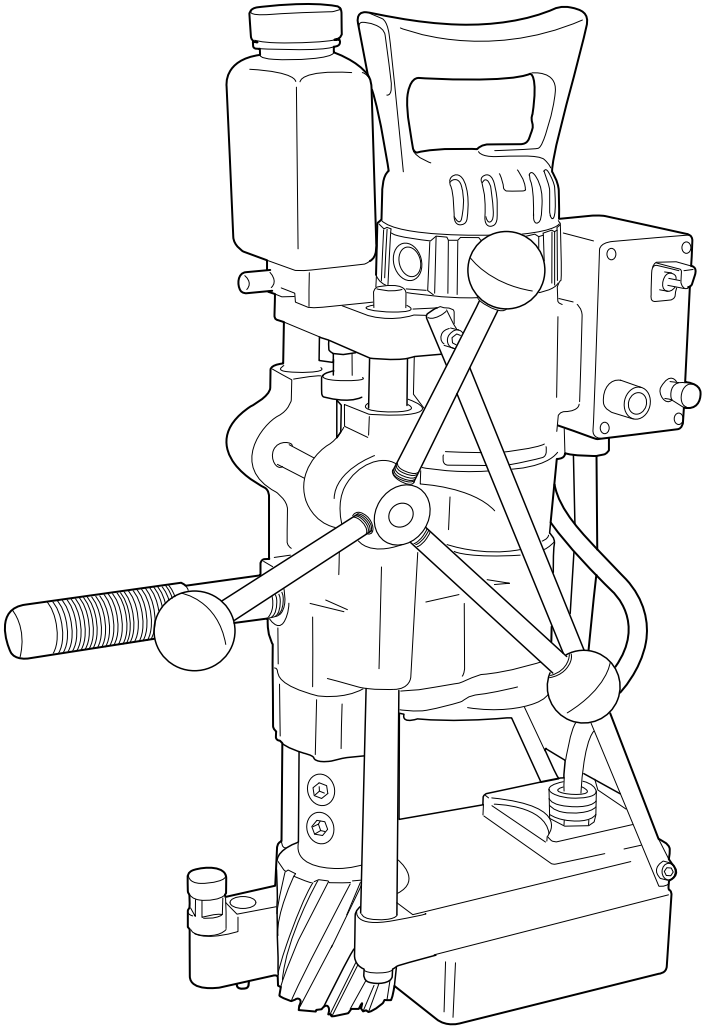




10915/10916
PORTABLE MAGNETIC DRILL

OPERATOR'S MANUAL



FOR USE WITH "42,000/43,000-SERIES" CUTTERS

HOUGEN®

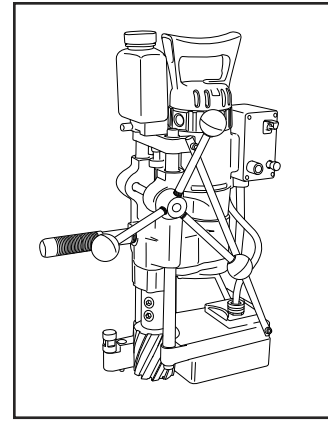
Portable Magnetic Drills

Models 10915, 10916

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.



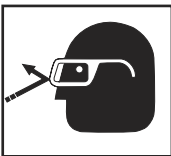
Specifications

Cutter Type.....	Hougen "42/43,000-Series"
Hole Capacity.....	3/4" - 3-1/16" (19mm - 77mm)
Depth of Cut.....	3" (75mm)
Drill RPM/Motor.....	120 RPM, 11.2A/5A
Net Weight.....	69 Lb/31Kg

INDEX

Important Safety Instructions	3-4
Operating Instructions	5
Feed and Glide Post Adjustment	6
Safety Switch and Impactor Adjustment	6
Ejector Rod Adjustment	6
Gear Combinations	7
Installing Cutter, Cutting Fluid, Hints for Smoother Operation	8
Panel Hookup Diagram	9-10
Panel Parts List	11
Exploded View	12-13
Drill Parts List	14-15
Motor Exploded View	16
Motor Parts List	17
Hougen Cutters	18
Commercial / Industrial Limited Warranty	19

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

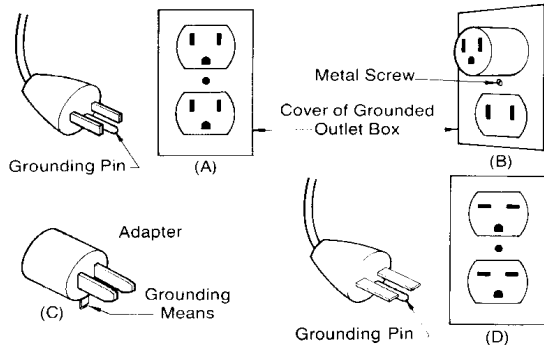


WARNING: When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury, including the following:

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. If your unit is for use on 115V, it has a plug that looks like that shown in sketch (A). If it is for use on 230V, it has a plug that looks like that shown in sketch (B). An adapter, see sketch and (C), is available for connecting sketch (A) type plugs to 2-prong receptacles. The green-colored rigid ear, lug, or the like, extending from the adapter must be connected to a permanent ground, such as a properly grounded outlet box. No adapter is available for a plug as shown in sketch (D).



3. 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. See Table below.

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

4. Do Not Force Tool

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

5. Keep Work Area Clean

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

6. 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.

7. Guard Against Electric Shock

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

8. Keep Children Away

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

9. 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.

10. 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.

11. Non-Conforming Cutting Tools

Your Magnetic 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.

12. 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.

13. Always Wear Safety Glasses or Goggles

14. 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 footwear are recommended when working outdoors. Wear sturdy leather gloves when working indoors.
Wear protective hair covering to contain long hair.

15. 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.

16. Do Not Overreach

Keep proper footing and balance at all time.

17. Maintain Tools With Care

Keep tools sharp and clean for better and safer performance.
Do not use dull or broken Houghen Cutters.
Follow instructions for lubricating and changing accessories.
Keep handles dry, clean, and free from oil and grease.

IMPORTANT SAFETY INSTRUCTIONS - CONTINUED

Continued...

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.

18. Disconnect Tools

Disconnect when not in use, before servicing, and when changing Hougen Cutters or accessories.

19. Remove Adjusting Keys and Wrenches

Form a habit of checking to see that keys and wrenches are removed from tool before turning it on.

20. 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.

21. Stay Alert

Watch what you are doing.
Use common sense.
Do not operate tool when you are tired.
Have defective switches replaced by authorized service center.

22. Outdoor Use Extension Cords

When tool is used outdoors, use only extension cords intended for use outdoors and so marked.

23. Additional Safety Precautions

Spindle and cutter should never be used as a handhold.

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). Be sure that all safety devices are properly adjusted and in use. 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 Hougen 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.

