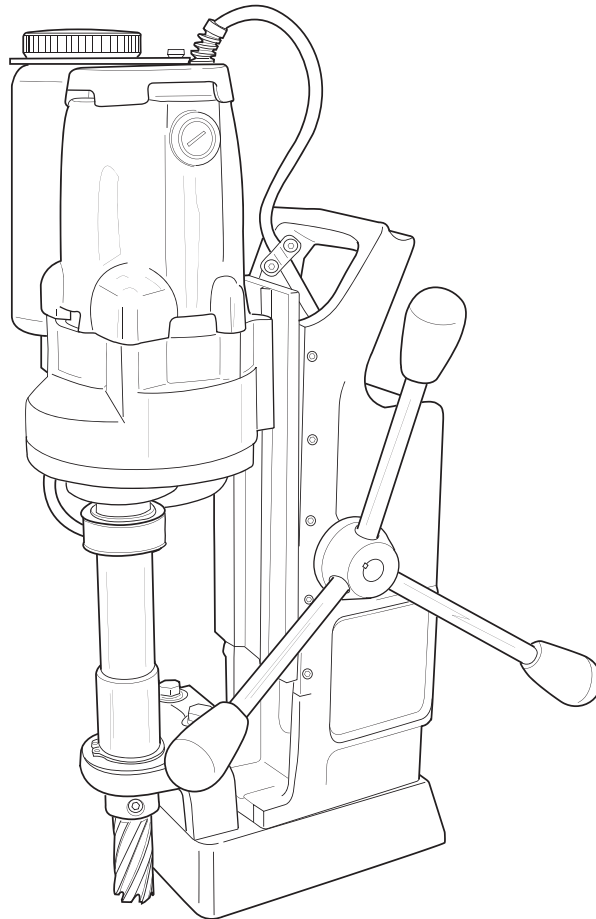




# **HMD914**

## **PORTABLE MAGNETIC DRILLS**

### **OPERATOR'S MANUAL**



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

# HOUGEN®

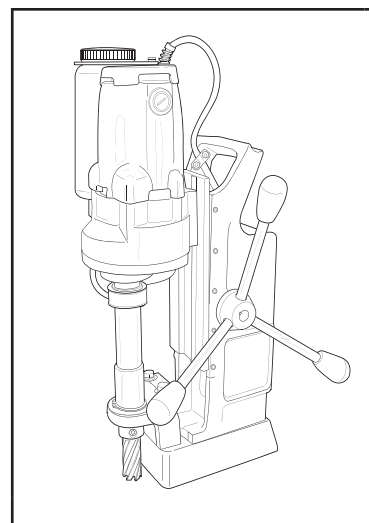
## Portable Magnetic Drills

### Models HMD914

#### 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



#### Specifications

Cutter Type.....Hougen "12,000-Series"  
Hole Capacity.....7/16" to 2-1/16"  
Depth of Cut.....3"  
Motor.....350 RPM, 11.2A  
Net Weight.....44 Lbs

## Commercial / Industrial Limited Warranty

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

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

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

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

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#### Hougen Patent Notice

The products in this manual may be covered by one or more of the following U.S. patents, foreign patents, and pending patents:  
4632610      4952102      5145296

Photographs and Specifications shown are accurate in detail at time of printing. Manufacture reserves the right to make improvements and modifications without prior notice.

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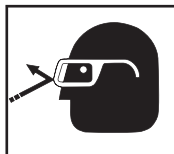
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## Unpacking Your New Portable Magnetic Drill

1. Open shipping carton and remove the literature and hardware packages.
2. Read and follow all Instructions before attempting to operate your new Magnetic Drill.
3. Complete and mail the Product Registration Card NOW. It is important that Hougen Manufacturing, Inc. have a record of product ownership.
4. Open hardware package and check contents.  
10565 1/8" Allen Wrench for Gib Adjustment  
10569 Feed handles (3)  
04532 Feed handle knobs (3)  
10727 3/16" Allen Wrench for reversing feed handle.  
10730 Safety Chain  
10779 7/32" Allen Wrench for cutter installation  
13013 5/32" Allen Wrench for arbor installation
5. Using the handle of the Magnetic Drill, lift unit out of the shipping case.
6. Remove all packing and securing material from the drill unit.
7. Screw the three Knobs (04532) onto the three feed handles (10569) and then screw the handles into the hub. Do not overtighten.
8. Your Magnetic Drill was factory adjusted prior to shipping. Check to make sure that all gib adjustment screws, motor mount screws, front support bracket screws, and magnet mounting screws are snug and have not vibrated loose in transit.
9. Your New Magnetic Drill comes complete with arbor mounted. The 3/4" diameter arbor bore fits all 3/4" - shank "12,000-Series" Hougen Cutters.

