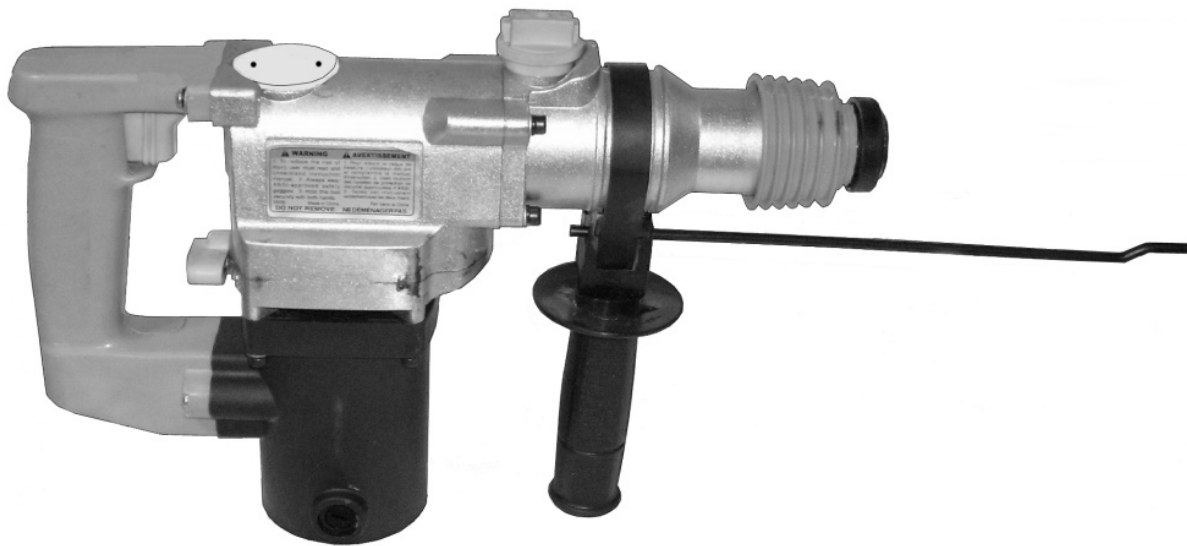


CHICAGO
Electric[®]Power Tools

ROTARY HAMMER - 1"

Model 97743

SET UP AND OPERATING INSTRUCTIONS



Diagrams within this manual may not be drawn proportionally.

Due to continuing improvements, actual product may differ slightly from the product described herein.

Distributed exclusively by Harbor Freight Tools[®].

3491 Mission Oaks Blvd., Camarillo, CA 93011

Visit our website at: <http://www.harborfreight.com>



**Read this material before using this product.
Failure to do so can result in serious injury.
SAVE THIS MANUAL.**

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For technical questions or replacement parts, please call 1-800-444-3353.

SAVE THIS MANUAL

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

CAUTION

CAUTION, without the safety alert symbol, is used to address practices not related to personal injury.

General Power Tool Safety Warnings



WARNING Read all safety warnings and instructions.

Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The term "power tool" in the warnings refers to your line-operated (corded) Rotary Hammer.

1. **Work area safety**
 - a. **Keep work area clean and well lit.** *Cluttered or dark areas invite accidents.*
 - b. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** *Power tools create sparks which may ignite the dust or fumes.*
 - c. **Keep children and bystanders away while operating a power tool.** *Distractions can cause you to lose control.*
2. **Electrical safety**
 - a. **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with grounded power tools.** *Unmodified plugs and matching*

outlets will reduce risk of electric shock.

- b. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.** *There is an increased risk of electric shock if your body is grounded.*
 - c. **Do not expose power tools to rain or wet conditions.** *Water entering a power tool will increase the risk of electric shock.*
 - d. **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** *Damaged or entangled cords increase the risk of electric shock.*
 - e. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** *Use of a cord suitable for outdoor use reduces the risk of electric shock.*
 - f. **If operating a power tool in a damp location is unavoidable, use a Ground Fault Circuit Interrupter (GFCI) protected supply.** *Use of a GFCI reduces the risk of electric shock.*
3. **Personal safety**
 - a. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** *A moment of inattention while operating power tools may result in serious personal injury.*
 - b. **Use personal protective equipment. Always wear eye protection.** *Safety equipment such as dust mask,*
- non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.*
 - c. **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool. Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.**
 - d. **Remove any adjusting key or wrench before turning the power tool on.** *A wrench or a key left attached to a rotating part of the power tool may result in personal injury.*
 - e. **Do not overreach. Keep proper footing and balance at all times.** *This enables better control of the power tool in unexpected situations.*
 - f. **Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts.** *Loose clothes, jewelry or long hair can be caught in moving parts.*
 - g. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** *Use of these devices can reduce dust-related hazards.*
 - h. **Only use safety equipment that has been approved by an appropriate standards agency.** *Unapproved safety equipment may not provide adequate protection. Eye protection must be ANSI-approved and breathing protection must be NIOSH-approved for the specific hazards in the work area.*

