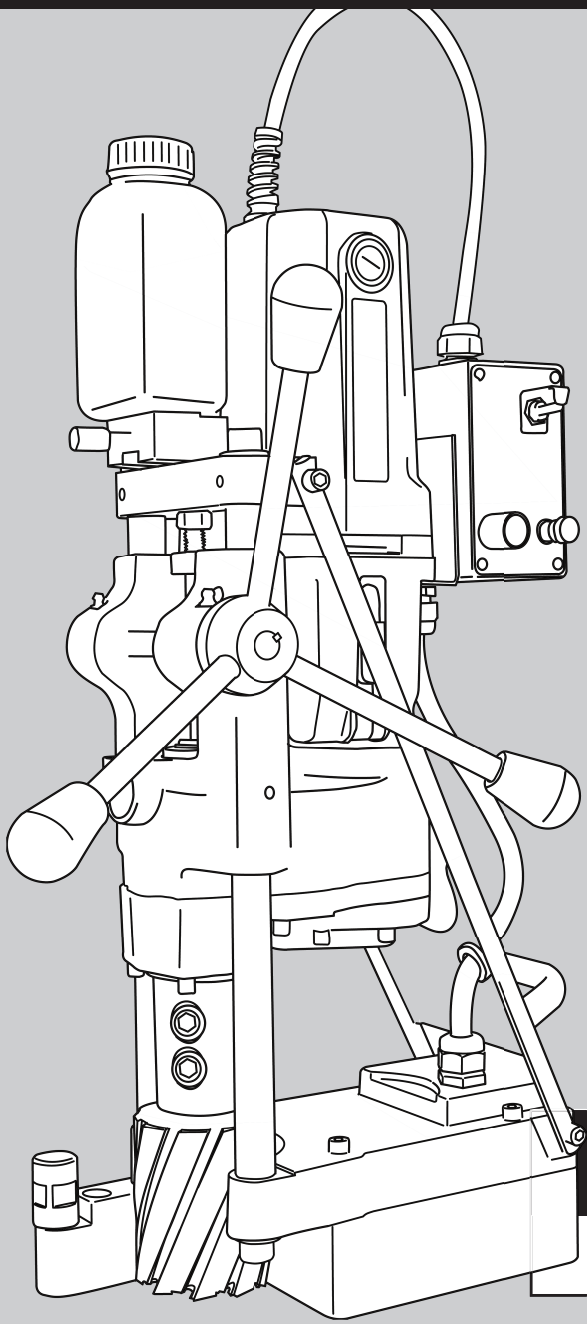
Hougen®

Solving holemaking problems through innovation™

OPERATOR'S MANUAL

HMD933 SERIES PORTABLE MAGNETIC DRILL



Covers Drill Part Numbers:

0933102	0933202
0933302	0933402

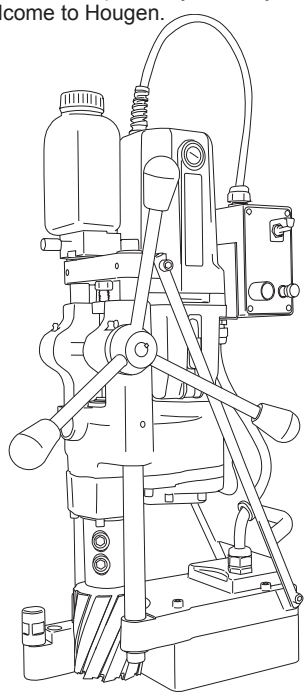
OM9330614EF Printed in U.S.A.

HOUGEN® PORTABLE MAGNETIC DRILL
MODEL HMD933 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.



Specifications

Cutter Type..... Hougen "42/43,000-Series"

Hole Capacity.....5/8" to 3-1/16" (16mm-77mm)
Depth of Cut.....3" (76mm)
Motor.....70/120/200/332 RPM, 12.5A (115V)
Net Weight..... 72 lbs. (32.6kg)

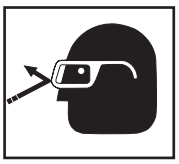
The HMD933 is offered in many versions. Refer to the Serial/Part number Label on your housing to direct you to the correct breakdown.

Part Number

0933102 HMD933 120V
0933202 HMD933 230V
0933302 HMD933 230V Type I
0933402 HMD933 230V No Plug

INDEX

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 ordinances. Never remove the ground prong or modify the plug in any way. Do not use 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 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 increase 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 putlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediatley. Damaged cords increase the risk of electric 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 switch is 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 footong and balance at all times. Proper footing and balance enables better control of the tool in unexpected situations.

Use safety equipment. Always wear eye protection. Dust mask, no-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 ways 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 the 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 preventative safety measures reduce the risk of starting the tool accidently.

Store idle tools out of reach of children 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.

IMPORTANT SAFETY INSTRUCTIONS

Use only accessories that are recommended by the manufacturer for your model. Accessories that may be suitable for one tool, may become hazadous when used on another tool.

Service

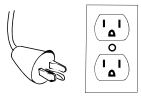
Tool service must be performed only be qualified repair personnel. Service or maintenance performed by unqualified personnel could result in a risk of injury.

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 Maintenance Instructions may create a risk of electric shock or injury.

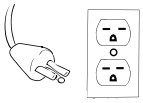
Safe Electrical Connection

Your Mag 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

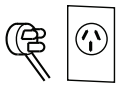
Plugs and Receptacles



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 handheld. 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)

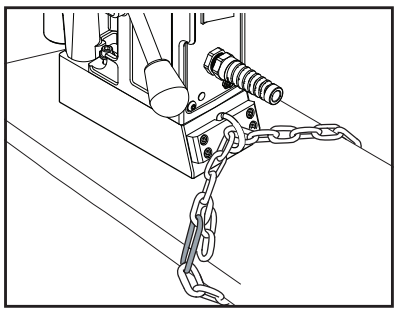
The circuit breaker is a thermal breaker. When it reaches the higher temperature rating it will trip and cause the unit to shut down. This is a protective device and can be reset after 5 to 10 minutes. To reset the breaker, press the breaker button back in. If it does not reset, let the unit cool a little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

Save these instructions.