## 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:** 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.

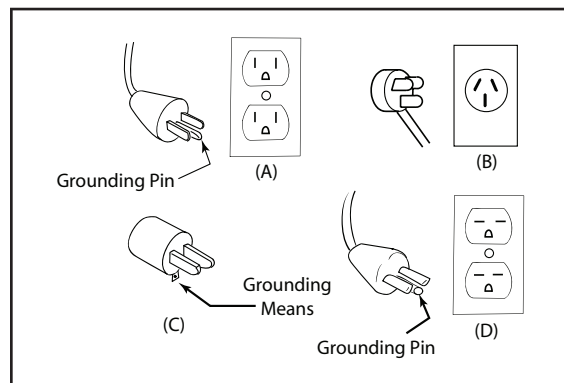
## 11. Use Right Tool

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.

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

Plugs and Receptacles



## 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

## 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.

## Important Safety Instructions - Continued

### 18. Maintain Tools With Care

Keep tools sharp and clean for better and safer performance. **Do not use** dull or broken Hougen 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 and 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 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.

### 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 (If Applicable)

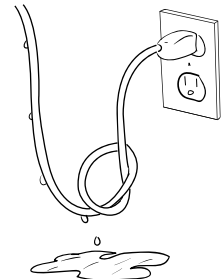
Changing of the circuit breaker to a higher amp rated breaker, or bypassing the circuit breaker is not recommended and will void product warranty.

### 27. 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.

### 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.

## SAFETY SWITCH INDICATOR LIGHT

The Safety Switch Indicator Light is a Standard Safety Feature on HMD914 magnetic drills. Its purpose is to inform the user that an unsafe condition exists.

### 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.
- Too thin material. Make sure material is at least 3/8" thick.

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

When light is Red the motor will still function, but "ON" switch becomes a momentary switch. (The switch must be held down to operate motor.)

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

## Operating Instructions

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 workpiece should be used when cutting thin material (3/8" or less) or material with uneven surfaces.

**Note: Always form a loose knot in the power cord close to the molded plug. This prevents cutting fluid from running down the cord and into the power receptacle. (Refer to the diagram within the Safety Instructions in this manual)**

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. Turn Feed Handle, raising the cutter until the pilot is above the work surface.
6. Open the cutting fluid valve.
7. Make certain that cutter is clear of workpiece and turn motor On by pressing the motor START button.
8. Feed the 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.
9. Ease up on feed pressure as cutter starts breaking through.
10. 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.
11. Turn magnet OFF by pressing the magnet OFF button.
12. **Disconnect from power source.**
13. If necessary, remove chips from cutter and magnet., preferably wearing leather work gloves and/or with pliers.
14. 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 grease 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.

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

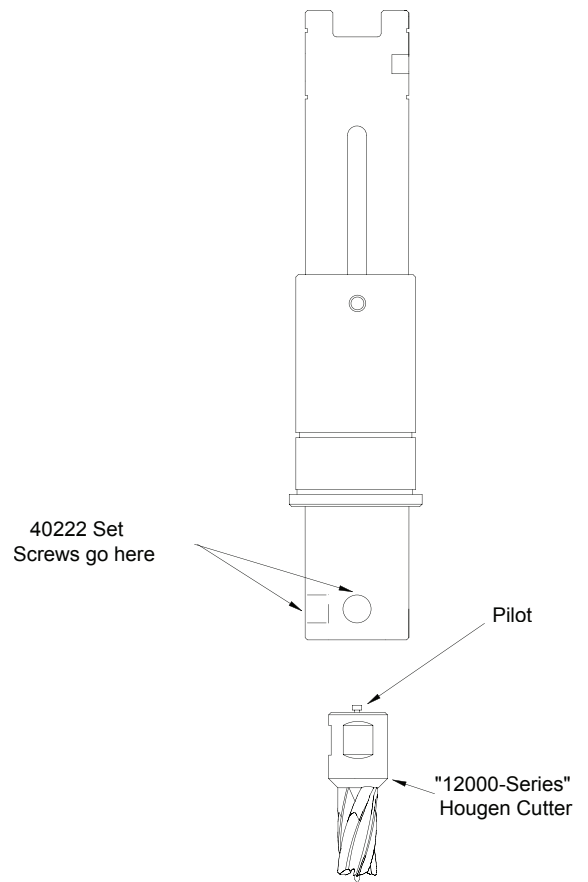
**"Babying" the cutter through the cut will only decrease tool life**