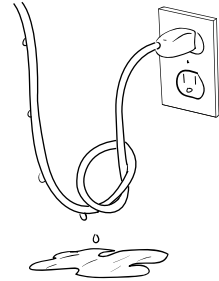
24. Operating Near Welding Equipment

It is NOT recommended that you use this tool on the same work surface as an arc welder. This can cause severe damage to the unit, particularly the power cord. This could also result in personal injury to the operator.

25. 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 at below. Also elevate extension cords or gang box connections.

26. Save These Instructions



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 (40100)
 - 10730 - Safety Chain
 - 10569 - Feed Handles (3)
 - 04532 - Knobs (3)
 - 10565 - Hex Key 1/8" S.A.
 - 13013 - Wrench Allen 5/32" L.A.
 - 10779 - Wrench Allen 7/32" L.A.
 - 10727 - Wrench Allen 3/16" L.A.
 - 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
 - 40088 - Grease #3 Extreme Pressure
 - 40126 - Coolant Btl. Assembly **(sometimes packed separately)
5. Using the handle of the Magnetic Drill, lift the 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.
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 3/4" shank.

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 diminishes 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, vertically, 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 (Detail No 63A) must be adjusted against the Feed Rod (Detail No.13) so that main housing (Detail No. 63) 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 (Detail No. 27), and loosen rear glide post lock screw (Detail No. 51).
3. Screw both glide posts (Detail No. 28 & 50) 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.

Safety Switch Adjustment

1. Unplug unit from power source and place it on a flat sheet of steel that is at least 3/8" thick. Only magnet portion should be on steel plate. Rear support block containing Glide Post and Impactor) should hang over the edge of the steel plate and Front Impactor should be screwed up to clear workpiece.
2. Remove Access Hole Screw (Detail No. 32 from back of housing.
3. Insert 5/32" Allen Wrench into access hole and back off (counterclockwise) Microswitch Adjusting Screw (Detail No. 47) about three full turns.
4. Plug unit into power source and turn magnet ON. Depress and hold motor START switch ON while simultaneously turning Microswitch Adjusting Screw clockwise until motor starts. Once the motor starts release the Motor On Switch. Turn the adjusting screw 1-1/2 turns clockwise. This will set the Microswitch.

Testing of Microswitch

1. Plug unit into power source. Turn Magnet and motor switches ON. Strike side of magnet at rear with a rubber hammer. Motor should shut off before the magnet moves 1/2" in any direction. If the test was successful, replace the Access Hole Screw. If the unit failed the test, recheck the Microswitch Adjustment.

NOTE: Safety switch adjustment should be checked regularly following the procedures outlined above.

IMPACTOR ADJUSTMENT

1. Adjustment is made with Magnet ON and impactor over the work surface.
2. Loosen Heads of Front and Rear Impactors (Detail No. 25)
3. Screw Impactor Points (Detail No. 26) up (counterclockwise) until point just touches work surface.
4. Screw Impactors down (clockwise) until point just touches work surface.
5. Screw Impactor Points 1/2 turn further toward work surface. (It may be necessary to turn off Magnet while advancing Impactor).
6. Tighten Heads.

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, diminishing 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 (Detail No. 14) and rotate the knurled nut (Detail No 15) 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 (Detail No. 11)

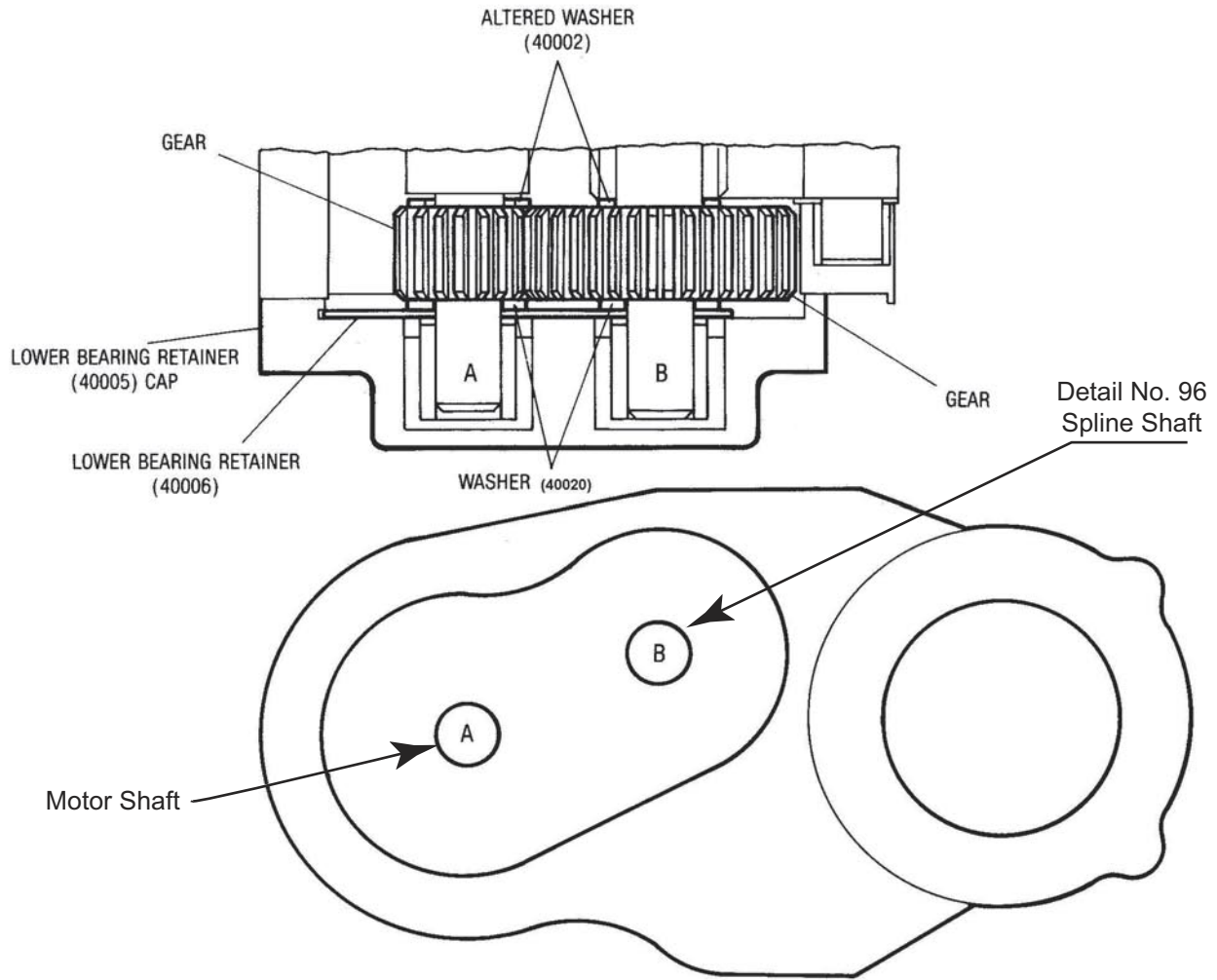


Figure 5. Drawing shows arrangement of gears. Be sure that upper and lower washers are replaced on Shafts A and B when changing gears. If necessary, refer to exploded view when removing lower bearing retainer cap