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 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 Mfg., Inc. have a record of product ownership.
4. Contents of Tool Box

   10730 - Safety Chain
   10569 - Feed Handles (3)
   04532 - Knobs (3)
   10565 - Hex Key 1/8" S.A.
   13013 - Wrench Allen 5/32"
   10779 - Wrench Allen 7/32"
   10727 - Wrench Allen 3/16"
   10780 - Wrench Allen 5/16"
   10781 - Wrench Allen 3/8"
   40040 - Adapter Assembly
   40041 - Screw-Soc Set 5/8-11
   40042 - Screw-Soc Set 3/4-10 (2)
   40061 - Handle Assembly
   05487 - Grease - Lubriplate GR-132
   40126 - Coolant Btl. Assembly *
   **(sometimes packed separately)*

5. Lift the unit out of the shipping case.
6. Remove all packing and securing material from the drill unit.
7. Screw the three knobs onto the three feed handles and then screw the handles into the hub
8. Install coolant bottle on unit, utilizing screws that are provided
9. Your Magnetic Drill was factory adjusted prior to shipping. Check to make sure that the feed rod adjustment screws, motor mount screws, exterior bolts and screws have not vibrated loose in transit.
10. Your New Magnetic Drill comes complete and ready to go. This unit utilizes the "42,000 and 43,000"-Series Cutters either with the 1-1/4" shank or the "12,000-Series" 3/4" shank cutters.

OPERATING INSTRUCTIONS

Always remember that the magnet's holding power is directly related to the workpiece thickness and surface condition. This drill is for use on 3/8" material or thicker. Since magnetic attraction diminshes with thinner material or rough surfaces, mechanical clamping of drill unit to the workpiece should be used when cutting such material.

1. Make sure workpiece and bottom of magnet are free chips, oil, etc.

2. Attach Safety Chain (particularly when operating on beams, horizontally, vetically, etc.)

3. Position drill by sliding it so that point of the ejector rod is above center of hole to be drilled.

4. Turn Magnet switch to ON position.

5. Set both impactors into the workpiece by striking with hammer.

6. Open the Adjustment Needle to provide a generous flow of cutting fluid until a puddle approximately the diameter of the cutter being used is developed on the workpiece. Once this initial supply of cutting fluid is established on the workpiece, adjust the flow to a steady drip.

7. Make certain that cutter is clear of workpiece and turn motor switch ON.

8. Feed Hougen Cutter slowly into workpiece. Only after cutting path is established to a depth of about 1/16" can full feed 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. Turn feed handles to raise Arbor, thereby ejecting the slug if it hasn't already fallen free.

11. Turn Magnet OFF and give switch a quick flip to the DEMAG position, allowing it to snap back to center or OFF position. (Do not hold switch in DEMAG position)

12. Remove chips from both cutter and magnet. Preferably while wearing leather work gloves.

13. Disconnect safety chain and you are ready to move unit to new position.

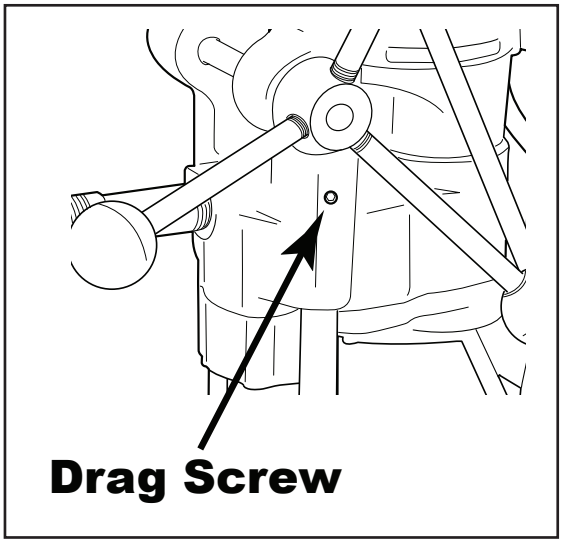
SPECIAL INSTRUCTION FOR HORIZONTAL OR OVERHEAD OPERATION

1. Always use Safety Chain and / or mechanical clamping.

2. Use grease or animal fat base solid lubricant applied liberally to cutter.

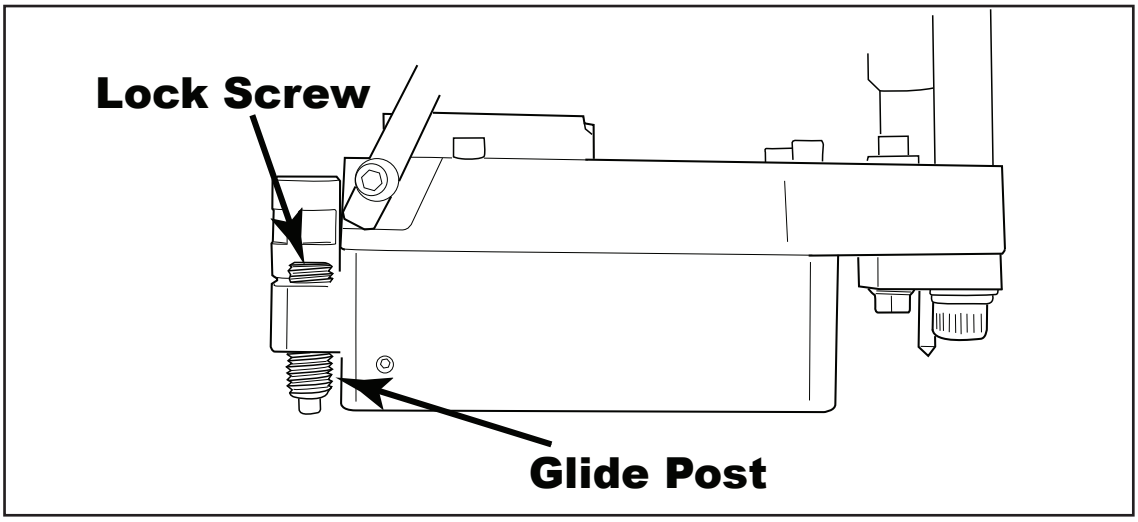
FEED ADJUSTMENT

Drag Screw must be adjusted against the Feed Rod so that main housing moves freely up and down the feed rods when feed wheel is turned, so that main housing stays in position on feed rod when wheel is released.



GLIDE POST ADJUSTMENT

1. Adjustment is made with magnet on and glide posts over work surface.
2. Remove front glide post lock screw, and loosen rear glide post lock screw.
3. Screw both glide posts up until the ends are above the work surface.
4. Place a .040" shim under the front glide post and a 0.125" shim under the rear glide post.
5. Screw glide posts down, compressing plungers, until the body of the glide posts rest on the shims.
6. Replace the front lock screw and tighten both the front and rear lock screws.



