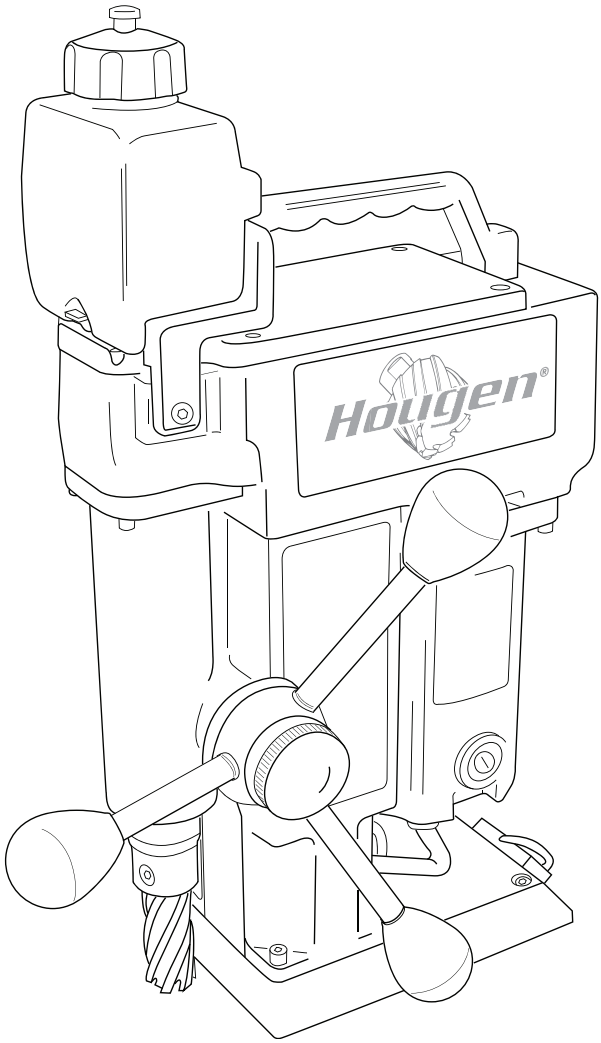
Hougen®

Solving holemaking problems through innovation™

HMD505 & 508 SERIES
PORTABLE MAGNETIC DRILL

OPERATOR'S MANUAL

COVERS DRILL PART NUMBERS 0505102, 0505202, 0505302 & 0505402,
& 0508102, 0508202, 0508302 & 0508402



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

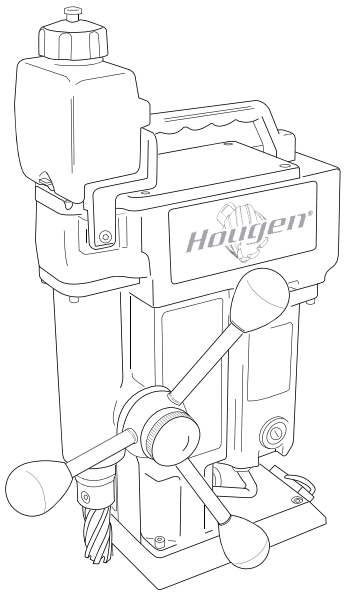
OM5050916 Printed in U.S.A.

HOUGEN® PORTABLE MAGNETIC DRILL
MODEL HMD505 & HMD508 SERIES

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.

Part No.	Description
0505102	HMD505, 2 speed with coolant, 115V
0505202	HMD505, 2 speed with coolant, 230V
0505302	HMD505, 2 speed with coolant, 230V Type I Plug
0505402	HMD505, 2 speed with coolant, 230V No Plug
0508102	HMD508, 2 speed with coolant, 115V
0508202	HMD508, 2 speed with coolant, 230V
0508302	HMD508, 2 speed with coolant, 230V Type I Plug
0508402	HMD508, 2 speed with coolant, 230V No Plug



Specifications

Cutter Type....."12,000-Series"
Hole Capacity.....7/16" to 2-3/8" (12mm to 52mm)
Depth of Cut..... 3" (76mm)
Motor..... **HMD505:** 250/450 RPM, 14A
HMD508: 450/750 RPM, 14A
Net Weight.....45 lbs. (20.3 kg)

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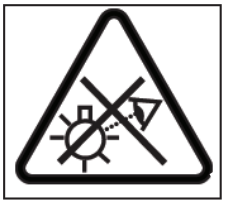
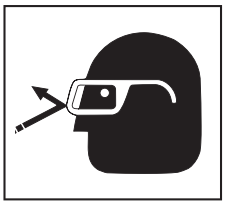
WARNING

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

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



Do not stare at operating light.



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

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.

