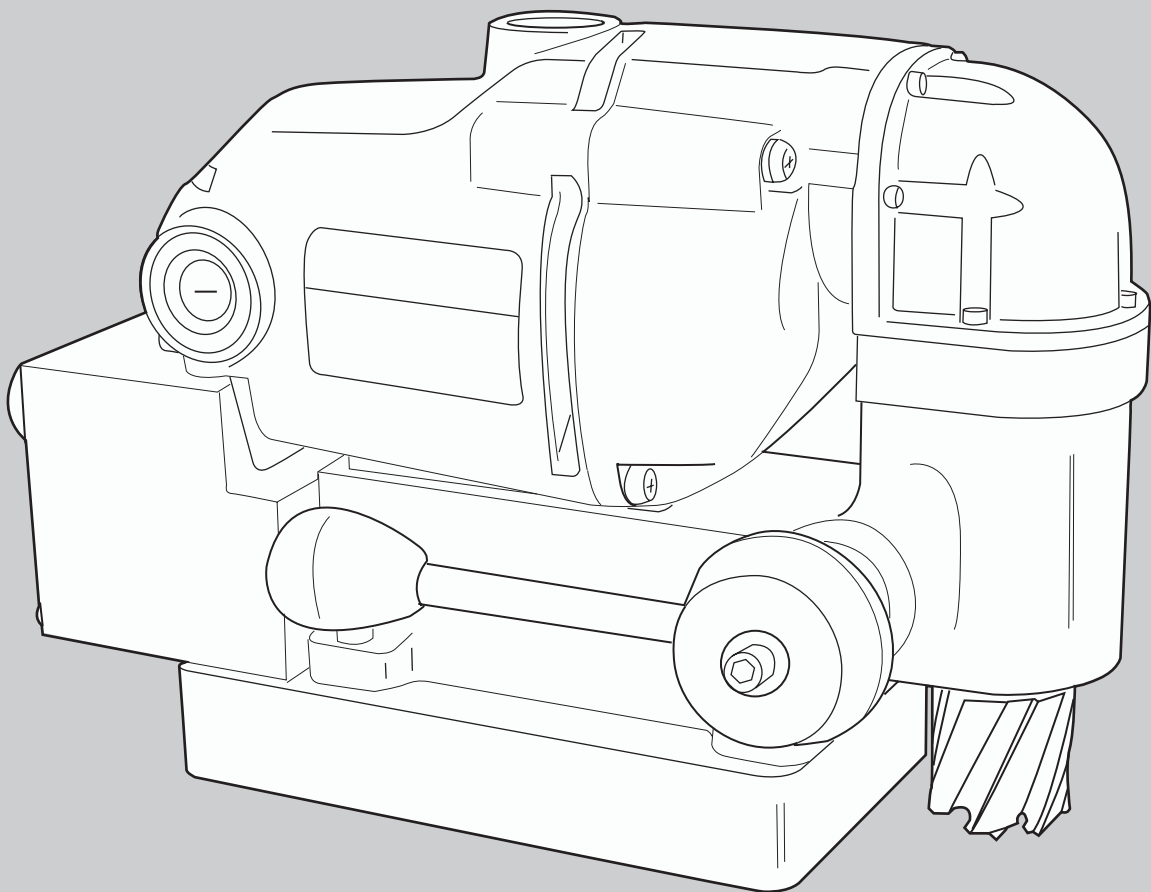




MODEL HMD150 SERIES PORTABLE MAGNETIC DRILLS

OPERATOR'S MANUAL

COVERS DRILL PART NUMBERS 0150101



FOR USE WITH ROTALOC PLUS™ CUTTERS

HOUGEN® PORTABLE MAGNETIC DRILL

Welcome to Hougen

Congratulations on your purchase of the Hougen® Portable Magnetic Drill. Your model is designed to produce superior holes quickly and efficiently. Through constant innovation and development, Hougen is committed to provide you with hole producing tools and products to help you be more productive.

Before attempting to operate your new Portable Magnetic Drill, please read all instructions first. These include the Operator's Manual and Warning Label on the unit itself. With proper use, care, and maintenance, your model will provide you with years of effective hole drilling performance. Once again, thank you for selecting our product and welcome to Hougen.

