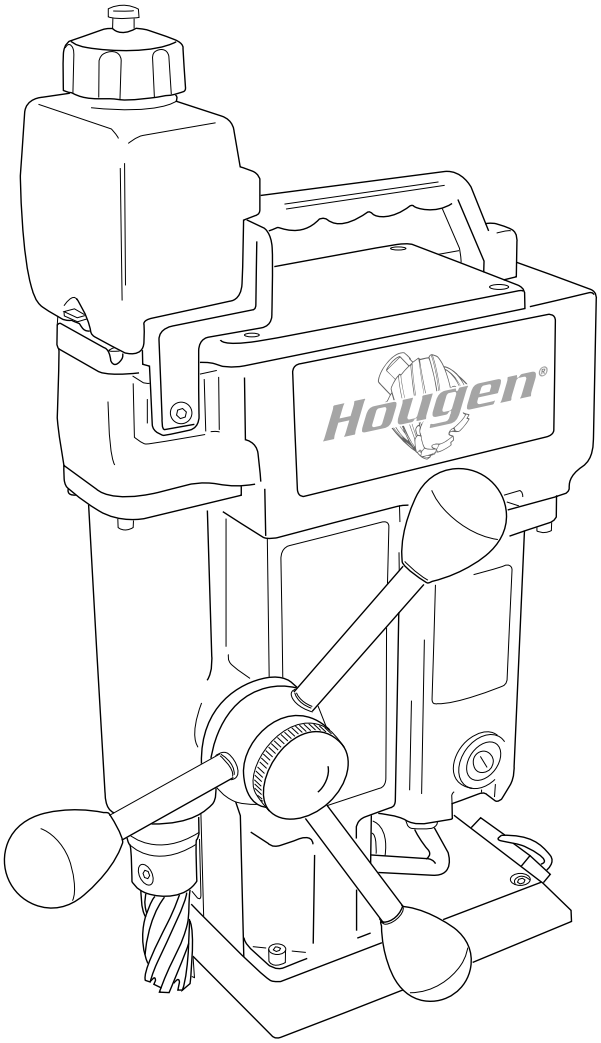
Hougen®

Solving holemaking problems through innovation™

HMD508 SERIES
PORTABLE MAGNETIC DRILL

OPERATOR'S MANUAL

COVERS DRILL PART NUMBERS 0508102, 0508202, 0508302 & 0508402



FOR USE WITH HOUGEN "12,000-SERIES" CUTTERS

HOUGEN® Portable Magnetic Drill

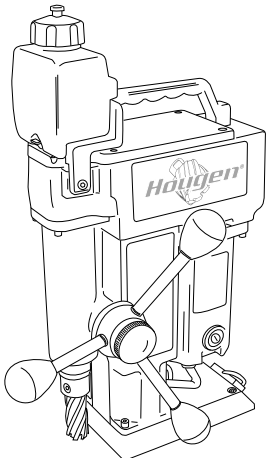
Welcome to Hougen

Congratulations on your purchase of the Hougen® Portable Magnetic Drill Model HMD501. 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 an explanation of the Part Number and the location of the Label is shown on the Drill Breakdown Diagram.

Part No.	**Descripton**
0508102	HMD508, 450/750 RPM with coolant,120 volt
0508202	HMD508, 450/750 RPM with coolant, 240 volt
0508302	HMD508, 450/750 RPM with coolant, 240 volt Type I Plug
0508402	HMD508, 450/750 RPM with coolant, 240 volt for Singapore



Specifications

Motor .....450/750 RPM, 14 A
Net Wieght.....45 Lbs.
Cutter Type..... "12,000-Series" & "Copperhead" Cutters
Hole Diameter Capacity.....7/16" to 1-1/16" 12,000-Series Cutters
.....14mm to 40mm "Copperhead" Cutters
Depth of Cut.....3" "12,000-Series"/
.....2" Copperhead Cutters

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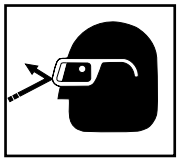
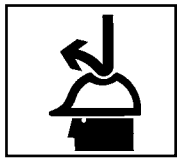
SAFETY FIRST



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



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

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 loose control.

Electrical Safety

Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordianaces. Never remove the ground prong or modify the plug in any way. Do not us 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 breakdown, grounding is 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 eletric 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 switchis 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 production. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Always use safety chain. 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 childern 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.

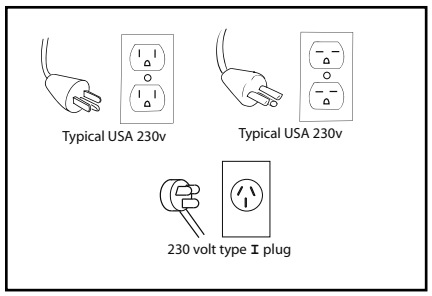
When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual. Use of unauthorized parts or failure to follow Maitenance Instructions may create a risk of electric shock or injury.

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 (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.

Plugs and Receptacles



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 counterclock-wise. Never attempt to free the jammed cutter by starting the motor. Service at authorized repair center only.

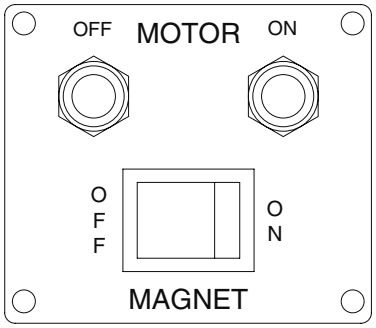
Operating Near Welding Equipment
DO NOT operate this unit on the same work surface that welding is being performed on. Severe damage to the unit, particularly the power cord, could occur. This could also result in personal injury to the operator.