IMPORTANT SAFETY INSTRUCTIONS

⚠ WARNING: **Read all safety warnings, instructions, illustrations and specifications provided with this power tool.** *Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.*

1. Work Area Safety

a) Keep your work area clean and well lit. *Cluttered or dark areas invite accidents.*

b) 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.*

c) Keep children and bystanders away while operating a power tool. *Distractions can cause you to lose control.*

2. Electrical Safety

a) Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools. *Unmodified plugs and matching outlets will reduce risk of electrical shock.*

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

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

d) Do not abuse the cord. Never use the cord for carrying or unplugging the power tool. Keep cord away from heat, oil, sharp egdges or moving parts. *Damaged or entangled cords increase the risk of electric shock.*

e) When operating a power tool outdoors, use an outdoor extension cord suitable for outdoor use. *Use of cord suitable for outdoor use reduces the risk of electric shock.*

f) If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply. *Use of an RCD reduces the risk of electric shock.*

3. Personal Safety

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

b) Use personal protective equipment. Always wear eye protection. *Protective equipment such as dust mask, non-skid shoes, hard hat or hearing protection used for appropriate conditions will reduce personal injuries.*

c) Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool. *Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.*

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

e) Do not overreach. Keep proper footing and balance at all times. *This enables better control of the power tool in unexpected situations.*

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

g) If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. *Use of dust collection can reduce dust-related hazards.*

h) Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles. *A careless action can cause severe injury within a fraction of a second.*

i) Always use safety chain. *Mounting can release.*

4. Power Tool Use and Care

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

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

c) Disconnect the plug from the power source and/or remove the battery pack, if detachable, from the power tool before making any adjustments, changing accessories or storing power tools. *Such preventative safety measures reduce the risk of starting the tool accidently.*

(Continued on page 4)

Save all warnings and instructions for future reference.

IMPORTANT SAFETY INSTRUCTIONS

d) Store idle power tools out of reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. *Power tools are dangerous in the hands of untrained users.*

e) Maintain power tools and accessories. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. *Many accidents are caused by poorly maintained power tools.*

f) Keep cutting tools sharp and clean. *Proper maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.*

g) Use the power tool, accessories and tool bits etc. in accordance with the instructions, taking into account the working conditions and the work to be performed. *Use of the power till for operations different from those intended could result in a hazardous situation.*

h) Keep handles and grasping surfaces, clean and free from oil and grease. *Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.*

5. Service

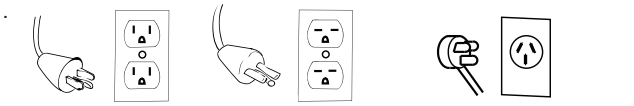
a) Have your power tool serviced by a qualified repair person using only identical replacement parts. *This will ensure that the safety of the power tool is maintained.*

ADDITIONAL SAFETY INSTRUCTIONS

Safe Electrical Connection

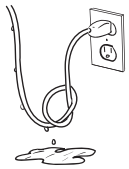
Your Drill is rated for use on 115VAC or 230V at 50-60Hz. Do not attempt to use drill on power sources rated other than this.

Plugs and Receptacles



Typical USA 115V Typical USA 230V 230V Type I Plug

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 a 3-prong grounding type plug 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.

LENGTH OF CORD, FEET	RECOMMENDED WIRE GAUGE	RECOMMENDED WIRE GAUGE
	115V MOTOR 10 - 12 AMPS	230V 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 Extension Cord Use

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 handhold or handle. 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.

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)

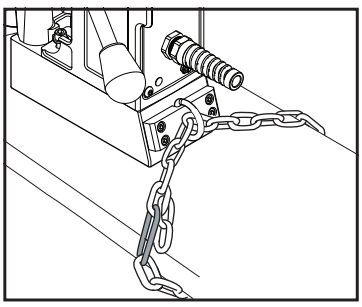
The circuit breaker is a thermal breaker. When it reaches the higher temperature rating it will trip and cause the unit to shut down. This is a protective device and can be reset after 5 to 10 minutes. To reset the breaker, press the breaker button back in. If it does not reset, let the unit cool a little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

Save all warnings and instructions for future reference.

SAFETY CHAIN INSTRUCTIONS

A safety chain should ALWAYS be used whenever operating the drill.

The safety chain prevents 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 attaches to the drill by running the chain thru the D-Ring on the back of the unit and then continuing around the material and/or work surface. Adjust the chain so it is tight and secure. Please refer to the diagram.



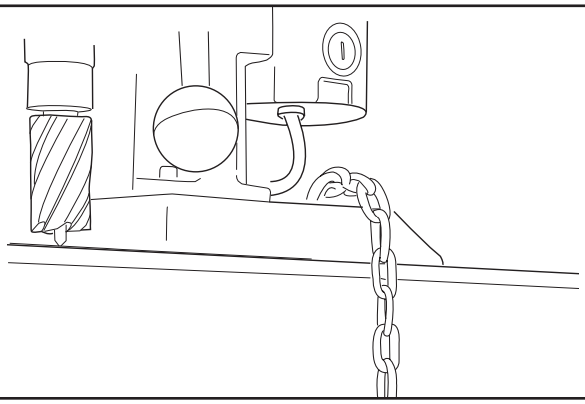
UNPACKING YOUR NEW MAGNETIC DRILL

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" diameter and use the 250 setting for 1-1/8" thru 2-3/8" diameters. 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 HMD505 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.