## Arbor Adjustment

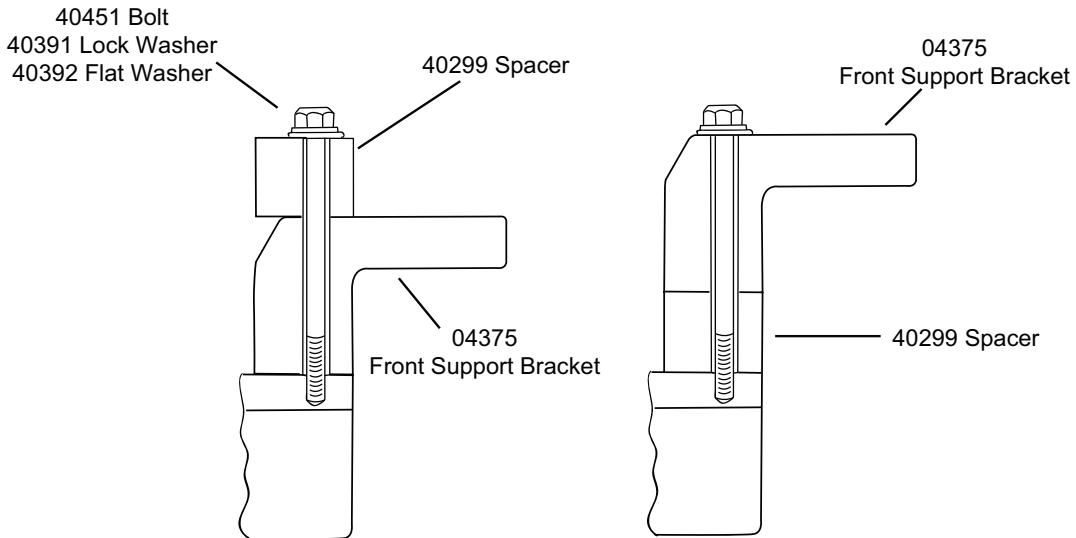
1. Loosen all Gib Screws (40237)
2. Feed the drill in and out a few times and then, with top of motor slide flush with top of housing, tighten the Gib Screws until you feel them touch the Steel Gib (40225)
3. Feed the drill in and out again.
4. Adjust Gib screws so that there is uniform pressure from top to bottom. (Top of motor slide flush with top of housing)
5. Turn each Gib Screw in about 1/8 to 1/4 turn, depending upon your preference.
6. Gibs should be tight enough so that slide moves in and out smoothly with no wobble or shaking. (looseness will cause cutter breakage)

## INSTALLING HOUGEN CUTTER IN ARBOR

1. Disconnect power source.
2. Lay drill on its side with feed wheel up to be sure arbor clears table if unit is in normal operating position.
3. Turn feed handles until cutter mounting set screws are exposed and then completely remove the set screws.
4. Insert proper pilot into shank end of the cutter.
5. Insert the Cutter until flats on cutter shank are aligned with set screw holes and is exactly perpendicular to the axis of set screw hole.
6. Insert Set Screws and tighten.



