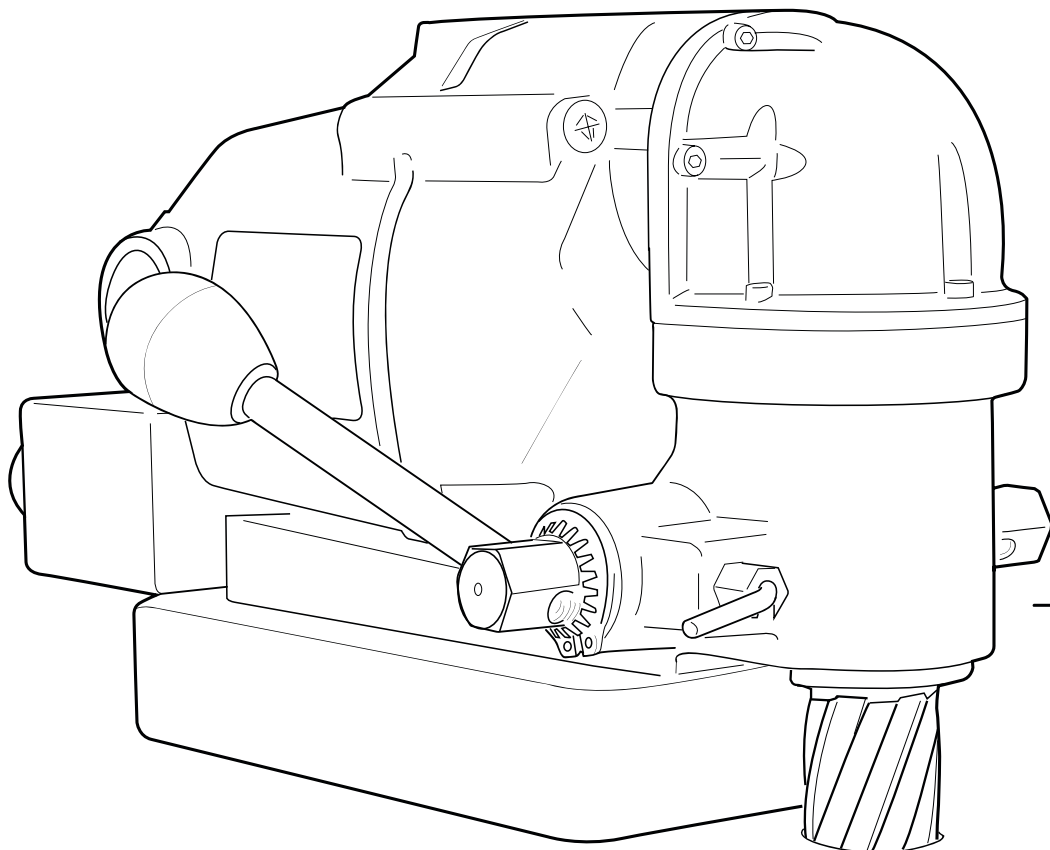




MODEL HMD115

PORTABLE MAGNETIC DRILLS

OPERATOR'S MANUAL

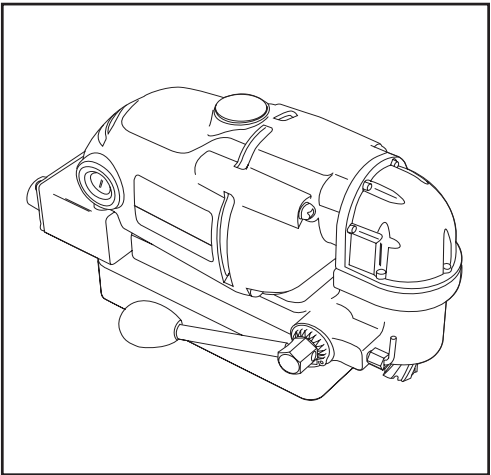


FOR USE WITH ROTALOC™ CUTTERS

HOUGEN®
PORTABLE MAGNETIC DRILL
Model HMD 115
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.

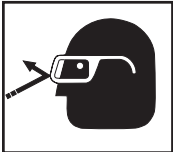
Before attempting to operate your new Portable Magnetic Drill, please read all instructions first. These include the Operator's Manual and Warning Label on the unit itself. With proper use, care, and maintenance, your model will provide you with years of effective hole drilling performance. Once again,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



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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: 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:

1. Read All Instructions

2. Grounding Instructions

This tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with a 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal. (Refer to Plug Diagram) Section A

3. Safe Electrical Connection

Your Mag Drill is rated for use on 115VAC (Plug A) or 230V (Plug B) at 50-60Hz. Do not attempt to use drill on power sources rated other than this. 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 in the power cord. Also elevate extension cords or gang box connections.