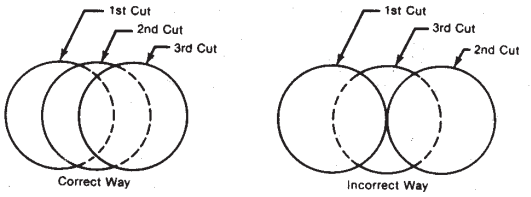
HINTS FOR SMOOTHER OPERATION

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.

HMD505 RECOMMENDED RPM'S

250 RPM	450 RPM
1/1/8" - 2-3/8" Dia. (28mm - 52mm)	7/16" - 1-1/16" Dia. (12mm - 27mm)

HMD508 RECOMMENDED RPM'S

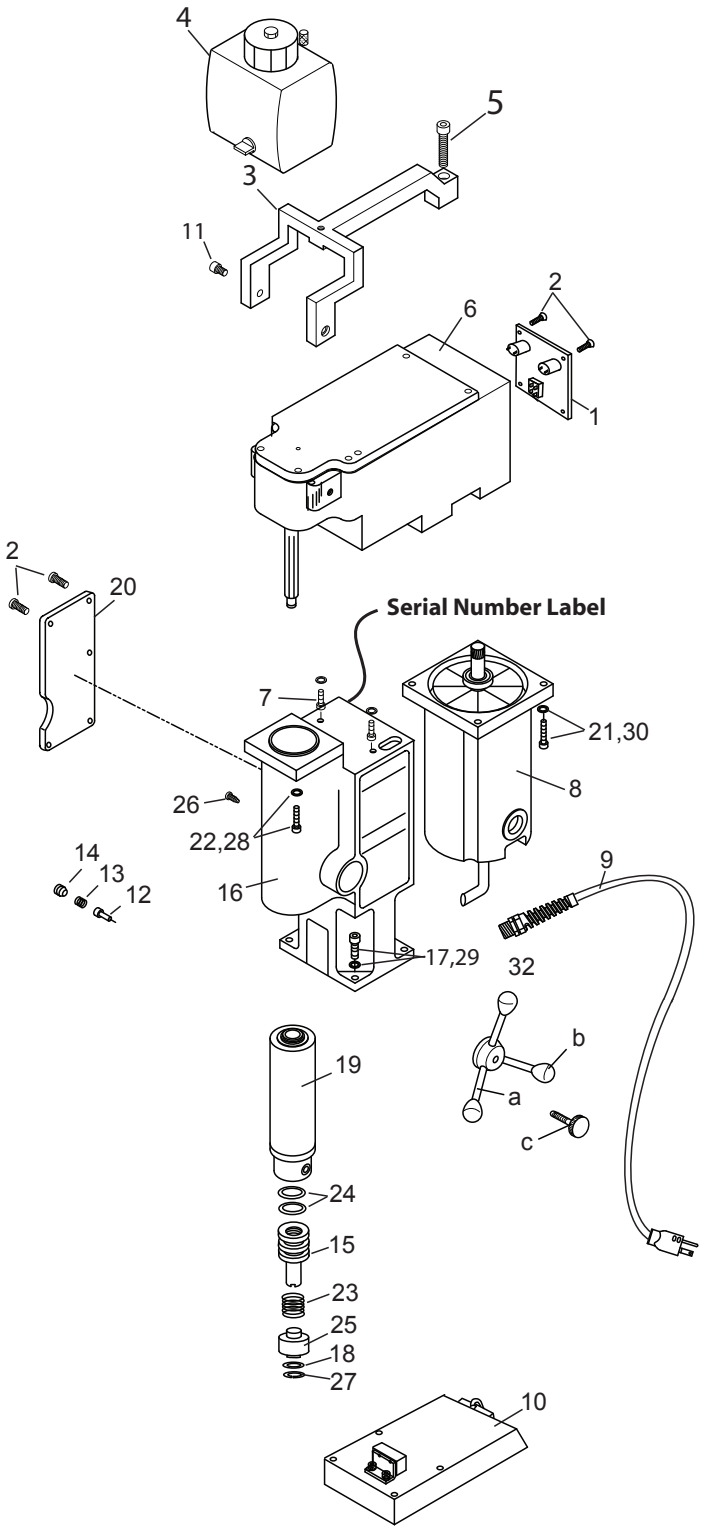
Diameter	Hardness of Steel	RPMS	NOTE:
7/16" - 9/16" H.S.S. (12mm - 14mm) H.S.S.	≤ 275 BHN	750 RPM	RPM recommendations are based on using your HMD508 drill with Hougen "12,000-Series" H.S.S. Cutters and Copperhead Carbide Tip Cutters. The RPM's do not represent optimum speeds for any given cutter diameter and application. For more information refer to Hougen's Speed & Feed Calculator located on Hougen.com, or call 1-800-426-7818 for Technical Support.
	> 275 BHN	450 RPM	
5/8" - 2-3/8" H.S.S. (15mm - 52mm) H.S.S.	Any	450 RPM	
9/16" - 1-1/8" Carbide (14mm - 28mm) Carbide	≤ 275 BHN	750 RPM	
	> 275 BHN	450 RPM	
1-3/16" - 2" Carbide (30mm - 40mm) Carbide	Any	450 RPM	

MAINTENANCE

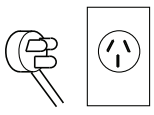
In order to minimize wear on moving parts and to insure smoother operation and longer life for your magnetic drill, the following maintenance should be done periodically, based on use.