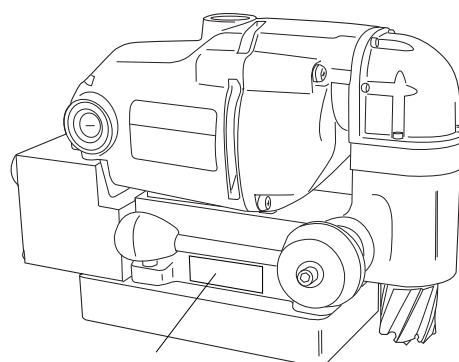
Your new Hougen Magnet Base Drill now incorporates a Label for the Drill Part Number and Serial Number. Below gives a explanation of the Part Number and the location of the Label is shown on the Drill Breakdown Diagram .

Part No. Description

0150101 HMD150 Low Profile, 115V

Specifications

Cutter Type.....RotaLoc Plus
Hole Capacity.....7/16" to 1-3/8" or 12mm to 35mm
Depth of Cut.....1" or 25mm
Motor.....450 RPM, 8A, 120V
Net Weight.....22.7 lbs. or 10.2 kg

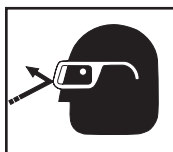


Serial / Part Number Label

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SAFETY FIRST



Always wear eye protection while using cutting tools, or in the vicinity of cutting.



CAUTION! Cutters are sharp. Wear gloves when installing or removing cutter from arbor. Do not grab a rotating cutter.



CAUTION! The slug is ejected at the end of the cut. Do not aim cutter or arbor so that ejected slug may hit someone around, or below you.



CAUTION! To prevent electric shock, do not use power tools near wet areas, or where power tool may become wet.

Important Safety Instructions



WARNING: Read and understand all instructions. Failure to follow all instructions listed below, may result in electrical shock, fire and/or serious personal injury.

Work Area

Keep your work area clean and well lit. Cluttered benches and dark areas invite accidents.

Do not operate power tools 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.

Keep bystanders, children, and visitors away while operating a power tool. Distractions can cause you to lose control.

Electrical Safety

Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the ground prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.

Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is grounded.

Don't expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.

Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately. Damaged cords increase the risk of electric shock.

When operating a power tool outside, use an outdoor extension cord marked "W-A" or "W"; These cords are rated for outdoor use and reduce the risk of electrical shock.

Personal Safety

Stay alert, watch what you are doing and use common sense when using a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating power tools may result in serious personal injury.

Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts.

Avoid accidental starting. Be sure switch is off before plugging in. Carrying tools with your finger on the switch or plugging in tools that have the switch on invites accidents.

Remove adjusting keys or switches before turning the tool on. A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.

Do not overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control of the tool in unexpected situations.

Use safety equipment. Always wear eye protection. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Always use safety strap. Mounting can release.

Tool Use and Care

Use clamps or other practical way to secure and support the work piece to a stable platform. Holding the work by hand or against your body is unstable and may lead to loss of control.

Do not force tool. Use the correct tool for your application. The correct tool will do the job better and safer at the rate for which it is designed.

Do not use tool if switch does not turn it on or off. Any tool that cannot be controlled with the switch is dangerous and must be repaired.

Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.

Store idle tools out of reach of children and other untrained persons. Tools are dangerous in the hands of untrained users.

Maintain tools with care. Keep cutting tools sharp and clean. Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.

Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.

Use only accessories that are recommended by the manufacturer for your model. Accessories that may be suitable for one tool, may become hazardous when used on another tool.

Service

Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified personnel could result in a risk of injury.

When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual. Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

Important Safety Instructions - Continued

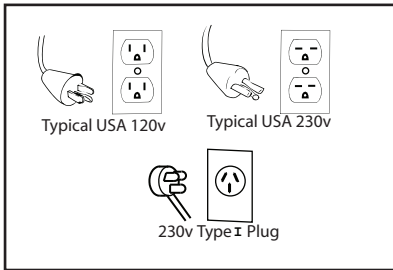


WARNING: Read and understand all instructions. Failure to follow all instructions listed below, may result in electrical shock, fire and/or serious personal injury.

Safe Electrical Connection

Your Mag Drill is rated for use on 115VAC or 230V at 50-60Hz. Do not attempt to use drill on power sources rated other than this.

Plugs and Receptacles



Wet electrical connections are shock hazards. To prevent the cutting fluid from traveling along the cord and contacting the plug or power outlet, tie a drip loop as shown. Also elevate extension cords or gang box connections.



Extension Cords

Use only 3-wire extension cords that have 3-prong grounding type plugs and 3-pole receptacles that accept the tool's plug. Replace or repair damaged cords. Make sure the conductor size is large enough to prevent excessive voltage drop which will cause loss of power and possible motor damage.

