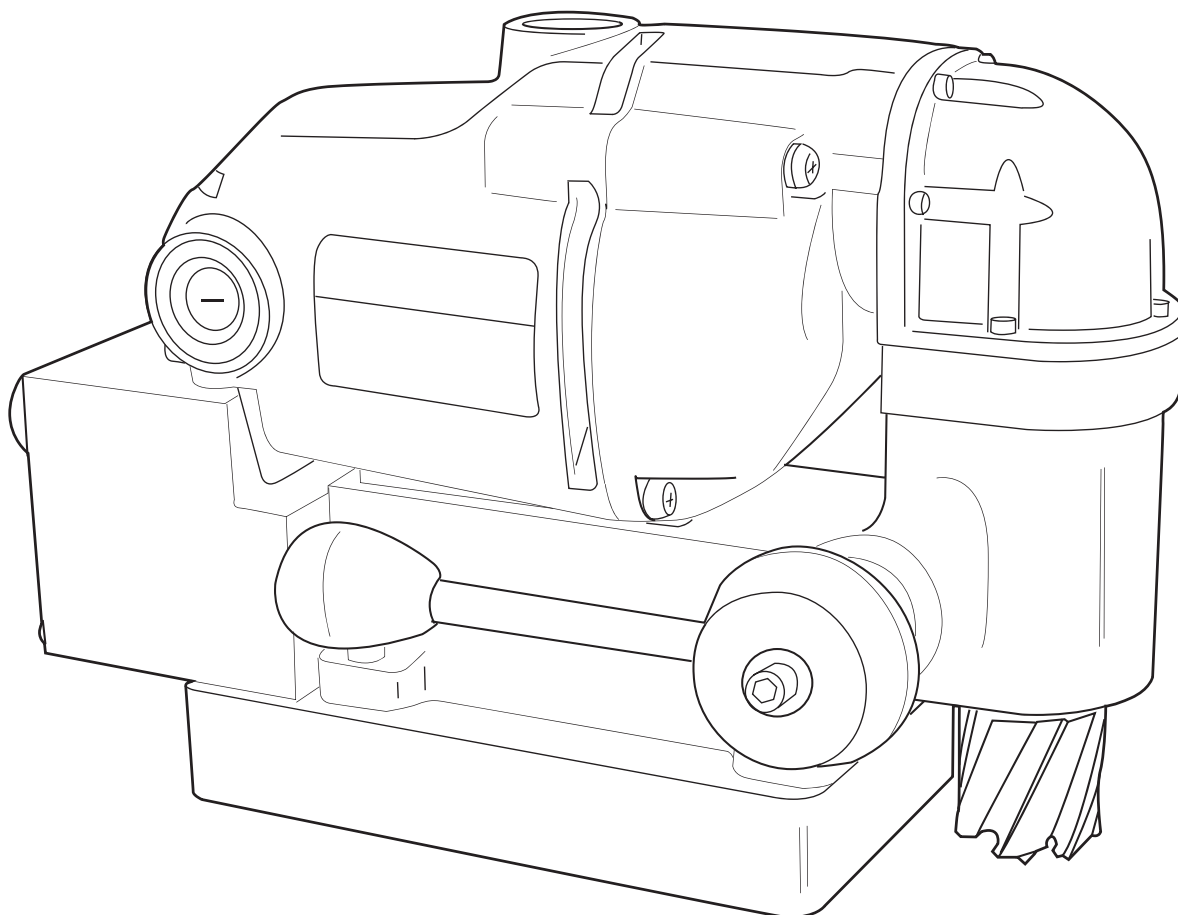




MODEL HMD150 PORTABLE MAGNETIC DRILLS OPERATOR'S MANUAL

COVERS DRILL PART NUMBERS 0150101-1008



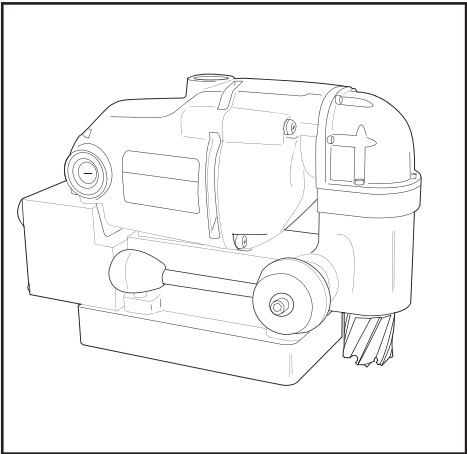
FOR USE WITH ROTALOC PLUS™ CUTTERS

HOUGEN®
PORTABLE MAGNETIC DRILL
Model HMD 150

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.