EJECTOR ROD ADJUSTMENT

In addition to providing a positive method to insure that a slug is not retracted with the cutter, the ejector rod serves as a conduit for the cutting fluid and as a centering guide for positioning the Mag Drill on the workpiece. Under normal conditions, the point of the ejector rod should be kept at least 1/16" above the work surface.

It is important that the point of the ejector rod not be allowed to rest on the work surface for two reasons:

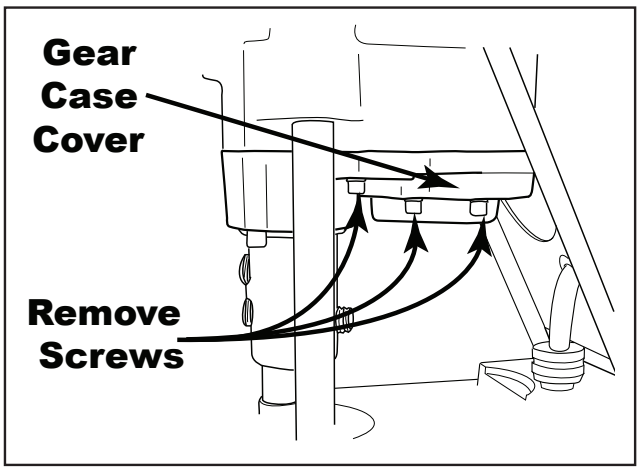
A) The point will drag on the work surface when Mag Drill is repositioned which may cause the ejector rod to become bent.

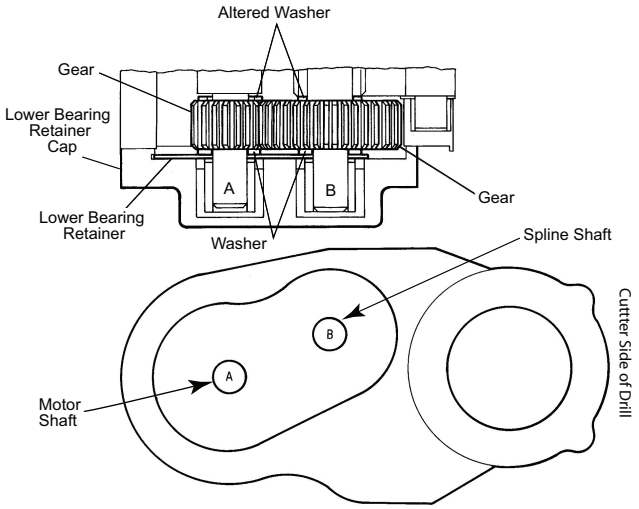
B) The ejector rod may hold the front of the magnet off of the work surface, deminishing its holding ability.

To adjust the ejector rod:

1. Place the Mag Drill on a steel plate and turn the magnet on.
2. Loosen the lock nut and rotate the knurled nut until the point of the ejector rod is in the desired location.
3. When adjusted properly, the point should clear the work surface (1/16" minimum) both when the magnet is on and when it is off (Mag Drill riding on glide post).
4. When adjustment is complete, using a wrench, retighten the lock nut against the underside of the tie bar.

GEAR COMBINATIONS FOR VARIOUS RPMS





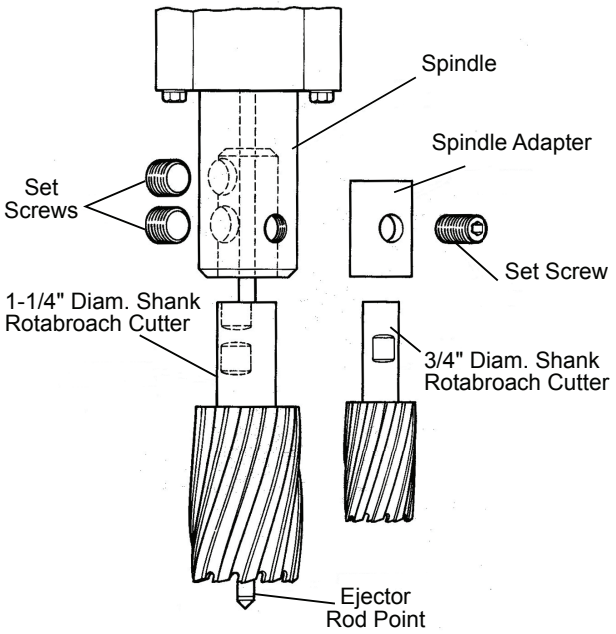
Drawings above show arrangement of gears. Be sure that upper and lower washers are replaced on Shafts A and B when changing gears. If necessary, refer to exploded view when removing lower bearing retainer cap.

Cutter RPM	No. of Teeth per Gear	
	Shaft A	Shaft B
Motor High Speed		
120	18	30
332	30	18
Motor Low Speed		
70	18	30
200	30	18

Drill unit comes with 18-tooth gear on Shaft A and 30-tooth gear on Shaft B to provide 120 RPM. For other RPM's, use optional gears with the following procedure.

1. Remove the Lower Bearing Retainer Cap by removing the four Cap screws and two Cap Screws.
2. Remove gears from Shafts A and B, being careful to save the two Altered Torrington Thrust Washers and two lower Washers.
3. Be certain that the two Altered Torrington Thrust washers are first mounted on Shaft A and B.
4. Slide proper gears on Shafts A and B (refer to table on left).
5. Mount lower washers on both shafts.
6. Pack gears with liberal supply of grease.
7. Replace Lower Bearing Retainer Cap. Replace and tighten all six cap screws.

INSTALLING CUTTER



1. Jog motor until appropriate set screws are accessible.

2. Either lay drill on its side with feed wheel up, or be sure Spindle sure Spindle clears table if unit is in normal operation position.

3. **A) Hougen Cutters with 1-1/4" dia. shanks**

   Loosen the two short set screws and cutter shank being certain that the flats are aligned with the set screw holes. Tighten the lower set screw first and then tighten the upper set screw. (Be sure the long set screw on opposite side of spindle has been removed.

   B) Hougen Cutters with 3/4" dia. shanks

   Install the spindle adapter using the same procedure as used when mounting cutters with 1-1/4" diameter shanks. Slip the Cutter Shank into the adapter so that the flat on its shank is aligned with the single set screw hole. Install the long set screw and tighten.

   C) "12,000-Series" Shanks

   When using "12,000-Series" shank cutters, **DO NOT** us the long set screws. Install cutter adapter using the two small set screws lining up the two flats. Install adapter into quill and secure using set screws.