4. **Power tool use and care**
 - a. **Do not force the power tool. Use the correct power tool for your application.** *The correct power tool will do the job better and safer at the rate for which it was designed.*
 - b. **Do not use the power tool if the switch does not turn it on and off.** *Any power tool that cannot be controlled with the switch is dangerous and must be repaired.*
 - c. **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing power tools.** *Such preventive safety measures reduce the risk of starting the power tool accidentally.*
 - d. **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** *Power tools are dangerous in the hands of untrained users.*
 - e. **Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** *Many accidents are caused by poorly maintained power tools.*
 - f. **Keep cutting tools sharp and clean.** *Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.*
 - g. **Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions**

and the work to be performed.

Use of the power tool for operations different from those intended could result in a hazardous situation.

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

Percussion and Rotary Hammer Safety Warnings

1. **Wear ear protectors.** *Exposure to noise can cause hearing loss.*
2. **Use auxiliary handles supplied with the tool.** *Loss of control can cause personal injury.*
3. **Hold power tools by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord.** *Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.*
4. Maintain labels and nameplates on the tool. These carry important safety information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
5. Do not operate the Rotary Hammer if any of the following problems occur: Hammer is too hot, insulation is torn, frayed or missing, or if excessive sparking occurs.
6. Move the Switching Knob (24) and Main Handle (91) only when the Motor is stopped. Attempting to move either one while the Motor is engaged will result in abrupt bit rotation, and

can cause serious personal injury and/or property damage.

7. Do not allow the bit to stop while in the hole. Remove the bit while it is still rotating. If the bit stops while in the hole, do not restart the Rotary Hammer. Remove the bit from the Hammer, and then remove the bit from the workpiece.
8. Always keep the Power Cord (112) and extension cord (if used) away from the moving parts of the Rotary Hammer.
9. Avoid unintentional starting. Prepare to begin work before turning on the tool.
10. Do not lay the tool down until it has come to a complete stop. Moving parts can grab the surface and pull the tool out of your control.
11. When using a handheld power tool, hold the tool with both hands to resist starting torque.
12. Do not leave the tool unattended when it is plugged into an electrical outlet. Turn off the tool, and unplug it from its electrical outlet before leaving.
13. This product is not a toy. Keep it out of reach of children.
14. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. In addition, people with pacemakers should:
 - Avoid operating alone.
 - Do not use with power switch locked on.
- Properly maintain and inspect to avoid electrical shock.
- Any power cord must be properly grounded. Ground Fault Circuit Interrupter (GFCI) should also be implemented – it prevents sustained electrical shock.
15. Some dust created by power sanding, sawing, grinding, drilling, and other construction activities, contains chemicals known [to the State of California] to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
 - Lead from lead-based paints
 - Crystalline silica from bricks and cement or other masonry products
 - Arsenic and chromium from chemically treated lumberYour risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles. (California Health & Safety Code § 25249.5, *et seq.*)
16. The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Vibration Safety

This tool vibrates during use.

Repeated or long-term exposure to vibration may cause temporary or permanent physical injury, particularly to the hands, arms and shoulders. To reduce the risk of vibration-related injury:

1. Anyone using vibrating tools regularly or for an extended period should first be examined by a doctor and then have regular medical check-ups to ensure medical problems are not being caused or worsened from use. Pregnant women or people who have impaired blood circulation to the hand, past hand injuries, nervous system disorders, diabetes, or Raynaud's Disease should not use this tool. If you feel any medical or physical symptoms related to vibration (such as tingling, numbness, and white or blue fingers), seek medical advice as soon as possible.
2. Do not smoke during use. Nicotine reduces the blood supply to the hands and fingers, increasing the risk of vibration-related injury.
3. Wear suitable gloves to reduce the vibration effects on the user.
4. Use tools with the lowest vibration when there is a choice between different processes.
5. Include vibration-free periods each day of work.
6. Grip tool as lightly as possible (while still keeping safe control of it). Let the tool do the work.
7. To reduce vibration, maintain the tool as explained in this manual. If any

abnormal vibration occurs, stop use immediately.