## Adjusting Arbor Support Bracket for Depth



**1" & 2" Depth of Cut**

**3" Depth of Cut**

*NOTE : Spacers must always be installed with short side toward arbor*

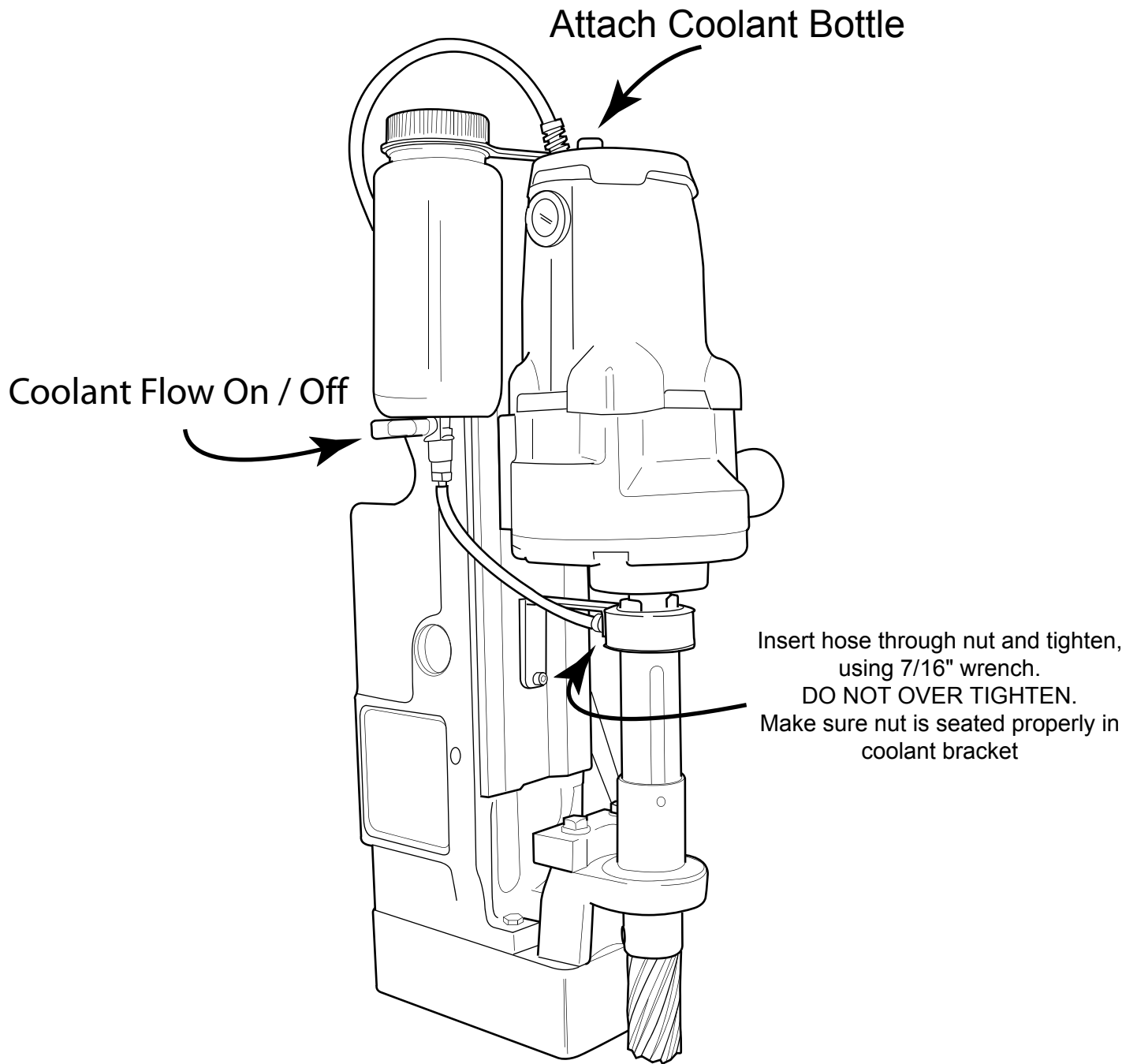
## Drill Maintenance

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

1. At intervals of 500 holes or 10 hours of actual running time, check all fasteners for tightness and retighten if necessary. This is especially important for fasteners required for smooth, efficient cutting action. These include: Gib screws and nuts, motor hold down screws, skid plate screws, bracket mounting screws and nuts, housing bolts, clamp screw and front support bracket bolts.
2. Coolant bottle must be attached to inducer under pressure with shut-off valve open to lubricate inducer o-rings whenever motor is running.
3. Apply grease to slide dovetails, brass gibs, and the feed gear rack. (For best results, use Shell Cyprina-RA or equivalent.)
4. Remove front support bracket from arbor and pack bearing with grease. (Shell Cyprina-RA or equivalent)