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.

HMD505 & HMD508 EXPLODED VIEW



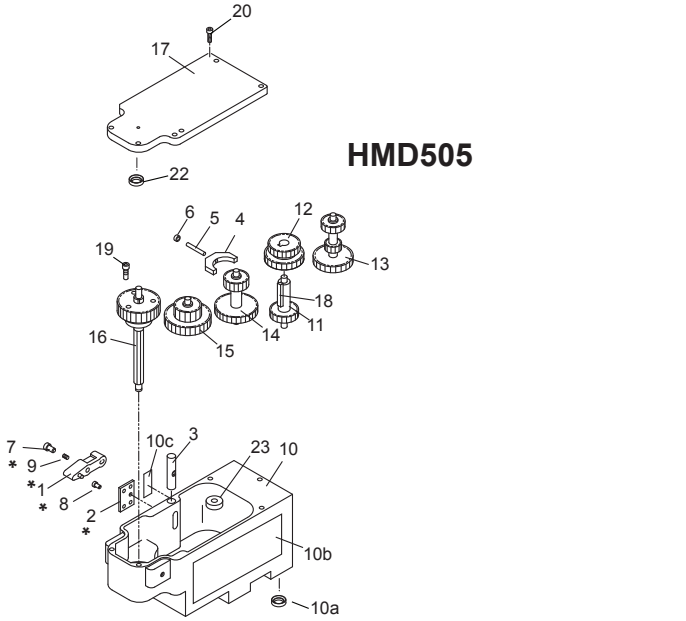
The **0505302 & 0508302** is assembled with a Type I Plug.



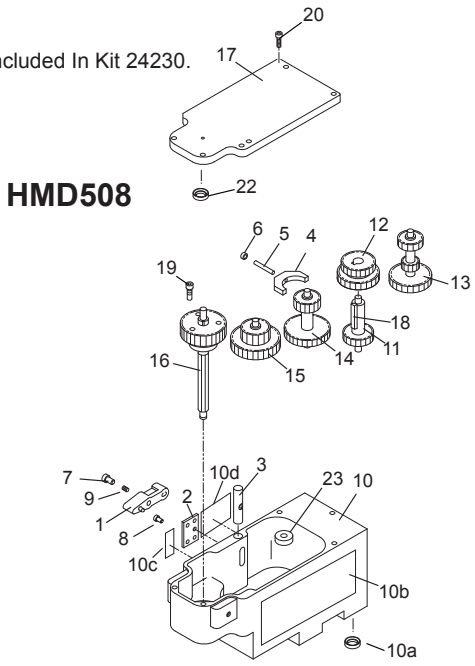
The **0505402 & 0508302** is assembled without an electrical plug at the end of the power cord.

Item	Part #	Description	Qty
1*	**04613**	End Panel Assembly **115V**	1
	04663	End Panel Assembly **230V**	1
2	**41044**	B.H.C Screw #10-32 X 3/8	9
3	**24033**	Carrying Handle	1
4	**24228**	Coolant Bottle Assembly	1
5	**40108**	S.H.C Screw 1/4-20 X 1-1/4	1
6*	**04625**	HMD 505 Gear Box Assembly	1
	05994	HMD 508 Gear Box Assembly	1
7	**40038**	S.H.C Screw #10-32 X 5/8	2
8*	**04631**	HMD505 Motor Assembly **115V**	1
	07177	HMD505 Motor Assembly **230V**	1
	07000	HMD508 Motor Assembly **115V**	1
	07002	HMD508 Motor Assembly **230V**	1
9	**24073**	Power Cord Assembly **115V** (0505102 & 0508102)	1
	24213	Power Cord Assembly **230V** (0505202, 050402 & 0508202, 0508402)	1
	24214	Power Cord Assembly **230V** (0505302 & 0508302 type I plug)	1
10*	**08228**	Magnet/Safety Switch Assem. **115V**	1
	08230	Magnet/Safety Switch Assem. **230V**	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 Oval	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 **115V**	1
	04665	Front Panel Assembly **230V**	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, Lubriplate	.01 oz
32	**24011**	Feed Hub Assy **115V** (includes a-c)	1
	24225	Feed Hub Assy. **230V** (includes a-c)	1
a	**04558**	Feed Handle **115V** models	3
	24224	Feed Handles **230V** models	3
b	**04532**	Handle Knob	3
c	**24007**	Feed Hub Knob	1

* See Following Pages for Assembly Breakdowns.