SAVE THESE INSTRUCTIONS.

GROUNDING

⚠️ WARNING

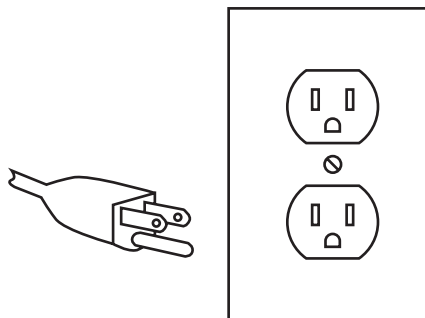
TO PREVENT ELECTRIC SHOCK



AND DEATH FROM INCORRECT GROUNDING WIRE CONNECTION:

Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. Do not modify the power cord plug provided with the tool. Never remove the grounding prong from the plug. Do not use the tool if the power cord or plug is damaged. If damaged, have it repaired by a service facility before use. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

Grounded Tools: Tools with Three Prong Plugs



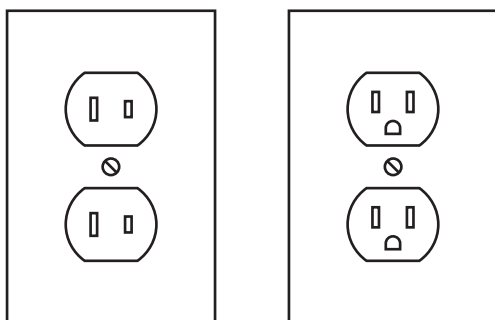
3-Prong Plug and Outlet

1. Tools marked with "Grounding Required" have a three wire cord

and three prong grounding plug. The plug must be connected to a properly grounded outlet. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user, reducing the risk of electric shock. **(See 3-Prong Plug and Outlet.)**

2. The grounding prong in the plug is connected through the green wire inside the cord to the grounding system in the tool. The green wire in the cord must be the only wire connected to the tool's grounding system and must never be attached to an electrically "live" terminal. **(See 3-Prong Plug and Outlet.)**
3. The tool must be plugged into an appropriate outlet, properly installed and grounded in accordance with all codes and ordinances. The plug and outlet should look like those in the preceding illustration. **(See 3-Prong Plug and Outlet.)**

Double Insulated Tools: Tools with Two Prong Plugs



Outlets for 2-Prong Plug

1. Tools marked "Double Insulated" do not require grounding. They have a special double insulation system which satisfies OSHA requirements and complies with the

applicable standards of Underwriters Laboratories, Inc., the Canadian Standard Association, and the National Electrical Code. **(See Outlets for 2-Prong Plug.)**

2. Double insulated tools may be used in either of the 120 volt outlets shown in the preceding illustration. **(See Outlets for 2-Prong Plug.)**

Extension Cords

1. Grounded tools require a three wire extension cord. **Double Insulated** tools can use either a two or three wire extension cord.
2. As the distance from the supply outlet increases, you must use a heavier gauge extension cord. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible tool damage. **(See Table A.)** The smaller the gauge number of the wire, the greater the capacity of the cord. For example, a 14 gauge cord can carry a higher current than a 16 gauge cord. **(See Table A.)**
3. When using more than one extension cord to make up the total length, make sure each cord contains at least the minimum wire size required. **(See Table A.)**
4. If you are using one extension cord for more than one tool, add the nameplate amperes and use the sum to determine the required minimum cord size. **(See Table A.)**
5. If you are using an extension cord outdoors, make sure it is marked with the suffix "W-A" ("W" in Canada) to






indicate it is acceptable for outdoor use.

6. Make sure the extension cord is properly wired and in good electrical condition. Always replace a damaged extension cord or have it repaired by a qualified electrician before using it.
7. Protect the extension cords from sharp objects, excessive heat, and damp or wet areas.

RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS* (110/220 VOLT)					
NAMEPLATE AMPERES (at full load)	EXTENSION CORD LENGTH				
	25'	50'	75'	100'	150'
0 – 2.0	18	18	18	18	16
2.1 – 3.4	18	18	18	16	14
3.5 – 5.0	18	18	16	14	12
5.1 – 7.0	18	16	14	12	12
7.1 – 12.0	18	14	12	10	-
12.1 – 16.0	14	12	10	-	-
16.1 – 20.0	12	10	-	-	-

TABLE A * Based on limiting the line voltage drop to five volts at 150% of the rated amperes.

Symbology

	Double Insulated
	Canadian Standards Association
	Underwriters Laboratories, Inc.
	Volts Alternating Current
	Amperes
n_0 xxxx/min.	No Load Revolutions per Minute (RPM)

SPECIFICATIONS

Electrical Requirements	120 V~ / 60 Hz / 620 W 2-Prong, Polarized Power Plug
Speed	n_0 750/min
Blows Per Minute	2920 BPM
Capacity	1"
Chuck Type	SDS
Rotation	Clockwise (non-reversible)
Applications	For drilling stone, concrete, and other hard and brittle materials. For chiseling.
Accessories	Wrench SDS Drill Bits: 10mm/12mm 14mm/22mm 4-Point Chisel Container of Grease Carbon Brush Set Depth Gauge Rod Auxiliary Handle Carrying Case



UNPACKING

When unpacking, check to make sure that the item is intact and undamaged. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

SET UP INSTRUCTIONS



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

WARNING

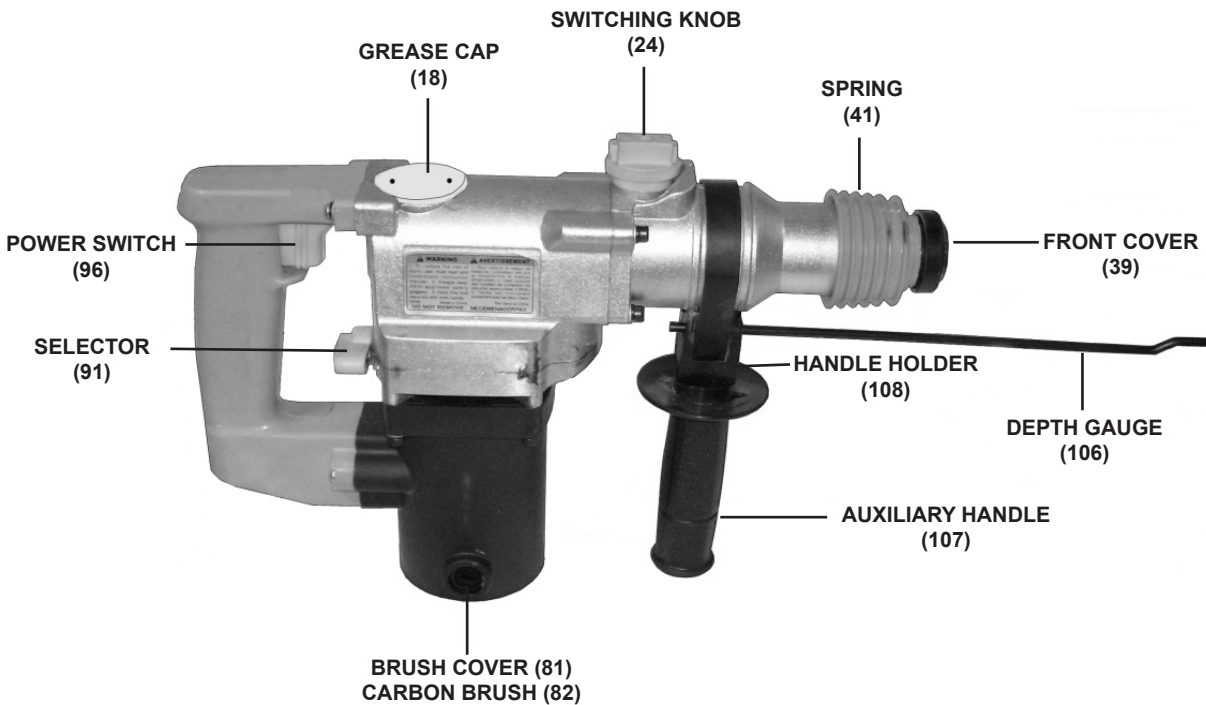
TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:

Turn the Power Switch (96) of the Rotary Hammer to its “OFF” position and unplug the tool from its electrical outlet before assembling or making any adjustments to the tool.