4. 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.

5. Do Not Force Tool

It will do the job better and faster at the rate for which it was intended.

6. Keep Work Area Clean

Cluttered areas and benches invite injuries. Keep dirt and chips from under the Cutter area.

7. Consider Work Area Environment

Do not expose tool to rain.
Do not use tool in damp or wet locations.
Keep work area well lit.
Do not use tool in presence of flammable liquids or gases. Disconnect from power source when changing cutters or maintaining drill.

8. Guard Against Electric Shock

Prevent body contact with grounded surfaces. For example: pipes, radiators, ranges, refrigerator enclosures.

9. Keep Children Away

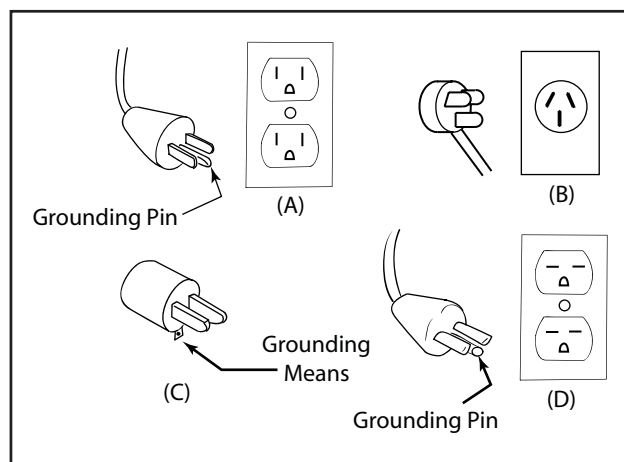
Do not let visitors contact tool. All visitors should be kept away from work area while in use.

10. Store Idle Tools

When not in use, tools should be stored in a dry, and high or locked-up place — out of reach of children.

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



11. Use Right Tool

Do not force small tool or attachment to do the job of a heavy duty tool.
Do not use tool for purpose not intended — for example — do not use a circular saw for cutting tree limbs or logs.

12. Non-Conforming Cutting Tools

Your Mag Drill is designed to use Houghen Cutters. The use of drilling tools having different shank styles is not recommended as they may not tighten securely in the drill arbor with risk of accident or injury.

13. Secure Work

Use clamps or a vise to hold work. It is safer than using your hand and it frees both hands to operate tool.

14. Always Wear Safety Glasses or Goggles

Important Safety Instructions - Continued

15. Dress Properly

Do not wear loose clothing or jewelry. They might entangle with spinning chips or get caught in moving parts. Rubber gloves and nonskid footwear are recommended when working outdoors. Wear sturdy leather gloves when working indoors. Wear protective hair covering to contain long hair.

16. Do Not Abuse Cord

Never carry drill unit by its cord or yank it to disconnect from receptacle. Keep cord away from heat, oil, and sharp edges.

17. Do Not Overreach

Keep proper footing and balance at all times.

18. Maintain Tools With Care

Keep tools sharp and clean for better and safer performance.

Do not use dull or broken Houghen Cutters.

Follow instructions for lubricating and changing accessories.

Inspect tool cords periodically and, if damaged, have repaired by authorized service facility.

Inspect extension cords periodically and, if damaged, have repaired by authorized service facility.

Keep handles dry, clean, and free from oil and grease.

19. Disconnect Tools

Disconnect when not in use, before servicing, and when changing cutters or accessories.

20. Remove Adjusting Keys and Wrenches

Form a habit of checking to see that keys and wrenches are removed from tool before turning it on.

21. Check Damaged Parts

Before further use of the drill, a part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function.

Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this operator manual. Do not operate tool if switch does not turn it on and off.

22. Stay Alert

Watch what you are doing.

Use common sense.

Do not operate tool when you are tired.

Have defective switches replaced by authorized service center.

23. Outdoor Use Extension Cords

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

24. Additional Safety Precautions

Arbor and cutter should never be used as a handhold. Keep hands and clothing away from all moving parts. Do not use Houghen 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.

25. 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.