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 product warranty.

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.

BEFORE INSTALLING CUTTER



IMPORTANT: Before turning on the machine, it is imperative that the operator understands the interrelated functions of the SAFETY SWITCH, MAGNET SWITCHES, AND MOTOR SWITCHES.

1. Place Magnetic Drill on clean, flat steel plate that is at least 3/8" thick.
2. Plug unit into proper AC power source. **DO NOT use with DC power.**
3. Locate the Magnet ON / OFF switch and the MOTOR ON and OFF switches as shown below.

MOTOR ON SWITCH — Starts the motor (will not function unless the magnetic base is energized and the safety switch is activated).

MOTOR OFF SWITCH — Deactivates motor. Magnetic base remains energized and safety switch activated.

MAGNET ON / OFF-- Energizes - De-energizes the magnetic base. Magnet must be ON to activate the motor.

SAFETY SWITCH — Located in base of drill. Enables motor operation only when magnet is properly seated on a clean and flat work surface. Turns motor off if drill unit should lift occur while cutting.

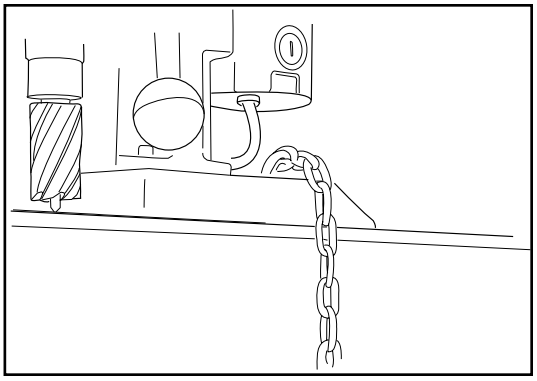
UNPACKING YOUR NEW MAGNETIC DRILL

1. Open shipping carton and lay the drill case on it's side.
2. Open the case lid and remove the hardware and literature packets.
3. **Read and Follow All Instructions** before attempting to operate your new Magnetic Drill.
4. Complete and mail the Product Registration Card now. It is important that Hougen Manufacturing, Inc. have a record of product ownership.
5. Included with your new Mag Drill are the following parts:
   24011 Hub Assembly
   01447 Feed Handles (3)
   04532 Feed Handle Knobs (3)
   10730 Safety Chain
   11741 Concentrated Cutting Fluid (Pint)
   24166 Hex-Key "T" Handle 7/32"
   10727 Allen Wrench 3/16"
   13013 Allen Wrench 5/32"
6. Using the handle of Magnetic Drill, lift unit out of the shipping case.
7. Remove all packing and securing material from the drill unit.
8. Your Magnetic Drill was factory adjusted prior to shipping. Check to make sure that all fasteners are snug and have not vibrated loose in transit.
9. Your new Magnetic Drill comes complete with an internal quill/arbor assembly. The 3/4" diameter arbor bore fits all 3/4"- shank "12,000-Series" Hougen Cutters.

Reread Safety Warnings listed in the Operator's Manual and on the drill unit to avoid injury. Follow operating procedures.

USE OF SAFETY CHAIN

The safety chain should be used to prevent the drill unit from falling in the event of a power failure or if the magnet breaks loose from the work surface. The safety chain should be attached to the drill by running it through the "D" ring located at the rear of the magnet, and tightly secured.



HOUGEN CUTTER INSTALLATION

1. Disconnect from power source.
2. Lay drill on its side with feed handles up or be sure Arbor clears table if unit is in normal operating position.
3. Remove set screws from spindle.
4. Insert proper pilot in shank end of Hougen Cutter. Pilot #24131 is recommended for use with spring loaded ejection on cutters 3/4" diameter and larger.
5. Insert Hougen Cutter until flats on cutter shank are aligned with set screw holes and are exactly perpendicular to axis of set screw holes. If 1/2" diameter shank cutter is used, slip (10851) Arbor Adapter over the cutter shank with adapter hole positioned exactly over flat on cutter shank prior to inserting into Arbor bore.
6. Insert set screws and tighten. Check to be certain that cutter is secure.

INSTALLATION OF CUTTING FLUID BOTTLE

1. With Magnetic Drill in operating position, turn feed handle so that cutter and pilot are above the work surface.
2. Set coolant bottle in carrying handle yoke with valve facing toward the spindle of the drill. Press down to seat nipple into port.
3. Tighten mounting screw on back of coolant bottle.
4. To test cutting fluid flow (with the magnet ON and motor OFF), feed the arbor gently toward the work surface until the pilot is pushed up into the cutter. Open valve on coolant bottle cap. Fluid should filter down onto the work surface through the groove in the pilot.
5. To insure proper cutter lubrication, always make sure that the slot in the pilot is kept clean.

OPERATION OF CUTTING FLUID BOTTLE

1. With Magnetic Drill in operating position, turn feed handle so that cutter and pilot are above the work surface.
2. Turn cutting fluid bottle valve to “OFF” position.
3. Remove bottle cap, fill with cutting fluid and replace cap.
4. Open cap vent by turning knurled screw 2 turns.
5. Test metering capabilities (MAGNET ON - MOTOR OFF) by feeding the Arbor gently toward work surface until pilot is pushed up into Cutter, thus allowing fluid to filter down onto work surface through groove in pilot.

Note: As quill is fed toward material, fluid is drawn from the bottle. As quill is returned to it’s starting position, fluid will return to the bottle.

Note: Coolant flow has been predetermined. Valve intended for “ON-OFF” operation only. Trying to regulate coolant-flow with valve will cause valve to leak.