Note: For additional information regarding the parts listed in the following pages, refer to the Assembly Diagram near the end of this manual.

Product Features

FIGURE A



Tool Set Up

Adjusting The Auxiliary Handle:

1. The Auxiliary Handle (107) can be placed in a variety of positions. **(See Figure A.)**
2. To rotate the Auxiliary Handle (107), turn the Auxiliary Handle counterclockwise to loosen the band and Foursquare Bolt (111). Once loosened, turn the Auxiliary Handle to the desired position. Then turn the Handle clockwise to secure in place. **(See Figure A.)**

Using The Depth Gauge:

1. The Depth Gauge (106) can only be used if the Auxiliary Handle (107) is positioned on either side or the top of the Rotary Hammer. The body of the Hammer will interfere with the Depth Gauge if the Handle is in the bottom position. **(See Figure A.)**
2. Loosen the Auxiliary Handle (107) by turning the Handle counterclockwise. **(See Figure A.)**
3. Once the Auxiliary Handle (107) is sufficiently loose, pull back on the Handle Holder (108) until the hole in the Handle is fully open. **(See Figure A.)**
4. Slide the Depth Gauge (106) in to the desired length. The tip of the Depth Gauge on the front of the Hammer should be the desired depth of the hole to be drilled. The depth is from the tip of the Drill Bit to the tip of the Depth Gauge.
 - For example; for a 2" deep hole, measure 2" back from the tip of the Drill Bit. Then position the front tip

of the Depth Gauge at that spot. **(See Figure A.)**

5. After the Depth Gauge (106) is placed in the desired position, turn the Auxiliary Handle (107) clockwise until tight. The Depth Gauge should be securely in position and should not move. **(See Figure A.)**

Changing The Settings:

1. The Rotary Hammer has a Switching Knob (24) and a Selector (91) which must be adjusted before drilling, hammer drilling, or chiseling. **(See Figure A.)**
2. **WARNING!** Move the Switching Knob (24) and Selector (91) **only** when the Motor is stopped. Attempting to move the Switching Knob or Selector while the Motor is engaged will result in abrupt Bit rotation and can cause serious personal injury and/or property damage. **(See Figure A.)**
3. **CAUTION:** When moving the Switching Knob (24) and Main Handle (91), make sure both actively "click" into the desired position. If not actively engaged, the Knob or Handle could slip out of position resulting in unexpected tool performance. **(See Figure A.)**
4. The front Switching Knob (24) has on one side a symbol of a Hammer and a Drill. On the other side is a symbol of just a Hammer. **(See Figure A.)**
5. The Main Handle (91) can be pointed either left or right. There are symbols for a Hammer and a Drill on the left

side and a symbol for a Drill only on the right side. **(See Figure A.)**

- **To drill only:** Set the Switching Knob (24) so that the symbol of the Hammer and Drill are facing forward. Then turn the Selector (91) so that it points to the right at the Drill symbol. **(See Figure A.)**
- **To hammer drill:** Set the Switching Knob (24) so that the symbol of the Hammer and Drill are facing forward. Then turn the Selector (91) so that it points to the left at the Hammer and Drill symbol. **(See Figure A.)**
- **To chisel:** Set the Switching Knob (24) so that the symbol of the Hammer only points forward. Then turn the Selector (91) so that it points left to the Hammer and Drill symbol. **(See Figure A.)**
- **NOTE:** Break Point (Bull) bits and cold chisels should be used when the Switches are in the hammering position only. Using these bits/ chisels with the Switches in the Hammer/Drill position will result in unexpected tool performance.

Workpiece and Work Area Set Up

1. Designate a work area that is clean and well-lit. The work area must not allow access by children or pets to prevent injury and distraction.
2. Route the Power Cord (112) along a safe route to reach the work area without creating a tripping hazard or exposing the Power Cord to possible damage. The Power Cord must reach the work area with enough extra length to allow free movement while working.

3. Secure loose workpieces using a vise or clamps (not included) to prevent movement while working.
4. There must not be hazardous objects, such as utility lines or foreign objects, nearby that will present a hazard while working.