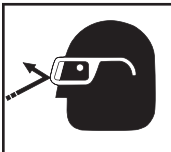
Specifications

Cutter Type.....	RotaLoc Plus
Hole Capacity.....	1/2" to 1-3/8"
Depth of Cut.....	1"
Motor.....	450 RPM, 8A
Net Weight.....	22.7 Lb

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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 D) 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

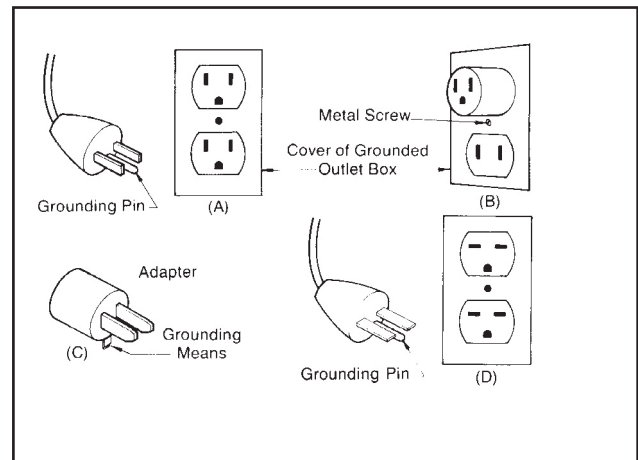
Do not let visitors contact tool. All visitors should be kept away from work area while in use.

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 foot wear 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 time.

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

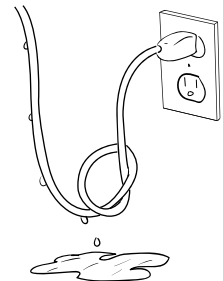
Arbor and cutter should never be used as a hand-hold. Keep hands and clothing away from all moving parts. Do not use Houghen Cutters where ejected slug might cause injury (slug ejected at end of cut). Also, adhere to all operating instructions. Do not drill through any surface that may contain live electrical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

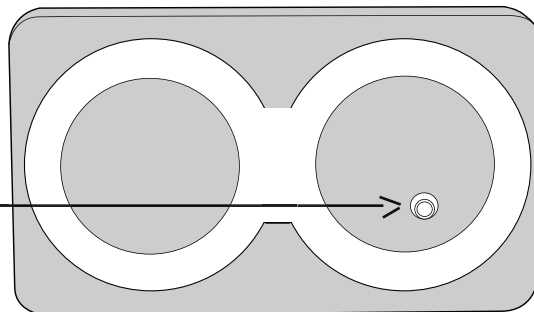
Wet electrical connections are shock hazards. To prevent the cutting fluid from traveling along the cord and contacting the plug or power outlet, tie a drip loop as shown. Also elevate extension cords or gang box connections.



27. SAVE THESE INSTRUCTIONS.

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.



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.

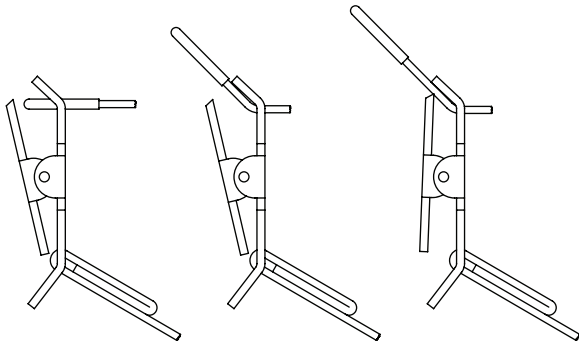
Make sure material is at least 3/8” thick. Material thinner than 3/8” will cause a “weak” magnet condition.

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.