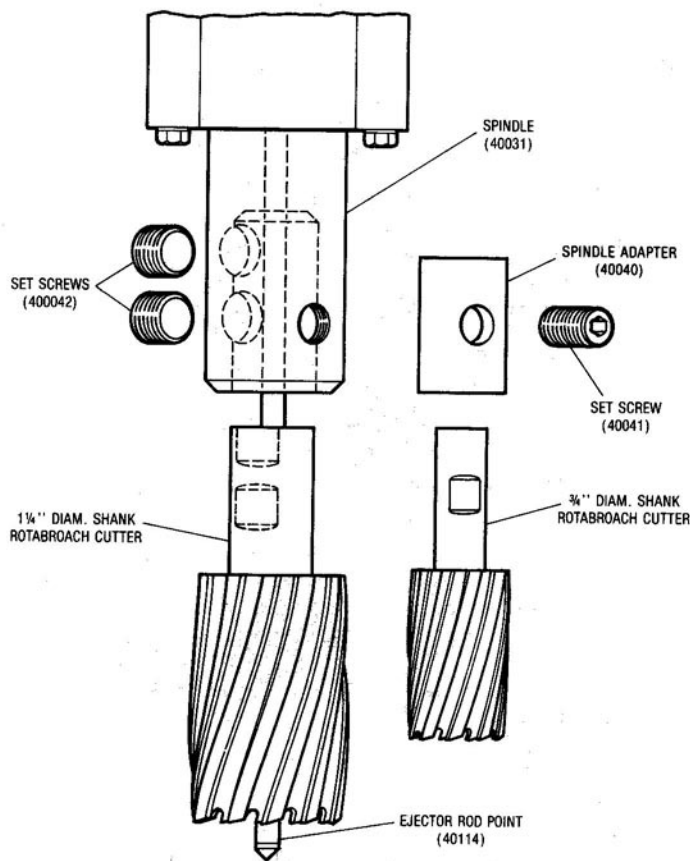
GEAR COMBINATIONS FOR VARIOUS RPMs

Cutter RPM	No. of Teeth per Gear	
	Shaft A	Shaft B
100	16	32
120	18	30
142	20	28
200	24	24
279	28	20
332	30	18
400	32	16

Drill unit comes with 18-tooth gear (40012) on Shaft A and 30-tooth gear (40016) 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 (Detail No. 122) and two Cap Screws (Detail No. 123)
2. Remove gears from Shafts A and B, being careful to save the two Altered Torrington Thrust Washers (Detail No. 95) and two lower Washers (Detail No. 98)
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 IN SPINDLE

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) Hougén Cutters with 1-1/4" dia. shanks**

Loosen the two short set screws (40040) and insert insert 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) Hougén Cutters with 3/4" dia. shanks

Install the spindle adapter (40040) 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 (40041) and tighten.

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.

ADJUSTMENT OF CHIPBREAKER

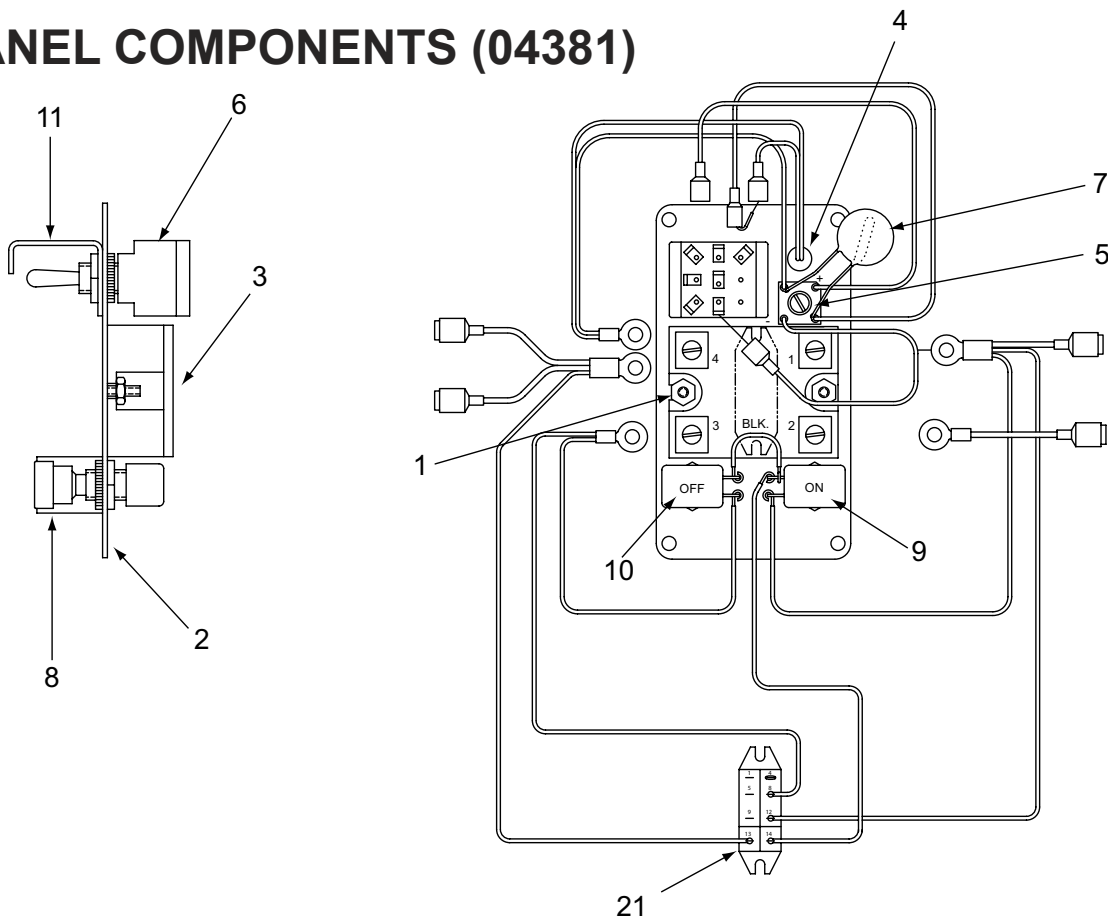
Adjust the chipbreaker blade to within .020" to .030" of cutter and tighten securely.