OPERATING INSTRUCTIONS



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Inserting and Removing Drill Bits:

1. **CAUTION:** Always wear heavy duty work gloves to provide protection when inserting and removing drill bits. Drill bits become very hot in use. Do not remove drill bits until the bit has completely cooled. Do not strike stuck bits with a hammer as metal chips may fly off. Always disconnect the Power Cord (112) from its electrical outlet when inserting and removing bits and chisels.
2. Add a light coating of grease or machine oil to the drill bit shank.
3. Pull back on the Spring (41) while at the same time inserting and turning the Drill Bit until it slides all the way in the Front Cover (39). Then release the Spring so that it returns to its original position. **NOTE:** You should not be able to move the Bit without pulling back on the Spring again. Make sure the Bit does not move to ensure that it is properly locked in place. **(See Figure A.)**

4. To remove the Drill Bit, pull back on the Spring (41) and pull out the Bit. For optimal performance, always keep Drill Bits and Chisels sharp.
NOTE: When drilling a hole larger than 1-1/4" diameter, always use a Drill Bit with four cutting edges.
(See Figure A.)
6. Store the Rotary Hammer in its Carrying Case (105) and keep the Case in a clean, dry, safe location out of children's reach.

General Operating Instructions

1. Before plugging in the Power Cord (112), insert the desired Bit. Adjust the Auxiliary Handle (107) and Depth Gauge (106) to the desired positions. Then adjust the Switching Knob (24) and Selector (91) to the desired positions. **(See Figure A.)**
2. Make sure the Power Switch (96) is in its "OFF" position. Then plug the Power Cord (112) into the nearest 110 volt, grounded, electrical outlet. **(See Figure A.)**
3. When ready to use the Rotary Hammer, squeeze the Power Switch (96) and allow the tool to run *without load* for about one minute. This allows the tool's parts to become properly lubricated. Check to see if the running tool sounds normal. Once the tool has been warmed up, it is ready for use. **(See Figure A.)**
4. When finished using the Rotary Hammer, release the Power Switch (96). Wait until the tool comes to a complete stop. Then unplug the tool from its electrical outlet. **(See Figure A.)**
5. Make sure the Drill Bit is completely cooled. Then remove the Bit from the tool.

MAINTENANCE AND SERVICING



Procedures not specifically explained in this manual must be performed only by a qualified technician.

⚠️ WARNING

TO PREVENT SERIOUS INJURY

FROM ACCIDENTAL OPERATION:

Turn the Power Switch (96) of the Rotary Hammer to its “OFF” position and unplug the tool from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

TO PREVENT SERIOUS INJURY FROM TOOL FAILURE:

Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

1. **BEFORE EACH USE:** Inspect the general condition of the Rotary Hammer. Check for loose screws, misalignment or binding of moving parts, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation.
2. **AFTER EVERY 50 HOURS OF USE:** Use the Spanner Wrench provided to unscrew the Grease Cap (18). Add the Grease provided. Then, replace and tighten the Grease Cap. **NOTE:** The Rotary Hammer is pre-greased from the manufacturer. Lubrication is

only needed beginning after about 50 hours of use. (See Figure A.)

3. **TO CHANGE OR CLEAN THE CARBON BRUSHES:** It may become necessary at sometime to replace or clean the two Carbon Brushes (82) when Motor performance decreases, or stops working completely. The Carbon Brushes are located on each side of the Motor Housing (78). To change or clean the Carbon Brushes:
 - Remove the two Brush Covers (81). Then remove the Carbon Brushes.
 - If the Carbon Brushes (82) are worn down more than 1/2, replace both Brushes.
 - If the Carbon Brushes (82) are only dirty, they may be cleaned by rubbing them with a pencil eraser.
 - When installing the Carbon Brushes (82), make sure the carbon portion of the Brushes contact the Motor Armature, and that the springs face away from the Armature. Also, make sure the springs operate freely. After replacing or cleaning, replace the two Brush Covers (81).
 - **NOTE:** New Carbon Brushes (82) tend to arc or spark when first used until they wear and conform to the Armature. (See Figure A.)
4. **AFTER USE:** Clean external surfaces of the tool with a clean cloth.
5. **WARNING! If the Power Cord (112) of this Rotary Hammer is damaged, it must be replaced only by a qualified service technician.**

