

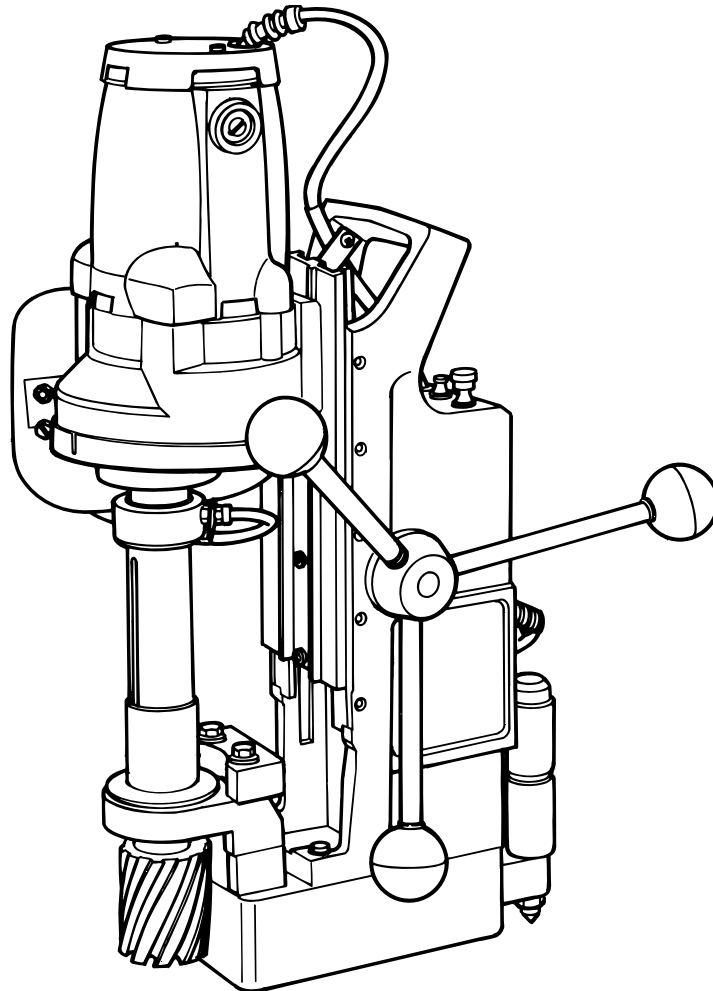


MODELS

10909(S) & 10909(S)AUS

PORTABLE MAGNETIC DRILLS

OPERATOR'S MANUAL



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

HOUGEN®

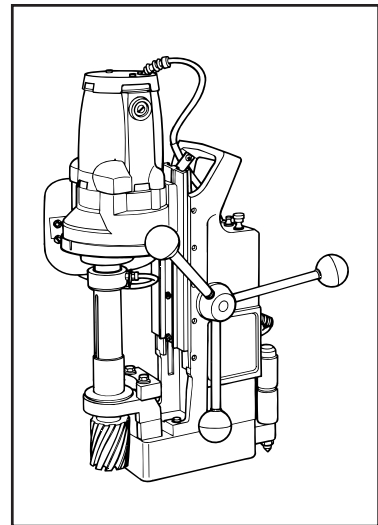
Portable Magnetic Drills

Models 10909, 10909S & Aus Models

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.



Commercial / Industrial Limited Warranty

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

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

Hougen Drills (Hougen Cutters) are warranted against manufacturing defects only. Subject to Hougen Manufacturing's 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:

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5145296

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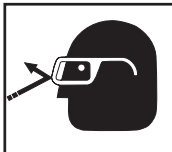
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Unpacking Your New Portable Magnetic Drill

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 and microswitch adjustment
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 (10570) 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. A 1/2" diameter bore Arbor Adapter (10851), for mounting 1/2" shank "12,000-Series" Hougen Cutters, is optional.

SAFETY FIRST



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



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



CAUTION! The slug is ejected at the end of the cut. Do not aim cutter or arbor so that ejected slug may hit someone around, or below you.



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

Important Safety Instructions



WARNING: When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury, including the following:

1. Read All Instructions

2. Grounding Instructions

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

3. Safe Electrical Connection

Your Mag Drill is rated for use on 115VAC (Plug A) or 230V (Plug B) at 50-60Hz. Do not attempt to use drill on power sources rated other than this. Wet electrical connections are shock hazards. To prevent the cutting fluid from traveling along the cord and contacting the plug or power outlet, tie a drip loop in the power cord. Also elevate extension cords or gang box connections.