HINTS FOR SMOOTHER OPERATION

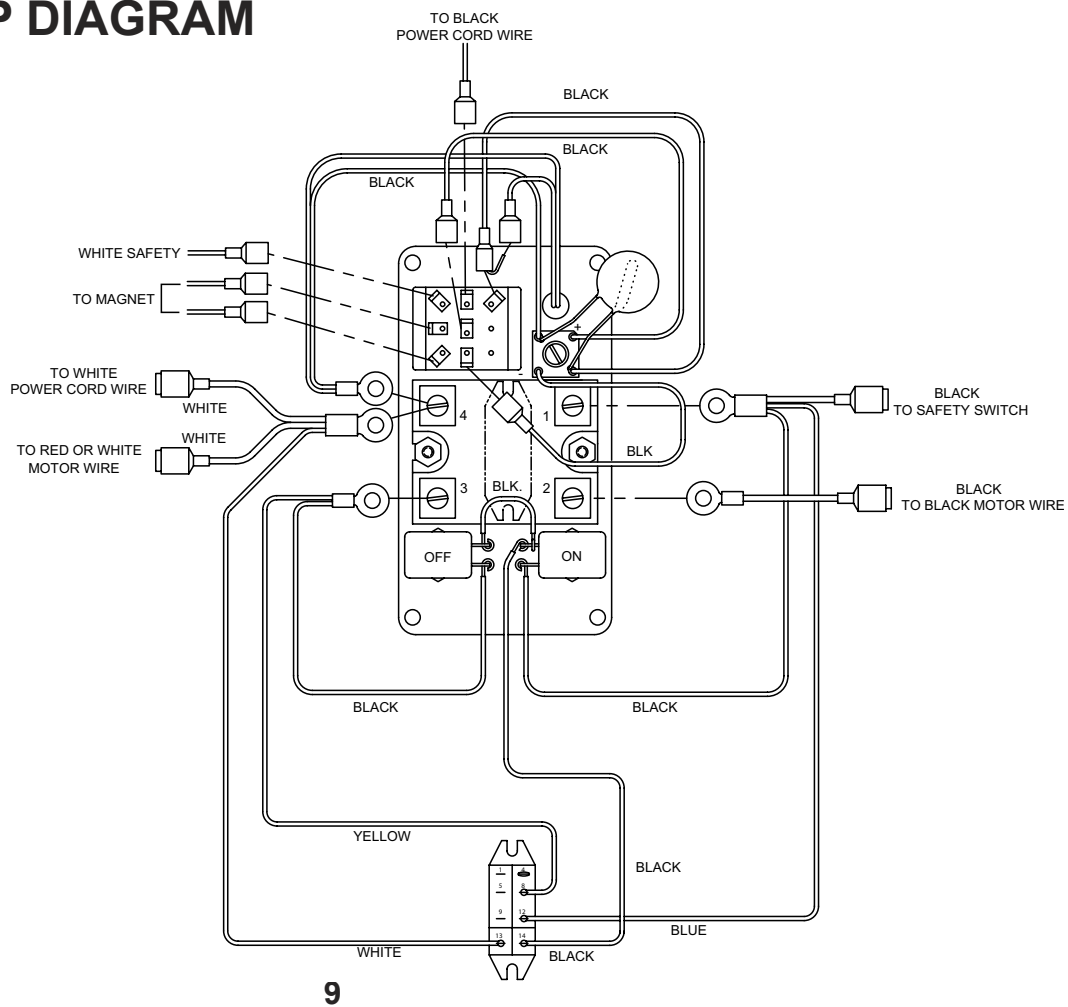
1. Keep inside of Hougén Cutter clear of chips. Chips will interfere with cutting to maximum depth, may impede the free flow of cutting fluid and can cause cutter breakage.
2. Keep work, machine, arbor and Hougén Cutter free of chips and dirt.
3. Tighten all fasteners periodically.
4. We highly recommend using a light cutting fluid (preferably Hougén Cutting Fluid)
5. Occasionally check metering of cutting fluid flow. Lack of cutting fluid may cause Hougén 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. 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

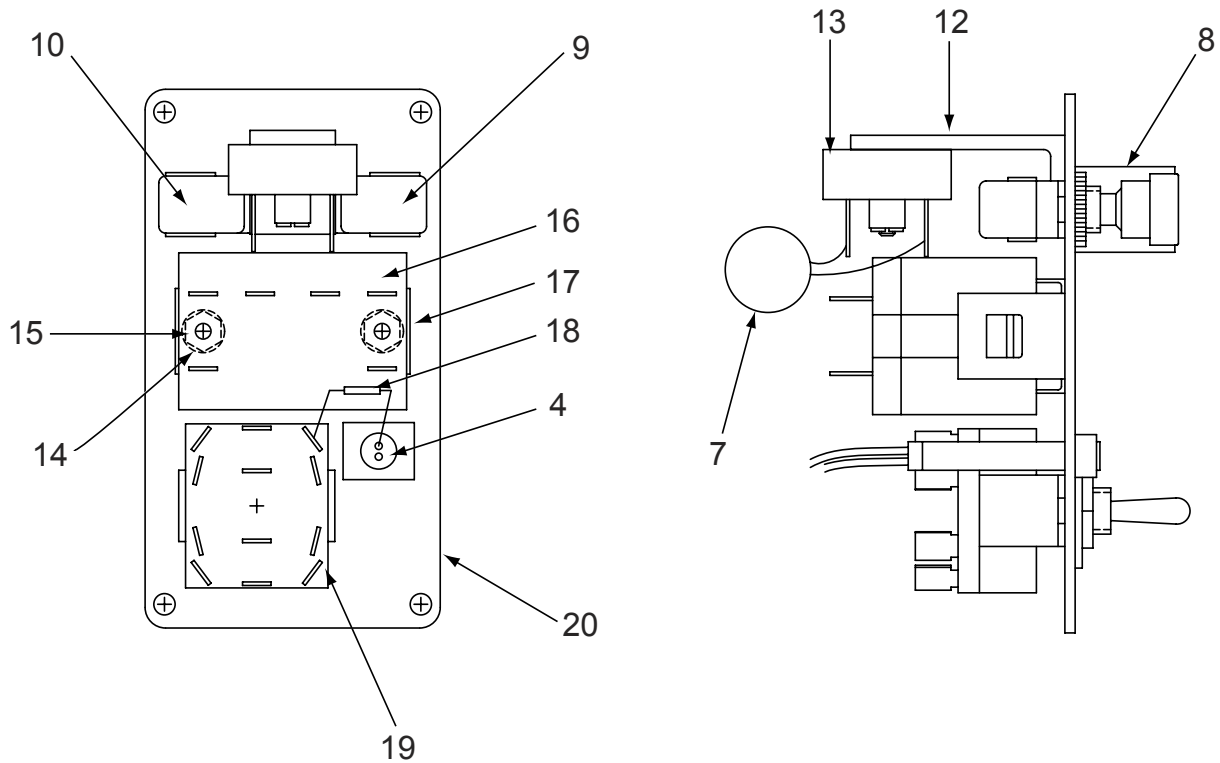
10915 PANEL COMPONENTS (04381)