26. Circuit Breaker

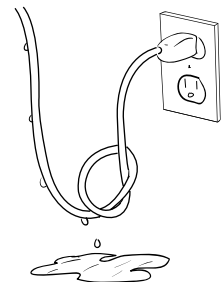
Changing of the circuit breaker to a higher amp rated breaker, or bypassing the circuit breaker is not recommended and is cause for cancellation of the product warranty.

27. Circuit Breaker Operation

The circuit breaker is a thermal circuit breaker. When it reaches the higher temperature rating it will trip and cause the unit to shut down. This is a protection device and can be reset after 5 to 10 seconds of cool down period. To reset the circuit 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.

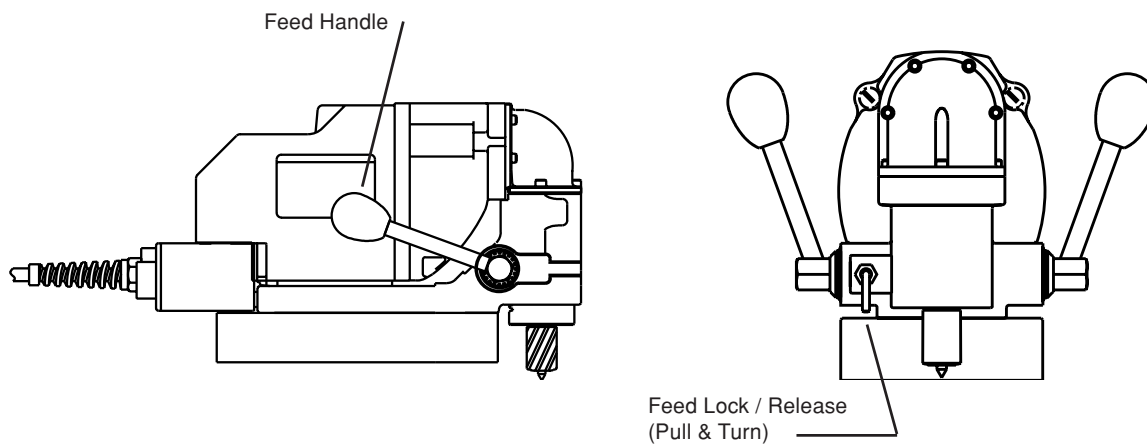
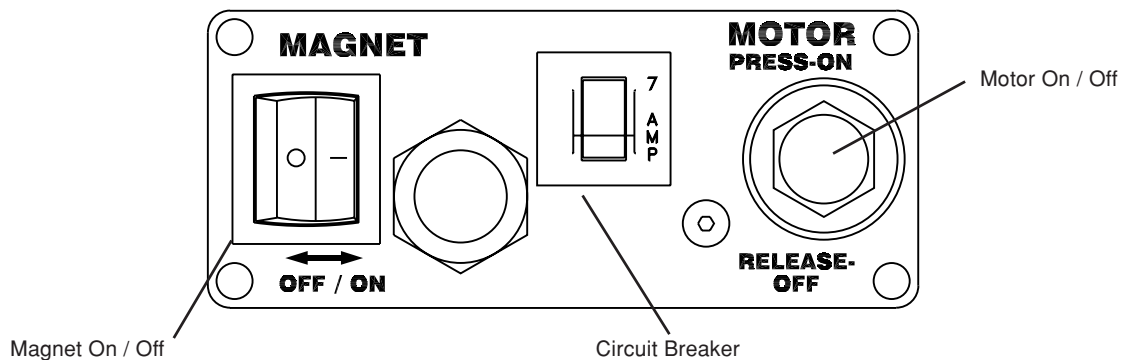
28. Safe Electrical Connection

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.



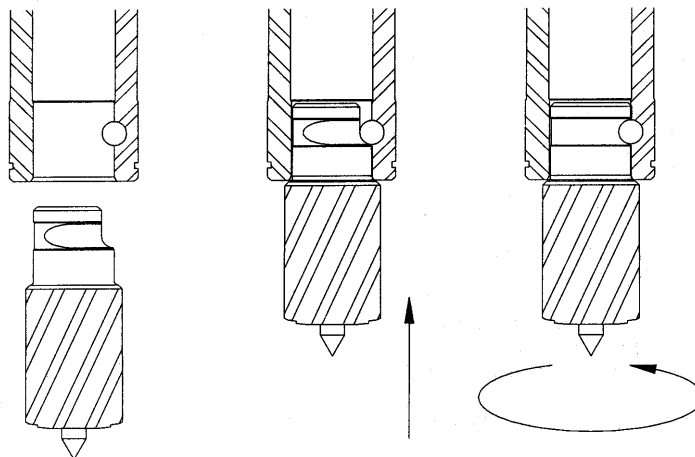
29. SAVE THESE INSTRUCTIONS.