4. Extension Cords

Use only 3-wire extension cords that have 3-prong grounding type plugs and 3-pole receptacles that accept the tool's plug. Replace or repair damaged cords. Make sure the conductor size is large enough to prevent excessive voltage drop which will cause loss of power and possible motor damage.

5. Do Not Force Tool

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

6. Keep Work Area Clean

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

7. Consider Work Area Environment

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

8. Guard Against Electric Shock

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

9. Keep Children Away

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

10. Store Idle Tools

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

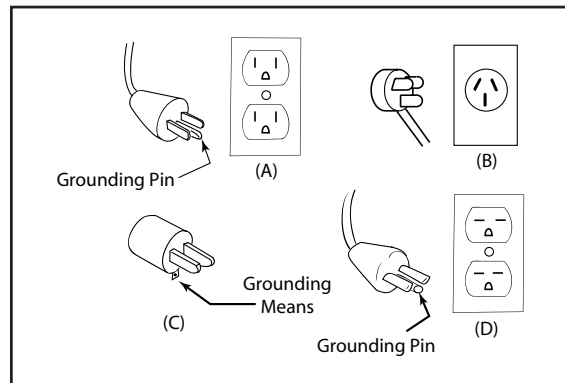
11. Use Right Tool

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 Hougén 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 Hougén Cutters where ejected slug might cause injury (slug ejected at end of cut). Also, adhere to all operating instructions. Do not drill through any surface that may contain live electrical wiring. Drilling into a live wire could cause exposed metal parts of the drill to be made live. Remove chips wrapped around Cutter and arbor after each hole. With motor off and power disconnected, grasp chips with leather gloved hand or pliers and pull while rotating counterclockwise. Should the cutter become jammed in the work, stop the unit immediately to prevent personal injury. Disconnect the drill from the power supply and loosen jammed cutter by turning the arbor counterclockwise. Never attempt to free the jammed cutter by starting the motor. Service at authorized repair center only.

25. Operating Near Welding Equipment

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

26. Circuit Breaker

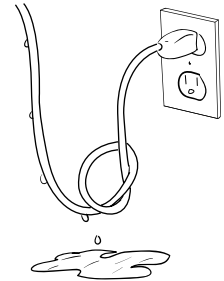
Changing of the circuit breaker to a higher amp rated breaker, or bypassing the circuit breaker is not recommended and will void product warranty.

27. Circuit Breaker Operation

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.

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 several full turns (10909 & 10909Aus Only)

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

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. As the magnet de-energizes, the rear of the magnet should lift up off the work surface.
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.

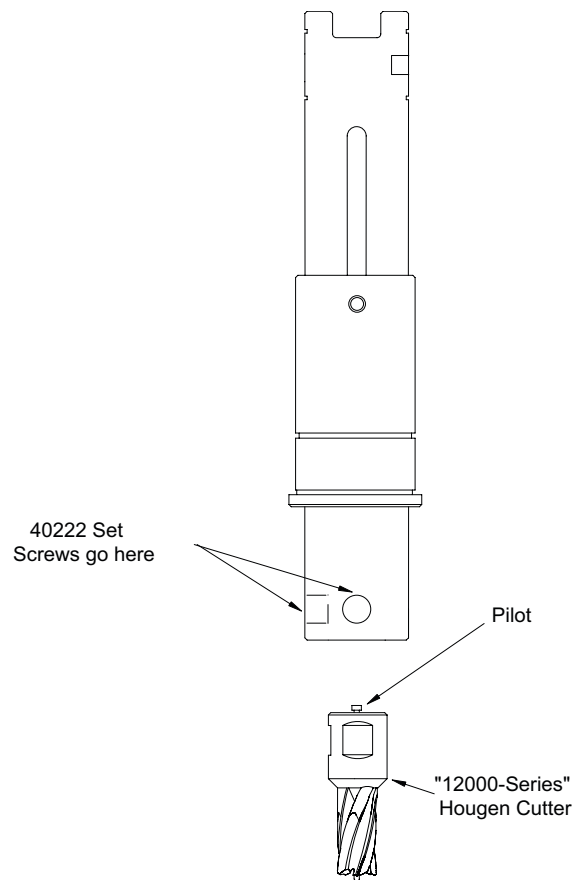
Special Instructions for horizontal or Overhead Operation

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.