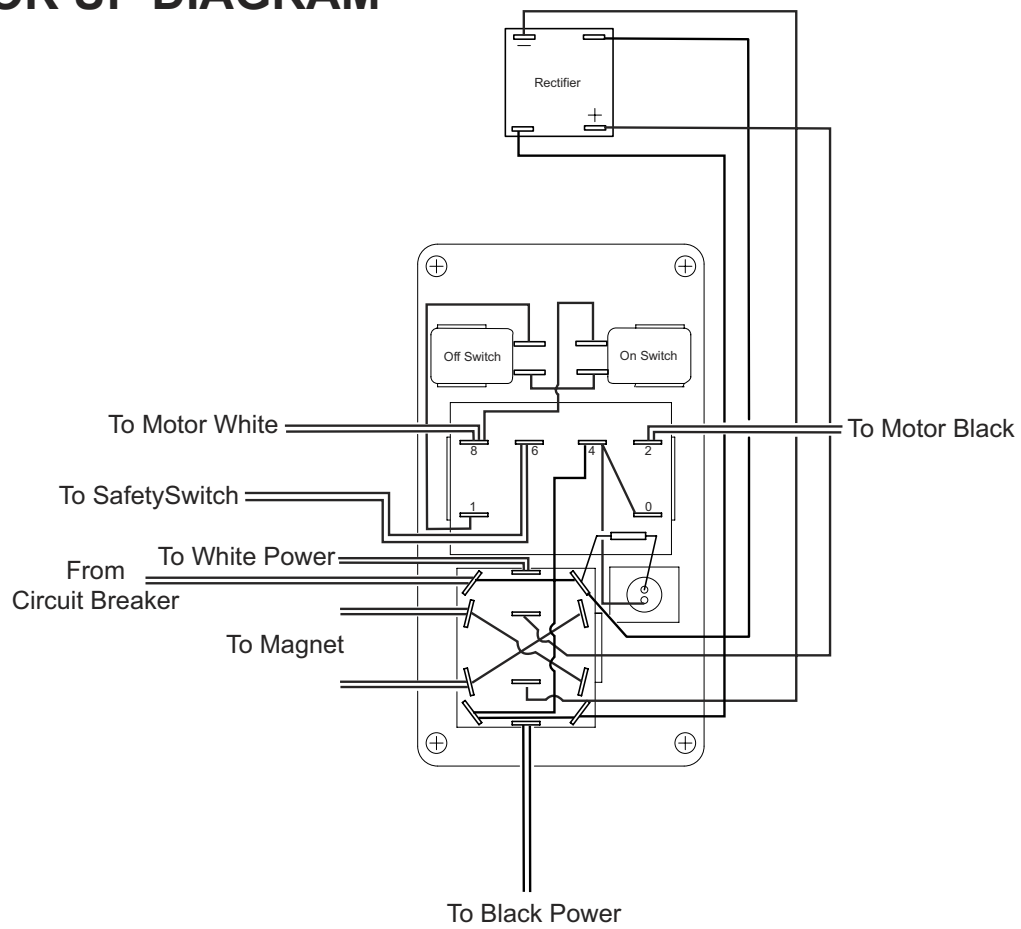
10915 HOOK UP DIAGRAM



10916 PANEL COMPONENTS (10796)

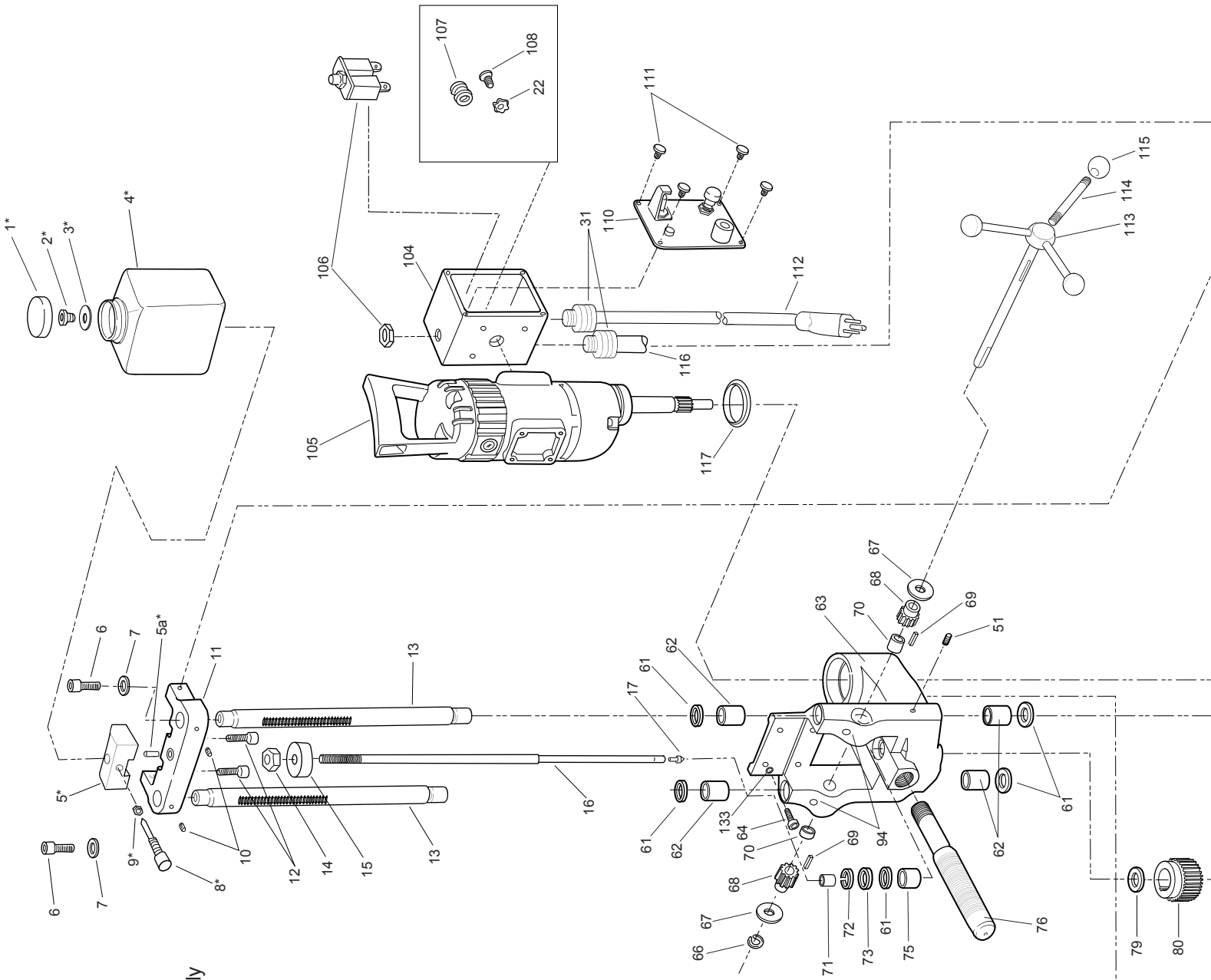


10916 HOOK UP DIAGRAM



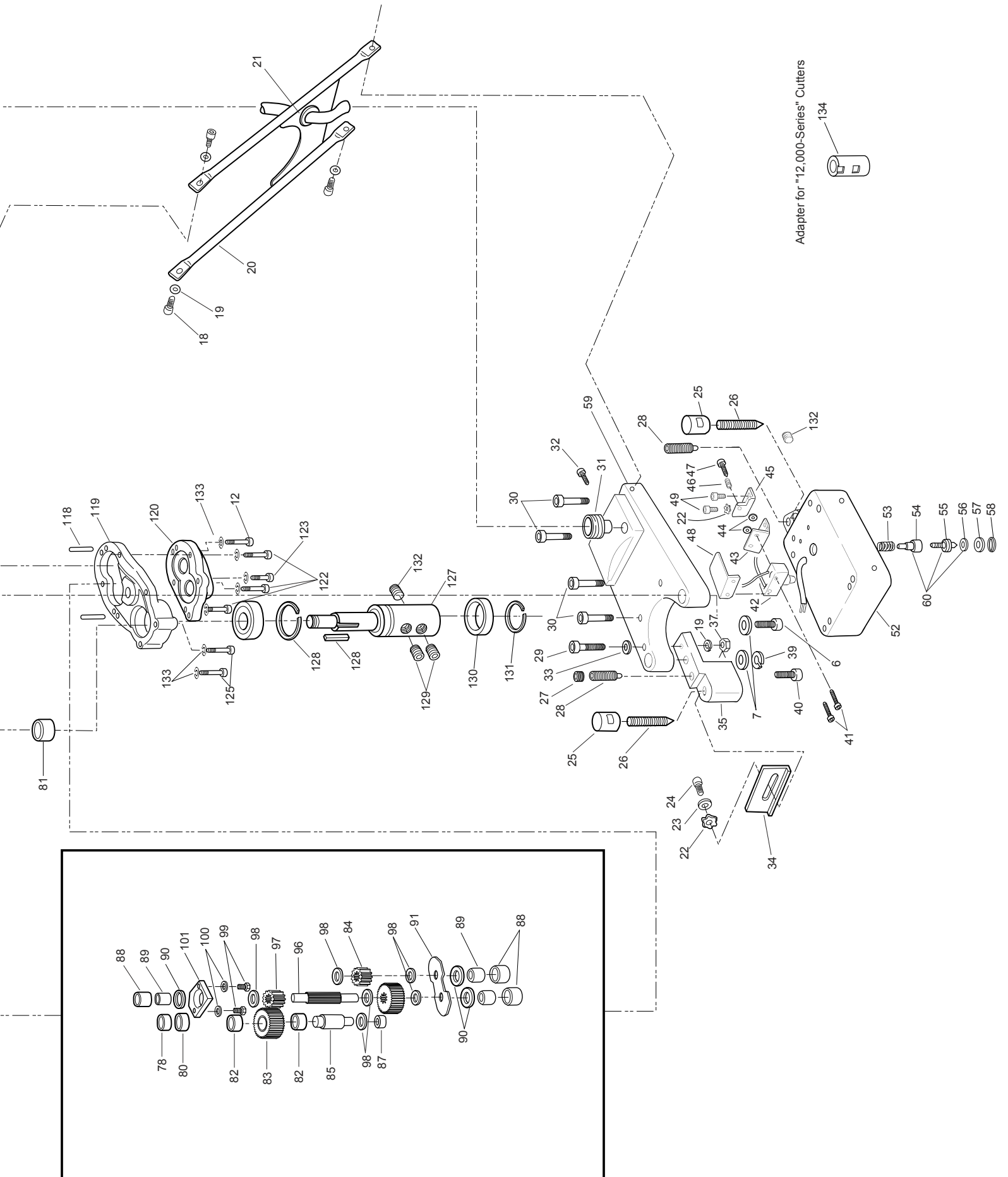
MODELS 10915/10916 PANEL COMPONENTS

No.	Part #	Description	Qty
1	01835	Plastic Knurled Nut	1
2	04380	Faceplate (10915)	1
3	04387	Relay (10915)	1
4	10703	Pilot Light	1
5	10705	Rectifier (10915)	1
6	10715	Toggle Switch Magnet	1
7	10718	Surge Suppressor	1
8	10762	Push Button Switch Guard	1
9	10764	Motor Switch "Off"	1
10	10763	Motor Switch "On"	1
11	10964	Toggle Switch Guard	1
12	02238	Rectifier Bracket	1
13	10758	Rectifier Full Wave	1
14	90052	Lock Washer #6	3
15	40374	Hex Nut #6-32	3
16	02235	Relay - 250v	1
17	02236	Relay Bracket	1
18	10757	Resistor	1
19	01068	Toggle Switch	1
20	02260	Faceplate (10916)	1
21	01205	Relay (10915)	1
22	04381	10915 Panel Assy	1
23	10796	10916 Panel Assy	1