See Page 9 for optional Pressurized Coolant Bottle Assembly.

OPERATING INSTRUCTIONS

1. Make sure workpiece and bottom of magnet are free of chips, oil, etc.
2. Secure unit to workpiece with safety chain.
3. Position drill by sliding it and gently feeding Arbor so that pilot point is touching center of hole to be drilled.
4. Turn magnet ON by pressing the MAGNET ON button.
5. Select the proper RPM for the cutter diameter you are using. Use the 450 setting for 7/16” thru 1-1/16” H.S.S dia. and use the 750 setting for 9/16” thru 1-1/2” Carbide dia.. Note: The RPM settings for the diameter ranges are to be used as starting points only. Setting may vary per application.
6. Turn Feed Handle, raising the cutter until the pilot is above the work surface.
7. Open the cutting fluid bottle valve.
8. Make certain that cutter is clear of workpiece and turn motor ON by pressing the MOTOR ON button.
9. Feed Hougen Cutter slowly into workpiece. Only after cutting path is established to a depth of about 1/16” can full force be applied to feed handles.
10. Ease up on feed pressure as cutter starts breaking through.
11. At conclusion of cut, turn motor OFF by pressing motor STOP button. Turn Feed Handles to raise Arbor thereby ejecting the slug if it hasn’t already fallen free.
12. Close the cutting fluid bottle valve.
13. Turn magnet OFF by pressing the magnet OFF button. As the magnet de-energizes, the rear of the magnet should lift up off the work surface.
14. Disconnect from power source.
15. If necessary, remove chips from cutter and magnet, preferably wearing leather work gloves and/or with pliers.
16. Disconnect safety chain and you are ready to move unit to new drilling position.

Special Instructions for Horizontal or Overhead Operation

1. **Always Use Safety Chain.**
2. Use Hougen Slick-Stick™ (P/N: 11745-6) or animal-fat base solid- lubricant applied liberally to cutter.
3. For horizontal use, apply cutting fluid to external parts of cutter with plastic bottle or oiling can, or use the optional pressurized coolant bottle assembly (P/N 24140).

MAGNET OPERATION

SPECIAL NOTES:

The magnet on the HMD508 is a dual voltage magnet. When turning on the magnet a control voltage is supplied to the magnet. When you turn the motor on, the control voltage is increased to the magnet. This combination provides a better holding power on the work surface.

With this special feature however, it requires that you do not leave the magnet and motor on for extended periods of time. This does not impede the normal performance of your unit. The increased holding power if left on could cause overheating of the unit. Take care of your unit by unplugging your unit when not in use. Failure to follow these special guide lines could cause damage to your unit and therefore result in personal injury.

Always remember that the magnet’s holding power is directly related to the workpiece thickness and surface condition. Since magnetic attraction diminishes with thinner material or rough surfaces, mechanical clamping of drill unit to the workpiece should be used when cutting thin material (3/8” or less) or material with uneven surfaces.

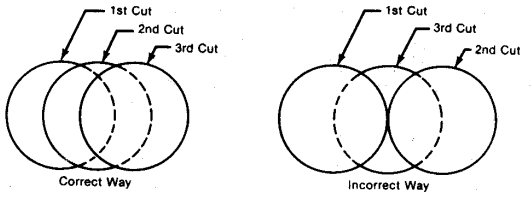
HINTS FOR SMOOTHER OPERATION

1. Keep insides of Hougen Cutter clear of chips. Chips will interfere with cutting to maximum depth as well as impede free oil flow from arbor to work and can cause cutter breakage.
2. Keep workpiece, machine, arbor and Hougen Cutter free of chips and dirt.
3. Tighten all bolts regularly.
4. We highly recommend using a light viscosity cutting fluid (preferably RotaMagic™ Cutting Fluid - P/N: 11742-4).
5. Occasionally check metering of cutting fluid flow. Lack of coolant may cause Hougen Cutter to freeze in cut, slug to stick, and may result in poor cutter life.
6. Always start cut with light feed pressure and then increase sufficiently to achieve maximum cutting rate.
7. Ease off on pressure as cutter begins to break through at end of cut.
8. Keep magnet and cutter free of chips and dirt.
9. if slug hangs up in cutter, turn motor off and bring cutter down on flat surface. This will normally straighten a cocked slug, allowing it to be ejected.

#1 cause of cutter breakage and prematurely dull teeth is too little feed pressure.

10. Cut overlapping holes as illustrated, using minimum steady pressure. When cutter is removing material whose cross-section is half or less than the cutter diameter, pilot should be removed and tool should be fed with care. External lubrication should be used.

NOTE: When cutting in this manner, cutting fluid may escape from the cutting area. Tool should be fed with care, using external lubrication.



11. When cutting large diameter or deep holes, it may be necessary to stop in the middle of the cut to add cutting fluid to the reservoir and also remove chips from around the arbor. When doing this, do not raise the cutter out of the hole. Doing so can allow chips to get under the teeth of the cutter and make it difficult to restart the cut.

“Babying” the Cutter through the cut will only decrease tool life.