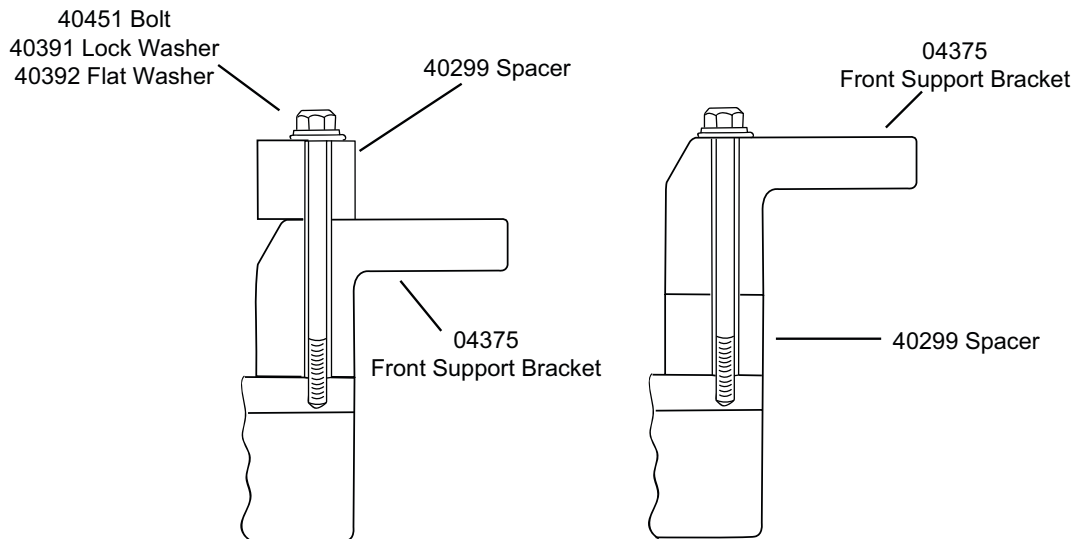
INSTALLING HOUGEN CUTTER IN ARBOR

1. Disconnect power source.
2. Lay drill on its side with feed handles 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.

NOTE: Arbor, Hougén part number #03736 and #40242 applies only to Models 10909 10909Aus.
Arbor, Hougén part number #03737 applies ONLY to "S" Models.



Adjusting Arbor Support Bracket for Depth

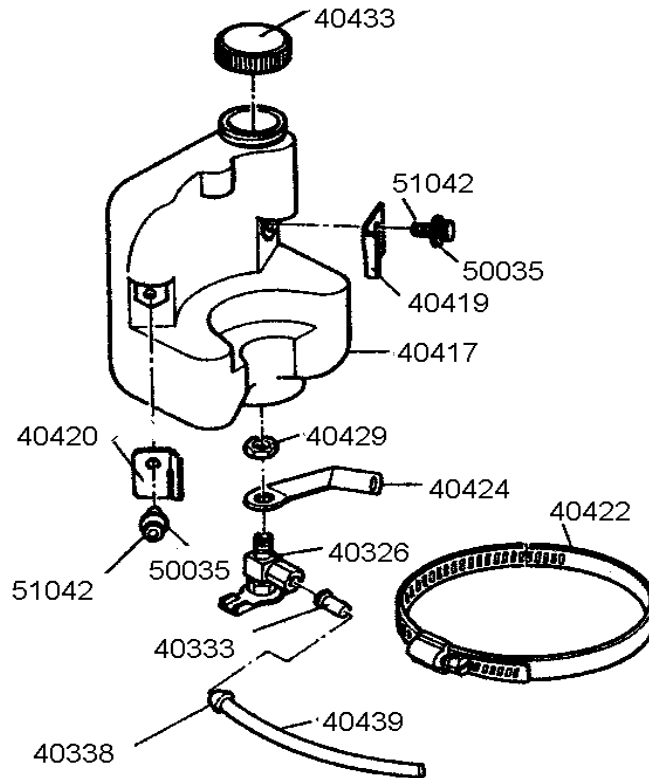


1" & 2" Depth of Cut

3" Depth of Cut

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

COOLANT BOTTLE ASSEMBLY - P/N: 40442



Checking Operation of Automatic Cutting Fluid Inducer

Note: The automatic cutting fluid inducer system works on a gravity flow basis. Therefore, it is only effective when the drill is mounted on a horizontal or slightly inclined work surface.

1. With Magnetic Drill in operation position, turn feed handle so that the cutter and pilot are above the work surface.
2. Fill cutting fluid bottle with cutting fluid.
3. To test automatic cutting fluid inducer (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 the needle valve until fluid is visible filling the plastic tube. Fluid should filter down onto the work surface through the groove in the pilot.
4. To insure proper cutter lubrication, always make sure that the slot in the pilot is kept clean from residual buildup.