Extension Cord Table

LENGTH OF CORD, FEET	RECOMMENDED WIRE GAUGE	RECOMMENDED WIRE GAUGE
	115V MOTOR 10 - 12 AMPS	230 V MOTOR 5 - 6 AMPS
UP TO 25	16	18
26 - 50	14	18
51 - 100	10	16
101 - 200	8	14
201 - 300	6	12
301 - 500	4	10

Outdoor Use Extension Cords

When tool is used outdoors, use only extension cords intended for use outdoors and so marked.

Additional Safety Precautions

Arbor and cutter should never be used as a hand-hold. Keep hands and clothing away from all moving parts. Do not use Hougen Cutters where ejected slug might cause injury (slug ejected at end of cut). Also, adhere to all operating instructions. Do not drill through any surface that may contain live electrical wiring. Drilling into a live wire could cause exposed

metal parts of the drill to be made live. Remove chips wrapped around Cutter and arbor after each hole. With motor off and power disconnected, grasp chips with leather gloved hand or pliers and pull while rotating counterclockwise. Should the cutter become jammed in the work, stop the unit immediately to prevent personal injury. Disconnect the drill from the power supply and loosen jammed cutter by turning the arbor counterclockwise. Never attempt to free the jammed cutter by starting the motor. Service at authorized repair center only. product warranty.

Operating Near Welding Equipment

DO NOT operate this unit on the same work surface that welding is being performed on. Severe damage to the unit, particularly the power cord, could occur. This could also result in personal injury to the operator.

Circuit Breaker (If Applicable)

Changing of the circuit breaker to a higher amp rated breaker, or bypassing the circuit breaker is not recommended and will void

Circuit Breaker Operation (If Applicable)

The circuit breaker is a thermal breaker. When it reaches the higher temperature rating it will trip and cause the unit to shut down. This is a protective device and can be reset after 5 to 10. To reset the breaker, press the breaker button back in. If it does not reset, let the unit cool a little longer until you can push the button in and it stays in position.

Save these Instructions.

SAFETY SWITCH INDICATOR LIGHT

The Safety Switch Indicator Light is a Standard Safety Feature on HMD150 magnetic drills. Its purpose is to inform the user that an unsafe condition exists or the safety switch is defective.

If light is Green:

In normal operation the safety switch light will be green. Motor "On" and "Off" Switches function normally.

If light is Red:

A condition with the safety switch exists that needs to be corrected.

Possible causes:

- Safety Switch is defective. Have drill serviced.
- Uneven work surface or material. Check work surface for flatness.
- Dirt or chips under magnet. Clean work surface.

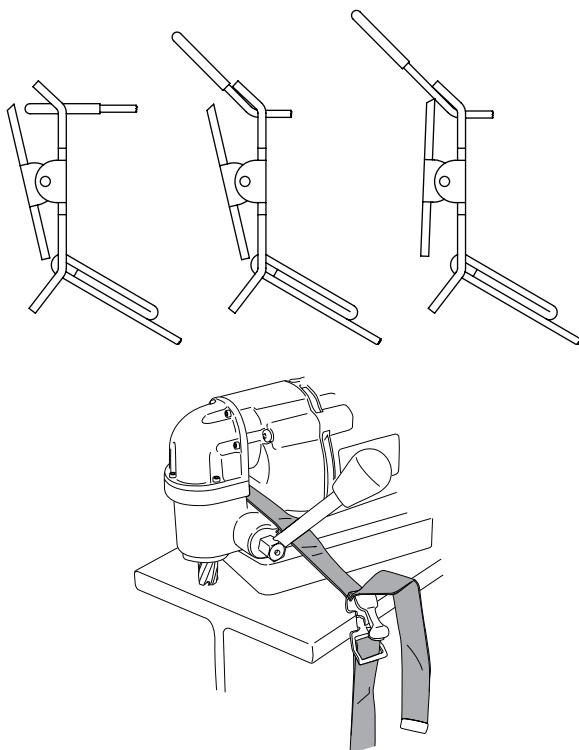
Make sure material is at least 3/8" thick. Material thinner than 3/8" will cause a "weak" magnet condition.

HOUGEN MANUFACTURING RECOMMENDS THAT CONDITIONS ARE CORRECTED SO LIGHT TURNS GREEN. THIS ALLOWS FOR THE UNIT TO BE OPERATED IN A SAFE MANNER.

For any questions please contact Hougen Manufacturing's Technical Service at (810) 635-7111.