4. Check periodically during operation to be certain that the cutter is secure.

OPERATION OF CUTTING FLUID RESERVOIR

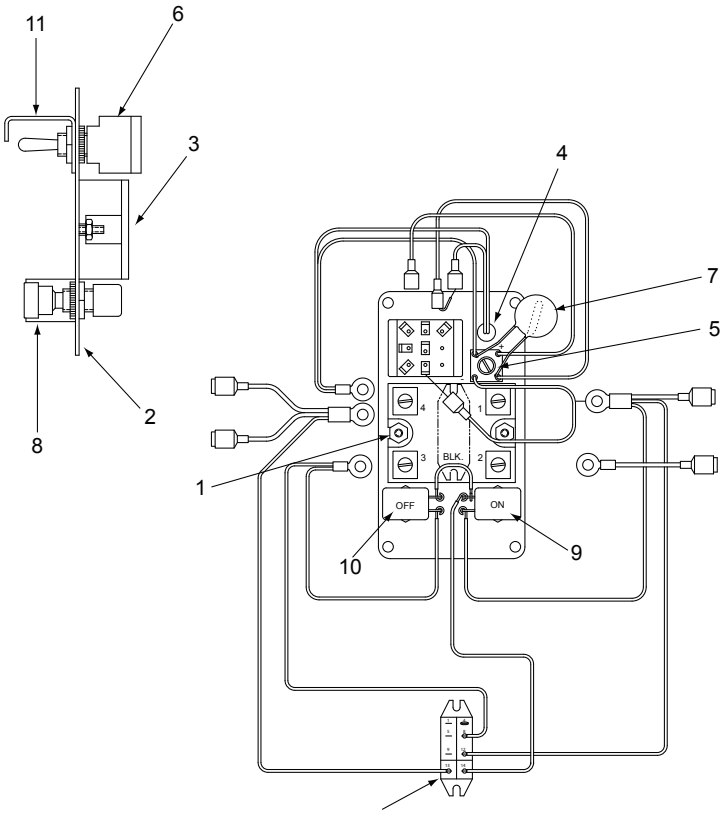
When everything is ready to go (Magnet ON and Impactors seated), open the Adjustment Needle to provide a generous flow of cutting fluid until a puddle approximately the diameter of the cutter being used is developed on the workpiece. Once this initial supply of cutting fluid is established on the workpiece, adjust the flow to a steady drip.

HINTS FOR SMOOTHER OPERATION

1. Keep inside of Hougen Cutter clear of chips.Chips will interfere with cutting to maximum depth, may impede the free flow of cutting fluid and can cause cutter breakage.
2. Keep work, machine, arbor and Hougen Cutter free of chips and dirt.
3. Tighten all fasteners periodically.
4. We highly recommend using a light cutting fluid (preferbly Hougen Cutting Fluid)
5. Occasionally check metering of cutting fluid flow. Lack of cutting fluid 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 maximumcutting rate.
7. Ease off on pressure as cutter begins to break through at end of cut.
8. When slug hangs up in cutter, bring cutter down on a flat surface. This will normally straighten a cocked slug, allowing it to be ejected.
9. Cut overlapping holes using minimum steady pressure. (External lubrication should be used)