REVIEW OF CONTROLS



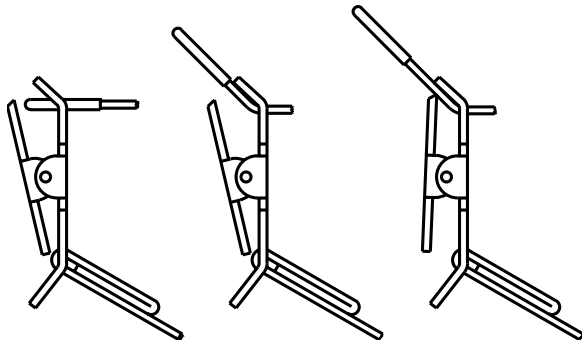
Rotaloc™ Cutter Installation

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.



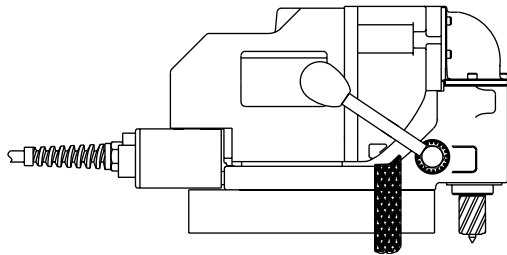
OPERATING INSTRUCTIONS

1. Place drill on material 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 needed to complete cut.
5. Disengage feed lock/release.
6. Press and hold motor switch. (Note: Switch must be held in "ON" position while cutting)
7. 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:

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.

- Release motor switch when cut is finished.
- Fully retract cutter from material, ejecting the slug.
- Engage feed lock/release.
- Remove safety strap.

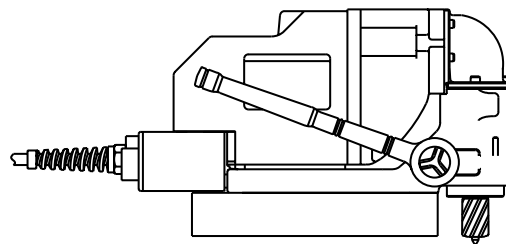
8. Turn magnet switch to "OFF" position.

CAUTION: Retain firm hold on drill to prevent dropping.

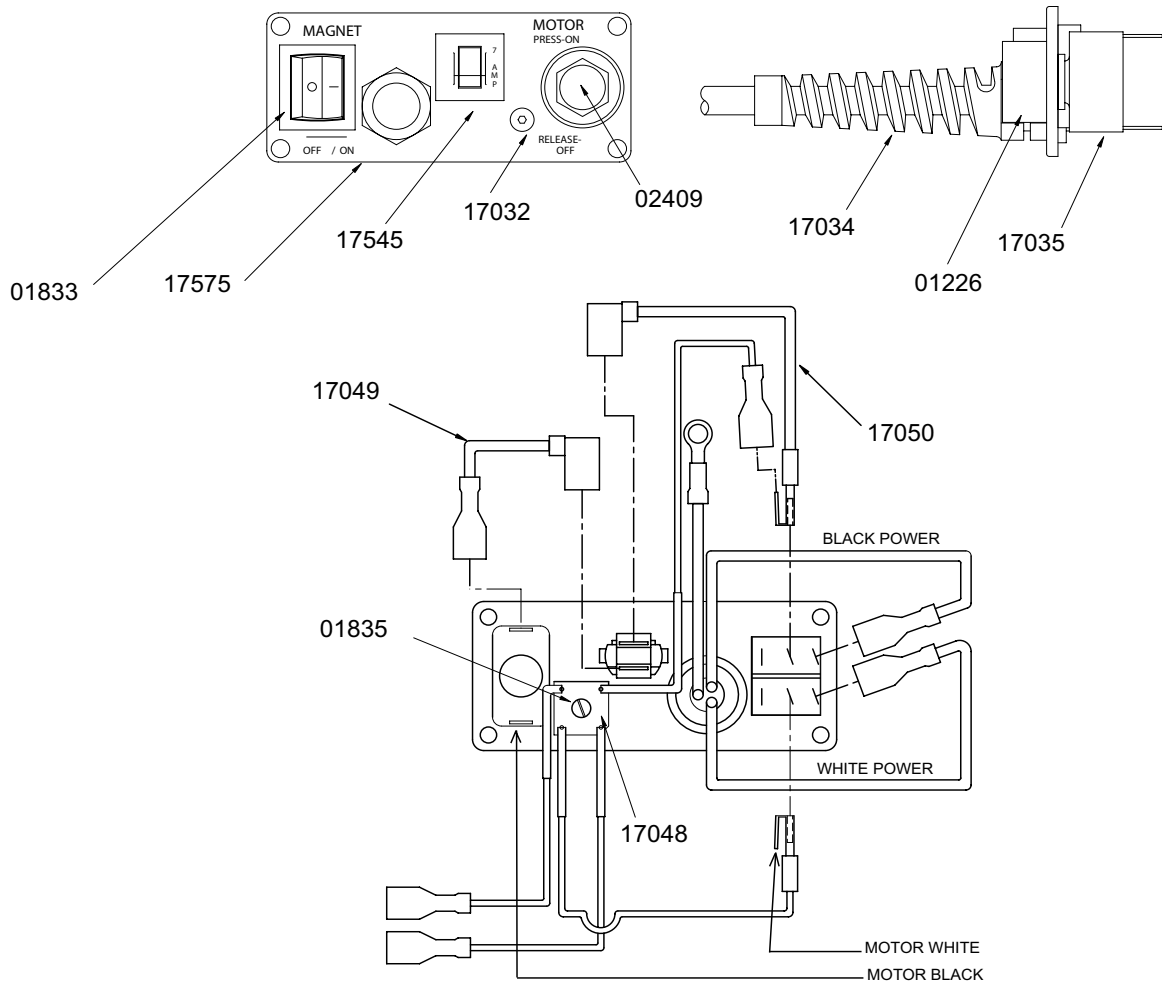
Cutter I.D. may collect chips, restricting depth of cut. Cutter should be frequently inspected and any chips or debris removed.