OPERATING INSTRUCTIONS

1. Place drill on material (at least 3/8" thick) and locate for drilling hole.
2. Press magnet switch to "ON"
3. Thread safety strap through opening between motor and drill housing. Ensure that strap does not interfere with operation of feed handles. Insert tab of strap into buckle. Cinch strap tight to material and drill housing. Check for slack and adjust as needed.



CAUTION:

- Keep strap clear of cutting area, chips, and rough edges on material.
- Inspect strap periodically for fraying and damage. Do not use a damaged safety strap.

4. Apply liberal amount of cutting fluid or stick lubricant to cutter. Additional lubrication may be required to finish cut.
5. Make certain that cutter is clear of workpiece and turn motor ON by pressing the motor START button.

6. Feed Cutter slowly into workpiece. Only after cutting path is established to a depth of about 1/16" can additional force be applied to feed handles. Ease up on feed pressure as cutter starts breaking through

CAUTION: Do not over-feed cutter. Excessive feed pressure may cause the magnet to break free from material.

DRILLING MULTIPLE LAYER MATERIALS:

****Special Cutter Geometry Required!**

Second layer penetration may be difficult. Slight additional feed pressure may be required (avoid over-feed as noted above).

If unable to penetrate second layer, withdraw cutter from material ejecting slug and clean away any remaining chips. Feed cutter in hole and continue cut.

- Turn motor off when cut is finished.
- Fully retract cutter from material, ejecting the slug.
- Remove safety strap.

7. Turn magnet switch to "OFF" position.

CAUTION: Retain firm hold on drill to prevent dropping.

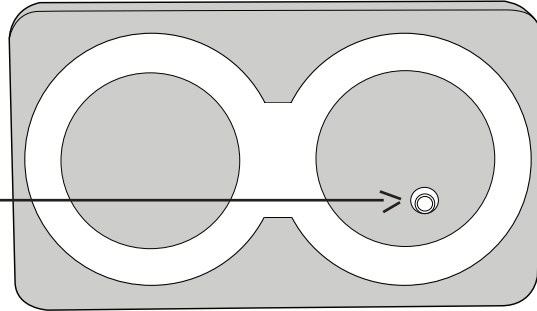
Cutter Inside Diameter may collect chips, restricting depth of cut. Cutter should be frequently inspected and any chips or debris removed.

OPTIONAL FEED METHODS:

- 5/8" Box Wrench
- Ratchet with 5/8" Socket
- NO PLIERS OR OPEN END WRENCH (They will damage threaded feed handle mounting holes)

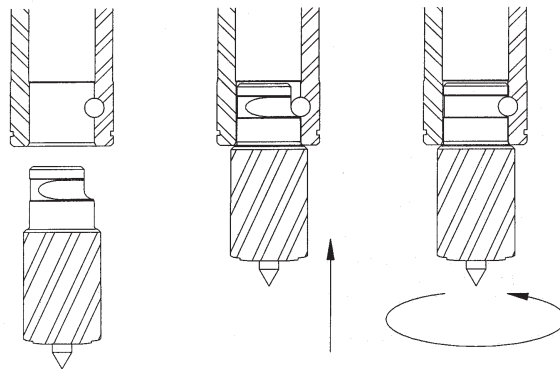
SAFETY SWITCH

NOTE: The Safety Switch located in the base of the unit shuts off the motor when the unit lifts. The magnet will stay engaged until you turn off the magnet. It is important to keep this area clean and free from chips. Periodically check this switch for proper function and if for some reason it is not working properly, send the unit to an authorized repair center for service.

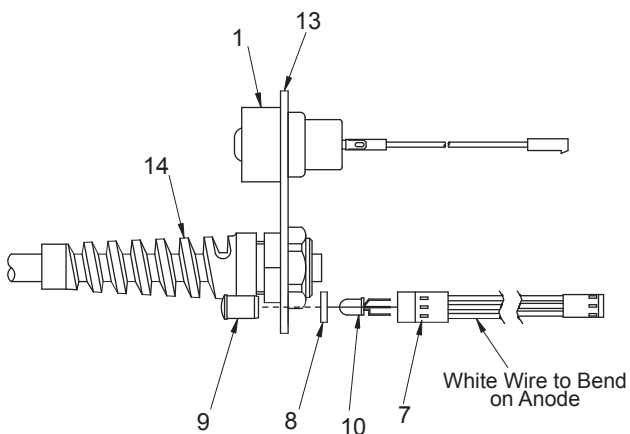
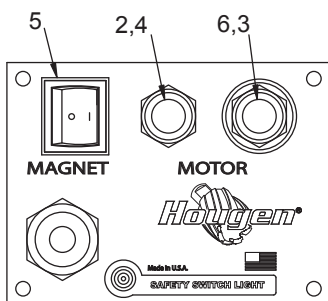


ROTALOC PLUS™ CUTTER INSTALLATION

1. Disconnect machine from power source.
2. Insert pilot into cutter.
3. Align flat on shank with pin in spindle.
4. Insert cutter into spindle.
5. Give cutter 1/4 turn in opposite direction of flutes.



