

# Owner's Manual & Safety Instructions

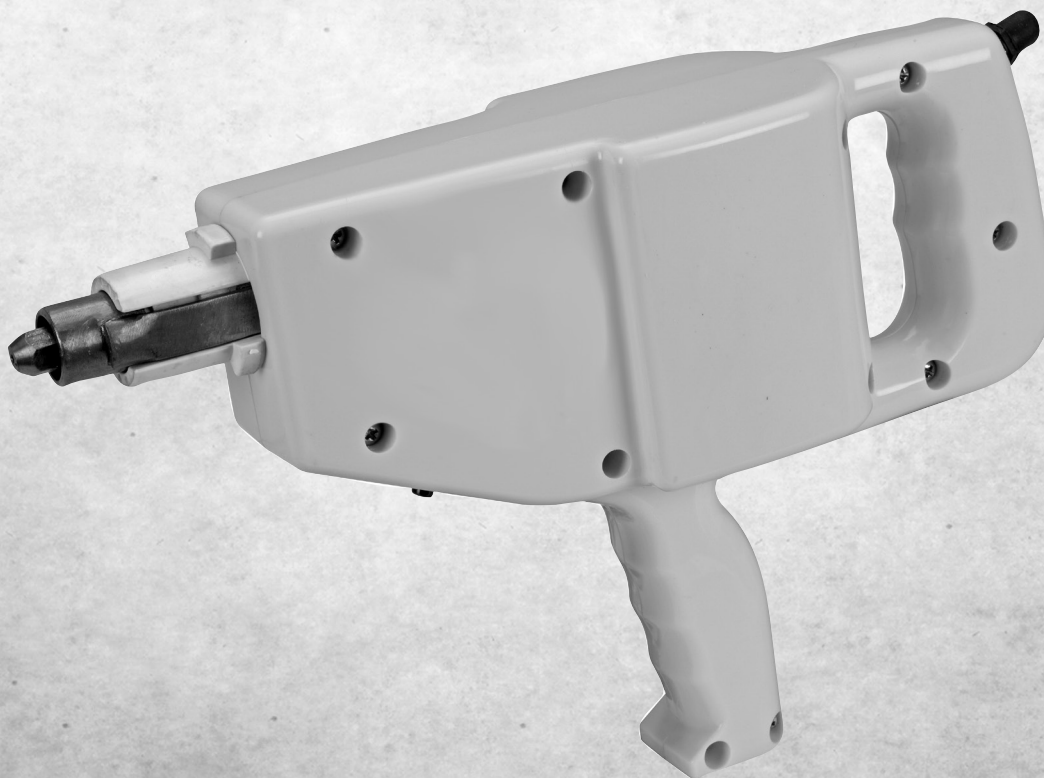
**Save This Manual** Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this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

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**CHICAGO  
ELECTRIC®**

# WELDING

## DENT REPAIR STUD WELDER



Visit our website at: <http://www.harborfreight.com>  
Email our technical support at: [productsupport@harborfreight.com](mailto:productsupport@harborfreight.com)

61433

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-888-866-5797 as soon as possible.

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No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools. Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.





### **⚠ WARNING**

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

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### WARNING SYMBOLS AND DEFINITIONS

	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.
 <b>DANGER</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
<b>NOTICE</b> <b>CAUTION</b>	Addresses practices not related to personal injury.

## IMPORTANT SAFETY INFORMATION

### **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.**

## General Safety Information

**PROTECT yourself and others. Read and understand this information.**

- Before use, read and understand manufacturer's instructions, Material Safety Data Sheets (MSDS), employer's safety practices, and ANSI Z49.1.**
- Keep out of reach of children.**  
Keep children and bystanders away while operating.
- Hold the Welder securely during use.**  
If it falls while plugged in, severe injury, electric shock, or fire may result.
- Stay alert, watch what you are doing and use common sense when operating a welder.**  
**Do not use a welder while you are tired or under the influence of drugs, alcohol or medication.**  
*A moment of inattention while operating welders may result in serious personal injury.*
- Do not overreach.**  
**Keep proper footing and balance at all times.**
- Avoid unintentional starting.** Make sure you are prepared to begin work before turning on the Welder.
- Never leave the Welder unattended while energized.** Turn power off if you have to leave.
- 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.

# Fume and Gas Safety Information



FUMES AND GASES can be hazardous to your health.