OPTIONAL FEED METHODS:

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



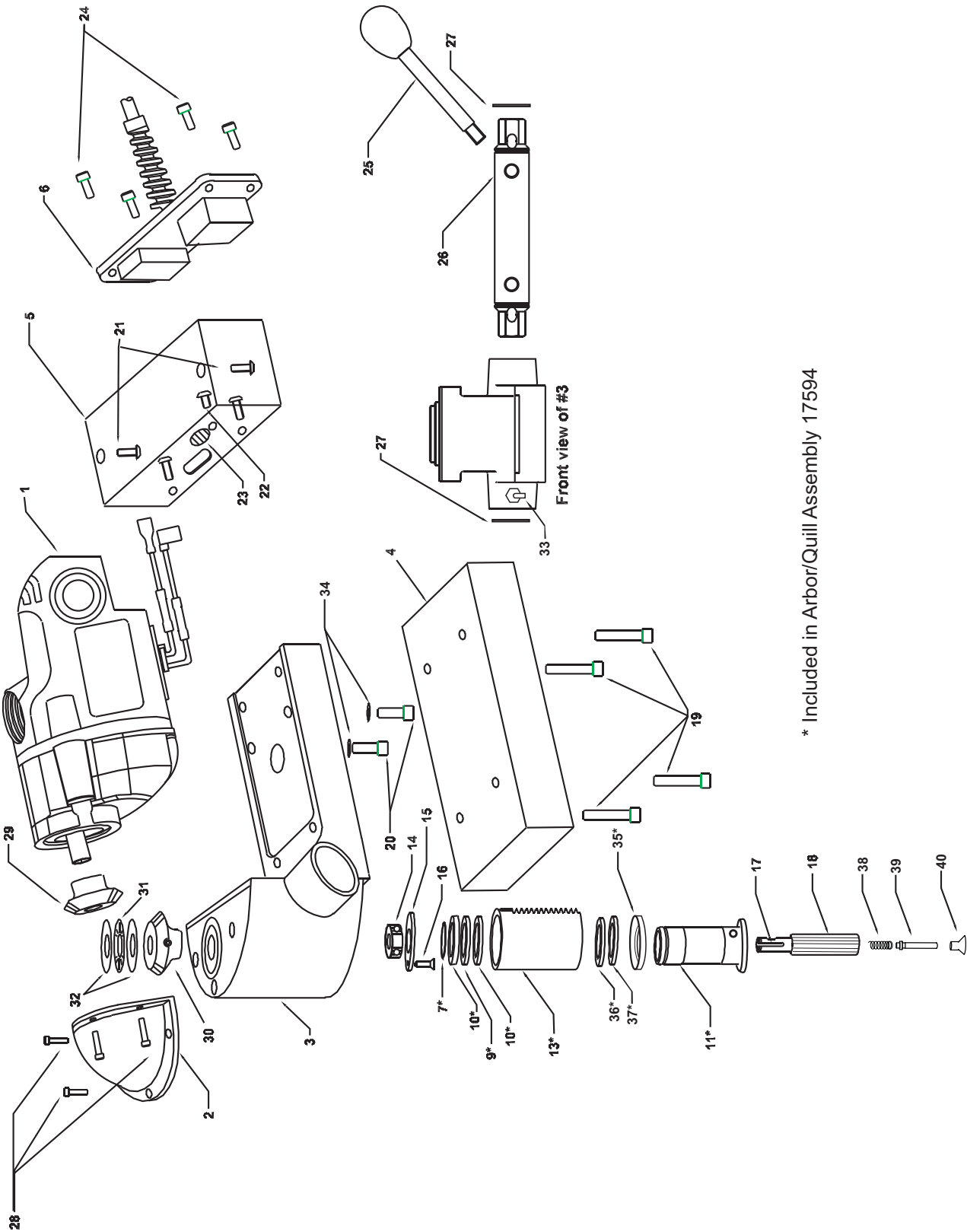
CONTROL PANEL PARTS



Part No.	Description	Qty. Req'd.
01226	Guard- Pushbutton Switch	1
01833	Switch-Rocker DPST	1
01835	Nut-Nylon Slotted	1
02409	Seal-Switch Green	1
17032	Screw BHC #6-32	1
17034	Power Cord Assembly	1

Part No.	Description	Qty. Req'd.
17035	Switch - Momentary	1
17048	Rectifier Assembly	1
17049	Jumper Wire Assy.	1
17050	Jumper Wire Assy.	1
17545	Circuit Breaker 7 Amp.	1
17575	Cover With Label	1

HMD115 DRILL PARTS DIAGRAM



* Included in Arbor/Quill Assembly 17594

HMD115 PARTS LIST

Item No.	Part No.	Description	Qty. Req'd.
1	17518	Motor Assembly	1
2	17510	Gear Cap Assembly	1
3	17525	Housing Assembly	1
4	17029	Magnet Assembly	1
5	17042	Electrical Box	1
6	17539	Control Panel Assy.	1
7	04720	O.D. Spiral Lock	2
9	17546	Thrust Washer Bronze	1