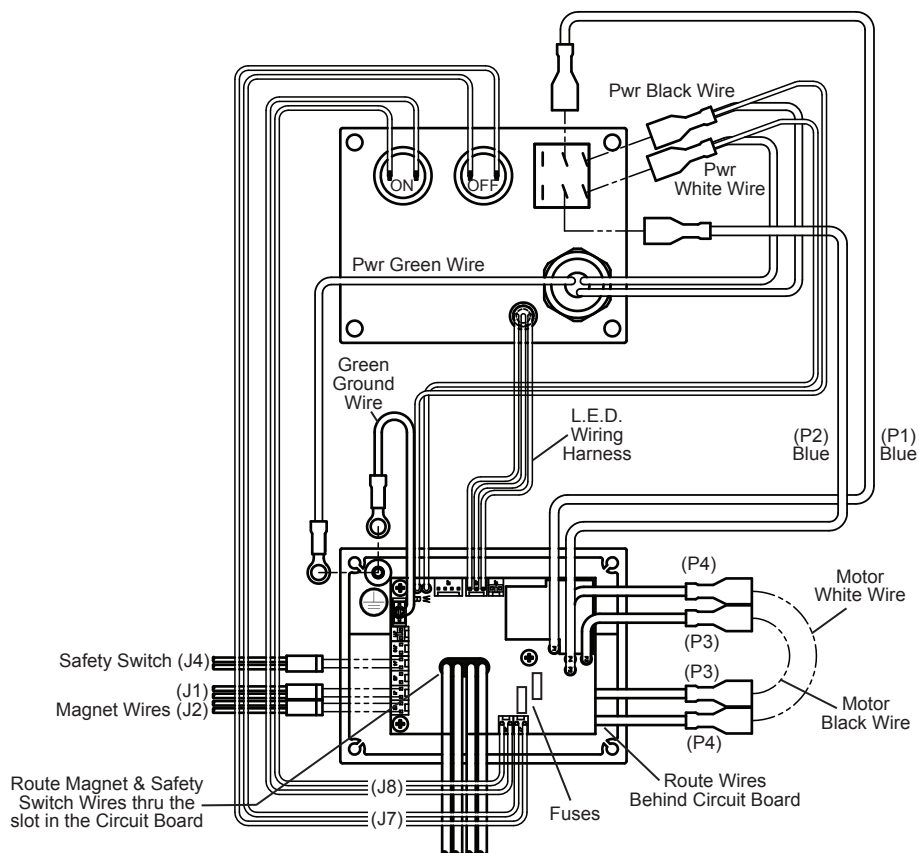
CONTROL PANEL ASSEMBLY



05916 Control Panel Assembly - HMD150 120V (includes 05911 Faceplate Assembly and 07947 Circuit Board)

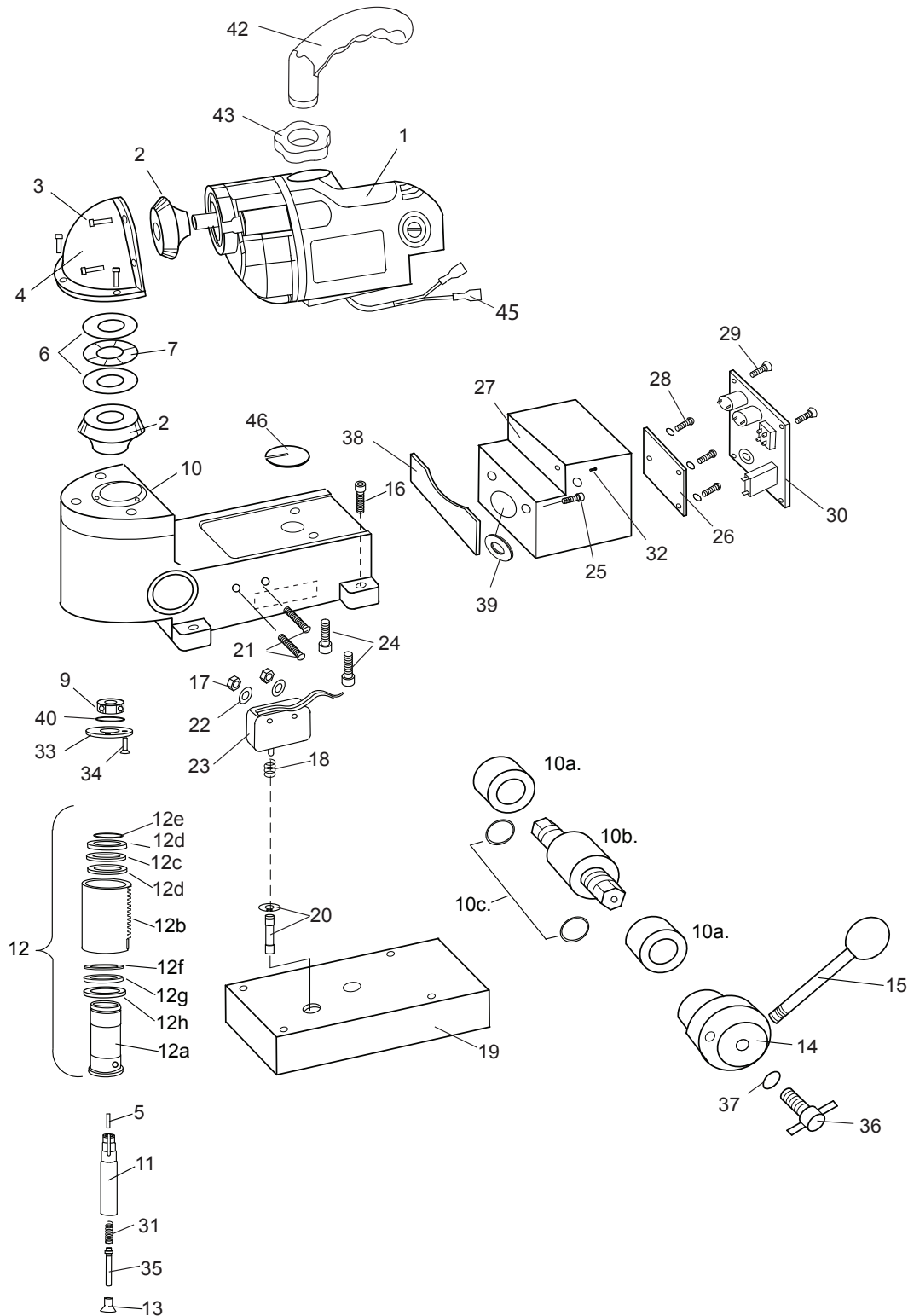
05911 Faceplate Assembly - HMD150 120V (includes 1-14)

Item	Part #	Description	Qty
1	01226	Switch Guard	1
2	01228	Red Switch Cover	1
3	01334	Motor ON Switch	1
4	01335	Motor OFF Switch	1
5	01833	Rocker Switch (120V)	1
6	02409	Green Switch Cover	1
7	04877	Wire Harness	1
8	04878	Spacer	1
9	04879	Clear Lens	1
10	04881	Bulb	1
11	05208	Green Ground Wire Assy.	1
13	05828	Faceplate	1
14	17490	Power Cord Assembly (120V)	1
15	07522	Fuse	2