* Included in 40126 Assembly

10915/16
Exploded View



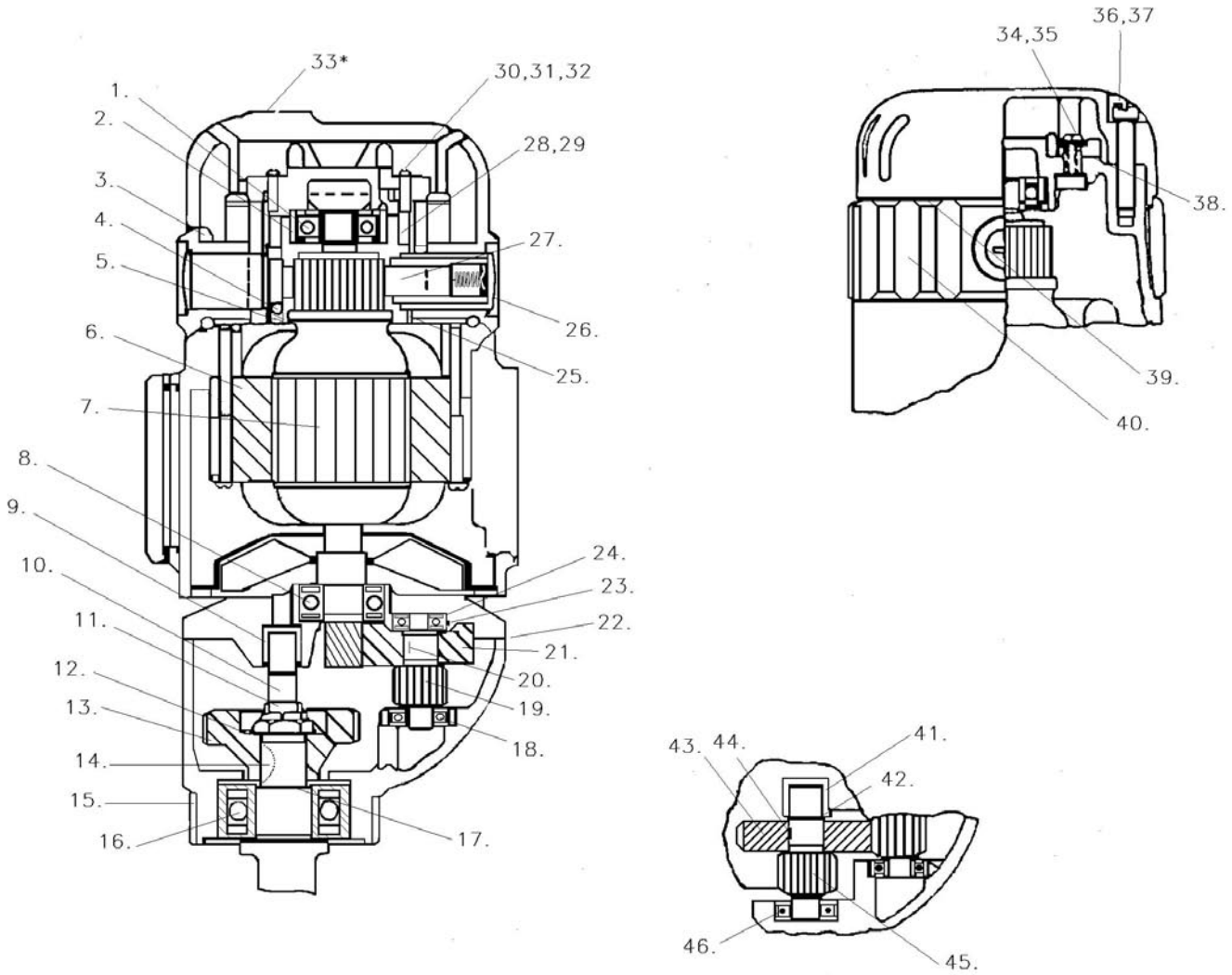
10915/10916 PART NUMBERS

No.	Part #	Description	Qty	No.	Part #	Description	Qty
	40126	Bottle Assembly	1	37	40184	Nut 5/16-18 UNC	1
1	40122	Cap	1	39	40110	Washer Lock 1/2 Hel	4
2	40123	Hold Down Fitting	1	40	40111	SCR-SHC 1/2-13 x 1-1/2	1
3	40058	Washer	1	41	10972	SCR-BHC #6-32	2
4	40121	Bottle	1	42	40130	Microswitch Assy	1
5	40119	Block	1	43	10967	Clip-Microswitch	1
5a	40125	Drip Tube	1	44	10973	Slip-Microswitch Mounting	2
6	40070	SHCS 1/2-13 x 1	3	45	10970	Bracket-SS Adjust	1
7	40069	Washer 1/2	4	46	10968	Spring	1
8	40120	Adjustment Needle	1	47	10969	SCR-SHC #10-32 Altered	1
9	40124	O-Ring	1	48	10983	Shield-Micro Switch	1
10	90071	Screw 1/4-20 x 1/4	2	49	10971	SCR-SHC 1/4-20 x 1/2	1
11	40062	Tie Bar	1	51	90497	SCR-SS 1/4-20 x 3/8 BR	2
12	40108	SHCS 1/4-20 x 1-1/4	3	52	10947	Magnet 203V (10916)	1
13	40067	Feed Rod	2		10948	Magnet 115V (10915)	1
14	40052	Hex Nut 7/16-14	1	53	10618	Spring	1
15	40105	Knurled Nut 7/16	1	54	10993	Plunger Assy	1
16	40113	Ejector Rod	1	55	10638	Bearing Assy	1
17	40114	Ejector Rod Point	1	56	10632	Retaining Ring	4
18	40558	SHCS 5/16-18 x 3/4	4	57	10975	Seal Assy-Safety Switch	1
19	40107	Lock Washer 5/16	4	58	10974	Retaining Ring	1
20	40086	Strut Assy	1	59	40139	Base Plate	1
21	40117	Grommet	1	61	10626	Seal 7/8	5
22	90065	Lock Washer 1/4	5	62	40065	Bushing 7/8	4
23	90027	Flat Washer 1/4	1	63	40001	Main Housing	1
24	10553	SHCS 5/16-18 x 7/8	1	64	40071	SCR-SHC 1/4-28 x 7/8	4
25	40181	Head Impactor	2	66	40044	Retaining Ring	1
26	40182	Point Impactor	2	67	40032	Washer 9/6 x 1-3/8	2
27	40141	SCR-SOC Set 5/8-11 x 1/2	1	68	40116	Gear Spur 16 teeth	2
28	10644	Spring Plunger	2	69	40045	Key	2
29	40183	SCR-SHC 5/16-18 x 2-1/4	1	70	40028	Bushing 9/16	1
30	40143	SCR-SHC 5/16-18 x 1-1/2	4	71	40032	Bushing 7/16	1
31	10592	Strain Relief	3	72	40092	Retaining Ring	1
32	10977	SCR-BHC 1/4-20 x 1/4	1	73	40112	Thrust Washer	2
33	40074	Washer 5/16 Flat	1	75	40090	Bearing 7/8	1
34	40095	Chip Breaker Insert	1	76	40061	Handle Assy	1
35	40134	Chip Breaker Block	1	78	40035	Bushing	1

10915/10916 PART NUMBERS (CONT)