10	17547	Thrust Washer Steel	2
11	17597	Arbor Assembly	1
12	17015	Screw, FHS 1/4-28	1
13	17595	Quill Assembly	1
14	17010	Ball Bearing	1
15	17509	Washer, Bearing Ret.	1
16	04409	Screw, FHC #6-32	3
17	17513	Key	1
18	17501	Splined Shaft	1
19	40108	Screw, SHC 1/4-20	4
20	75096	Screw, SHC M6	2
21	75094	Screw, SHC M5	4
22	04439	Screw, BHS #10-32	1
23	17557	Ground Label	1
24	41042	Screw, BHC #8-32	4
25	17588	Feed Handle Assy.	2
26	17022	Feed Gear	1
27	17023	Snap Ring	2
28	17002	Screw, SHC #6-32	7
29	17502	Gear, Left Hand	1
30	17504	Gear, Right Hand	1
31	17516	Thrust Bearing	1
32	17517	Thrust Washer	2
33	17039	Spring Plunger Retactable	1
34	50035	Lock washer	2
35	17643	Shield, Thrust washer	1
36	17644	Thrust Washer	1
37	17645	Thrust Needle Bearing	1
38	17492	Spring Plunger	1
39	17494	Plunger	1
40	17493	Screw Flat Head Mod.	1
Part Number 17594 (Arbor/Quill Assembly includes part no. 7, 9, 10, 11, 13, 35, 36, 37)			