1. **Exposure to welding or cutting exhaust fumes can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer.**  
Also, some diseases that may be linked to exposure to welding or cutting exhaust fumes are:
  - Early onset of Parkinson's Disease
  - Heart disease
  - Ulcers
  - Damage to the reproductive organs
  - Inflammation of the small intestine or stomach
  - Kidney damage
  - Respiratory diseases such as emphysema, bronchitis, or pneumonia
2. **Do not use near degreasing or painting operations.**
3. **Keep head out of fumes.**  
Do not breathe exhaust fumes.
4. **Use enough ventilation or exhaust, or both, to keep fumes and gases from breathing zone and general area.** If engineering controls are not feasible, use an approved respirator.
5. **Work in a confined area only if it is well-ventilated, or while wearing an air-supplied respirator.**
6. **Have a recognized specialist in Industrial Hygiene or Environmental Services check the operation and air quality and make recommendations for the specific welding situation.**  
Follow OSHA guidelines for Permissible Exposure Limits (PEL's) and the American Conference of Governmental Industrial Hygienists recommendations for Threshold Limit Values (TLV's) for fumes and gases.

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# Arc Ray Safety Information



ARC RAYS can injure eyes and burn skin.

1. **Wear ANSI-approved welding eye protection featuring at least a number 10 shade lens rating.**
2. **Wear leather leggings, fire resistant shoes or boots during use.** Do not wear pants with cuffs, shirts with open pockets, or any clothing that can catch and hold molten metal or sparks.
3. **Keep clothing free of grease, oil, solvents, or any flammable substances.**  
Wear dry, insulating gloves and protective clothing.
4. **Wear an approved head covering to protect the head and neck.** Use aprons, cape, sleeves, shoulder covers, and bibs designed and approved for welding and cutting procedures.
5. **When welding/cutting overhead or in confined spaces, wear flame resistant ear plugs or ear muffs to keep sparks out of ears.**

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# Electrical Safety Information



**ELECTRIC SHOCK can KILL.**

1. **Never leave the Stud Welder unattended while energized.** Turn off and disconnect power when leaving the work area.
2. **Do not touch energized electrical parts.** Wear dry, insulating gloves. Do not touch electrode or conductor tong with bare hand. Do not wear wet or damaged gloves.
3. **Connect to grounded, GFCI-protected power supply only.**
4. **Do not use near water or damp objects.**
5. **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.
6. **Do not expose welders to rain or wet conditions.** Water entering a welder will increase the risk of electric shock.
7. **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the Welder. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.**
8. **Do not use outdoors.**
9. **Insulate yourself from the workpiece and ground.** Use nonflammable, dry insulating material if possible, or use dry rubber mats, dry wood or plywood, or other dry insulating material large enough to cover your full area of contact with the work or ground.
10. **Use care not to touch the welding tip to conductive material whenever the unit is plugged in.** Electric shock, fire, or burns may happen if appropriate precautions are not taken.

# Fire Safety Information



**SPARKS AND HOT SLAG can cause fire.**

1. **Clear away or protect flammable objects.** Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area. Use a fire resistant material to cover or block all open doorways, windows, cracks, and other openings.
2. **Keep ABC-type fire extinguisher near work area and know how to use it.**
3. **Maintain a safe working environment.** Keep the work area well lit. Make sure there is adequate surrounding workspace. Keep the work area free of obstructions, grease, oil, trash, and other debris.
4. **Do not operate welders in atmospheres containing dangerously reactive or flammable liquids, gases, vapors, or dust.** Provide adequate ventilation in work areas to prevent accumulation of such substances. *Welders create sparks which may ignite flammable substances or make reactive fumes toxic.*
5. **If working on a metal wall, ceiling, etc., prevent ignition of combustibles on the other side by moving the combustibles to a safe location.** If relocation of combustibles is not possible, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the cutting process and for at least one half hour after the cutting is completed.
6. **Do not weld or cut on materials having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.**
7. **Do not dispose of hot slag in containers holding combustible materials.**
8. **After welding, make a thorough examination for evidence of fire.** Be aware that easily visible smoke or flame may not be present for some time after the fire has started.
9. **Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors.** Clean and purge containers before applying heat. Vent closed containers, including castings, before preheating, welding, or cutting.