RECOMMENDED RPM’S

450 RPM
7/16” - 1-1/16” H.S.S. Cutter
12mm - 22mm H.S.S Cutters
750 RPM
9/16” - 1-1/2 Carbide Cutters
14mm - 40mm Carbide Cutters

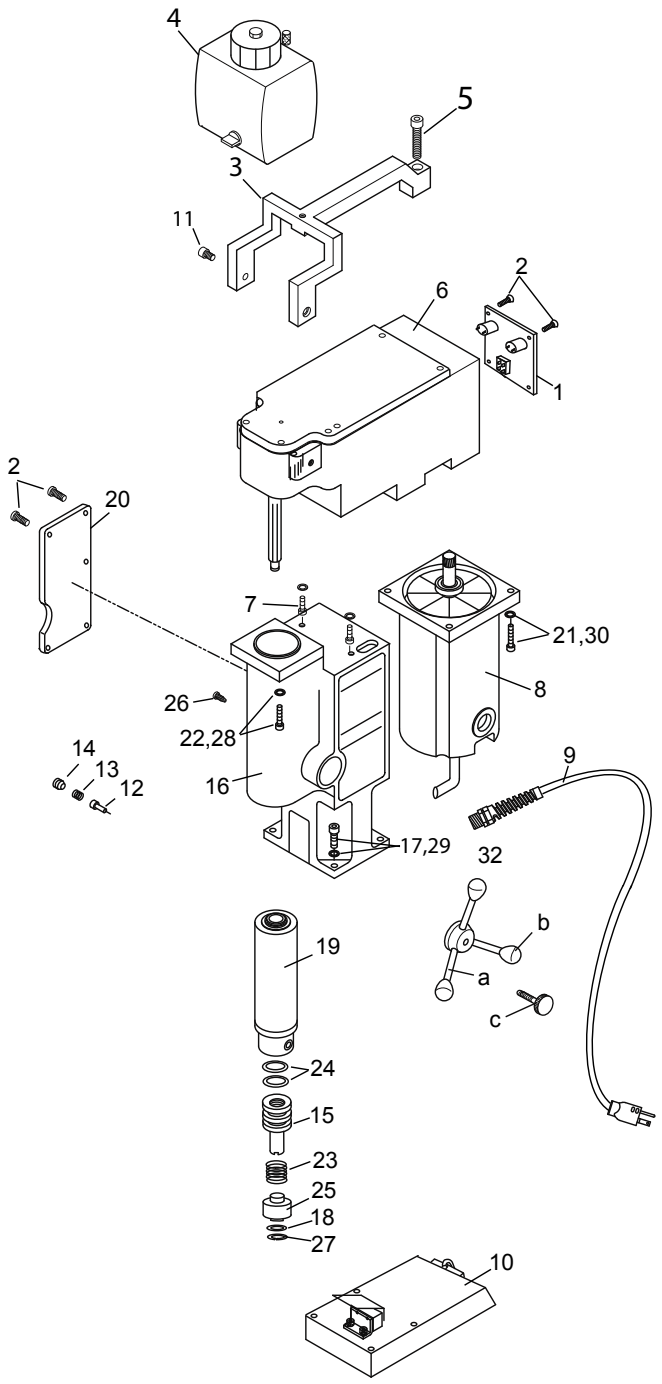
MAINTENANCE

In□
maintenance should be done periodically, based on use.

1. Regularly tighten all fasteners and replace any worn components.
2. Check motor brushes and replace if worn.
3. Check power cord and motor cord. If cracked or frayed, return to authorized repair center for replacement.

HOUGEN HMD508 EXPLODED VIEW

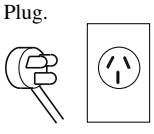
0508102, 0508202, 0508302 & 0508402



Item	Part #	Description	Qty
*1	04613	End Panel Assembly **120v**	1
	04663	End Panel Assembly **240v**	1
2	41044	B.H.C Screw #10-32 X 1/2	9
3	24033	Carrying Handle	1
4	24228	Coolant Bottle Assembly	1
5	40108	S.H.C Screw 1/4 X 1-1/4	1
*6	05994	Gear Box Assembly	1
7	04159	S.H.C Screw #10-32 X 5/8	2
*8	07000	Motor Assembly **120v**	1
	07002	Motor Assembly **240v**	1
9	24073	Power Cord Assembly **120v** (0508102)	1
	24213	Power Cord Assembly **240v** (0508202)	1
	24214	Power Cord Assembly **240v** (0508302 type I plug)	1
	24227	Power Cord Assembly **240v** (0508402 no plug)	1
*10	24223	Magnet/Safety Switch Assem.**120v**	1
	24219	Magnet/Safety Switch Assem.**240v**	1
11	10971	SHC Screw 1/4-20 X 1/2	2
12	24051	Quill Stop	1
13	24125	Spring	1
14	04207	Set Screw 3/8-16 X 3/8	1
15	24193	Spline Shaft Extension	1
16	05400	Housing Assembly	1
17	40077	SHC Screw 1/4-20 X 1”	4
18	24198	Seal 1/2 ID X 11/16 OD	1
*19	24199	Quill / Arbor Assembly	1
20	04620	Front Panel Assembly **120v**	1
	04665	Front Panel Assembly **240v**	1
21	01116	SHC Screw #10-32 X 1	4
22	24077	SHC Screw #10-32 X 7/8	4
23	24195	Spring	1
24	24126	O-Ring	2
25	24194	Spring Plunger	1
26	04158	SCR Self-Tap 10-24 X 3/8	1
27	10517	Retaining Ring	1
28	50038	#10 Lock Washer	4
29	90028	1/4” Lock washer	4
30	04307	#10 Flat washer	4
31	05372	Grease, Lubrplate	.01oz
32	24011	Feed Hub Assembly (includes a-c)	1
a	04558	Feed Handle	3
b	04532	Handle Knob	3
c	24007	Feed Hub Knob	1

* See Following Pages For Assembly Breakdowns

The **0505302** is assembled with a Type I Plug.



The **0505402** is assembled without an electrical plug at the end of the power cord.

