	AC5009	1	47	CABLE PROTECTOR (5/16"x40CM)	SB35-47	1
10	PARALLEL KEY (5x5x10)	AC5010	1	48	ZIP TIE (2.5x160MM)	AC5066	2
11	SPINDLE (157MM)	AC4211	1	49	CRIMP CAP CONNECTOR (C4)	AC5065	4
12	RING (Ø40xØ44x9)	AC5012	1	50	CABLE CLIP	AC5063	2
13	COLLAR PIN (Ø8)	AC5013	1	51	PANHEAD TAPPING SCREW (M4x14)	SB35-50	2
14	QUICK-RELEASE COLLAR	AC5014	1	52	MOTOR COVER PLATE	AC4252	1
15	SPRING (Ø2.3xØ39xØ43.6x3Tx30L)	AC5015	1	53	FLAT HEAD TAPPING SCREW (M4x8)	AC50126	4
16	SPRING SEAT RING (Ø35.1xØ44.5x2)	AC5016	1	54	HEX NUT (M4xP0.7)	AC5055	6
17	EXTERNAL CIRCLIP (S-35)	AC5017	1	55	CARBON BRUSH HOLDER (7x11)	AC5056	2
18	INTERNAL CIRCLIP (R-47)	AC5018	1	56	CARBON BRUSH (7x11x17)	AC5057	2
19	BALL BEARING (6005)	AC5019	1	57	BRUSH SPRING (0.35x3x3T)	AC5058	2
20	EXTERNAL CIRCLIP (S-25)	AC5020	1	58	PANHEAD MACHINE SCREW (M4x10xP0.7)	AC5059	2
21	PANHEAD TAPPING SCREW (M5x65)	AC5021	4	59	PANHEAD TAPPING SCREW (M4x12)	SB35-44	4
22	GEAR HOUSING	AC4222	1	60	MOTOR TAIL CASTING	RB3043	1
23	PUSH LOCK FITTING (PT1/8"xØ6)	SB35-18	1	61	PANHEAD TAPPING SCREW (M4x25)	SB35-46	2
24	SLIDE HEIGHT LOCK	AC5031	1	62	ELECTROMAGNET (164x80x48)	AC3572Q	1
25	LOCK BRACKET	AC5034	1	63	SPRING WASHER (M6)	AC50101	3
26	FLAT HEAD MACHINE SCREW (M4x10xP0.7)	AC5035	4	64	SOCKET CAP SCREW (M6x20xP1.0)	AC3538Q	3
27	BALL BEARING (608)	AC5036	5	65	STAND BODY	AC4265	1
28	INPUT SHAFT (M1.0x12T)	AC4228	1	66	PANHEAD MACHIME SCREW (M4x16xP0.7)	AC5099	1
29	PARALLEL KEY (4x4x8)	AC35122Q	2	67	FLAT WASHER (Ø4xØ10x1)	AC5091	7
30	INPUT GEAR (M1.0x36T)	AC5039	1	68	RUBBER WASHER (Ø4xØ11x1)	SB35-132	3
31	EXTERNAL CIRCLIP (S10)	AC5040	1	69	SOCKET SET SCREW (M5x20xP0.8)	AC5082	5
32	OIL SEAL (Ø25xØ40x7)	AC5041	1	70	HEX NUT (M5xP0.8)	AC5083	5
33	OUTPUT GEAR (M1.25x37T)	SB35-24	1	71	THUMB SCREW (M5x16)	AC5084	1
34	EXTERNAL CIRCLIP (S-15)	AC5043	1	72	PANHEAD MACHINE SCREW (M4x30xP0.7)	AC50108	2
35	COUNTERSHAFT (M1.25x12T)	AC4235	1	73	CABLE PROTECTOR (5/16"x7CM)	SB35-107	1
36	LAY GEAR (M1.0x45T)	AC4236	1	74	CORD ARMOR	AC50110	1
37	EXTERNAL CIRCLIP (S-12)	AC4237	1	75	SPADE TERMINAL BOOT	AC50131	8
38	NEEDLE BEARING (HK 0810)	AC5047	1	76	POWER SUPPLY CABLE (UL-16Ax3Cx2.5M-SJTW)	SB35-109	1

PARTS LIST

#	Part Name	Part #	QTY	#	Part Name	Part #	QTY
77	EXTERNAL STAR WASHER (M5)	AC50100	1	102	CRANK SPINDLE (Ø28)	AC50106	1
78	EARTHING MARKING	AC50140	1	103	CRANK HANDLE	AC50107	3
79	CABLE GLAND (5/16")	AC50112	1	104	TRUSS HEAD MACHINE SCREW (M4x6xP0.7)	AC50123	2
80	GIB STRIP-LEFT (258MM)	AC5096	1	105	SLIDE PLATE (L217MM)	AC5076	1
81	GIB STRIP-RIGHT (258MM)	AC5097	1	106	GEAR RACK (M1.5x150L)	AC5080	1
82	GIB TENSIONER (258x11x1.2T)	AC5098	1	107	TUBE (Ø4xØ6x20CM)	AC421071	1
83	SWITCH GUARD BAR (90MM)	AC5089	2	108	COOLANT TANK ASSEMBLY	AC42108	1
84	SWITCH PANEL (90x110x1.5T)	AC4284	1	109	COOLANT TANK BRACKET	AC5077	1
85	SPRING WASHER (M4)	AC5092	4	110	SOCKET CAP SCREW (M5x16xP0.8)	AC5079	2
86	SOCKET CAP SCREW (M4x16xP0.7)	AC5093	4	111	FEMALE SPADE TERMINAL	AC50128	4
87	MOTOR SWITCH (110V)	AC5094	1	112	RECTIFIER (110&220V)	AC3568Q	1
88	MAGNET SWITCH (110V&220V)	AC5095	1	113	WIRE LEAD (1015-16#18CM)	AC50114	2
89	REVERSING SWITCH (110V&220V)	AC4289	1	114	WIRE LEAD (1015-16#18CM)	AC50115	2
90	SOCKET CAP SCREW (M6x16xP1.0)	AC5075	3	115	SAFETY BELT	AC3583Q	1
91	FLAT WASHER (Ø6xØ25x1)	AC5087	1	116	HEX KEY (M2.5)	AC50117	1
92	FLAT WASHER (Ø6xØ40x2.5)	AC5086	1	117	HEX KEY (M4)	AC50118	1
93	BUSHING (Ø28xØ32x12)	AC5085	2	118	T-HANDLE HEX KEY (M6)	AC42118	1
94	PANHEAD TAPPING SCREW (M5x20)	AC4294	2	119	WRENCH (M8)	AC42119	1
95	FLAT WASHER (Ø5xØ12x1)	AC3540Q	4	120	CHIP GUARD	AC42120	1
96	ELECTRONICS UNIT (110V)	AC4296	1	121	FLAT WASHER (Ø6xØ13x1)	AC50133	2
97	SPEED CONTROL (110V&220V)	AC4297	1	122	BUTTERFLY SCREW (M6x10xP1.0)	AC3581CQ	2
98	SWITCH PANEL (90x110x1.5T)	AC4298	1	123	UNIVERSAL TAP CHUCK (M12)	TAP123	1
99	PANHEAD MACHINE SCREW (M4x8xP0.7)	AC50104	4	124	DRILL CHUCK (1/2") + ADAPTOR	QX1234	1
100	PANHEAD MACHINE SCREW (M4x25xP0.7)	AC50129	1				
101	FLAT WASHER (Ø8xØ14x2)	AC42101	1				

WIRING


REVERSING SWITCH
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