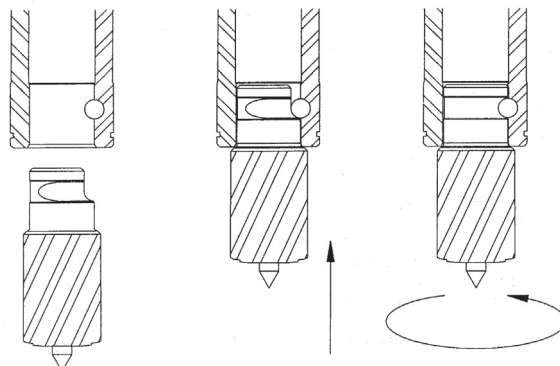
Cutter Inside Diameter may collect chips, restricting depth of cut. Cutter should be frequently inspected and any chips or debris removed.

OPTIONAL FEED METHODS:

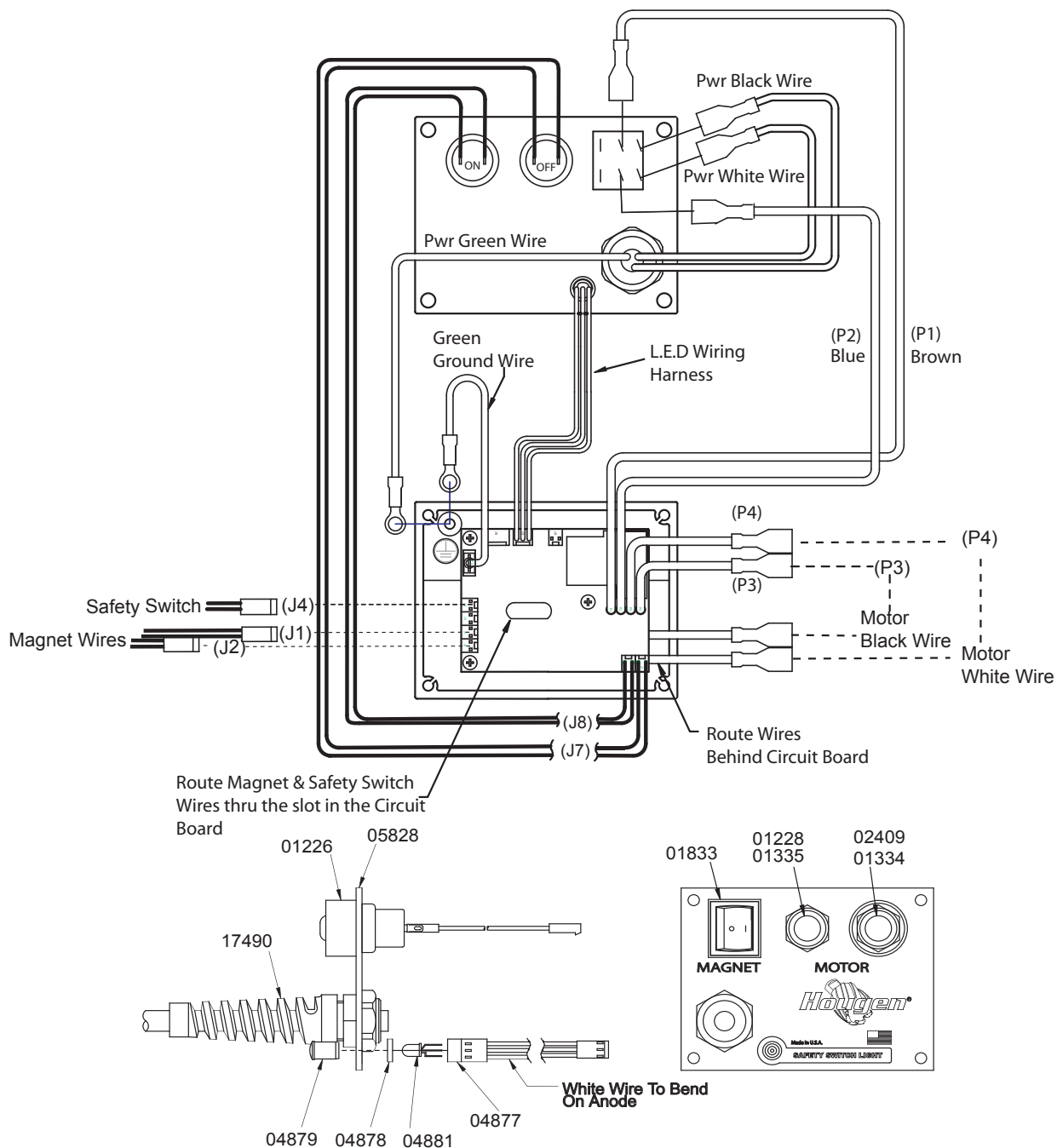
- 5/8" Box Wrench
- Ratchet with 5/8" Socket
- **NO PLIERS OR OPEN END WRENCH** (They will damage threaded feed handle mounting holes)

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.