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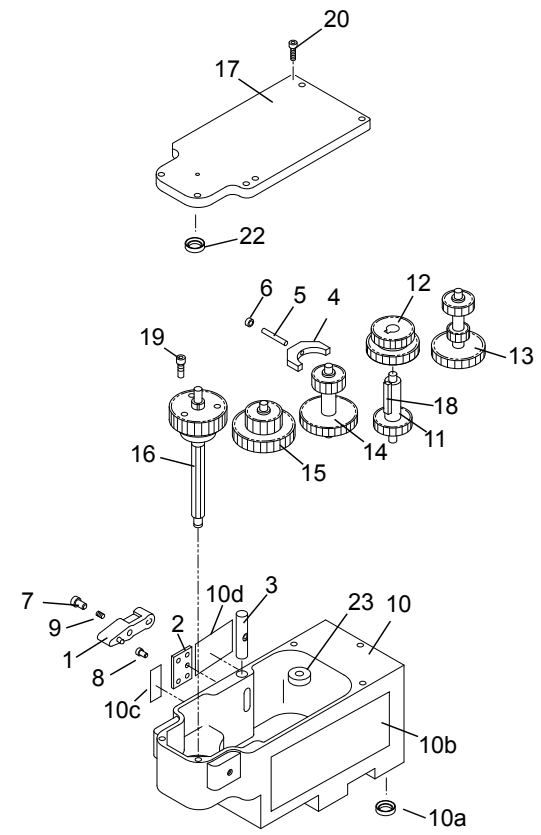
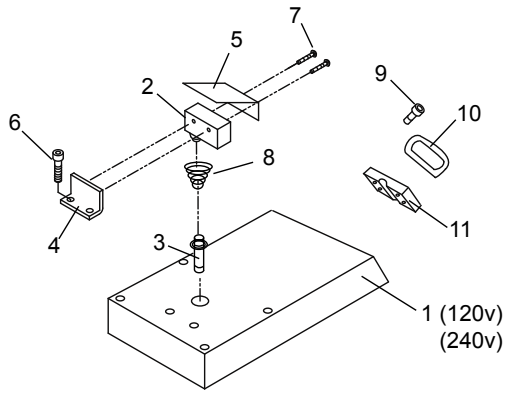
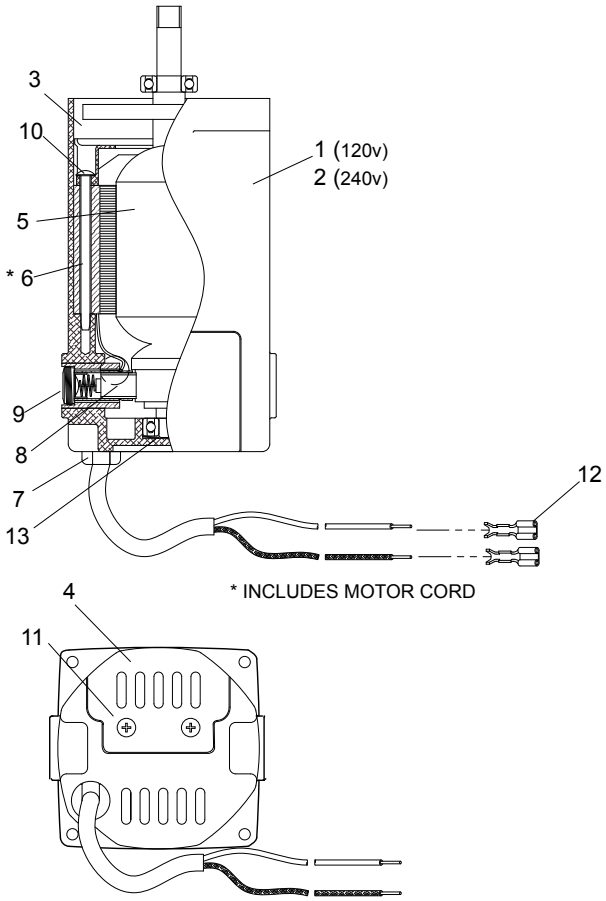


*These Parts Are Included In Kit 24230.

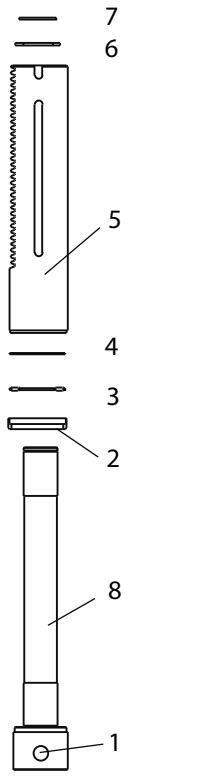
05994 Gear Box Assembly			
Item	Part #	Description	Qty
*1	24229	Gear Shift Handle	1
*2	24046	Gear Switch Plate	1
3	24038	Gear Shift Pin	1
4	24039	Gear Shift Yoke	1
5	24037	Dowel Pin 3/16 X 1-1/4	1
6	24036	Gear Shift Spacer	2
*7	24101	SHSLD Screw 1/4 X 3/8	1
8	04157	FHSC Screw #10-32 X 3/8	4
*9	05740	Spring	1
10	05993	Gear Box Assembly (includes a-d)	1
10a	24096	Lip Seal	1
10b	05181	Hougen Label	1
10c	05991	Drill Speed Label	1
10d	07129	Carbide Speed Label	1
11	24027	Gear & Shaft Assembly	1
12	05989	Gear 32/39 Tooth	1
13	05992	Gear & Shaft Assembly 15/20 Tooth	1
14	24104	Gear & Shaft Assembly 14 Tooth	1
15	24103	Gear & Shaft Assembly 15 Tooth	1
16	24102	Spline Shaft Assembly	1
17	04623	Cover & Bearing Assembly	1
18	24030	Key 3/16 sq. X 1.70	1
19	24082	SHC Screw 6-32 X 3/8	3
20	40038	SHC Screw 10-32 X 5/8	6
21	24152	Grease Lubriplate GR132	
22	24095	Lip Seal	1
23	24100	Ball Bearing	4