## COOLANT BOTTLE ASSEMBLY - P/N: 05060

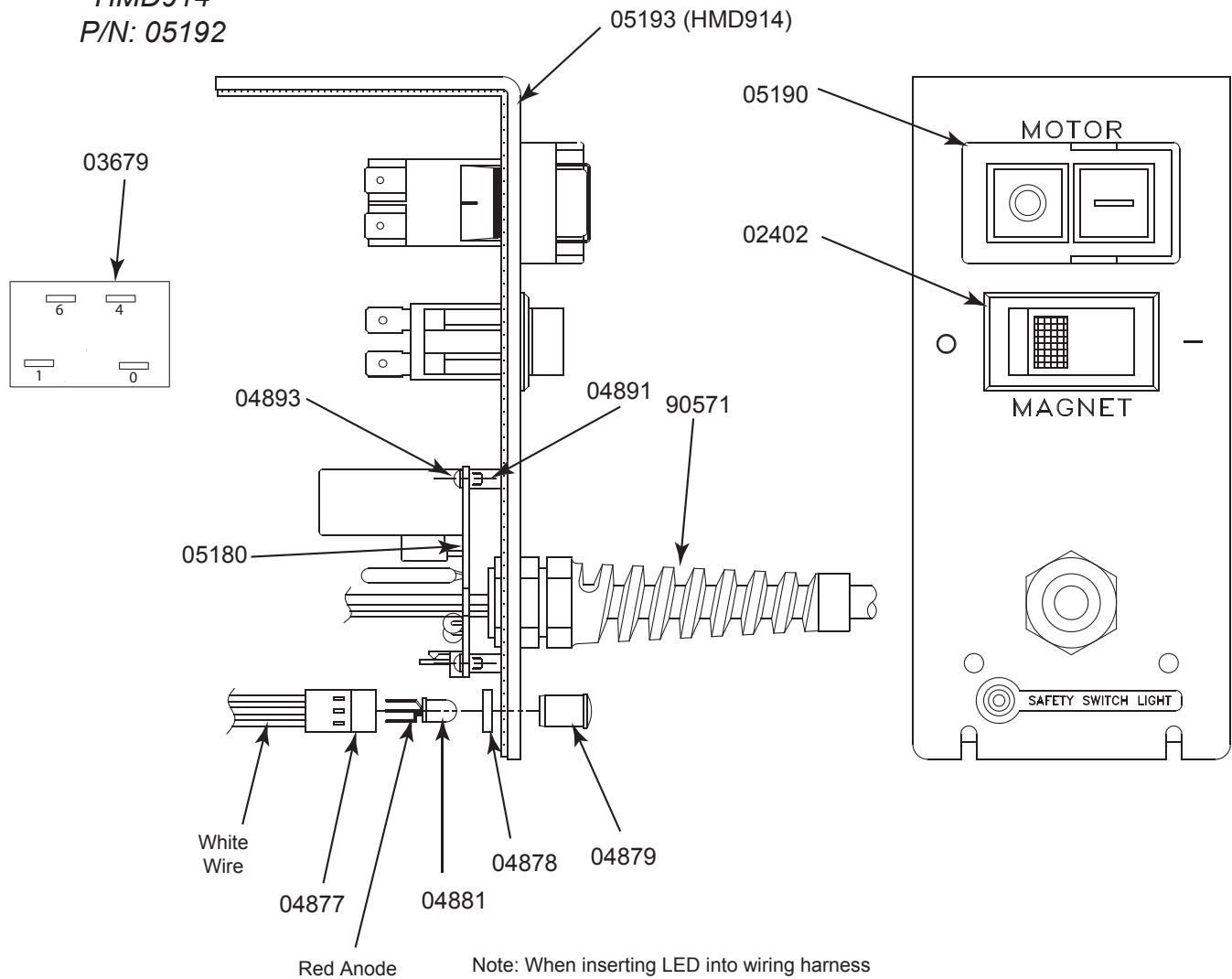


## PANEL COMPONENTS

## Panel Assembly

HMD914

*P/N: 05192*



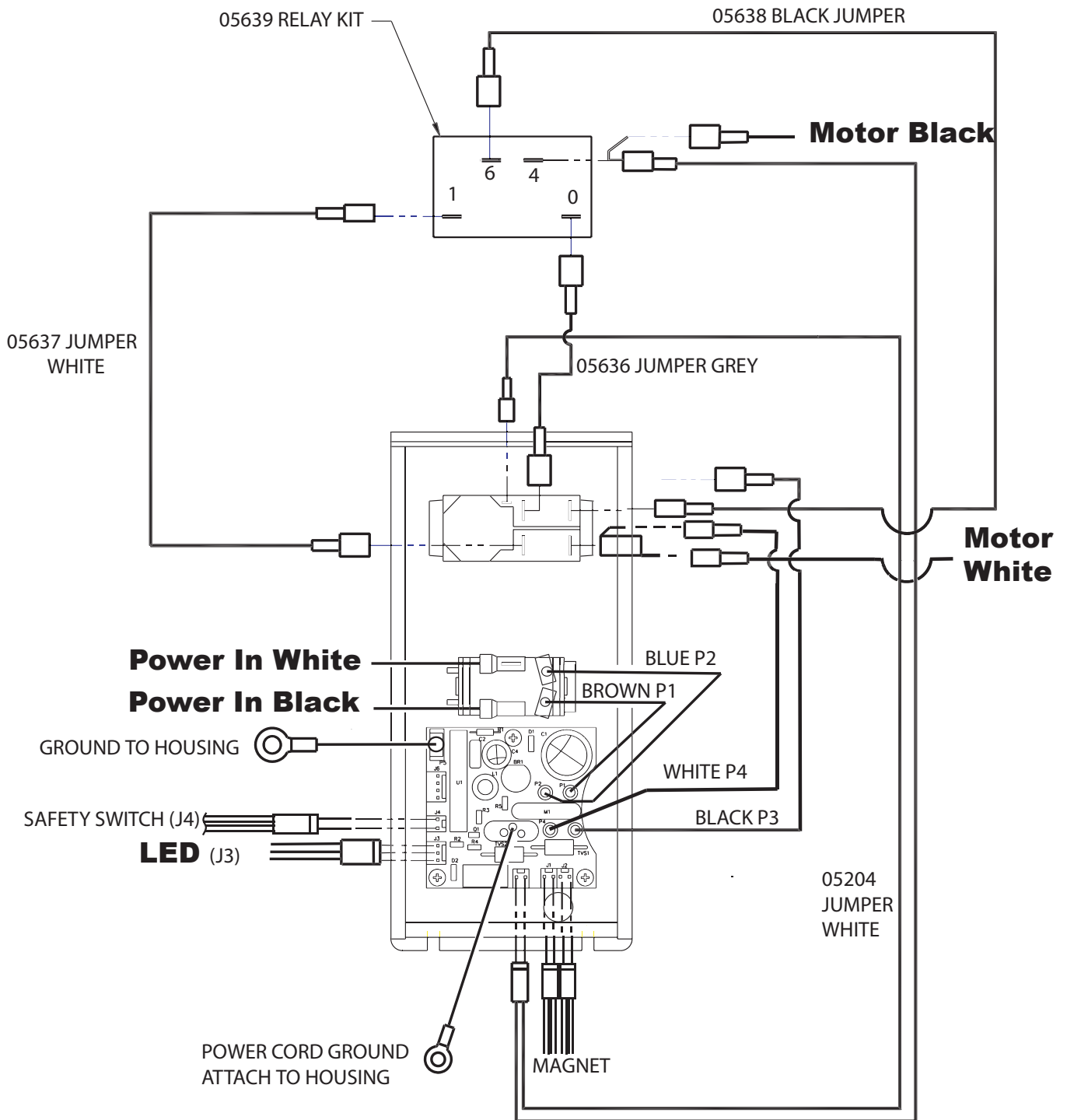
Red Anode

Note: When inserting LED into wiring harness  
make sure red anode lines up  
with white wire