## Operation Specific Safety Information

1. **Do not use the Welder if the switch does not turn it on and off.** *Any welder that cannot be controlled with the switch is dangerous and must be repaired.*
2. **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing welders.** *Such preventive safety measures reduce the risk of starting the Welder accidentally.*
3. **Prevent unintentional starting.** **Ensure the switch is in the off-position before connecting to power source or moving the Welder.** *Carrying or energizing welders that have the switch on invites accidents.*
4. **Store idle Welder out of the reach of children and do not allow persons unfamiliar with the Welder or these instructions to operate the Welder.** Welders are dangerous in the hands of untrained users.
5. **Use the Welder and accessories in accordance with these instructions, taking into account the working conditions and the work to be performed.** *Use of the Welder for operations different from those intended could result in a hazardous situation.*

## Service Specific Safety Information

1. **Maintain welders. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the Welder's operation. If damaged, have the Welder repaired before use.** *Many accidents are caused by poorly maintained welders.*
2. **Have your Welder serviced by a qualified repair person using only identical replacement parts.** *This will ensure that the safety of the Welder is maintained.*
3. **Maintain labels and nameplates on the Welder.** These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
4. **Unplug before maintenance.** Unplug the Welder from its electrical outlet before any inspection, maintenance, or cleaning procedures.



**SAVE THESE INSTRUCTIONS.**

**⚠ 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. Have a plug installed by a certified electrician. Do not use the Welder 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

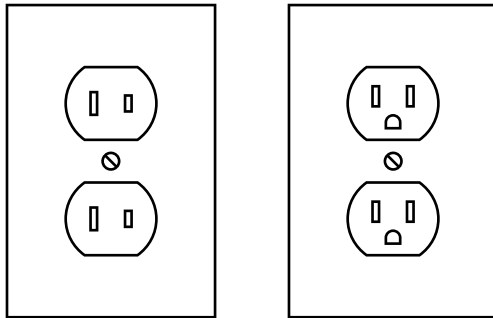



Figure A: Outlets for 2-Prong Plug

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.
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. If an extension cord is used, it must have the following wire size: up to 30 feet, use 10 AWG size wire; 30 to 50 feet, use 8 AWG wire; Over 50 feet, use 6 AWG wire.
2. As the distance from the supply outlet increases, a heavier gauge extension cord must be used. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible Welder damage.
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.
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.
5. If using one extension cord for more than one welder, add the nameplate amperes and use the sum to determine the required minimum cord size.
6. If 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.

## Symbology

	Housing Ground Point
<b>V</b>	Volts
~	Alternating Current
<b>A</b>	Amperes

<b>OCV</b>	Open Circuit Voltage
<b>KVA</b>	Kilovolt Amperes (Volts / 1000 * Amperes)
<b>AWG</b>	American Wire Gauge

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## Specifications

Power Rating	120 VAC, 60 Hz
Circuit Requirement	20 A (dedicated)
Weldable Materials	Sheet steel
Stud Weld Time	0.5 to 1.0 seconds
Duty Cycle	Tool can weld one stud each 8 minute time interval