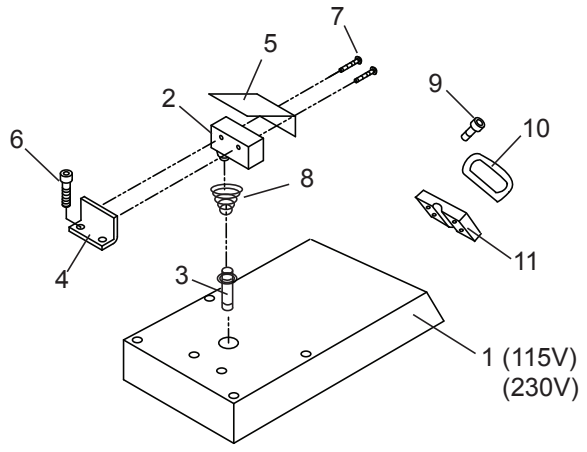
✱These Parts Are Included In Kit 24230.



04625 Gear Box Assembly - HMD505
05994 Gear Box Assembly - HMD508

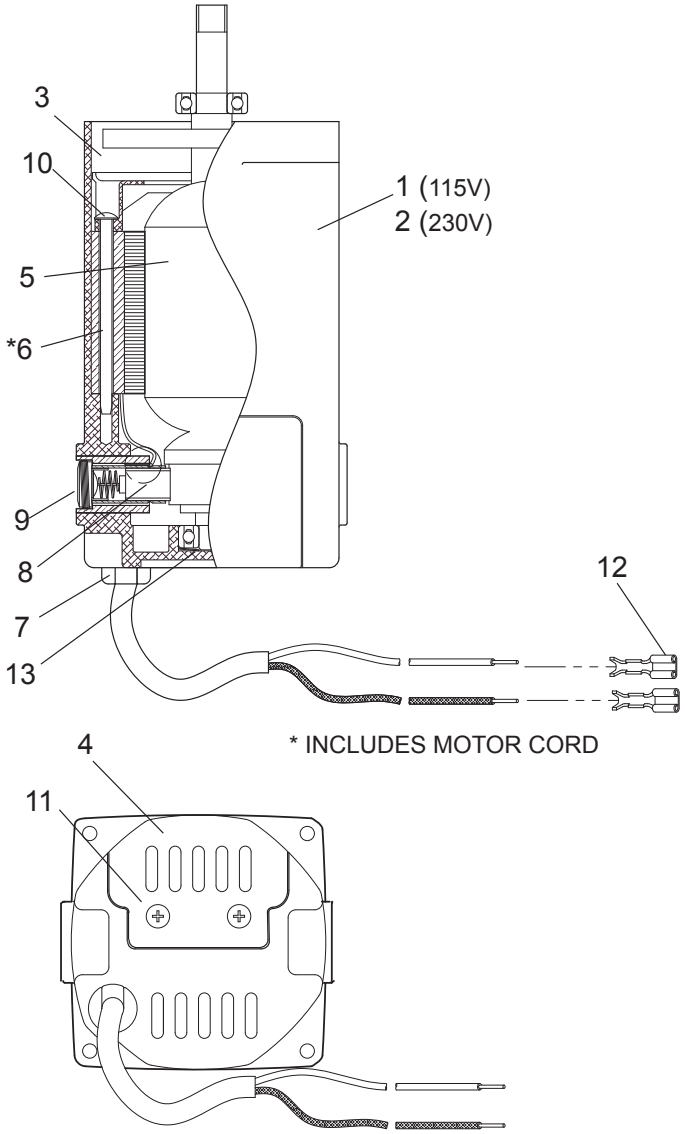
Item	Part #	Description	Qty
1	**24229**	Gear Shift Handle	1
2	**24046**	Gear Switch Plate	1
3	**24038**	Gear Shift Pin	1
4	**24039**	Gear Shift Yoke	1
5	**24037**	Dowel Pin 3/16 X 1-1/4	1
6	**24036**	Gear Shift Spacer	2
7	**24101**	SHSLD Screw 1/4 X 3/8	1
8	**04157**	FHSC Screw #10-32 X 3/8	4
9	**05740**	Spring	1
10	**04640**	Gear Box Assembly (includes a-c)	1
10a	**24096**	Lip Seal	1
10b	**05181**	Hougen Label	1
10c	**24060**	Drill Speed Label - HMD505	1
	05991	Drill Speed Label - HMD508	1
10d	**07129**	Carbide Speed Label - HMD508	1
11	**24027**	Gear & Shaft Assembly	1
12	**24026**	Gear 32/39 Tooth - HMD505	1
	05989	Gear 32/39 Tooth - HMD508	1
13	**24105**	Gear & Shaft Assembly - HMD505	1
	05992	Gear & Shaft Assembly - HMD508	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