No.	Part #	Description	Qty	No.	Part #	Description	Qty
79	40091	Washer 7/8	1	112	40128	Power Cord 115V	1
80	40026	Gear Spindle 36 Teeth	1		04808	Power Cord 230V	1
81	40118	Spacer - Spindle	1	113	90264	Hub - Feed Shaft Assy	1
82	40033	Bearing 3/4	1	114	10569	Feed Handle	3
83	40021	Gear Idler 32 Teeth	1	115	04532	Feed Handle Knob	3
84	40011	Change Gear 16 Teeth	1	116	40084	Cord	1
	40012	Change Gear 18 Teeth	1	117	40127	O-Ring	1
	40013	Change Gear 20 Teeth	1	118	40076	Dowel Pin 1/4	2
	40014	Change Gear 24 Teeth	1	119	40003	Housing Spindle Bearing	1
	40015	Change Gear 28 Teeth	1	120	40005	Lower Bearing Cap Assy	1
	40016	Change Gear 30 Teeth	1	122	40078	SCR-SHC 1/4-20 x 1-1/2	3
	40017	Change Gear 32 Teeth	1	123	40077	SCR-SHC 1/4-20 x 1	1
85	40018	Idler Shaft	1	125	40129	SCR-SHC 1/4-20 x 2-1/4	2
87	40019	Bushing	1	126	40023	Retaining Ring	1
88	40008	Bearing	3	127	40031	Spindle	1
89	40009	Bearing	3	128	40025	Key 3/16	1
90	40007	Seal 3/4 x 1	3	129	40042	SCR-SS 3/4-10 Alt	2
91	40006	Retaining Ring Lower	1	130	40636	Chip Guard	1
94	10681	Grease Fitting	2	131	40635	Retaining Ring	1
95	40002	Washer Altered	2	132	10621	SCR-SS 1/4-20 x 1/4 BR	1
96	40039	Shaft-Spline	1	133	04721	Washer 1/4 Lock Washer	12
97	40010	Driven Gear 16 Teeth	1	134	40040	Adapter	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	40083	Electrical Box 10915	1				
	40651	Electrical Box 10916	1				
105	40082	Motor 10915	1				
	40131	Motor 10916	1				
106	10766	Circuit Breaker 15A - 10915	1				
	10785	Circuit Breaker 8A - 10916	1				
107	10771	Grommet	1				
108	40066	SCR-BHC 1/4-28	3				
110	10796	Panel Assy - 10916	1				
	04381	Panel Assy - 10915	1				
111	10710	SCR- #6-32	2				

MOTOR PARTS



MOTOR PARTS LISTING

Item No.	Part No.	Description	Qty.	Item No.	Part No.	Description	Qty.
1	BD-14201	BALL BEARING	1	22	BD-939467	GASKET	1
2	BD-30612	BEARING PLUG	1	23	BD-30613	BEARING PLUG	1
3	BD-31675	SET SCREW	2	24	BD-20774-01	BALL BEARING	1
4	BD-475	3/16" BALL	1	25	BD-24323	INSULATING SHIELD	2
5	BD-38769	DETENT PIN SPRING	1	26	BD-33880-01	BRUSH HOLDER CAP	2
	40140	LOCK PIN	1	27	10583	BRUSH (PAIR)	1
6	BD-285841-00*	FIELD (10915)	1	28	BD-38226	BRUSH LEAD	2
6	BD-450070-00	FIELD (10916)	1	29	BD-9293	BRUSH LEAD TERM.	2
7	BD-285841-00*	ARMATURE (10915)	1	30	BD-38225	CONTACT BLOCK ASSY.	1
7	BD-38206-01	FAN (10916)	1	31	BD-4006-01	RIVET	2
7	BD-450063-42	ARMATURE (10916)	1	32	BD-38224	CONTACT BLOCK ASSY.	2
8	BD-330003-12	BALL BEARING	1	33	BD-449900	COVER	1
9	BD-21635	NEEDLE BEARING	1		BD-54914-01	SPADE HANDLE	1
10	40000	OUTPUT SHAFT	1	34	BD-4145-01	LOCK WASHER	2
11	BD-70920	LOCK NUT	1	35	BD-37955	SCREW	2
12	BD-45051	CONE LOCK WASHER	1	36	BD-9842	SCREW	2
13	BD-55196	SPINDLE GEAR	1	37	BD-416	LOCK WASHER	6
14	BD-13851	SPINDLE GEAR KEY	1	38	BD-37914	INSULATING SPACER	2
15	BD-38219	BEARING CAP	1	39	BD-445694	ANTI-FRICTION RING	1
16	BD-944821	BALL BEARING	1	40	BD-38201	REV. SWITCH RING	1
17	BD-944822	SPACER	1	41	BD-38221	NEEDLE BEARING	1
18	BD-30090	BALL BEARING	1	42	BD-38218	THRUST WASHER	1
19	BD-38278	1ST INTER. PINION	1	43	BD-55401	GEAR & PINION ASSY.	1
20	BD-6952	1ST INTER. GEAR KEY	1	44	BD-6952	2ND INTER. GEAR KEY	1
21	BD-38210	1ST INTER. GEAR	1	45	BD-8068	BALL BEARING	1

* BD-285841-00 replaces older Armature & Field assemblies.
This kit includes armature, field, baffle and fan

"42,000 / 43,000-SERIES" HOUGEN CUTTERS

"42,000-SERIES" - M2 HSS			
"22,000-SERIES" - M2 HSS TIN COATED			
Cutter Diameter (Inches)	Decimal Equivalent	Part Number	
		M2	M2 TiN Coated
3/4" Weldon Shank - 2" D.O.C.			
3/4	.7500	42024	22024
13/16	.8125	42026	22026
7/8	.8750	42028	22028
15/16	.9375	42030	22030
1	1.0000	42032	22032
1-1/16	1.0625	42034	22034
1-1/8	1.1250	42036	22036
1-3/16	1.1875	42038	22038
1-1/4	1.2500	42040	22040
1-5/16	1.3125	42042	22042
1-3/8	1.3750	42044	22044
1-7/16	1.4375	42046	22046
1-1/4" Weldon Shank - 2" D.O.C.			
1-1/2	1.5000	42048	22048
1-9/16	1.5625	42050	22050
1-5/8	1.6250	42052	22052
1-11/16	1.6875	42054	22054
1-3/4	1.7500	42056	22056
1-13/16	1.8125	42058	22058
1-7/8	1.8750	42060	22060
1-15/16	1.9375	42062	22062
2	2.0000	42064	22064
1-1/4" Weldon Shank - 3" D.O.C.			
2-1/16	2.0625	43066	23066
2-1/8	2.1250	43068	23068
2-3/16	2.1875	43070	23070
2-1/4	2.2500	43072	23072
2-5/16	2.3125	43074	23074
2-3/8	2.3750	43076	23076
2-7/16	2.4375	43078	23078
2-1/2	2.5000	43080	23080
2-9/16	2.5625	43082	23082
2-5/8	2.6250	43084	23084
2-11/16	2.6875	43086	23086
2-3/4	2.7500	43088	23088
2-13/16	2.8125	43090	23090
2-7/8	2.8750	43092	23092
2-15/16	2.9375	43094	23094
3	3.0000	43096	23096
3-1/16	3.0625	43098	23098

Commercial / Industrial Limited Warranty

Hougen

(1) year

repair or replace (at its option) without charge any items returned. This warranty is void if the item has been damaged by accident or unreason

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sions of

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.

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