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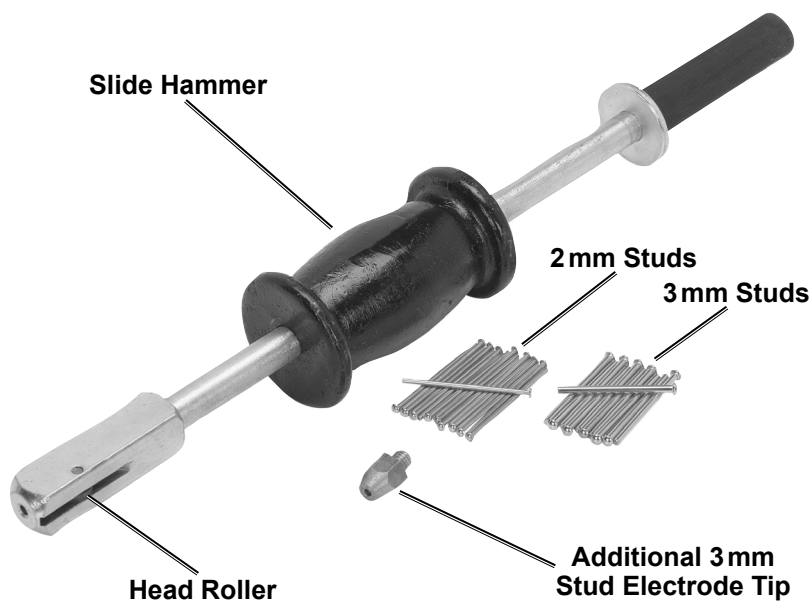
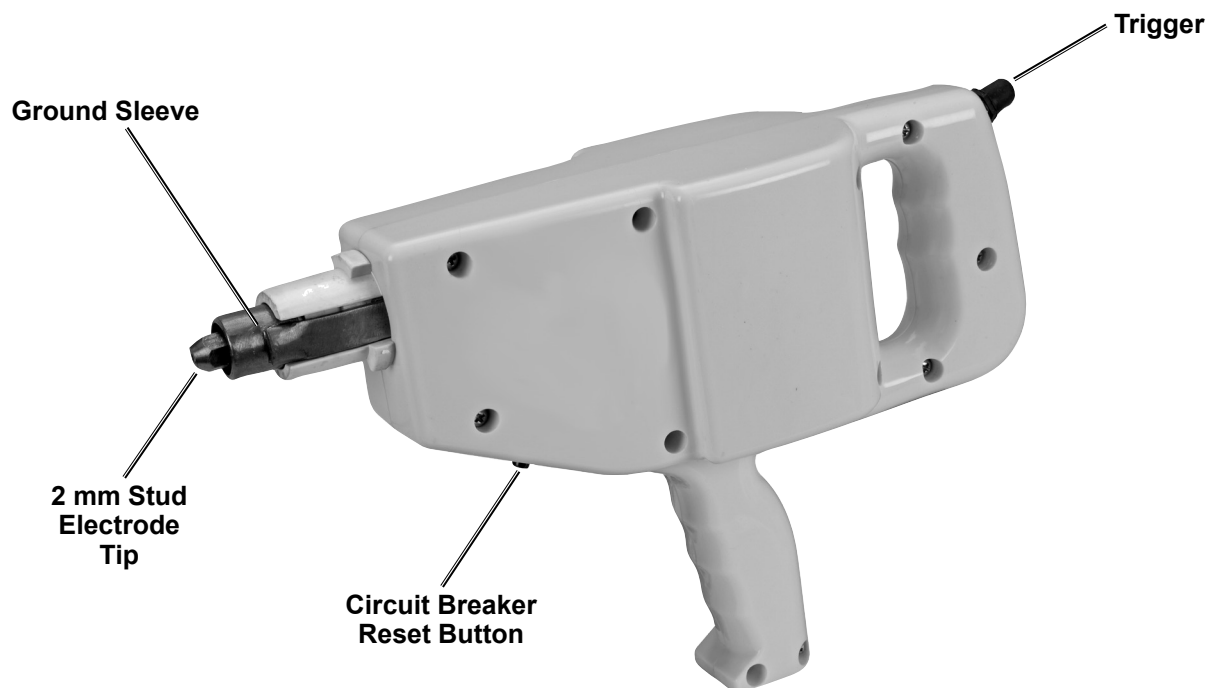
## Setup



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.

**Note:** For additional information regarding the parts listed in the following pages, refer to Parts List and Diagram on page 14.

## Components and Controls



## Operation



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.

## Welding the Stud

**Note:** It is recommended that the following procedures be practiced on a piece of scrap metal prior to actual use.

1. Clean the surface where the stud is to be welded, in an area **as large as the Ground Sleeve**, down to the metal. Ensure that the surface is free from scale, oxides, paint, grease, and oil. The entire Ground Sleeve needs to evenly contact the surface without interference to weld properly.

2. With the Welder unplugged, insert a stud of the correct size into the hole in the Stud Electrode Tip.

**Note:** Ensure that the size of stud being used matches the size of the Stud Electrode Tip installed on the Stud Welder.

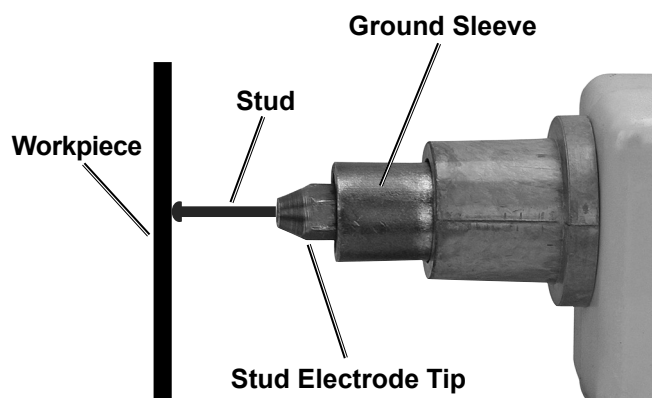


Figure B

3. Plug the Power Cord into an electrical outlet on a circuit with a minimum 20 amp capacity.

4. Assume a well-balanced stance and hold the Stud Welder firmly with both hands. Push the Welder and stud against the workpiece until the Ground Sleeve is flush with the metal surface.

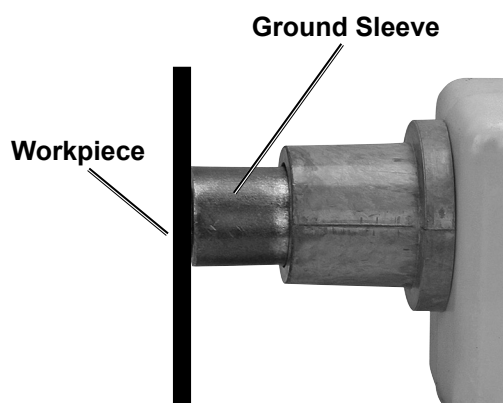


Figure C

5. With the Ground Sleeve **PERFECTLY FLUSH** against the surface, hold the Stud Welder steady and press in on the Trigger momentarily for 0.5 to 1 second, then immediately release the Trigger.