MAGNET ASSEMBLY



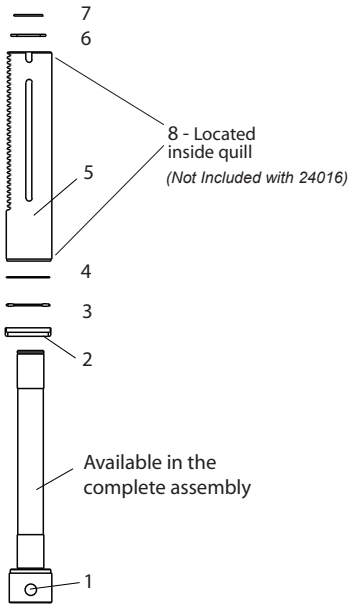
08228 115V Magnet Assembly
08230 230V Magnet Assembly

Item	Part #	Description	Qty
1	**08227**	Magnet Assembly **115V**	1
	08229	Magnet Assembly **230V**	1
2	**10990**	Safety Switch Assy.	1
3	**24221**	Plunger Assembly	1
4	**04909**	Safety Switch Bracket	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	**07887**	Plate - Chain Hold down	1



04631 HMD505 - 115V Motor Assembly
07177 HMD505 - 230V Motor Assembly
07000 HMD508 - 115V Motor Assembly
07002 HMD508 - 230V Motor Assembly

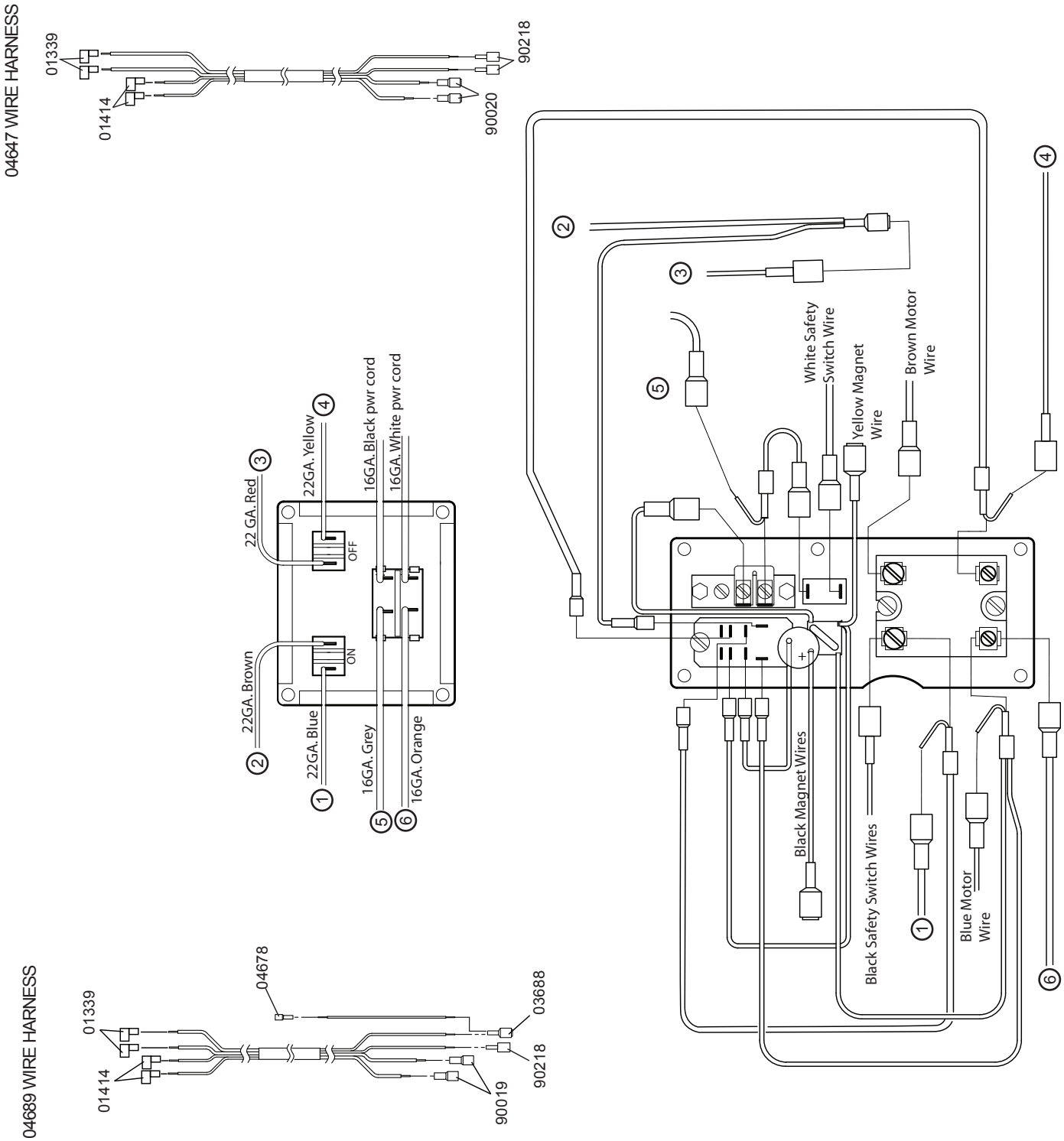
Item	Part #	Description	Qty
1	**04633**	Motor Housing Assy. HMD505 **115V**	1
	05999	Motor Housing Assy. HMD508 **115V**	1
1a	**04632**	HMD505 Label	1
	05996	HMD508 Label	1
1b	**04634**	Motor Specs Label HMD505 **115V**	1
	05997	Motor Specs Label HMD508 **115V**	1
2	**07178**	Motor Housing Assy. HMD505 **230V**	1
	07001	Motor Housing Assy. HMD508 **230V**	1
2a	**04632**	HMD505 Label	1
	05996	HMD508 Label	1
2b	**07154**	Motor Specs Label HMD505 **230V**	1
	05995	Motor Specs Label HMD508 **230V**	1
3	**24114**	Motor Baffle	1
4	**24066**	Access Door	1
5	**24041**	Armature **115V**	1
	24207	Armature **230V**	1
6	**24042**	Field Assembly **115V**	1
	24206	Field Assembly **230V**	1
7	**40373**	Strain Relief	2
8	**24045**	Carbon Brushes **115V/230V**	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