24223 120v Magnet Assembly 24219 240v Magnet Assembly			
Item	Part #	Description	Qty
1	24222	Magnet Assembly 120v	1
	24220	Magnet Assembly 240v	1
2	10990	Safety Switch Assy.	1
3	24221	Plunger Assembly	1
4	04909	Safety Switch Bracket	1
5	10983	Shield	1
6	10971	Screw SHC 1/4-20 X 1/2	2
7	10972	Screw BHC 6-32 X 7/8	2
8	17271	Spring	1
9	41046	Screw SHC 10-32 X 1/2	2
10	24144	“D” Ring 1” Wide	1
11	04698	Plate - Chain Hold down	1



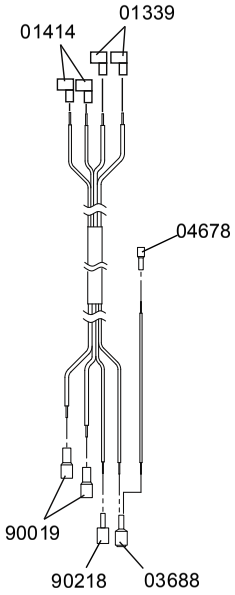
07000 120v Motor Assembly 07002 240v Motor Assembly			
Item	Part #	Description	Qty
1	05999	Motor Housing Assy. **120v**	1
1a	05996	HMD508 Label	1
1b	05997	Motor Specs Label **120v**	1
2	07001	Motor Housing Assy. **240v**	1
2a	05996	HMD508 Label	1
2b	05995	Motor Specs Label **240v**	1
3	24114	Motor Baffle	1
4	24066	Access Door	1
5	24041	Armature **120v**	1
	24207	Armature **240v**	1
6	24042	Field Assembly **120v**	1
	24206	Field Assembly **240v**	1
7	40373	Strain Relief	2
8	24045	Carbon Brushes **120v/240v**	2
9	24044	Brush Cap	2
10	24080	Screw #10 X 3-1/4 Self Tapping	2
11	24153	Screw #10 X 1/2 Self Tapping	2
12	90019	16-14 Connector	2
13	24093	Spring Washer	1



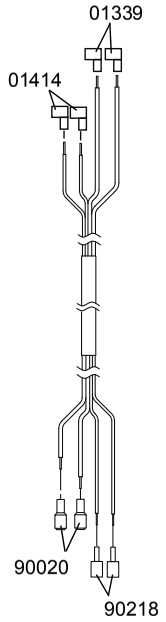
24199 Arbor / Quill Assembly			
Item	Part #	Description	Qty
1	40222	Set Screw 7/16-14 X .305	2
2	24013	Thrust Bearing Seal	1
3	24094	Thrust Bearing	1
4	24091	Thrust Washer	1
5	24016	Quill	1
6	24165	Washer	1
7	24164	Retaining Ring	1