DRILL PARTS BREAKDOWN

0150101 HMD150 120V

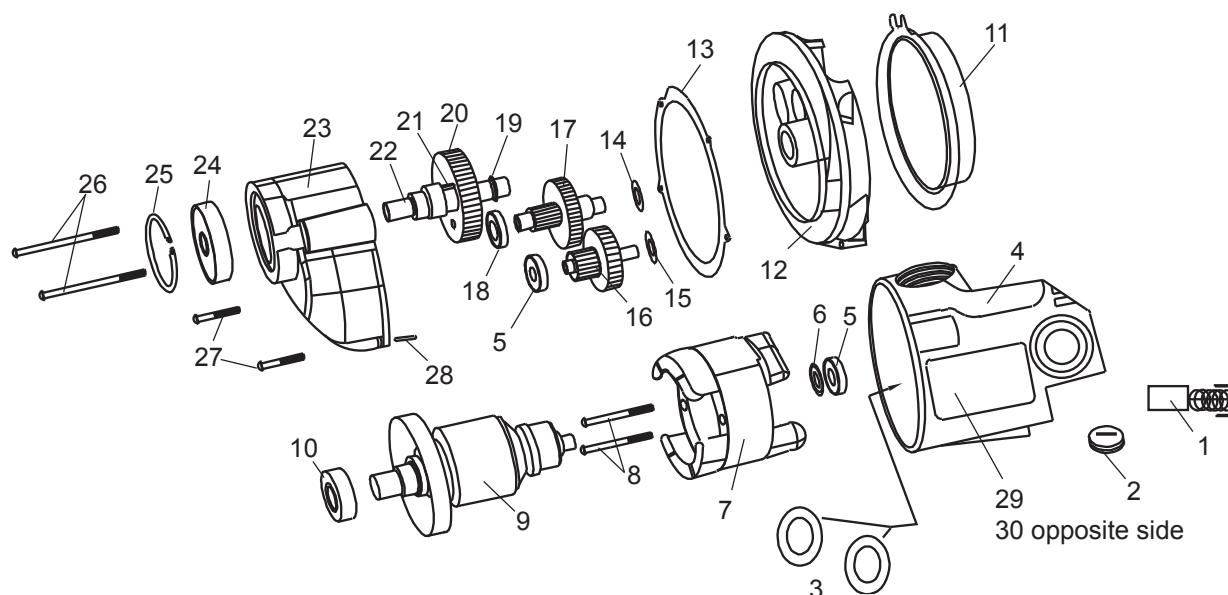


HMD150 PARTS LIST

Item #	Part #	Description	Qty
1	07124	Motor Assy (120V)	1
2	17535	Miter Gear Set	2
3	17002	SHC #6-32 X 1/2	7
4	17510	Gear Cap Assembly	1
5	17277	Key 1/8 sq. X .53 lg.	1
6	17517	Thrust Washers .312 ID X .750 OD	2
7	17516	Thrust Bearing .312 ID X .750 OD	1
9	17270	Ball Bearing 32 X12 X 10mm	1
10	17279	Housing Assy	1
10a	17495	Bronze Bearing	2
10b	17298	Feed Gear	1
10c	40546	O-Ring	2
11	17280	Spline Shaft	1
12	17646	Quill / Arbor Assembly	1
12a	17649	Arbor Assembly	1
12b	17647	Quill Assembly	1
12c	17546	Bronze Thrust Washer	1
12d	17547	Steel Thrust Washer	2
12e	04720	Retaining Ring	1
12f	17644	Thrust Washer	1
12g	17645	Thrust Needle Bearing	1
12h	17643	Thrust Washer Seal	1
13	17493	SCR-FHC Modified 1/4-28 X 1/2 lg	1
14	17282	Hub Assembly	1
15	17283	Feed Handle Assembly	1
16	10553	SHC Screw 1/4-20 X 7/8	4
17	40374	Hex Nut #6-32	2
18	17271	Tapered Spring	1

Item#	Part #	Description	Qty
19	17651	Magnet Assembly	1
20	17285	Plunger Assembly	1
21	17476	BHC Torx Screw #6-32 X 1-1/4	2
22	90052	Lock Washer #6 ext. tooth	2
23	04885	Safety Switch Assembly	1
24	75096	SHC Screw M6 X 20	2
25	75094	SHC Screw M5 X 12	2
26	07947	Circuit Board (120V)	1
27	17691	Electrical Box	1
28	02547	SCR- #4-40 X 5/16 lg	3
29	24081	SCR #10 X 3/8 self tap.	4
30	05911	Faceplate Assy. (120V)	1
31	17492	Comp. Spring	1
32	04439	BHC Screw #10-32 X 3/16	1
33	17289	Bearing Retaining Washer	1
34	04718	Screw #4-40 X 3/8	3
35	17494	Plunger	1
36	17291	Thumb Screw	1
37	90027	1/4 Flat Washer	1
38	17293	Motor Seal	1
39	17274	Grommet	1
40	17475	Retaining Ring 12mm Shaft	1
41	05208	Green Ground Wire	1
42	05921	Handle	1
43	05920	Locking Nut	1
44	05372	Lubriplate Grease	.01 oz
45	90218	Wire Terminal	2
46	07294	1" Diam. Lexan Protector	1

07124 120V MOTOR DIAGRAM AND PARTS LIST



Item	Part #	Description	Qty
1	17621	Carbon Brush	2
2	17622	Brush Cap	2
3	17632	Paper Washer	2
4	17600	Field Case	1
5	17602	Ball Bearing	2
6	17606	Dust Seal	1
7	17628	Field (120V)	1
8	17623	Pan Head Screw	2
9	17630	Armature (120V)	1
10	17604	Ball Bearing	1
11	17617	Fan Guide	1
12	17601	Gear Housing	1
13	17618	Gasket	1
14	17613	Flat Washer	1
15	17610	Flat Washer	1