HOUGEN HOLEMAKING PRODUCTS

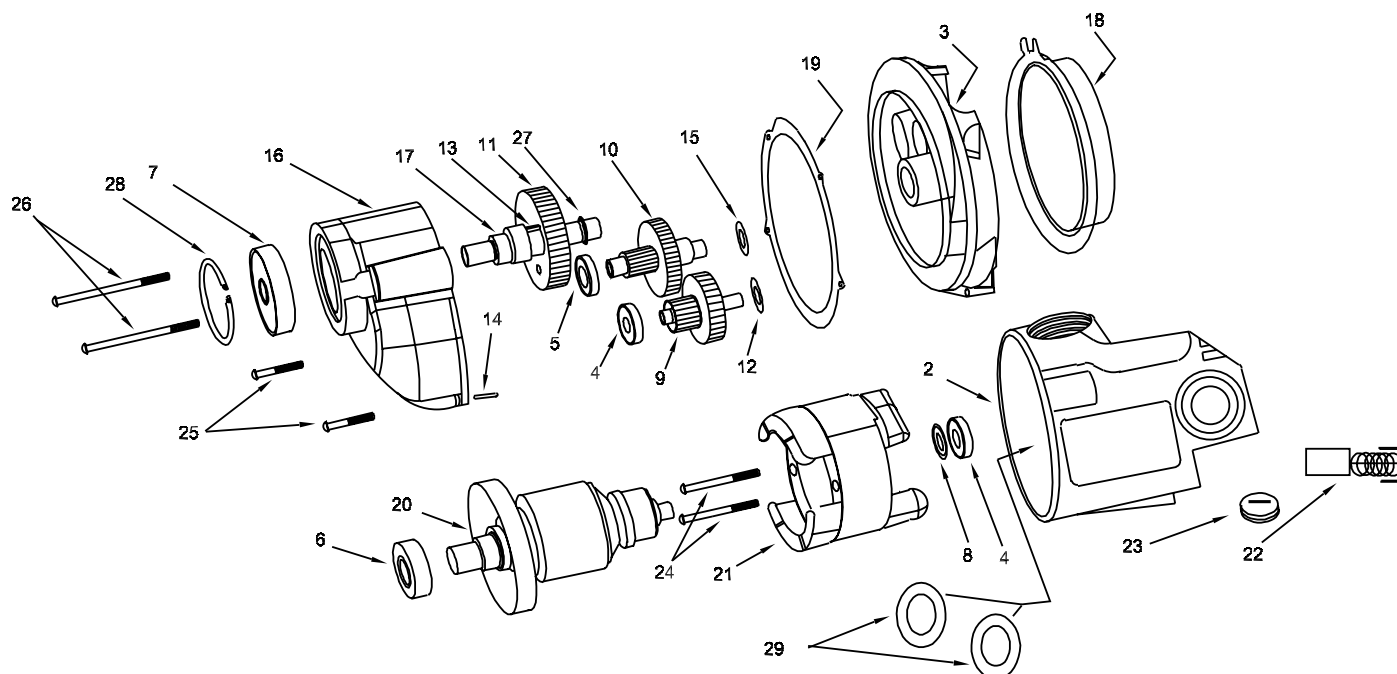
Rotaloc™ Cutters for HMD115

The Rotaloc™ Annular cutters are made specifically for the HMD115. They are equipped with 5/8" tool-less quick release shank, and can drill up to 3/4" deep in single or stacked plate. They are made of premium high speed steel and available in diameters from 1/2" to 1-1/16".

Rotaloc™ Cutter Kit -
Hougen part number 17001
Kit includes all 10 cutters listed plus 2 pilots all in a handy case.

Part No.	Diameter
17116	1/2"
17118	9/16"
17120	5/8"
17122	11/16"
17124	3/4"
17126	13/16"
17128	7/8"
17130	15/16"
17132	1"
17134	1-1/16"