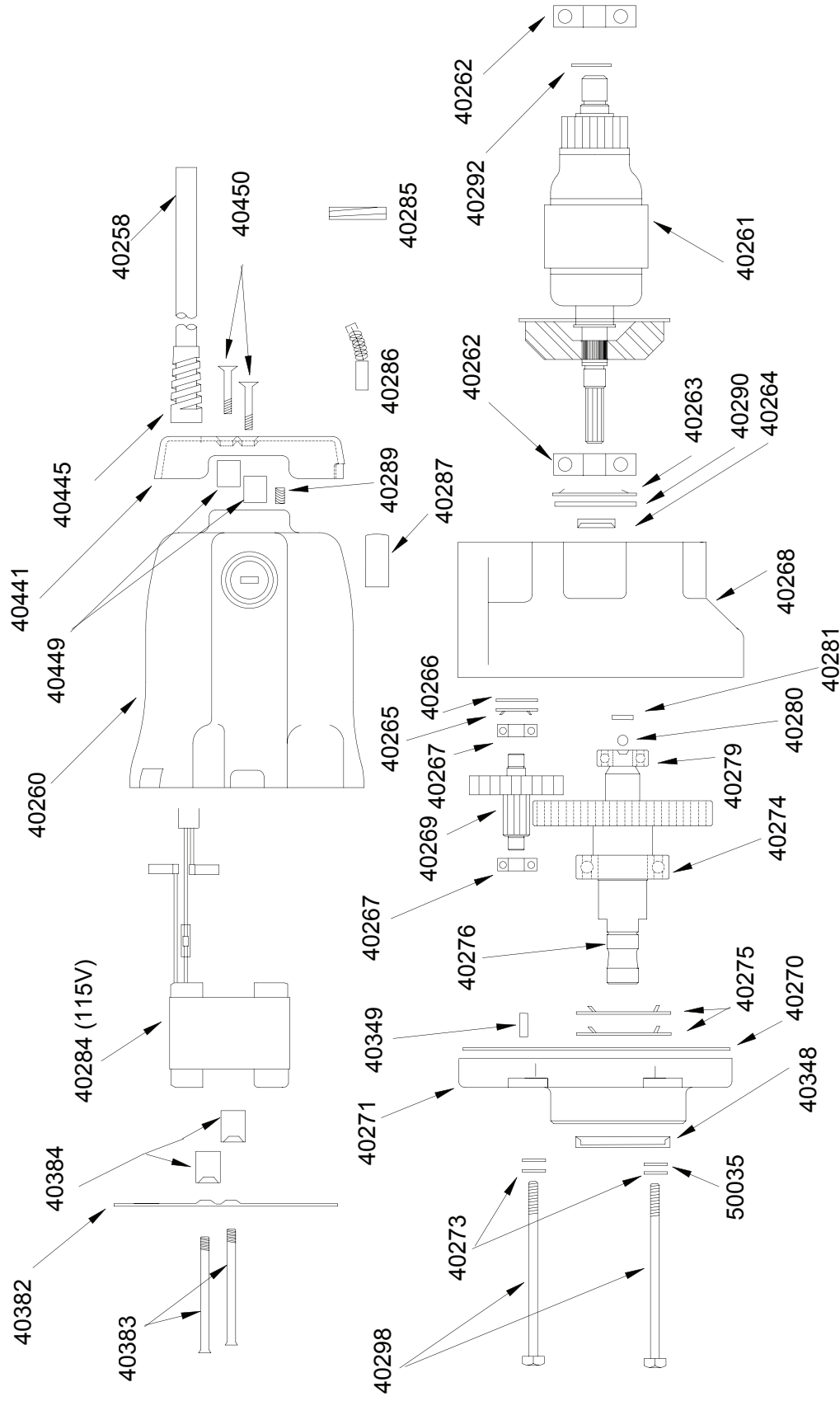
Part #	Description	Qty	Part #	Description	Qty
02402	Magnet Switch	1	05190	On/Off Switch	1
03679	Relay	1	05193	Faceplate (HMD914)	1
04877	Wire Harness	1	05204*	Wire Harness Jumper	1
04878	Spacer LED	1	05207*	Wire Harness Ground	1
04879	Lens Cover	1	05636*	Wire Harness Jumper	1
04881	LED	1	05637*	Wire Harness Jumper	1
04891	Spacer	3	05638*	Wire Harness Jumper	1
04893	Phillips Screw	3	05678*	Connector Dbl Male	1
05180	Circuit Board	1	90571	Power Cord	1
			* Not Shown		