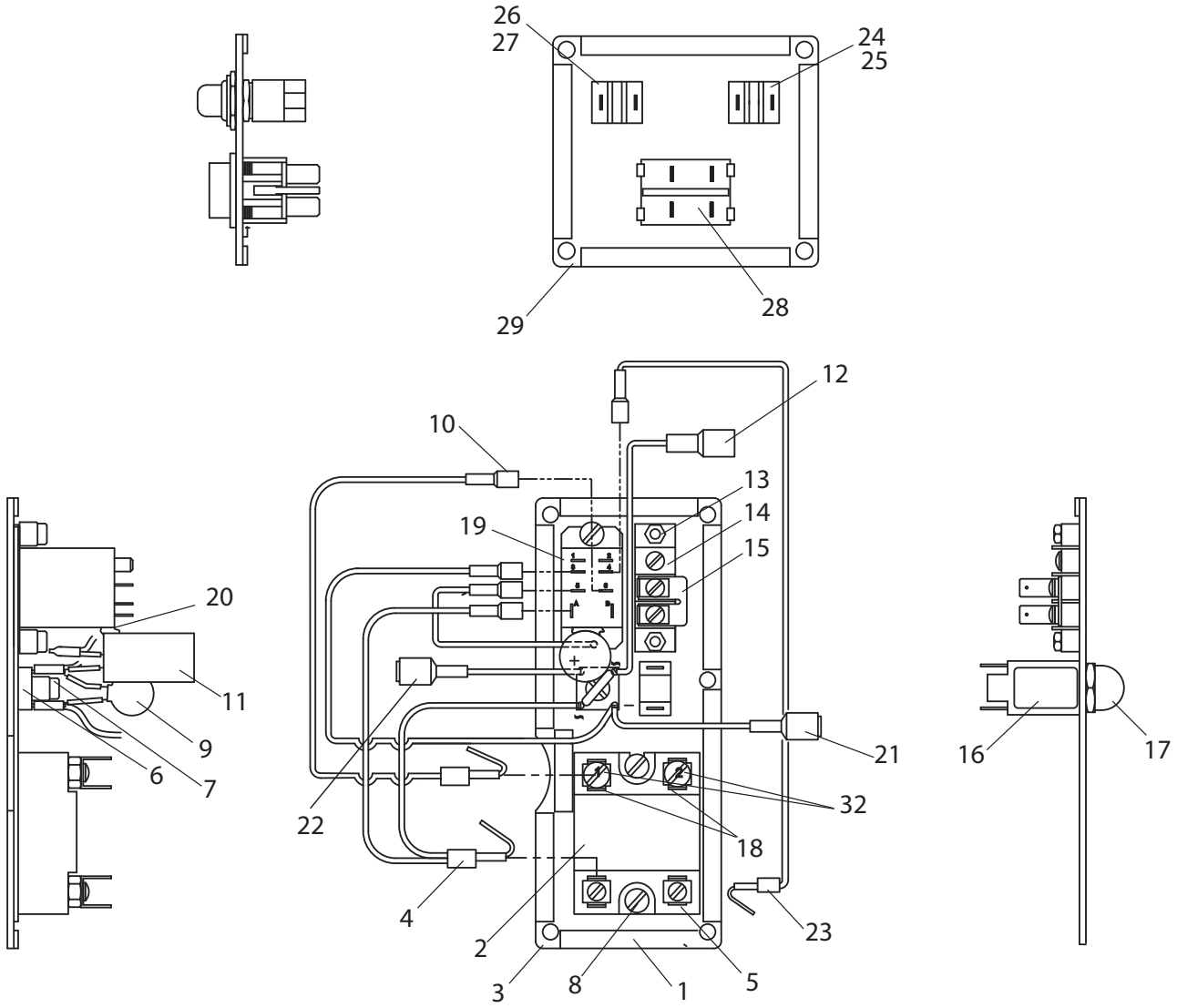
24199 Arbor / Quill Assembly

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
8	**24086**	Bushing *(not included with 24016)*	2