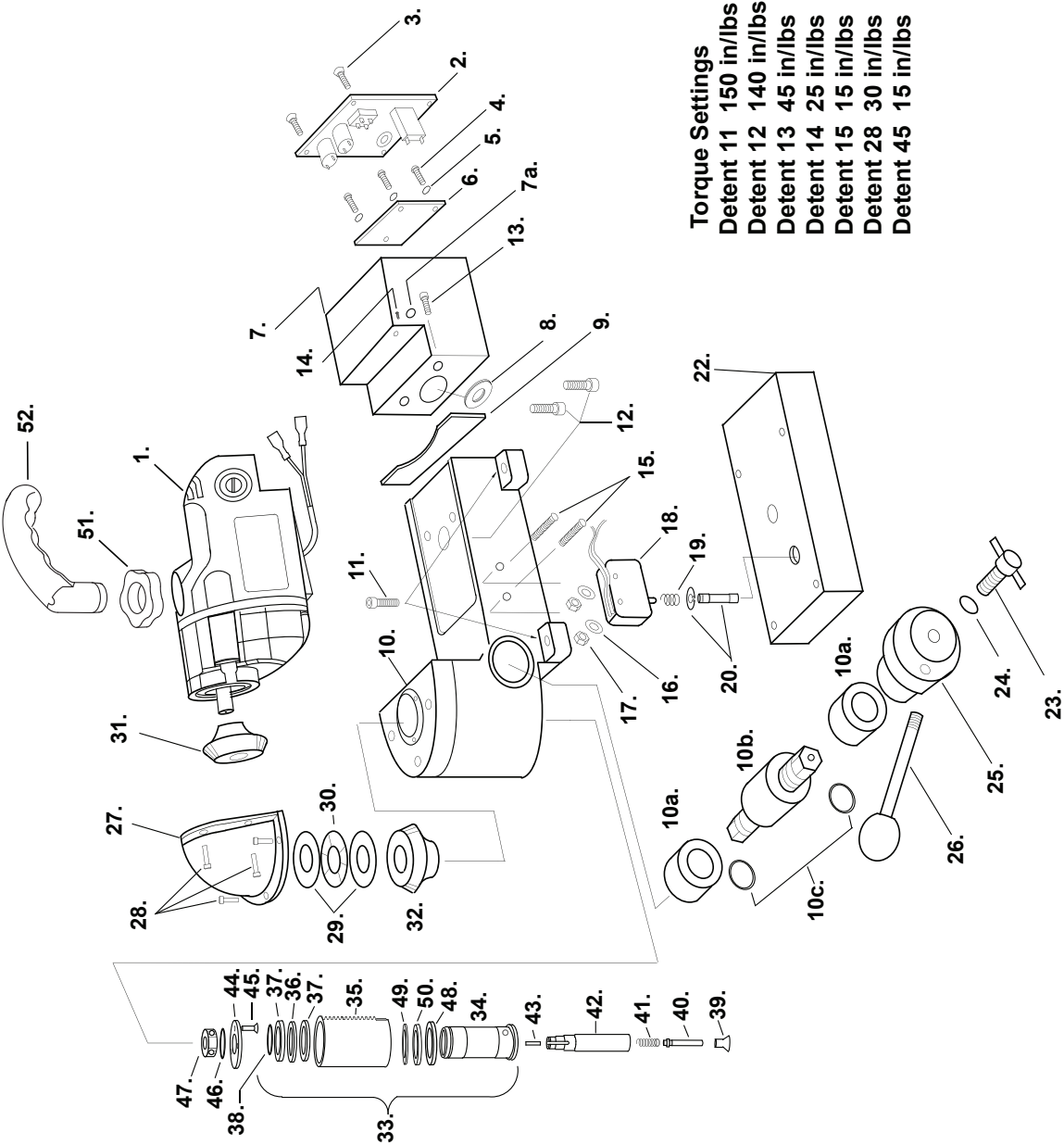


CONTROL PANEL /HOOKUP DIAGRAM



PART #	DESCRIPTION	QTY	PART #	DESCRIPTION	QTY
01226	Switch Guard	1	04878	Spacer	1
01228	Red Switch Cover	1	04879	Clear Lens	1
01334	Motor ON Switch	1	04881	Bulb	1
01335	Motor OFF Switch	1	05826	Circuit Board	1
01833	Rocker Switch	1	05828	Faceplate	1
02409	Green Switch Cover	1	17490	Power Cord Assy	1
04877	Wire Harness	1	17688	Faceplate Assy	1