Checking Operation of Cutting Fluid Reservoir (10909S & 10909Aus)

1. With magnetic drill in operating position, turn feed handle so that cutter and pilot are above the work surface.
2. With magnet turned ON and Motor OFF, fill reservoir by introducing cutting fluid through slots in Arbor. Cutting fluid should not leak out.
3. Test metering capabilities of Arbor/Cutter/ Pilot assembly (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.
4. For proper lubrication, all cutting fluid in reservoir should empty onto work surface in no less than 15 seconds and no more than 30 seconds.

Drill Maintenance

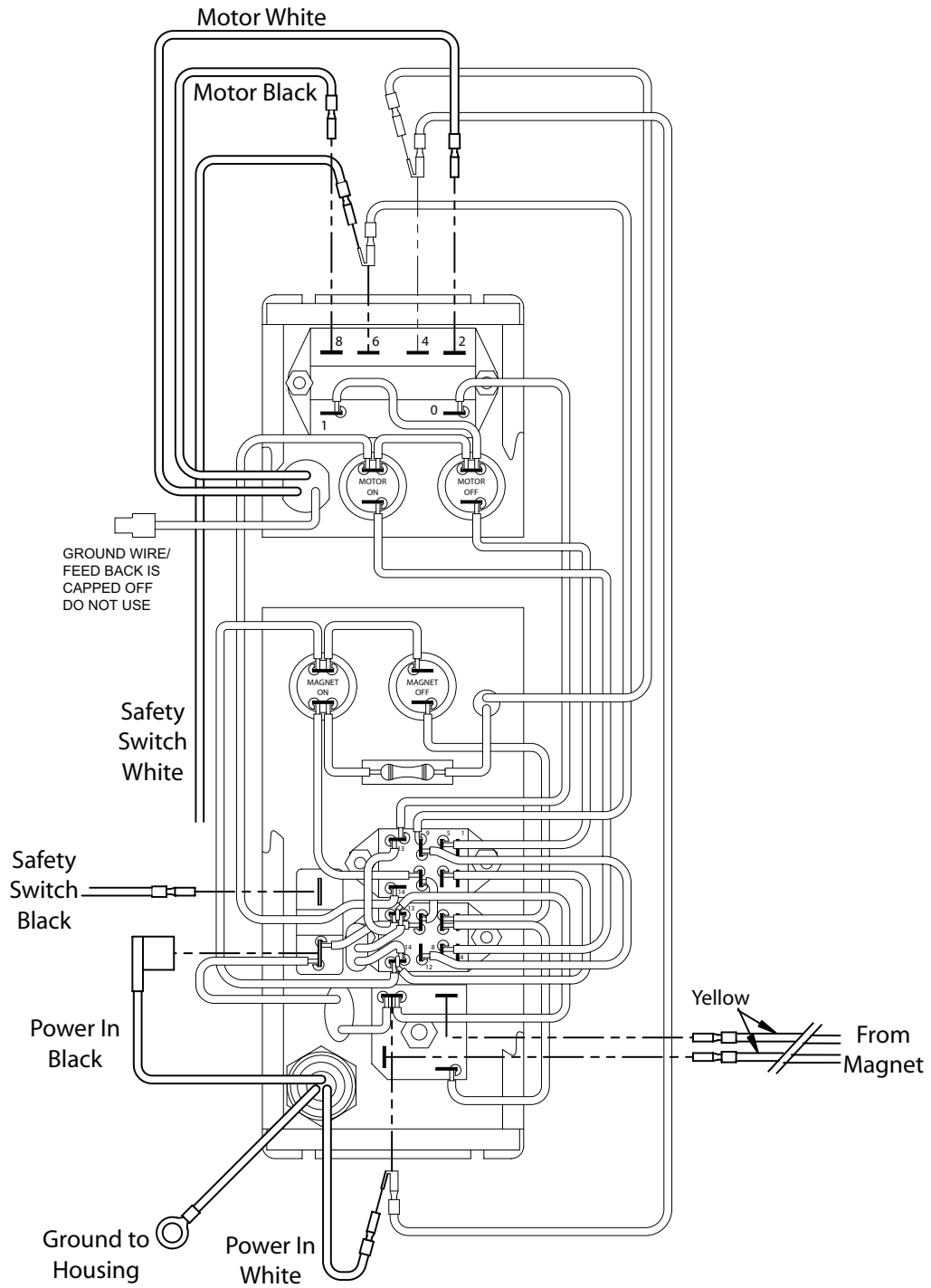
In order to minimize wear on moving parts and insure smoother operation and longer life, the following maintenance should be done periodically, based on use.