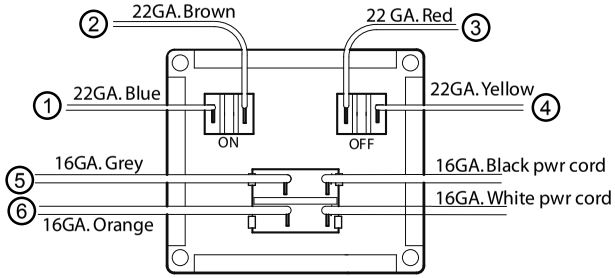
HMD508 Wiring Diagram 120v & 240v

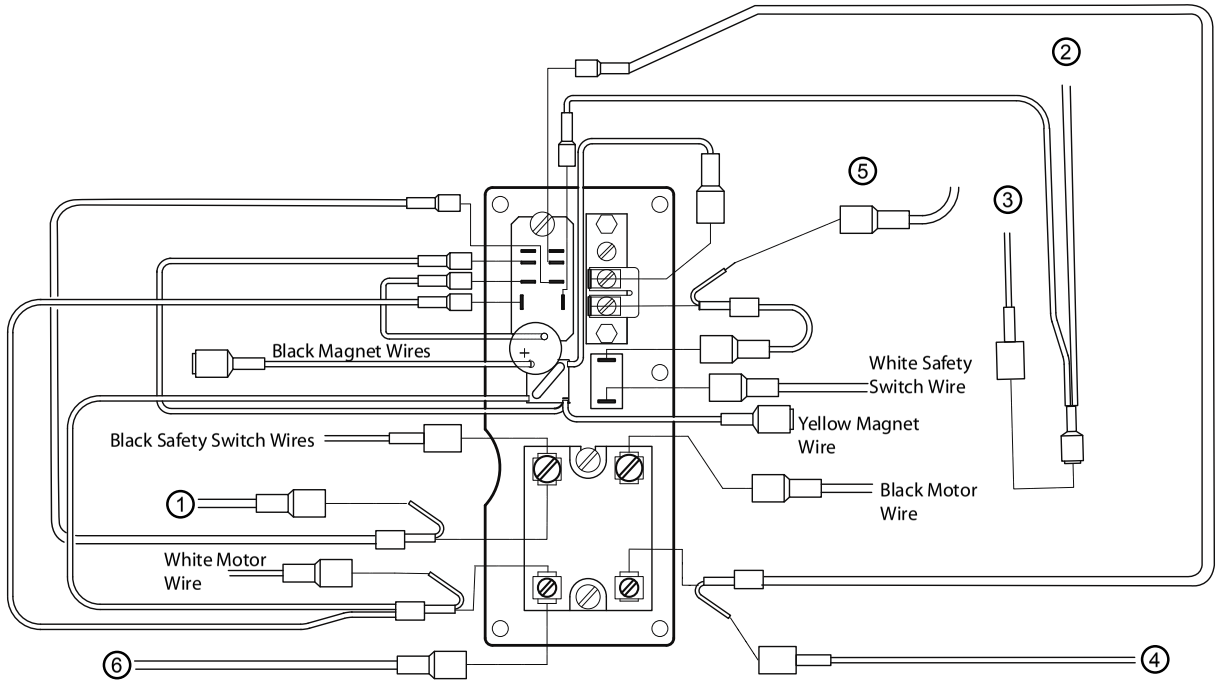
04689 WIRE HARNESS



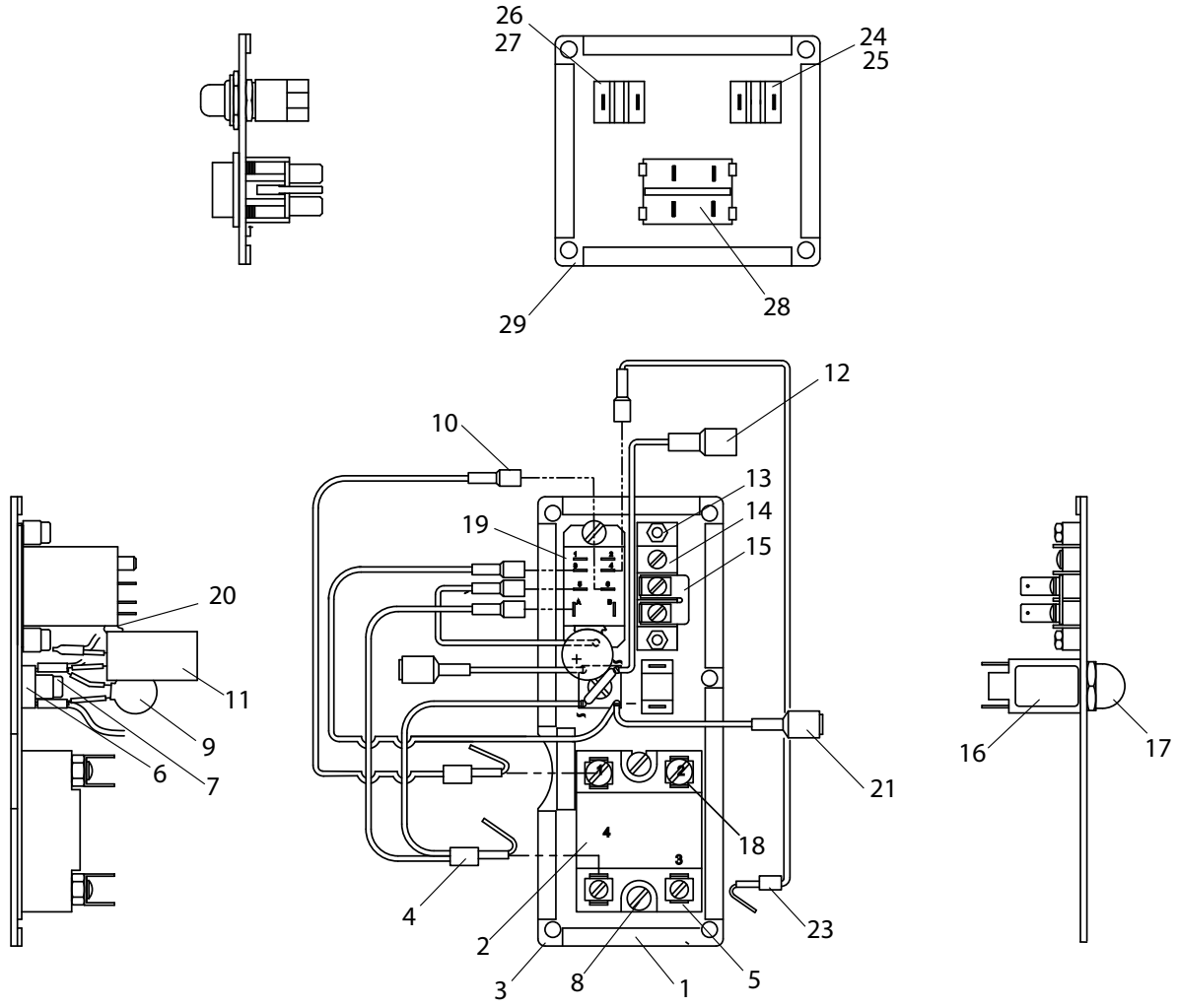
04647 WIRE HARNESS







HMD508 PANEL PARTS



Item	Part #	Description	Qty	Item	Part #	Description	Qty
1	40296	Sponge Seal	1	16	24141	Circuit Breaker 14A (120v)	1
2	04387	Relay	1		24216	Circuit Breaker 7A (240v)	1
3	04621	Faceplate Front	1	17	24142	Cover	1
4	90020	Terminal Piggy Back	2	18	04622	Double Terminal	3
5	01945	Terminal Spade	5	19	04690	Relay 15A (120v)	1
6	10705	Rectifier	1		07119	Relay 15A (240v)	1
7	01835	Nylon Nut	3	20	90036	Adhesive	1
8	40374	Nut #6-32 Jam	2	21	03688	Terminal Male Insulator	2
9	10718	Surge Suppressor (120v)	1	22	90019	Female terminal 16/14 GA.	1
	10760	Surge Suppressor (240v)	1	23	01310	Terminal Piggy Back	2
10	04678	Female Terminal 22/18 GA	5	24	04646	Switch Off	1
11	02916	Capacitor (120v)	1	25	04643	Red Seal	1
	07210	Capacitor (240v)	1	26	04645	Switch On	1
12	90218	Terminal Female	1	27	04644	Green Seal	1
13	01496	Spacer	2	28	04614	Rocker Switch (120v)	1
14	01547	Terminal Strip	1		04664	Rocker Switch (240v)	1
15	01944	Terminal Jumper	1	29	04615	Faceplate End	1

"12,000-SERIES" HOUGEN CUTTERS				
Cutter Diameter	Decimal Equiva-lent	Part Number		
		1" DOC	2" DOC	3" DOC
Use with Pilot		10531	10532	
7/16	.4375	12114	12214	-----
12mm	.4724	12312	12412	-----
Use with Pilot		10533	10534	
1/2	.5000	12116	12216	-----
13mm	.5118	12313	12413	-----
14mm	.5512	12314	12414	-----
9/16	.5625	12118	12218	-----
15mm	.5906	12315	12415	-----
5/8	.6250	12120	12220	-----
16mm	.6299	12316	12416	-----
17mm	.6693	12317	12417	-----
11/16	.6875	12122	12222	-----