HMD150 DRILL PARTS DIAGRAM



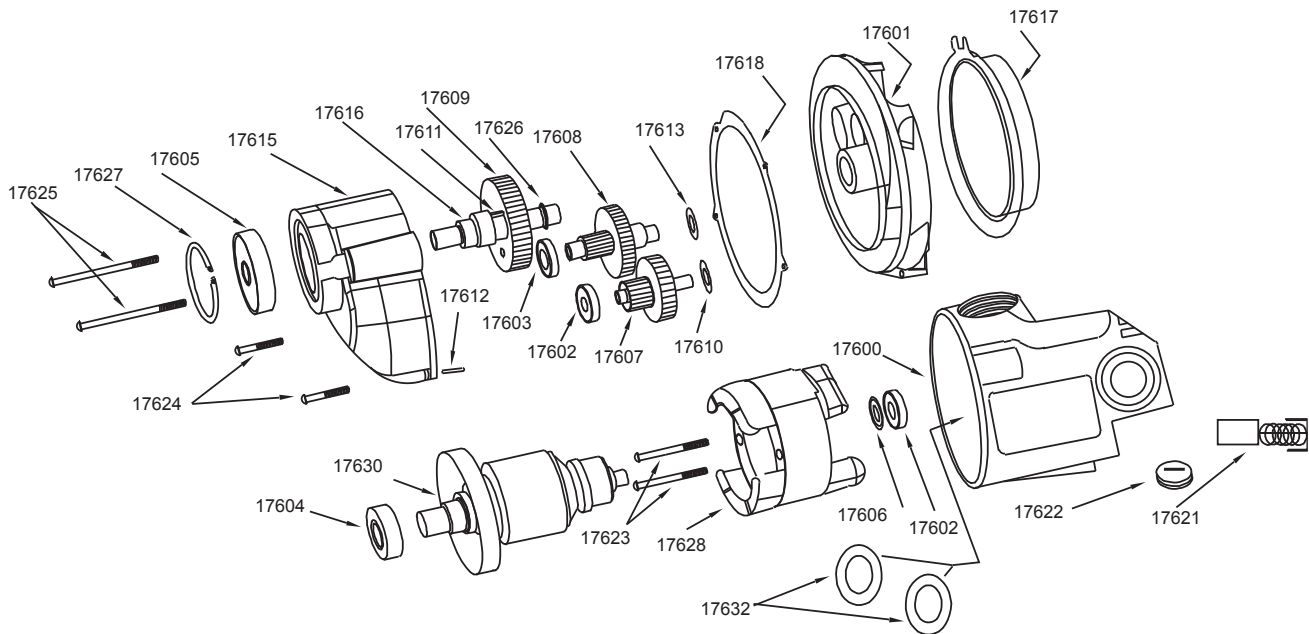
Torque Settings

Detent 11	150 in/lbs
Detent 12	140 in/lbs
Detent 13	45 in/lbs
Detent 14	25 in/lbs
Detent 15	15 in/lbs
Detent 28	30 in/lbs
Detent 45	15 in/lbs