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

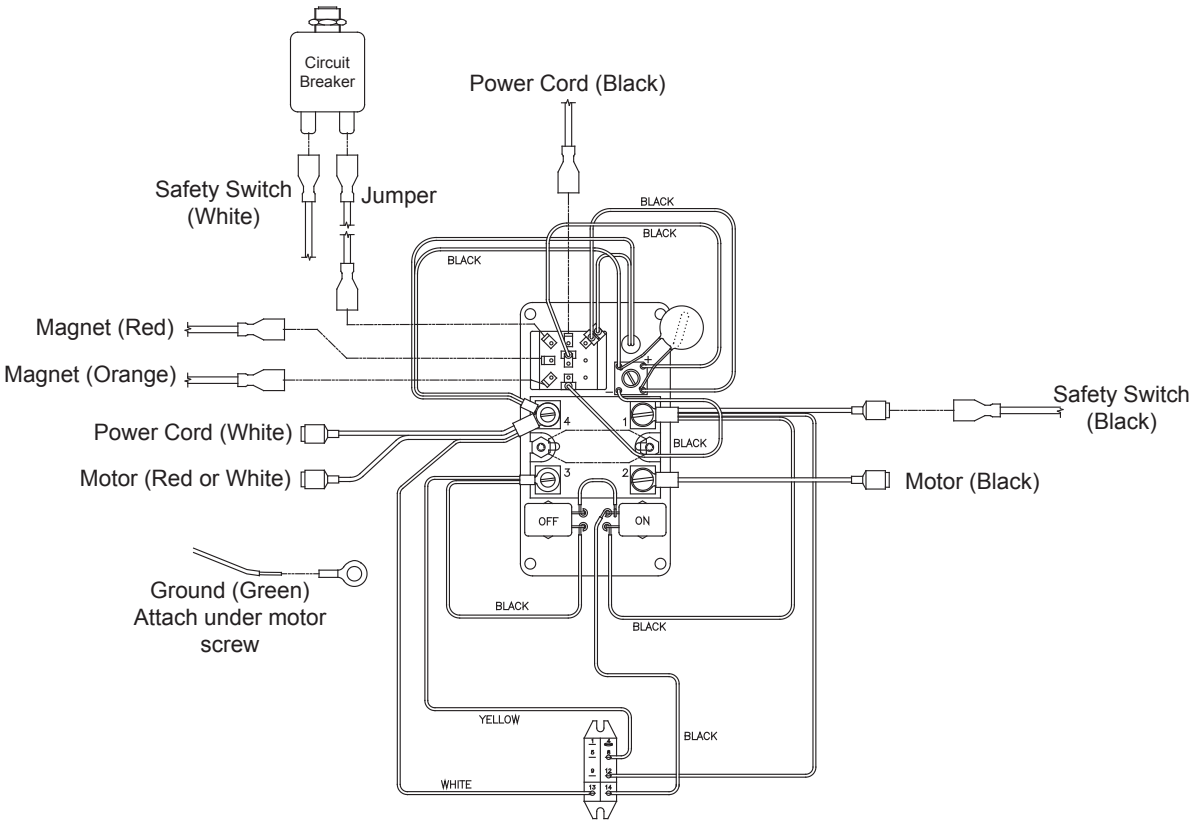
120V PANEL COMPONENTS



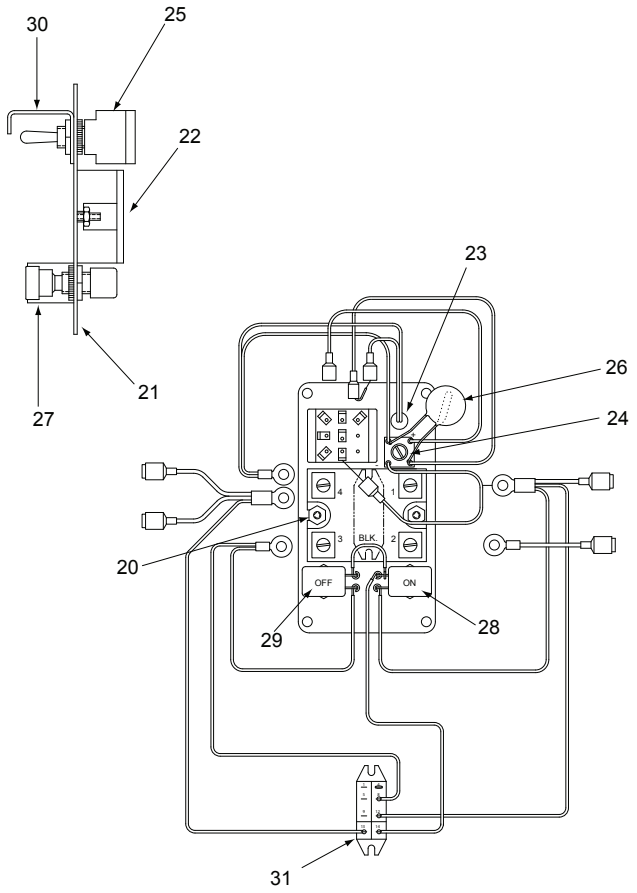
No.	Part #	Description	Qty.
1	**40374**	Nut #6-32	2
2	**05840**	Faceplate	1
3	**04387**	Relay - Solid State	1
4	**10703**	Pilot Light	1
5	**10705**	Rectifier	1
6	**10715**	Toggle Switch Magnet	1
7	**10718**	Surge Suppressor	1
8	**10762**	Push Button SwitchGuard	1
9	**10763**	Motor "ON" Switch	1
10	**10764**	Motor "OFF" Switch	1
11	**10964**	Toggle Switch Guard	1
12	**01205**	Relay Logic	1
13	**04381**	120V Panel Assy.	1
*	**10766**	Circuit Breaker	1
*	**40084**	Wire Harness	1

