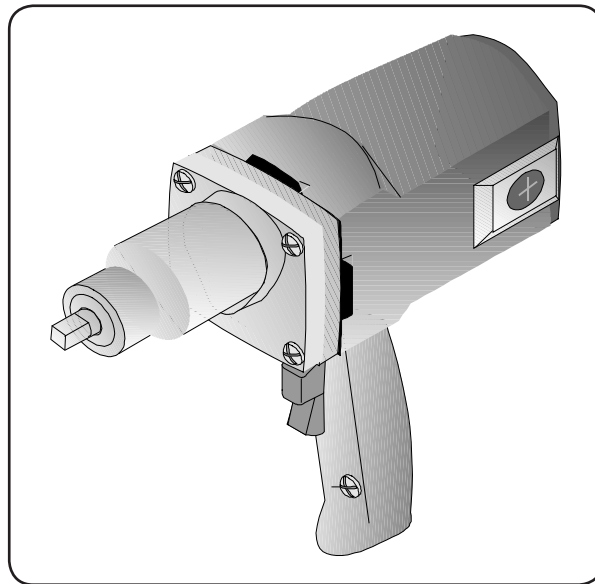


**CHICAGO**  
**Electric<sup>®</sup> Power Tools**  
**INDUSTRIAL**

**1/2" ELECTRIC IMPACT WRENCH**  
**Model 31877**

**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<sup>®</sup>.**

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.**

Manual Revised 07i

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## SAVE THIS MANUAL

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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.

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## IMPORTANT SAFETY INFORMATION

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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 SAFETY RULES



### **WARNING! Read all instructions**

**Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.** The term “power tool” in all of the warnings listed below refers to your line-operated (corded) power tool or battery-operated (cordless) power tool.

### SAVE THESE INSTRUCTIONS

1. KEEP WORK AREA CLEAN. Cluttered areas invite injuries.
2. OBSERVE WORK AREA CONDITIONS. Do not use machines or power tools in damp, wet, or poorly lit locations. Don't expose to rain. Keep work area well lit. Do not use electrically powered tools in the presence of flammable gases or liquids.
3. KEEP CHILDREN AWAY. Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.
4. STORE IDLE EQUIPMENT. When not in use, tools must be locked up in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. DO NOT FORCE THE TOOL. It will do the job better and more safely at the rate for which it was intended. Do not use inappropriate attachments in an attempt to exceed the tool's capacities.
6. USE THE RIGHT TOOL FOR THE JOB. Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. Do not use a tool for a purpose for which it was not intended.
7. DRESS PROPERLY. Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
8. USE EYE AND EAR PROTECTION. Always wear ANSI-approved chemical splash goggles when working with chemicals. Always wear ANSI-approved impact safety goggles at other times. Wear a full face shield if you are producing metal filings or wood chips. Wear and ANSI approved dust mask or respirator when working around metal, wood, and chemical dusts and mists.
9. DO NOT ABUSE THE POWER CORD. Do not yank it to disconnect it from the receptacle. Do not carry tools by the cord.
10. DO NOT OVERREACH. Keep proper footing and balance at all times. Do not reach over or across running machines.
11. MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords and, if damaged, have them repaired by an authorized technician. The handles must be kept clean, dry, and free from oil and grease at all times.
12. DISCONNECT POWER. Unplug when not in use, before servicing, and when changing accessories.

13. REMOVE ADJUSTING KEYS AND WRENCHES. Make it a habit to check that keys and adjusting wrenches are removed from the tool or machine work surface before plugging it in.
14. AVOID UNINTENTIONAL STARTING. Be sure the switch is in the OFF position when not in use and before plugging in. Do not carry any tool with your finger on the trigger, whether it is plugged in or not.
15. OUTDOOR EXTENSIONS CORDS. When the equipment is operated outdoors, use only extension cords intended for outside use. See chart under "Extension Cords: for the proper AWG rating depending on the length of the cord(s) being used.
16. STAY ALERT. Watch what you are doing, use common sense. Do not operate any tool when you are tired.
17. CHECK DAMAGED PARTS. Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not turn on and off properly.
18. GUARD AGAINST ELECTRIC SHOCK. Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.
19. REPLACEMENT PARTS AND ACCESSORIES. When servicing, use only identical replacement parts. Use of any other parts will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from Harbor Freight Tools.
20. DO NOT OPERATE TOOL IF UNDER THE INFLUENCE OF ALCOHOL OR DRUGS. Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.
21. ONLY USE IMPACT SOCKETS. Sockets built for impact wrenches are specifically designed to withstand the force of the delivered blow. Any other socket may shatter, causing injury to the operator and damage to any nearby equipment.
22. 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.
23. 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 lumber

Your 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.*)

24. 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.