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)

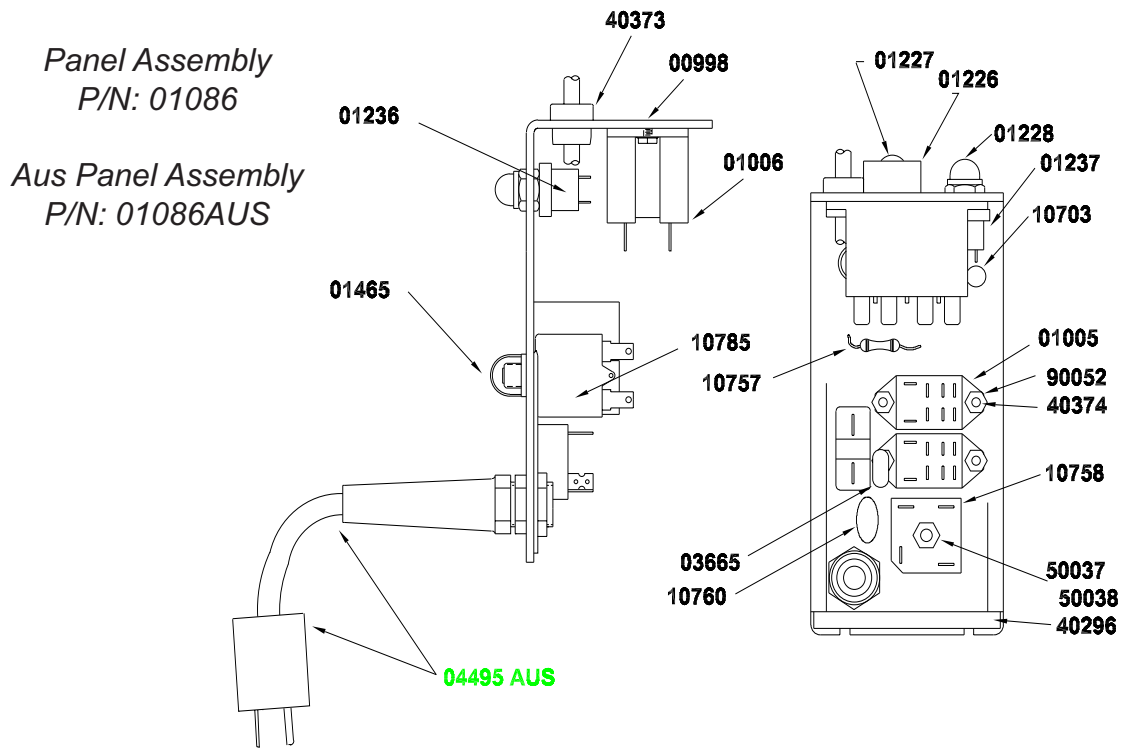
Adjustment of Gibs

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)