* Not Shown

120V HOOK UP DIAGRAM



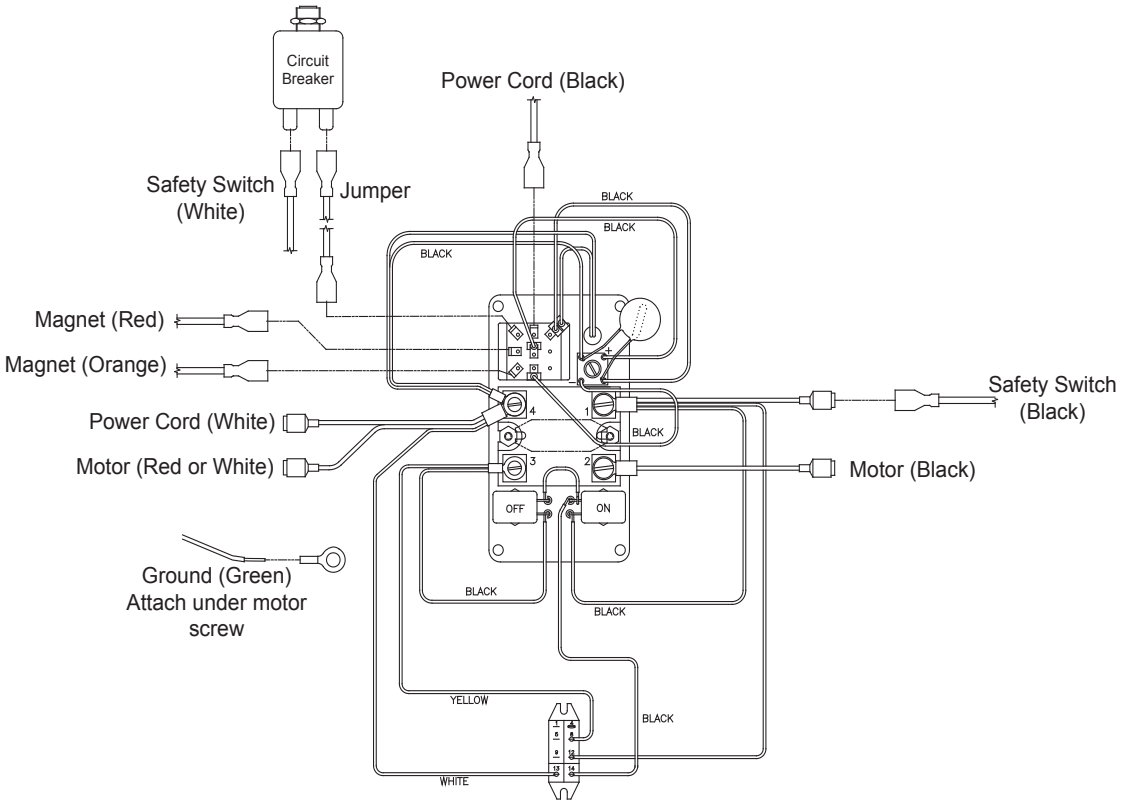
230V PANEL COMPONENTS



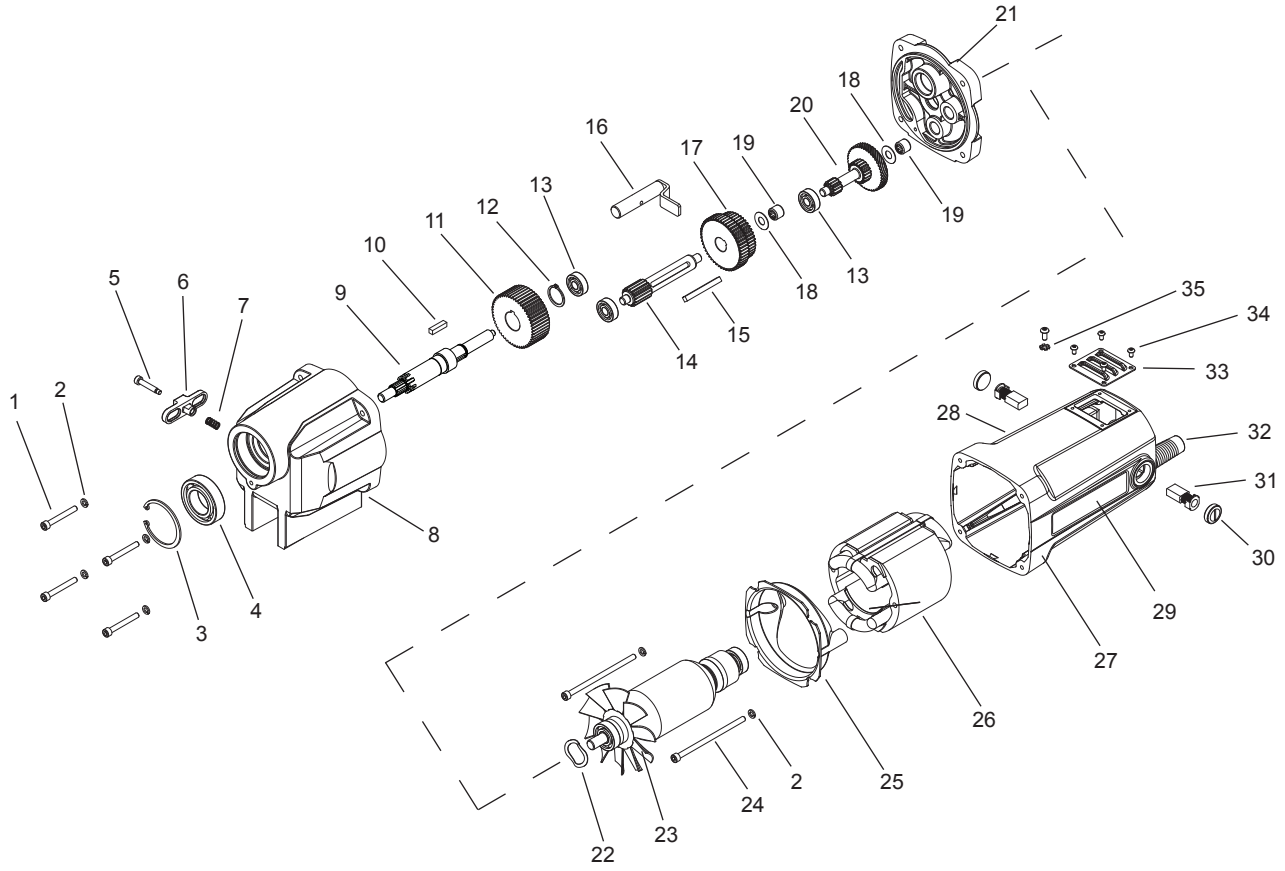
No.	Part #	Description	Qty.
20	**40374**	Nut #6-32	2
21	**05840**	Faceplate	1
22	**04387**	Relay - Solid State	1
23	**10703**	Pilot Light	1
24	**10705**	Rectifier	1
25	**10715**	Toggle Switch Magnet	1
26	**10760**	Surge Suppressor	1
27	**10762**	Push Button SwitchGuard	1
28	**10763**	Motor "ON" Switch	1
29	**10764**	Motor "OFF" Switch	1
30	**10964**	Toggle Switch Guard	1
31	**01005**	Relay Logic	1
32	**10796**	230V Panel Assy.	1
*	**10785**	Circuit Breaker	1
*	**40084**	Wire Harness	1