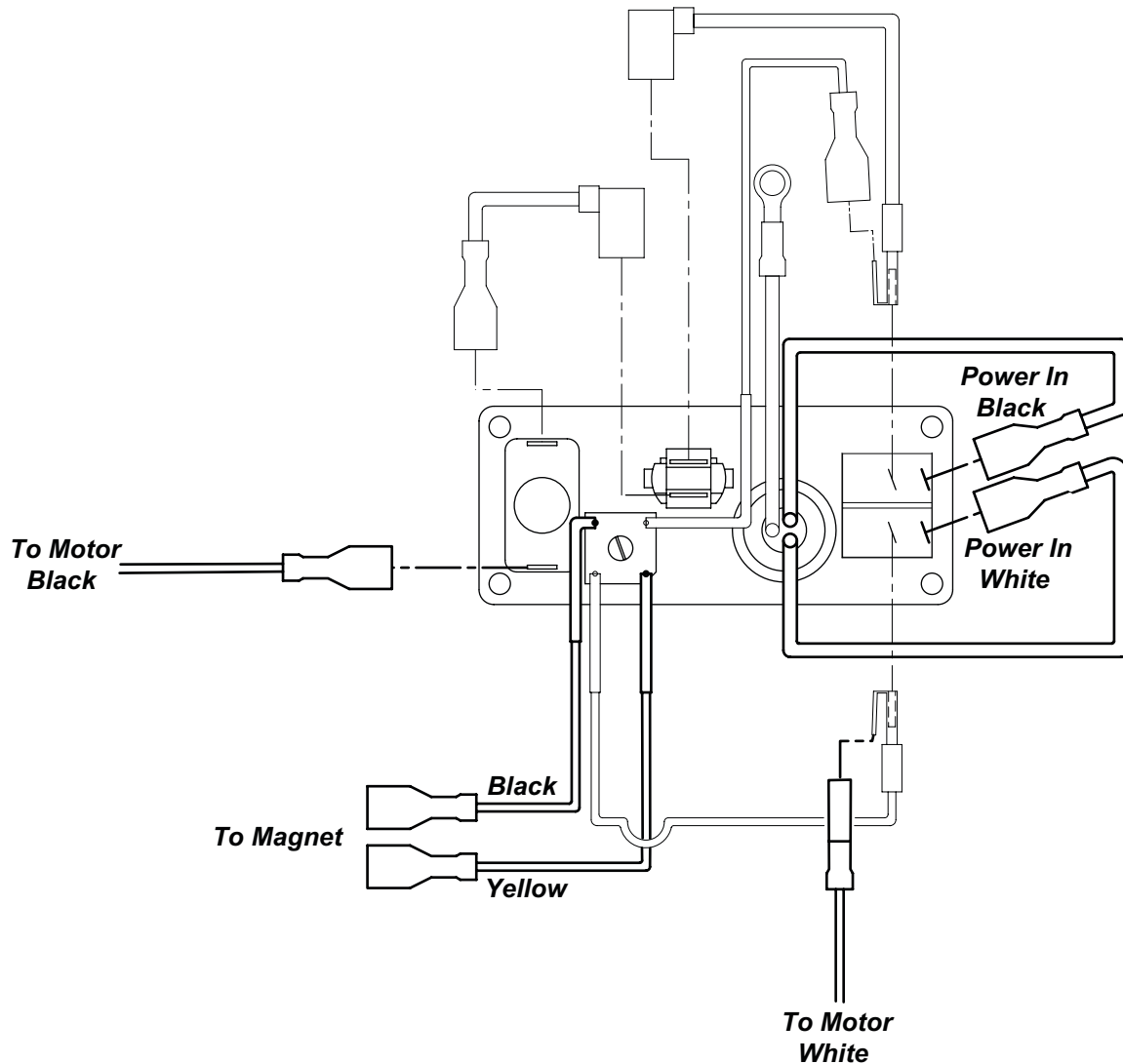
Motor Diagram and Parts List



Item No.	Part No.	Description	Qty. Req'd.
	17514	Motor Assembly	1
2	17600	Field Case	1
3	17601	Gear Housing Cover	1
4	17602	Ball Bearing	2
5	17603	Ball Bearing	1
6	17604	Ball Bearing	1
7	17605	Ball Bearing	1
8	17606	Dust Seal	1
9	17607	1st. Inter. Gear Assembly	1
10	17608	2nd. Inter Gear Assembly	1
11	17609	Spur Gear	1
12	17610	Flat washer	1
13	17611	Key	1
14	17612	Dowel Pin	1

Item No.	Part No.	Description	Qty. Req'd.
15	17613	Flat Washer	1
16	17614	Gear Housing	1
17	17616	Spindle	1
18	17617	Fan Guide	1
19	17618	Gasket	1
20	17630	Armature	1
21	17628	Field	1
22	17621	Carbon Brush	2
23	17622	Brush cap	2
24	17623	Pan Head Screw (Field)	2
25	17624	Pan Head Screw (Short)	2
26	17625	Pan Head Screw (Long)	2
27	17626	Retaining Ring	1
28	17627	Retaining Ring	1
29	17632	Paper Washer	2

HMD115 WIRING DIAGRAM



Commercial / Industrial Limited Warranty

Hougen Manufacturing, Incorporated warrants its Portable Magnetic Drills, Electro-hydraulic Hole Punchers, and Tornado II Paint Shaker for one (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 Repair Center or to Hougen Manufacturing, Inc., 3001 Hougen Drive, Swartz Creek, Michigan 48473.

Hougen Drills (Hougen Cutters) 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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