HOOK UP DIAGRAM



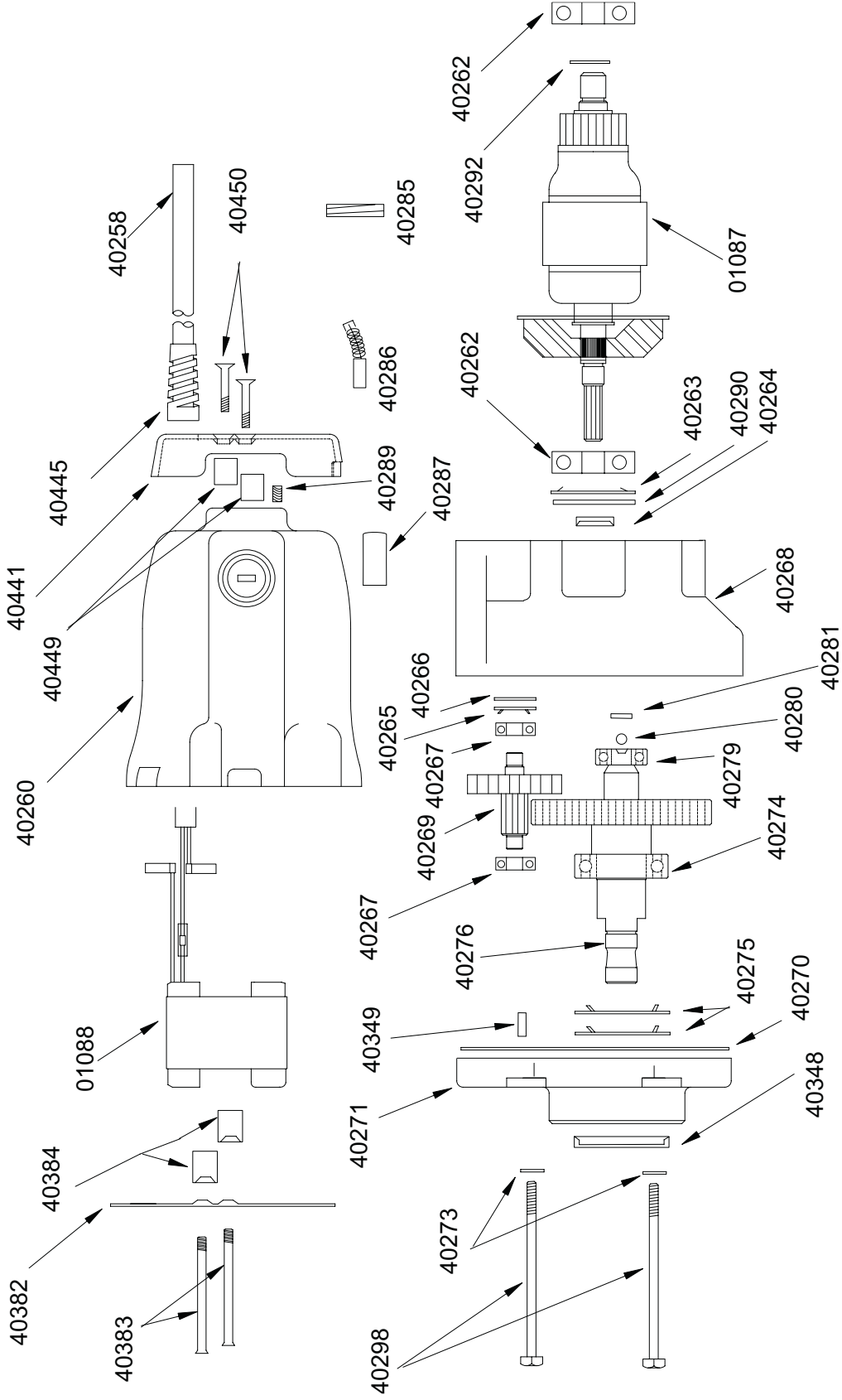
Panel Components



Panel Components

Part #	Description	Quan.	Part #	Description	Quan.
00998	Faceplate	1	04893	Phillips Screw	3
01005	Relay-Logic	2	10703	LED	1
01006	Relay-Power 2	1	10757	Resistor 1 Meg	1
01183	Plug	1	10758	Rectifier Fullwave	1
01226	Switch Guard	1	10760	Surge Supressor	1
01228	Switch Seal Red/Off	2	10785	Circuit Breaker	1
01236	Push Button Switch On	2	40288	Cord 16/3	1
01237	Push Button Switch Off	2	40373	Strain Relief	1
01465	Circuit Breaker Boot	1	40374	Hex Nut #106-32	6
02409	Switch Seal Green	2	40455	Strain Relief	1
03665	Snubber Circuit	1	50037	Hex Nut #10-32	1
04495AUS	Power Cord Assembly (Aus Model)	1	50038	Lock Washer	1