\* Not Shown

# HOOK UP DIAGRAM



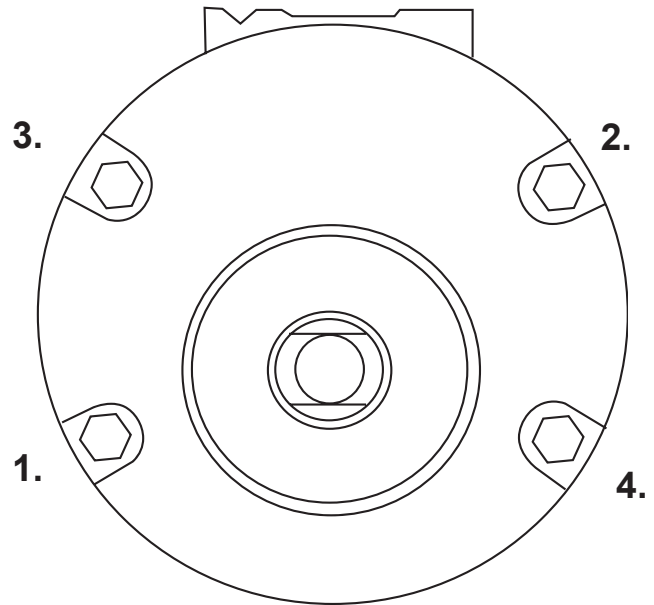
# Motor Exploded View and Parts List



- 40287 Torque to 4 - 6 in/lb
- 40383 Torque to 15 - 25 in/lb (Use Loctite® #242)
- 40287 Loctite® #271 to outside of Brush Holder

## Motor Bolt Sequence

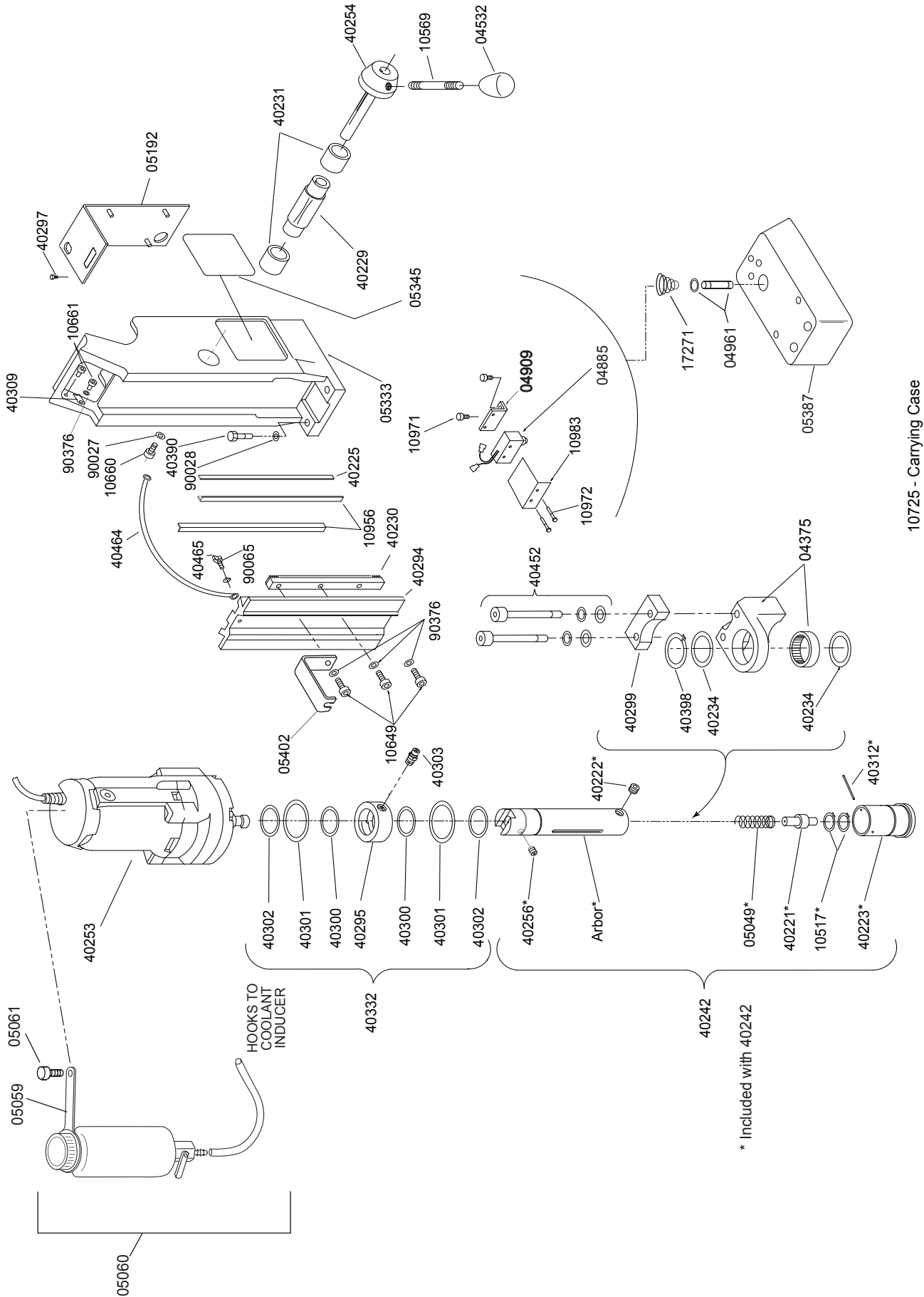
1. Tighten bolts in the sequence shown to 5 - 10 in/lb.
2. Retighten bolts in the same sequence to 35 - 40 in/lb.