Item	Part #	Description	Qty
16	17607	1st Inter. Gear Assy	1
17	17608	2nd Inter. Gear Assy	1
18	17603	Ball Bearing	1
19	17626	Retaining Ring	1
20	17609	Spur Gear	1
21	17611	Key	1
22	17616	Spindle	1
23	17615	Gear Housing (includes 24 & 25)	1
24	17605	Ball Bearing	1
25	17627	Retaining Ring	1
26	17625	Pan Head Screw Long	2
27	17624	Pan Head Screw Short	2
28	17612	Dowel Pin	1
29	07025	Label - Motor Safety (120V)	1
30	17294	Label - Motor Specs (120V)	1

ROTALOC PLUS™ CUTTERS for the HMD150

The ROTALOC PLUS™ cutters are made specifically for the HMD150. They are equipped with 5/8" tool-less Bayonet-style twist and lock shank, the 1" depth of cut standard cutter. They are made of premium high speed steel and available in diameters from 1/2" to 1-3/8" and 12mm to 35mm. Cutters are also available in 3/4 depth of cut, please refer to our Hougen Catalog for those sizes.

Rotaloc Plus™ Cutters 1" D.O.C.

Use with Pilot Pin 17470		Use with Pilot Pin 17470	
17214	7/16"	17400	12mm
17216	1/2"	17402	13mm
17218	9/16"	17404	14mm
17220	5/8"	17406	15mm
17222	11/16"	17408	16mm
17224	3/4"	17410	17mm
17226	13/16"	17412	18mm
17228	7/8"	17414	19mm
17230	15/16"	17416	20mm
17232	1"	17418	21mm
17234	1-1/16"	17420	22mm
17236	1-1/8"	17422	23mm
17238	1-3/16"	17424	24mm
17240	1-1/4"	17425	24.5mm
17240	1-5/16"	17426	25mm
17244	1-3/8"	17428	26mm
		17430	27mm
		17432	28mm
		17434	29mm
		17436	30mm
		17438	31mm
		17440	32mm
		17442	33mm
		17444	34mm
		17446	35mm

Rotaloc Plus™ Cutter Kits 1" D.O.C.

Part #	Description
17800	Kit contains (3) Cutters, 1" D.O.C. - 1/2", 5/8", 3/4" dia. plus (2) pilots in a sturdy plastic case
17801	Kit contains (3) Cutters, 1" D.O.C. - 9/16", 11/16", 13/16" dia. plus (3) Pilots in a plastic carrying case
17804	Kit contain (3) cutters, 1" D.O.C - 14mm, 16mm, 18mm dia. plus (3) pilots in a plastic carrying case.

COMMERCIAL / INDUSTRIAL LIMITED WARRANTY

Hougen Manufacturing, Incorporated warrants its Portable Magnetic Drills and its Electro-hydraulic Hole Punchers for a period of 1 year and other products for ninety (90) days from date of purchase against defects due to faulty material or workmanship and will repair or replace (at its option) without charge any items returned. This warranty is void if the item has been damaged by accident or unreasonable use, neglect, improper service, or other causes not arising out of defects in material or workmanship. No other expressed warranty is given or authorized. Hougen Manufacturing, Inc. disclaims any implied warranty of MERCHANTABILITY or FITNESS for any period beyond the expressed warranty and shall not be liable for incidental or consequential damages. Some states do not allow exclusions of incidental or consequential damages or limitation on how long an implied warranty lasts and, if the law of such a state governs your purchase, the above exclusion and limitation may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

To obtain warranty service: return the item(s), transportation prepaid, to your nearest Factory Authorized Warranty Repair Center or to Hougen Manufacturing, Inc., 3001 Hougen Drive, Swartz Creek, Michigan 48473.

Hougen Drills are warranted against manufacturing defects only. Subject to Hougen Manufacturing inspection.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

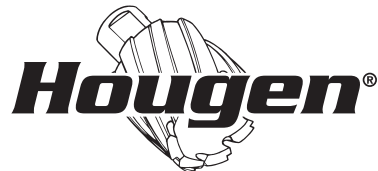
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HOUGEN AUTHORIZED WARRANTY REPAIR CENTERS

Hougen Authorized Warranty Repair Centers have been factory trained to properly service and repair Hougen Portable Magnetics Drills. To locate an Authorized Warranty Repair Centers near you, please visit:

www.hougen.com



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