HMD150 PARTS LIST

Item #	Part #	Description	Qty	Item#	Part #	Description	Qty
1	17276	Motor Assy	1	26	17283	Feed Handle Assy	1
2	17688	Faceplate Assy.	1	27	17510	Gear Cap Assy	1
3	24153	Screw Self Tapping	4	28	17002	SCR SHC #6-32	7
4	02547	Phillips Screw	3	29	17517	Thrust Washer	2
5	10714	Washer Lock #4	3	30	17516	Thrust Bearing	1
6	05826	Circuit Board	1	31	17502	Gear Left Hand	1
7	17691	Electrical Box	1	32	17278	Gear Right Hand	1
7a	17557	Ground Label	1	33	17646	Quill & Arbor Assy	1
8	17274	Grommet	1	34	17649	Arbor Assy	1
9	17293	Motor Seal	1	35	17647	Quill Assy	1
10	17279	Housing Assy	1	36	17546	Washer Thrust Bronze	1
10a	17495	Bronze Bearing	2	37	17547	Washer Thrust Steel	2
10b	17298	Feed Gear	1	38	04720	Retaining Ring Lt Hand	1
10c	40546	O Ring	2	39	17493	SCR Flat Head Mod.	1
11	10553	SCR SHC 1/4-20	4	40	17494	Plunger	1
12	75096	SCR SHC M6 x 20mm	2	41	17492	Comp. Spring	1
13	75094	SCR SHC M5 x 12mm	2	42	17280	Splined Shaft	1
14	04439	SCR BHS #10-32	1	43	17277	Key 1/8" Square	1
15	17476	SCR BHC Safety Torx	2	44	17289	Washer Brg. Ret	1
16	90052	Washer Lock #6	2	45	04718	SCR-Pan Phillips	3
17	40374	Nut Hex #6-32	2	46	17475	Retaining Ring	1
18	04885	Safety Switch	1	47	17270	Ball Bearing	1
19	17271	Taper Spring	1	48	17643	Shield, Thrust Washer	1
20	17285	Plunger Assy	1	49	17644	Thrust Washer	1
22	17651	Magnet	1	50	17645	Thrust Needle Bearing	1
23	17291	SCR SHC M6-1	1	51	05920	Locking Nut 1"-14	1
25	17282	Feed Hub Assy	1	52	05921	Handle	1

Motor Diagram and Parts List



Part #	Description	Qty	Part #	Description	Qty
04502	Brush Cover	1	17612	Dowel Pin	1
10538	Washer #8	1	17613	Flat Washer	1
11053	Screw BHS #8-32	1	17615	Gear Housing	1
17276	Motor Assy	1	17616	Spindle	1
17294	Label, Motor Specs	1	17617	Fan Guide	1
17537	Label, Motor Safety	1	17618	Gasket	1
17600	Field Case	1	17630	Armature	1
17601	Gear Housing	1	17628	Field	1
17602	Ball Bearing	2	17621	Carbon Brush	2
17603	Ball Bearing	1	17622	Brush Cap	2
17604	Ball Bearing	1	17623	Pan Head Screw	2
17605	Ball Bearing	1	17624	Pan Head Screw Short	2
17606	Dust Seal	1	17625	Pan Head Screw Long	2
17607	1st Inter. Gear Assy	1	17626	Retaining Ring	1
17608	2nd Inter. Gear Assy	1	17627	Retaining Ring	1
17609	Spur Gear	1	17632	Paper Washer	2
17610	Flat Washer	1	75289	Pan Head Screw	2
17611	Key	1			

Rotaloc™ Series of 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, available either in the 3/4" depth of cut, stack cut cutters or, 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".

3/4" D.O.C Rotaloc™ Cutters Stack Cut Geometry

PART#	DESCRIPTION
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"
17100	PILOT

1" D.O.C Rotaloc Plus™ Cutters Standard Geometry Cutters

PART#	DESCRIPTION
17216	1/2"
17218	9/16"
17220	5/8"
17222	11/16"
17224	3/4"
17226	13/16"
17228	7/8"
17230	15/16"
17232	1"
17234	1-1/16"
17236	1-1/8"
17238	1-3/16"
17240	1-1/4"
17242	1-5/16"
17244	1-3/8"
17470	PILOT

Rotaloc™ Cutter Kits 3/4" D.O.C

PART#	DESCRIPTION
17001	Kit contains (10) Cutters, 3/4" D.O.C. - 1/2", 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1", 1-1/16" dia. plus (2) pilots in a sturdy plastic case
17770	Kit contains (3) Cutters, 3/4" D.O.C. - 1/2", 5/8", 3/4" dia. plus (3) Pilots in a plastic carrying case
17701	Kit contains (3) Cutters, 3/4" D.O.C. - 9/16", 11/16", 13/16" Cutters plus (3) Pilots in a plastic Carrying Case

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

Commercial / Industrial Limited Warranty

Hougen Manufacturing, Incorporated warrants its Portable Magnetic Drills for one (1) year and its Electro-hydraulic Hole Punchers 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 (Rotabroach 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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