## Motor Parts List

Part #	Description	Qty	Part #	Description	Qty
40258	Motor Cord	1	40284	Field Assy 115V	1
40260	Housing, Brush End	1	40285	Brush Plug	2
40261	Armature Assy 115V	1	40286	Brush (Package of 2)	1
40262	Bearing	2	40287	Brush Holder	2
40263	Flat Spring	1	40289	Screw #10-32 x 1/4"	2
40264	Seal	1	40290	Washer	1
40265	Flat Spring	1	40292	Retaining Ring	1
40266	Washer	1	40298	Screw 1/4-20 x 3-1/2"	4
40267	Bearing	2	40348	Seal	1
40268	Gear Housing	1	40349	Plug	1
40269	Gear Cluster	1	40350	Syntech grease	8 oz.
40270	Gasket	1	40382	Baffle	1
40271	Cap. Gear Housing	1	40383	Screw #10-32	2
40273	Lock Washer 1/4"	4	40384	Baffle Spacer	2
40274	Bearing	1	40441	End Cap	1
40275	Flat Spring	2	40445	Strain Relief	1
40276	Gear Output	1	40449	Spacer	2
40279	Bearing	1	40450	Screw #10-32 x 1"	2
40280	Ball	1	50035	Washer 1/4" Int Tooth	4
40281	Motor Slug	1	90424	Brush Holer Clip	2

# HMD914 EXPLODED VIEW



# PARTS LIST

Part #	Description	Qty	Part #	Description	Qty
04375	Arbor Sup. Bracket Assy	1	40230	Gear Rack	1
04532	Feed Handle Knob	3	40231	Bushing Bronze	2
04885	Safety Switch	1	40234	Thrust Washer	2
04909	Safety Switch Bracket	1	40237	Set Screw 1/4-28	5
04961	Plunger Assy	1	40242	Arbor Assy	1
05049	Arbor Spring	1	40253	Motor 115V	1
05059	Holder for Coolant Bottle	1	40254	Hub Assy	1
05060	Coolant Bottle Assy	1	40256	Set Screw 5/16-18	1
05061	Thumb Knob	1	40294	Motor Slide	1
05192	Control Panel	1	40295	Inducer	1
05333	Housing	1	40297	Screw-Slotted Hex	4
05345	Warning Label	2	40299	Arbor Support Bracket	1
05387	Magnet	1	40300	O-Ring	2
05402	Coolant Bracket	1	40301	Thrust Washer	2
10517	Retaining Ring	1	40302	Retaining Ring	2
10569	Feed Handle	3	40303	Coolant Fitting	1
10649	Screw SHC #10-32	3	40309	Cord Clamp	1
10660	Screw SHC 1/4-20 x 5/8	1	40312	Roll Pin-Modified	1
10661	Screw BHC #10-24	2	40332	Inducer Assy	1
10725	Carrying Case	1	40377	Shrink Tube	1
10956	Brass Gibbs-Pair	1	40390	Bolt-HH 1/4-20	3
10971	Screw SHC 1/4-20	2	40398	Ejector Collar Re. Ring	1
10972	Screw BHC #6-32	2	40452	Arbor Bolt Kit	1
10977	Screw BHC 1/4-20	1	40464	Ground Strap	1
10983	Safety Switch Ins. Shield	1	40465	Screw HH 1/4-20	1
17271	Taper Spring	1	90027	Washer Flat	1
40221	Spring Seat	1	90028	Washer 1/4" Helical	3
40222	Set Screw - Arbor	2	90052	Washer Ground Screw	1
40223	Ejector Collar	1	90065	Washer 1/4" Star	2
40225	Steel Gib	1	90352	Screw SHC 1/4-28	4
40229	Feed Gear	1	90376	Washer #10 Internal	3