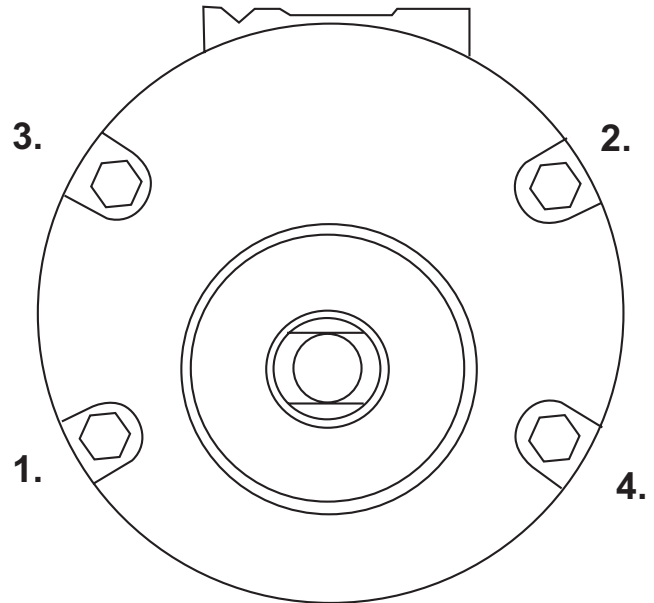
Motor Exploded View and Parts List



- 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

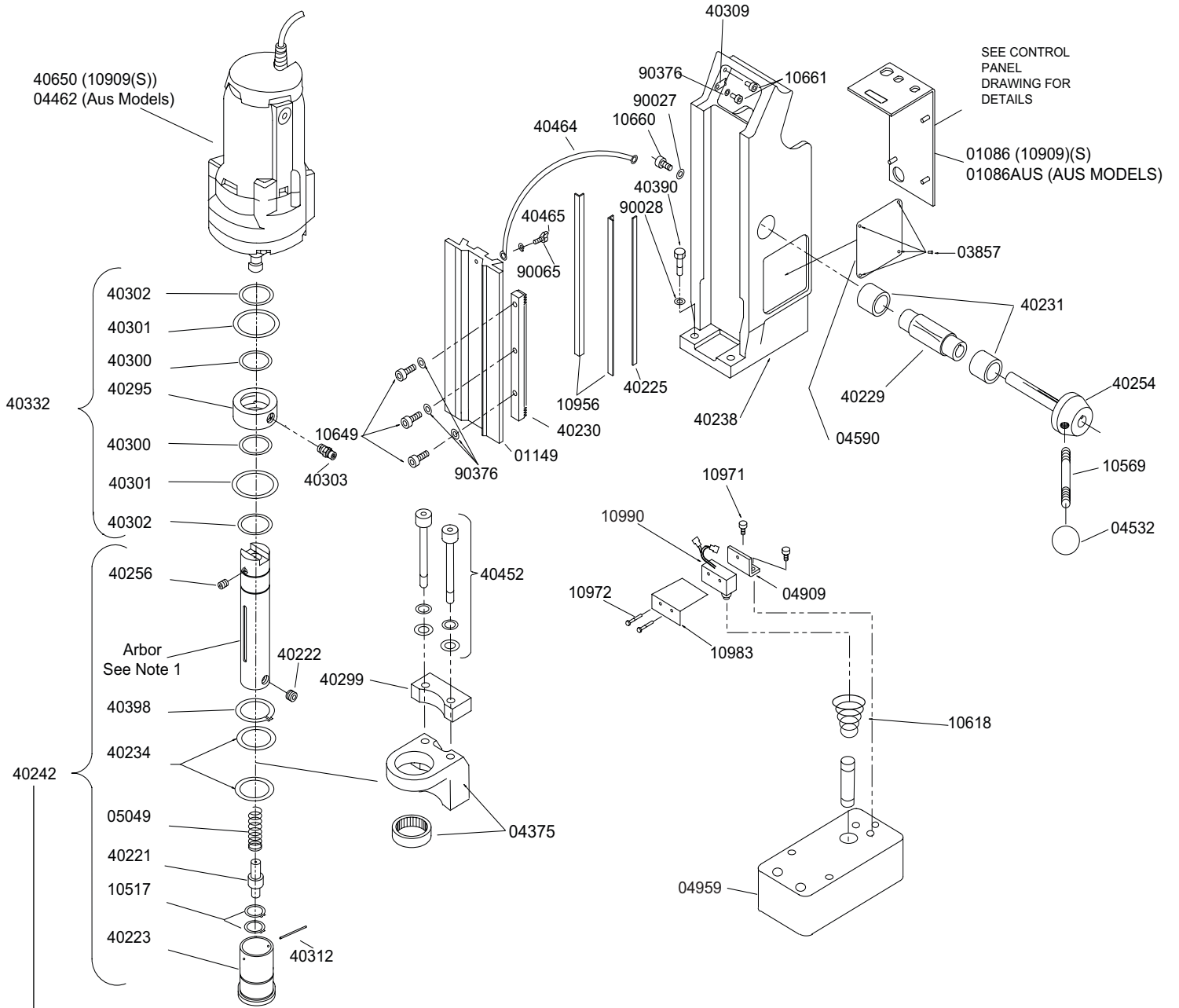
1. Tighten bolts in the sequence shown to 5 - 10 in/lb.
2. Retighten bolts in the same sequence to 35 - 40 in/lb.