## **SAVE THESE INSTRUCTIONS.**

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### **GROUNDING**

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#### **WARNING**

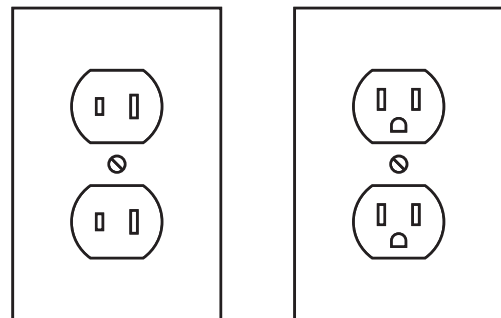
Improperly connecting the grounding wire can result in electric shock.



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. 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.

#### **Double Insulated Tools: Tools with Two Prong Plugs**

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 illustration to the right. **(See Outlets for 2-Prong Plug.)**



**Outlets for 2-Prong Plug**

#### **Extension Cords**






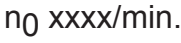
1. **Grounded** tools require a three wire extension cord. **Double Insulated** tools can use either a two or three wire extension cord.
2. As the distance from the supply outlet increases, you must use a heavier gauge extension cord. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible tool damage. **(See Table A.)**

3. 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.)**
4. 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.)**
5. 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.)**
6. 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.
7. 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.
8. Protect the extension cords from sharp objects, excessive heat, and damp or wet areas.

<b>RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS* (120/240 VOLT)</b>					
<b>NAMEPLATE AMPERES (at full load)</b>	<b>EXTENSION CORD LENGTH</b>				
	<b>25 Feet</b>	<b>50 Feet</b>	<b>75 Feet</b>	<b>100 Feet</b>	<b>150 Feet</b>
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		Volts Alternating Current
	Canadian Standards Association		Amperes
	Underwriters Laboratories, Inc.		No Load Revolutions per Minute (RPM)

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## SPECIFICATIONS

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Motor	120 V~, 60 Hz, 7 A; 2100 RPM
Power	2400 BPM: 240 ft-lb Torque
Drive	1/2"



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## UNPACKING

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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.

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## OPERATING INSTRUCTIONS

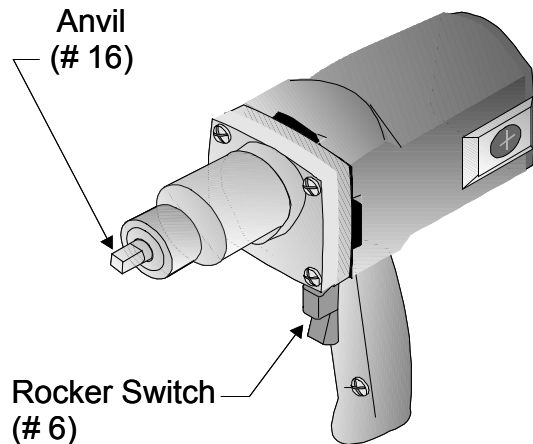
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Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

### General Guidelines

1. Use sockets designed for impact wrench use.
2. Do not use sockets with drives smaller than 1/2". You may use impact socket adapters to use impact sockets with drives greater than 1/2".
3. Only use socket extensions designed for impact use.
4. Pressing the top of the **ROCKER SWITCH** (6) up will cause the **ANVIL** (16) to move in a counterclockwise direction. This will commonly loosen the fastener.
5. Pressing the bottom of the **ROCKER SWITCH** down will cause the **ANVIL** to move in a clockwise direction. This will commonly tighten the fastener.