18mm	.7087	12318	12418	-----
Use with Pilot		10527	10528	24131
19mm	.7480	12319	12419	12519
3/4	.7500	12124	12224	3-12224
20mm	.7874	12320	12420	12520
13/16	.8125	12126	12226	3-12226
21mm	.8268	12321	12421	12521
22mm	.8661	12322	12422	12522
7/8	.8750	12128	12228	3-12228
15/16	.9375	12130	12230	3-12230
1	1.0000	12132	12232	3-12232
1-1/16	1.0625	12134	12234	3-12234

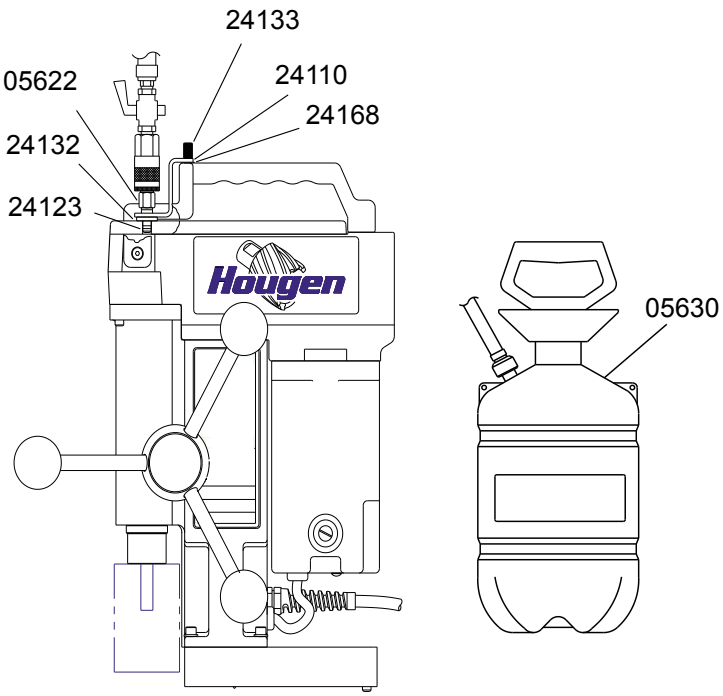
"Copperhead™"		
Cutter Diameter	Decimal Equivalent	Part Number (2" D.O.C)
Use with Pilot 10530		
14mm	.5512	18414
9/16	.5625	18218
15mm	.5906	18415
16mm	.6299	18416
11/16	.6875	18222
18mm	.7087	18418
20mm	.7874	18420
13/16	.8125	18226
22mm	.8661	18422
7/8	.8750	18228
15/16	.9375	18230
24mm	.9449	18424
25mm	.9843	18425
1	1.000	18232
26mm	1.0236	18426
1-1/16	1.0625	18234
28mm	1.1024	18428
1-1/8	1.1250	18236
30mm	1.1811	18430
1-3/16	1.1875	18238
1-1/4	1.250	18240
32mm	1.2598	18432
1-5/16	1.3125	18242
34mm	1.3386	18434
1-3/8	1.3750	18244
36mm	1.4173	18436
38mm	1.4961	18438
1-1/2	1.5000	18248
40mm	1.5743	18440

RECOMMENDED RPM'S	
450 RPM	**750 RPM**
7/16" - 1-1/16" H.S.S. Cutters 12mm - 22mm H.S.S. Cutters	9/16" - 1-1/2 Carbide Cutters 14mm - 40mm Carbide Cutters

OPTIONAL PRESSURIZED COOLANT BOTTLE
24140

Part #	Description	Qty
05622*	QUICK CONNECT	1
05630*	COLLANT BOTTLE ASSY	1
24110*	SCREW, CAPTIVE	1
24123*	“O” RING	1
24132*	ADAPTER	1
24133*	BRACKET	1
24168*	NYLON FLAT WASHER	1

* PARTS INCLUDED WITH 24140



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of incid□
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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.

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