* Not Shown

230V HOOK UP DIAGRAM

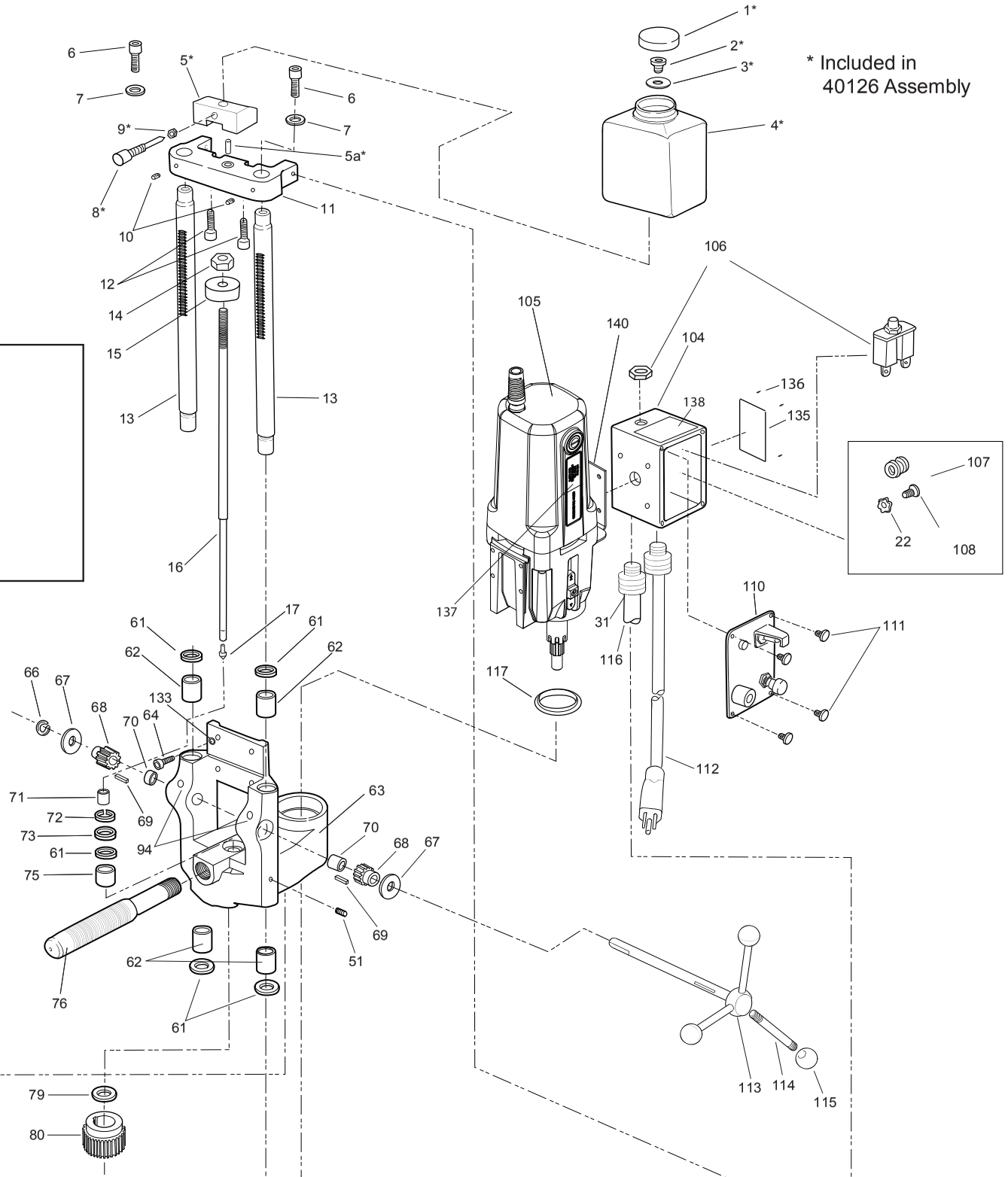


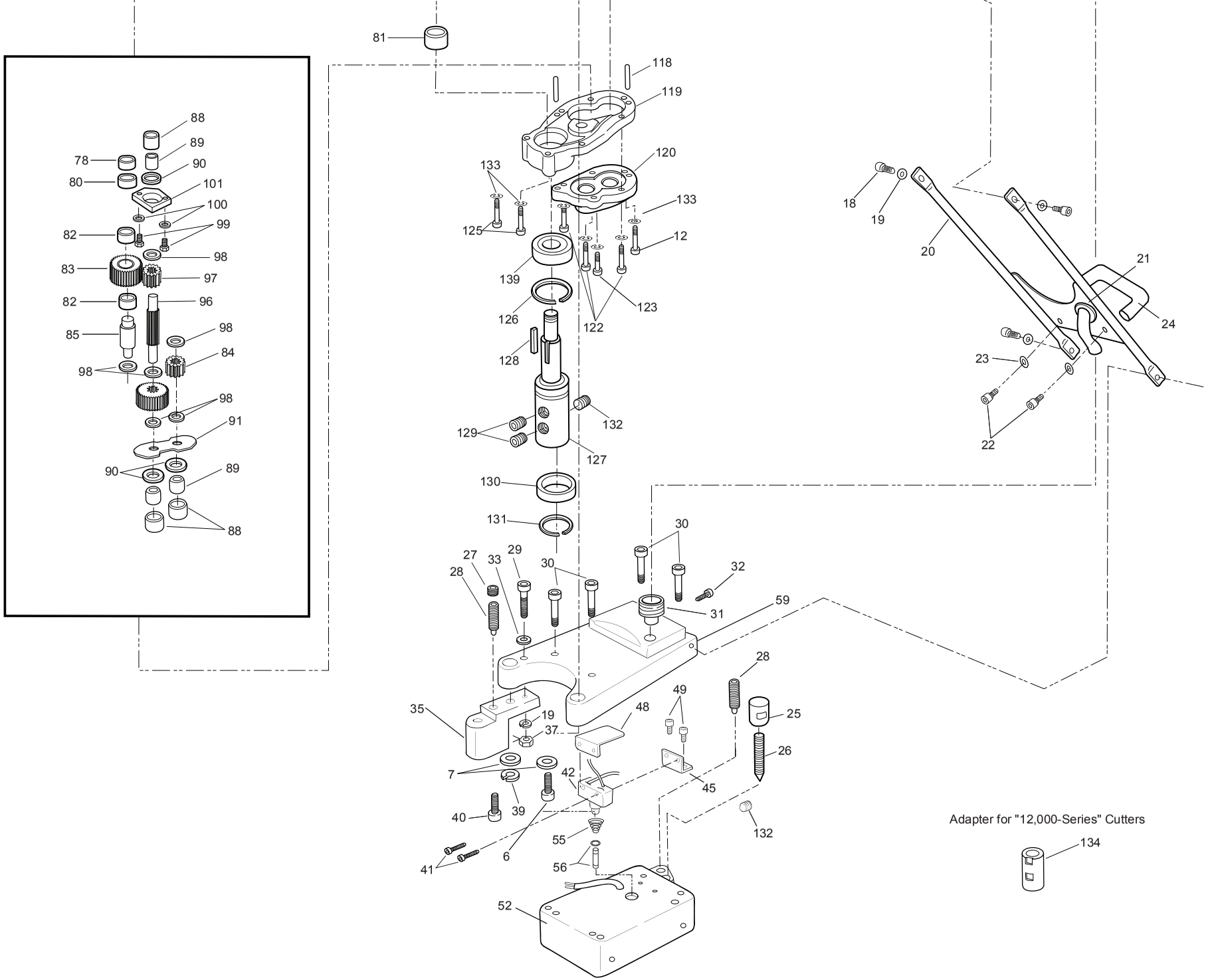
MOTOR PARTS



08146 Motor Assembly 120V 08196 Motor Assembly 230V							
Item	**Part #**	**Description**	**Qty**	**Item**	**Part #**	**Description**	**Qty**
1	**41048**	SCR-SHC #10-32 x 1-1/2	4	20	**07911**	Assembly Gears #2 & #3	1
2	**50038**	Washer - Lock Helical #10	6	21	**08278**	Gear Box Cover	1
3	**07860**	Retaining Ring	1	22	**24093**	Washer - Spring	1
4	**40274**	Bearing 25MM x 47MM x 12MM	1	23	**08276**	Armature Assembly - 120V	1
5	**08069**	SCR-SHSLD 3/16 x 7/8	1		**08277**	Armature Assembly - 230V	1
6	**07908**	Switch	1	24	**07895**	SCR-SHC #10-32 x 3-1/2 LG	2
7	**07910**	Spring-Comp	1	25	**07892**	Baffle	1
8	**07826**	Gear Box Housing	1	26	**07891**	Field - 120V	1
9	**08131**	Spindle- Motor Drive	1		**08040**	Field - 230V	1
10	**07904**	Key	1	27	**08280**	Motor Brush Holder Assembly	1
11	**07900**	Gear Spur Removable	1	28	**07876**	Specs Label - 120V	1
12	**24160**	Retaining Ring	1		**08038**	Specs Label - 230V	1
13	**24100**	Ball Bearing	3	29	**08194**	Motor Label	1
14	**07899**	Gear Spur Removable	1	30	**24044**	Brush Holder Cap	2
15	**07905**	Key	1	31	**24045**	Carbon Brushes	2
16	**07868**	Shift Control Rod Arm	1	32	**08086**	Strain Relief	1
17	**07914**	Assembly, Change gear	1	33	**07848**	Cover, Brush Access	1
18	**17610**	Washer - Flat 8MM	2	34	**02385**	SCR-BHC #6-32 x 1/4	4
19	**07903**	Needle Bearing	2	35	**10538**	Washer - Lock	1