**Figure 1 -- Operation**

### "Breaking Loose" Fasteners

**Note:** This procedure is used when a fastener becomes "frozen", typically due to corrosion. This procedure assumes that the threads are standard (clockwise to tighten, counter clockwise to loosen). If the threads are reversed, you must reverse the switch directions contained herein.

1. Spray silicon or another appropriate lubricant on the fastener and allow it to sit for 15-30 minutes.
2. Rapidly press the **ROCKER SWITCH** (6) up and then down. This will cause the **ANVIL** (16) change direction rapidly and loosen the bolt.



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## MAINTENANCE

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### **⚠ WARNING**

Risk of serious personal injury from accidental starting or electric shock. Turn the Power Switch of the tool to its "OFF" position and unplug the tool from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

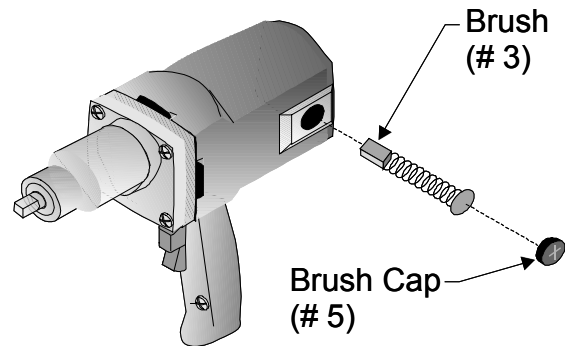
Damaged equipment can fail, causing serious personal injury. Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

1. **BEFORE EACH USE**, inspect the general condition of the tool. 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 USE**, clean external surfaces of the tool with clean, moist cloth.
3. **WARNING!** If the supply cord of this power tool is damaged, it must be replaced only by a qualified service technician.

### **Brushes**

**Note:** Both BRUSHES (3) must be replaced at the same time.

1. The BRUSHES must be changed when less than 3/8" remains or when performance noticeably degrades.
2. Remove the BRUSH CAP (5) using a large, flat-head screwdriver.
3. Remove the BRUSH and replace.
4. Replace the BRUSH CAP.



**Figure 2 -- Brush Replacement**

### **Lubrication**

**Note:** The following procedures should only be attempted by a qualified technician. The instructions are only provided for their reference. Refer to the Parts Diagram for numbered call-outs.

1. The gears must be lubricated after every 30 hours of continuous use or 50 hours of intermittent use.
2. Open the GEAR CASE (13) by removing the four SCREWS (12).
3. Liberally apply a high temperature grease (standard automotive wheel grease is sufficient). to the THRUST WASHER (14), the back of the ANVIL (16), IMPACTOR (19), SPRING (21), and GEARS (22 & #27).
4. Replace the ANVIL and GEAR CASE.