HMD505 & HMD508 HOOK UP DIAGRAM



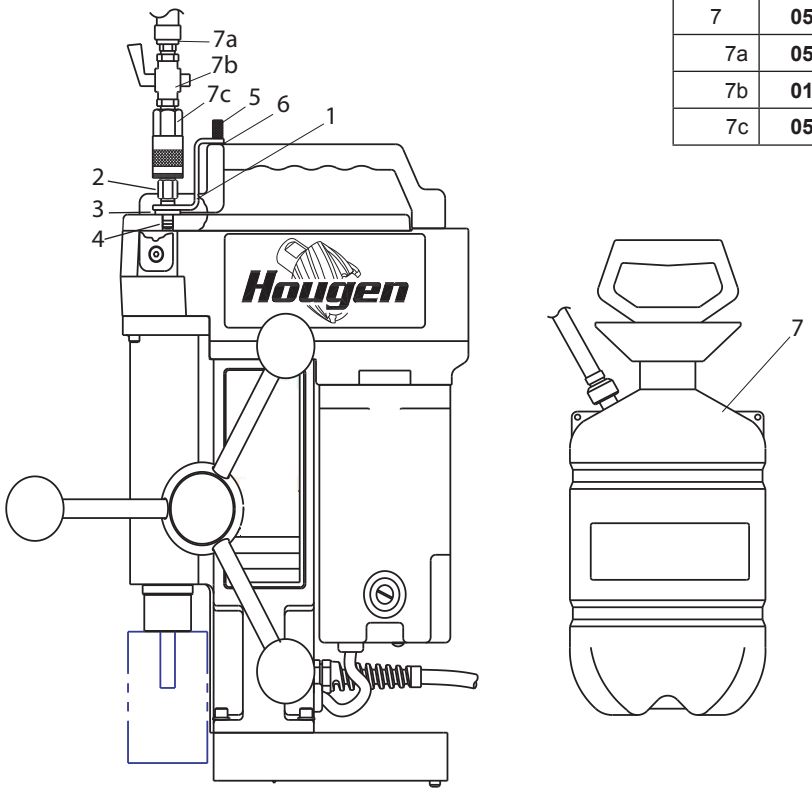
HMD505 & HMD508 PANEL PARTS



Item	Part #	Description	Qty
1	**40296**	Sponge Seal	1
2	**04387**	Relay	1
3	**04621**	Faceplate Front	1
4	**90020**	Terminal Piggy Back	2
5	**01945**	Terminal Spade	5
6	**10705**	Rectifier	1
7	**01835**	Nylon Nut	3
8	**40374**	Nut #6-32 Jam	2
9	**10718**	Surge Suppressor **115V**	1
	10760	Surge Suppressor **230V**	1
10	**04678**	Female Terminal 22/18 GA	5
11	**02916**	Capacitor **115V**	1
	07210	Capacitor **230V**	1
12	**90218**	Terminal Female	1
13	**01496**	Spacer	2
14	**01547**	Terminal Strip	1
15	**01944**	Terminal Jumper	1

Item	Part #	Description	Qty
16	**24141**	Circuit Breaker 14A **115V**	1
	24216	Circuit Breaker 7A **230V**	1
17	**24142**	Cover	1
18	**04622**	Double Terminal	2
19	**04690**	Relay 15A **115V**	1
	07119	Relay 15A **230V**	1
20	**90036**	Adhesive	1
21	**03688**	Terminal Male Insulator	2
22	**90019**	Female terminal 16/14 GA.	1
23	**01310**	Terminal Piggy Back	2
24	**04646**	Switch Off	1
25	**04643**	Red Seal	1
26	**04645**	Switch On	1
27	**04644**	Green Seal	1
28	**04614**	Rocker Switch **115V**	1
	04664	Rocker Switch **230V**	1
29	**04615**	Faceplate End	1
30	**07453**	#8-32 x 3/8 Screw	2

OPTIONAL PRESSURIZED COOLANT BOTTLE



24140 Coolant Bottle Assembly			
Item	**Part #**	**Description**	**Qty**
1	**24133**	Bracket	1
2	**05622**	Quick Fitting 1/4” Body	1
3	**24132**	Adapter	1
4	**24123**	O-Ring	1
5	**24110**	Thumb Screw	1
6	**24168**	Flat Nylon Washer	1
7	**05630**	Coolant Bottle Assembly includes 7a-7c	1
7a	**05556**	Fitting 1/8 NPT 3/8 Hose	1
7b	**01569**	Shut Off Valve	1
7c	**05621**	Quick Connector	1

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

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