Motor Parts List

Part No.	Description	No. Req'd.	Part No.	Description	No. Req'd.
01087	Armature Assembly 230V	1	40280	Ball	1
01088	Field Assembly 230V	1	40281	Motor Slug	1
04204	Motor Cord (3 wire)	1	40285	Brush Plug	2
40258	Motor Cord	1	40286	Brush, Carbon	2
40260	Housing, Brush End	1	40287	Brush Holder	2
40262	Bearing	2	40289	Screw #10-32 x 1/4"	2
40263	Spring, Flat	1	40290	Washer	1
40264	Seal	1	40292	Retaining Ring	1
40265	Spring, Flat	1	40298	Screw 1/4-20 x 3-1/2"	4
40266	Washer	1	40348	Seal	1
40267	Bearing	2	40349	Plug	1
40268	Housing, Gear	1	40350	Syntech Grease	8 oz.
40269	Gear Cluster	1	40382	Baffle	1
40270	Gasket	1	40383	Screw #10-32	2
40271	Cap, Gear Housing	1	40384	Baffle Spacer	2
40273	Lock Washer 1/4"	4	40441	End Cap	1
40274	Bearing	1	40445	Strain Relief	1
40275	Spring, Flat	2	40449	Spacer	2
40276	Gear Output	1	40450	Screw #10-32 x 1"	2
40279	Bearing	1	90424	Brush Holder Clip	2

EXPLODED VIEW



COOLANT BOTTLE SHOWN ON PAGE 8

10725 - Carrying Case

Note 1:

03736 - 10909 — Includes: 40222, 40256, 10517, 10513
03737 - 10909S —

40242 for Coolant arbors only

PARTS LIST

Part No.	Description	No. Req'd.	Part No.	Description	No. Req'd.
01086	Control Panel 230V	1	40294	Motor Slide	1
01086Aus	Control Panel (Aus Model)	1	40295	Inducer	1
03736	Arbor 10909	1	40297	Screw - Slotted Hex	4
03737	Arbor 10909S	1	40299	Arbor Support Brkt. (3/4")	1
04375	Arbor Supp. Brkt. Assy	1	40300	"O" Ring	2
04462	230V Aus Replacement Motor	1	40301	Thrust Washer	2
04532	Feed Handle Knob	3	40302	Retaining Ring	2
04590	Warning Label	1(2)	40303	Coolant Fitting	1
04909	Safety Switch Adj. Brkt.	1	40304	Tubing 1/4" O.D.	1
04959	Magnet Assy	1	40309	Cord Clamp	1
04961	Plunger Assy	1	40312	Roll Pin - Modified	1
05049	Arbor Spring	1	40326	Cutting Fluid Valve	1
10517	Retaining Ring	1	40332	Inducer Assy.	1
10569	Feed Handle	3	40333	Brass Insert	1
10649	Screw SHC #10-32	3	40338	Nylon Ferrule, 1/4" Tube	1
10660	Screw SHC 1/4-20 x 5/8	1	40377	Shrink Tube	1
10661	Screw BHC #10-24	2	40390	Bolt-HH 1/4-20	3
10725	Carrying Case	1	40398	Ejector Collar Ret. Ring	1
10956	Brass Gibs - Pair	1	40417	Coolant Bottle	1
10971	Screw SHC 1/4-20	2	40419	Retaining Bracket - Right	1
10972	Screw BHC #6-32	2	40420	Retaining Bracket - Left	1
10977	Screw BH 1/4-20	1	40422	Coolant Bottle Clamp	1
10983	Safety Switch Ins. Shield	1	40424	Anti-Rotational Finger	1
10990	Safety Assy.	1	40429	Nut - Locking	1
17271	Taper Spring	1	40433	Coolant Bottle Cap	1
40221	Spring Seat	1	40442	Cutting Fluid Bottle Assy.	1
40222	Set Screw - Arbor	2	40452	Arbor Bolt Kit	1
40223	Ejector Collar	1	40464	Ground Strap	1
40225	Steel Gib	1	40465	Screw - HH 1/4-20	1
40229	Feed Gear	1	40650	230V Replacement Motor	1
40230	Gear Rack	1	50035	Washer 1/4" Internal Tooth	6
40231	Bushing - Bronze	2	51042	Screw SHC 1/4-20	2
40234	Thrust Washer	2	90027	Washer Flat	1
40237	Set Screw 1/4-28	5	90028	Washer 1/4" Helical	3
40238	Housing	1	90052	Washer Ground Screw	1
40242	Arbor Assy w/ejector (coolant)	1	90065	Washer 1/4" Star	2
40254	Hub Assy.	1	90352	Screw SHC 1/4-28	4
40256	Set Screw 5/16-18	1	90376	Washer #10 Internal	3