## 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.

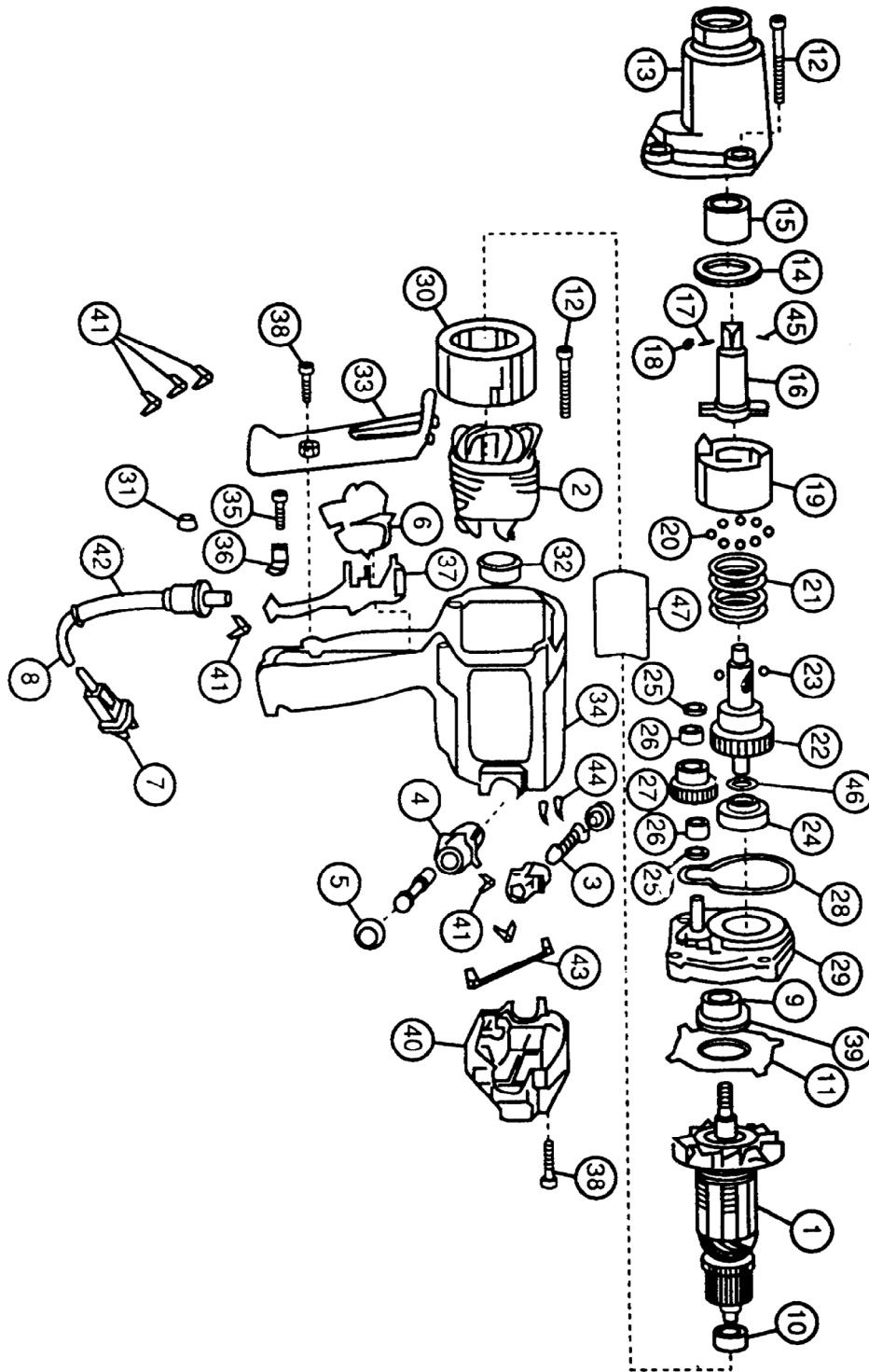
### PARTS LIST

Part	Description	Q'ty	Part	Description	Q'ty
1	Armature*	1	24	Bearing	1
2	Field	1	25	Washer	2
3	Brush Assembly	2	26	Needle Bearing	2
4	Brush Holder	2	27	Gear & Pinion*	1
5	Brush Cap	2	28	Gasket	1
6	Switch	1	29	Gear Case Cover*	1
7	Plug	1	30	Fan Baffle	1
8	Cord	1	31	Wire Connector	1
9	Ball Bearing	1	32	Rubber Clip	1
10	Ball Bearing*	1	33	Handle Cover	1
11	Bearing Retainer	1	34	Field Case	1
12	Screw	6	35	Screw	2
13	Gear Case*	1	36	Cord Clamp*	1
14	Thrust Washer*	1	37	Switch Support	1
15	Bearing & Seal	1	38	Screw*	6
16	Anvil Assembly*	1	39	O-Ring*	1
17	Spring	1	40	End Cap	1
18	Detent Pin	1	41	Receptacle	6
19	Impactor	1	42	Cord Sheath	1
20	Steel Ball	25	44	Terminal	2
21	Spring	1	45	Roll Pin	1
22	Gear & Cam	1	46	Washer	1
23	Steel Ball	2	47	Name Plate	1

**\*Note:**

1. Includes 9, 10, & 11.
10. Before assembling bearing into rubber boot, coat O.D. with grease.
13. Includes 15.
14. When assembling, make sure bevel side is towards the ears of the anvil.
16. Includes 17 & 18.
27. Includes 26.
29. Includes 24.
36. Convex side towards cable.
38. Torque from 22 to 27 in-lb.
39. Fits on bearing O.D.

# ASSEMBLY DIAGRAM



**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.

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## LIMITED 90 DAY WARRANTY

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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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