HMD933
Exploded View

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Adapter for "12,000-Series" Cutters
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English

HMD933 PARTS BREAKDOWN

No.	Part #	Description	Qty
	40126	Bottle Assembly	1
1	**40126**	Cap (Must buy Bottle Assy)	1
2	**40123**	Hold Down Fitting	1
3	**40058**	Washer	1
4	**40121**	Bottle	1
5	**40126**	Block (Must buy Bottle Assy)	1
5a	**40125**	Drip Tube	1
6	**40070**	SHCS 1/2-13 x 1	3
7	**40069**	Washer 1/2	4
8	**40126**	Adjustment Needle	1
9	**40124**	O-Ring	1
10	**90071**	Screw 1/4-20 x 1/4	2
11	**40062**	Tie Bar	1
12	**40108**	SHCS 1/4-20 x 1-1/4	3
13	**40067**	Feed Rod	2
14	**40052**	Hex Nut 7/16-14	1
15	**40105**	Knurled Nut 7/16	1
16	**40113**	Ejector Rod	1
17	**40114**	Ejector Rod Point	1
18	**40558**	SHCS 5/16-18 x 3/4	4
19	**40107**	Lock Washer 5/16	4
20	**40086**	Strut Assy	1
21	**40117**	Grommet	1
27	**40141**	SCR-SOC Set 5/8-11 x 1/2	1
28	**10644**	Spring Plunger	2
29	**40183**	SCR-SHC 5/16-18 x 2-1/4	1
30	**40143**	SCR-SHC 5/16-18 x 1-1/2	4
31	**08231**	Strain Relief	3
32	**10977**	SCR-BHC 1/4-20 x 1/4	1
33	**40074**	Washer 5/16 Flat	1
37	**40184**	Nut 5/16-18 UNC	1
39	**40110**	Washer Lock 1/2 Hel	4
40	**40111**	SCR-SHC 1/2-13 x 1-1/2	1
41	**10972**	SCR-BHC #6-32	2
42	**40130**	Safety Switch Assy	1
45	**04909**	Bracket-Safety Switch	1
48	**10983**	Shield-Safety Switch	1

No.	Part #	Description	Qty
49	**10971**	SCR-SHC 1/4-20 x 1/2	1
51	**90497**	SCR-SS 1/4-20 x 3/8 BR	2
52	**05329**	Magnet 230V	1
	05325	Magnet 115V	1
55	**17271**	Spring	1
56	**04961**	Plunger Assy	1
59	**40139**	Base Plate	1
61	**10626**	Seal 7/8	5
62	**40065**	Bushing 7/8	4
63	**40001**	Main Housing	1
64	**40071**	SCR-SHC 1/4-28 x 7/8	4
66	**40044**	Retaining Ring	1
67	**40032**	Washer 9/6 x 1-3/8	2
68	**40116**	Gear Spur 16 teeth	2
69	**40045**	Key	2
70	**40048**	Bushing 9/16	1
71	**40032**	Bushing 7/16	1
72	**40092**	Retaining Ring	1
73	**40112**	Thrust Washer	2
75	**40090**	Bearing 7/8	1
76	**40061**	Handle Assy	1
78	**40035**	Bushing	1
79	**40091**	Washer 7/8	1
80	**40026**	Gear Spindle 36 Teeth	1
81	**40118**	Spacer - Spindle	1
82	**40033**	Bearing 3/4	1
83	**40021**	Gear Idler 32 Teeth	1
84	**40012**	Change Gear 18 Teeth	1
	40016	Change Gear 30 Teeth	1
85	**40018**	Idler Shaft	1
88	**40008**	Bearing	3
89	**40009**	Bearing	3
90	**40007**	Seal 3/4 x 1	3
91	**40006**	Retaining Ring Lower	1
94	**10681**	Grease Fitting	2
95	**40002**	Washer Altered	2
96	**40039**	Shaft-Spline	1

HMD933 PARTS BREAKDOWN

No.	Part #	Description	Qty
97	**40010**	Driven Gear 16 Teeth	1
98	**40020**	Thrust Washer	4
99	**40038**	SHCS 10-32 x 5/8	2
100	**10560**	Washer #10	2
101	**40037**	Upper Retaining Ring	1
104	**08152**	Electrical Box	1
105	**08146**	120V Motor	1
	08196	230V Motor	1
106	**10766**	Circuit Breaker 15A - 120V	1
	10785	Circuit Breaker 8A - 230V	1
107	**10771**	Grommet	1
108	**40066**	SCR-BHC 1/4-28	3
110	**10796**	Panel Assy - 120V	1
	04381	Panel Assy - 230V	1
111	**10710**	SCR- #6-32	2
112	**08222**	Power Cord 120V	1
	08226	Power Cord 230V	1
	08223	Power Cord 230V Type I	1
113	**90264**	Hub - Feed Shaft Assy	1
114	**10569**	Feed Handle	3
115	**04532**	Feed Handle Knob	3
116	**08232**	Cord	1

No.	Part #	Description	Qty
117	**40127**	O-Ring	1
118	**40076**	Dowel Pin 1/4	2
119	**40003**	Housing Spindle Bearing	1
120	**40005**	Lower Bearing Cap Assy	1
122	**40078**	SCR-SHC 1/4-20 x 1-1/2	3
123	**40077**	SCR-SHC 1/4-20 x 1	1
125	**40129**	SCR-SHC 1/4-20 x 2-1/4	2
126	**40023**	Retaining Ring	1
127	**40031**	Spindle	1
128	**40025**	Key 3/16	1
129	**40042**	SCR-SS 3/4-10 Alt	2
130	**40636**	Chip Guard	1
131	**40635**	Retaining Ring	1
132	**10621**	SCR-SS 1/4-20 x 1/4 BR	1
133	**04721**	Washer 1/4 Lock Washer	12
134	**40040**	Adapter	1
135	**08206**	Tag - Gear Chart	1
136	**40104**	#2 Drive Screw	4
137	**17537**	Label - Safety Instructions	1
138	**08148**	Label - 120V	1
139	**40022**	Bearing	1
140	**08144**	Bracket Electrical Box	1

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

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