TROUBLESHOOTING

Problem	Possible Causes	Probable Solutions
Tool will not start.	<ol style="list-style-type: none"> 1. No power at outlet. 2. Cord not connected. 3. Blown fuse or tripped circuit breaker. 	<ol style="list-style-type: none"> 1. Check power at outlet. 2. Check that cord is plugged in. 3. Replace fuse or reset circuit breaker.
Motor does not rotate with power switch depressed.	<ol style="list-style-type: none"> 1. Disrupted power supply. 2. Poor contact at the switch. 3. Armature or field coil burnt. 4. Broken stator coil. 5. Carbon brushes worn out. 	<ol style="list-style-type: none"> 1. Check power supply. 2. Repair switch. 3. Change coil. 4. Replace stator coil. 5. Replace carbon brushes.
Abnormal noise from motor. Does not rotate, or rotates slowly.	Overload of motor caused by excessive drilling pressure.	Reduce drilling pressure. Decrease force.
Partial short circuit.	Partial short circuit or open circuit at armature.	Repair or change armature.
Main voltage too low.	Main power voltage too low.	Adjust main power voltage.
Gearbox becomes too hot.	<ol style="list-style-type: none"> 1. Overload. Dull bit. 2. Damp coils. 3. Incorrect fitting. 4. Decrease in voltage. 	<ol style="list-style-type: none"> 1. Reduce load. Sharpen bit. 2. Dry coils. 3. Repair or change armature. 4. Adjust voltage.
Sparking.	<ol style="list-style-type: none"> 1. Short circuit or break at armature. 2. Surface of armature not smooth and clean. 3. New carbon brushes installed. 	<ol style="list-style-type: none"> 1. Repair armature. 2. Inspect and clean armature. 3. Normal condition. Sparking will discontinue once new carbon brushes are worn flush with the armature.



Follow all safety precautions whenever diagnosing or servicing the tool. Disconnect power supply before service.

PARTS LIST

Part #	Description	Qty.
1	O-Ring	1
2	Steel Ball	3
3	Cylinder	1
4	Feather Key	2
5	Piston	1
6	O-Ring	1
7	Spring Holder	1
8	Spring	1
9	Clutch	1
10	Third Gear	1
11	O-Ring	1
12	Piston	1
13	Connecting Shaft	1
14	Needle Bearing	1
15	O-Ring	1
16	O-Ring	1
18	Grease Cap	1
19	Gear Housing	1
20	Name Plate	1
21	Level	2
22	Slide Bearing	2
23	Screw	1
24	Switching Knob	1
25	Position Limit	1
26	Auxiliary	1
28	Handle Seat	2
29	Handle Bracket	1
30	Screw (M5x25)	4
31	Spring	4
32	Cylinder Case	1
33	Cylinder Cap	1
34	Oil Seal	1

Part #	Description	Qty.
35	Washer	1
36	Bearing	1
37	Distance Ring	1
38	Distance Cover	1
39	Front Cover	1
40	O-Ring	1
41	Spring	1
42	Steel Column	2
43	Retainer Sleeve	1
44	O-Ring	2
45	O-Ring	2
46	Second Hammer	1
47	Spring	1
48	Name Plate	1
49	Oil Seal Ring	1
50	Gear Bearing	1
51	Distance Ring	1
52	Bearing	1
53	Spacer	1
54	Washer	2
55	Slip Plate	2
56	Gear (No. 2)	1
57	Spring Washer	1
58	Special Nut	1
59	Bearing	1
60	Crank Shaft	1
61	Steel Ball	3
62	Bearing	1
63	Washer	1
64	Bearing Cover	1
65	Screw (M5x60)	2
66	Gear (No. 1)	1

PARTS LIST (CONTINUED)

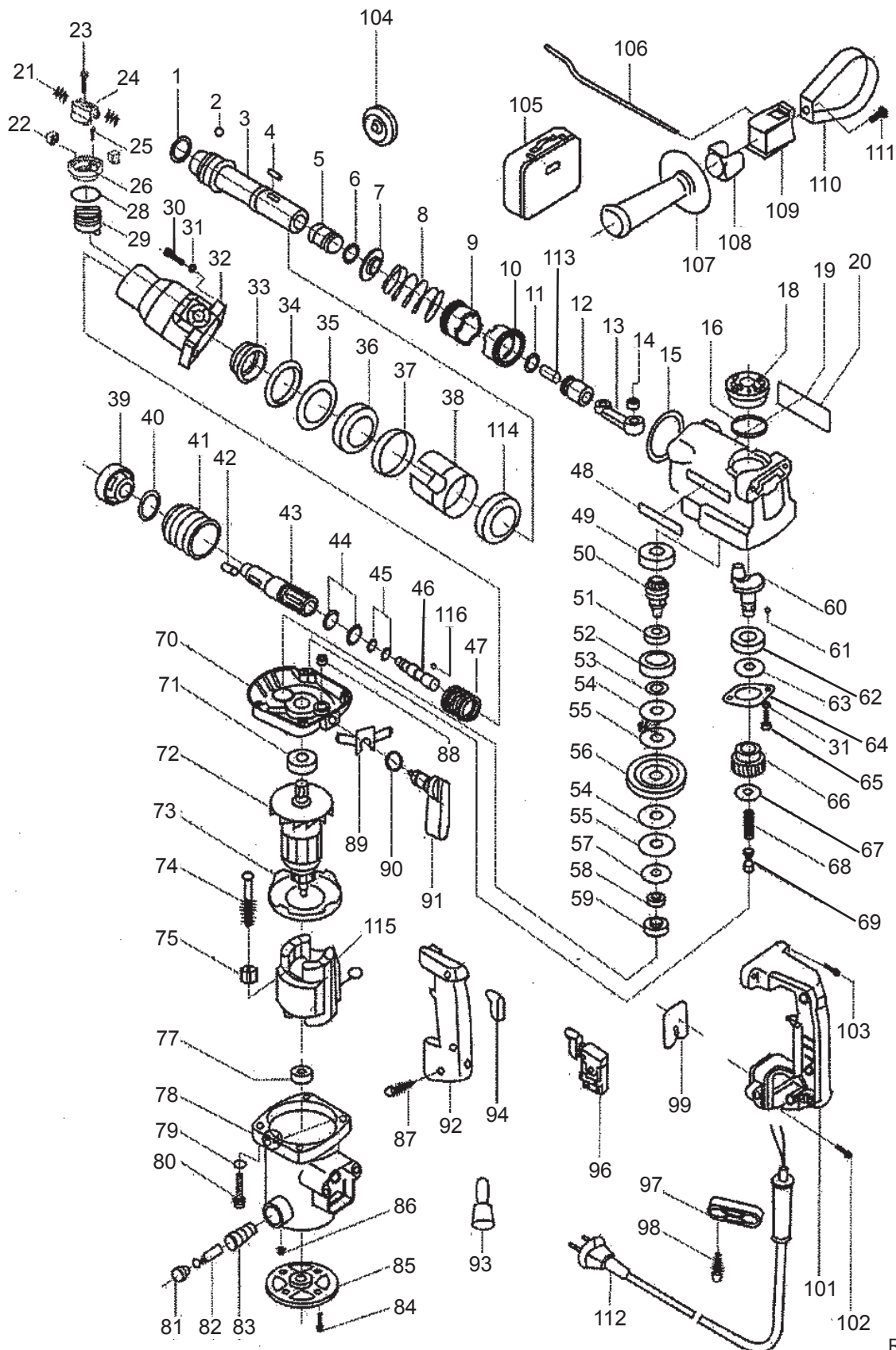
Part #	Description	Qty.
67	Washer	1
68	Spring	1
69	Clutch Shaft	1
70	Center Cover	1
71	Bearing	1
72	Armature	1
73	Fan Guide	1
74	Field Screw	2
75	Washer	2
77	Bearing	1
78	Housing	1
79	Washer	4
80	Screw (M5x50)	4
81	Brush Cover	2
82	Carbon Brush	2
83	Brush Holder	2
84	Tapping Screw	2
85	Back Cover	1
86	Fixed Screw (M5x6)	2
87	ST Screw (M4x23)	3
88	Needle Bearing	1
89	Spring Holder	1
90	O-Ring	1
91	Selector	1

Part #	Description	Qty.
92	Left Handle Cover	1
93	Insulating Sleeve	4
94	Switch Cover	1
96	Power Switch	1
97	Cord Pressing Board	1
98	ST Screw (M4x16)	2
99	Board	1
101	Right Handle Cover	1
102	ST Screw (M5x25)	2
103	Screw (M5x25)	2
104	Dust Cover	1
105	Carrying Case	1
106	Depth Gauge	1
107	Auxiliary Handle	1
108	Handle Holder	1
109	Handle Shaft	1
110	Pressing Board	1
111	Four Square Bolt	1
112	Power Cord	1
113	Piston Pin	1
114	Slide Bearing	1
115	Stator	1
116	Steel Ball	1

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

ASSEMBLY DIAGRAM



LIMITED 90 DAY WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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Record Product's Serial Number Here: _____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.