**Note:** It is normal for approximately 1/4" of discoloration to show around the weld. If the Trigger is held down for more than 1 second, the metal skin of the vehicle will burn.

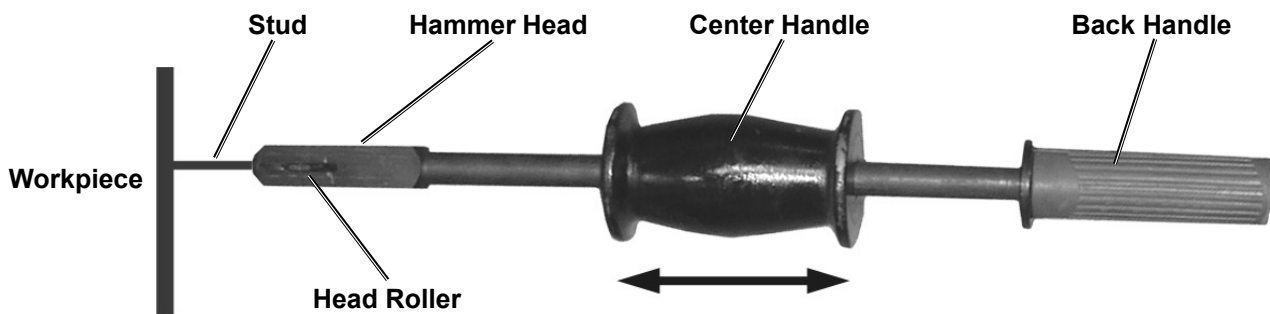
**Note:** If the Stud Welder remains on too long (approximately 6 seconds) the circuit breaker will shut the unit down to protect it. To reset the circuit breaker, allow the unit to cool down and then push the Circuit Breaker Reset Button.

6. Pull the Stud Welder directly back, leaving the welded stud in place with the tip of the stud exposed.

## Pulling Out the Dent

1. Slip the head of the Slide Hammer over the welded stud and tighten it on the exposed tip of the stud by holding the Back Handle and turning the Head Roller away from the workpiece.
2. With one hand on the Center Handle and one on the Back Handle, apply a backward hammering motion, hammering the Center Handle against the Back Handle (away from the workpiece) until the dent has popped out.
3. To disengage the Slide Hammer head from the stud, gently tap the Center Handle forward against the head of the Hammer until the stud is released.
4. Cut the stud off and grind it down so it is flush with the metal surface.

**CAUTION!** Keep hands clear of pinch points.



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## Maintenance



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


### WARNING

#### TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:

Release the Trigger and unplug the Stud Welder from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

#### TO PREVENT SERIOUS INJURY FROM WELDER 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 Stud Welder. Check for:
  - loose hardware
  - misalignment or binding of moving parts
  - cracked or broken parts
  - damaged electrical wiring
  - any other condition that may affect its safe operation.
2. **AFTER USE**, wipe external surfaces of the Welder with clean cloth.
3. Keep the Ground Sleeve free of oxidation by cleaning with fine steel wool.
4. Periodically inspect Stud Electrode Tips. Use a fine metal file as needed to keep the Electrode Tip flat and clean to maintain a proper contact surface.
5.  **WARNING!** If the supply cord of this Welder is damaged, it must be replaced only by a qualified service technician.

## Troubleshooting

Problem	Possible Causes	Likely Solutions
Stud Does Not Weld; Weld Area Cold	<ol style="list-style-type: none"><li>1. Unit not plugged into electrical outlet.</li><li>2. No power to Power Cord.</li><li>3. Welder circuit breaker tripped.</li><li>4. Ground Sleeve has poor/no contact with weld surface.</li></ol>	<ol style="list-style-type: none"><li>1. Plug Power Cord into electrical outlet.</li><li>2. Check power source.</li><li>3. Press Circuit Breaker Reset Button.</li><li>4. Clean weld surface for the entire Ground Sleeve to contact fully, press harder, and ensure Ground Sleeve contacts the surface evenly.</li></ol>
Weak Weld, Stud Does Not Hold	<ol style="list-style-type: none"><li>1. Weld time too short.</li><li>2. Electrode Tip or stud dirty.</li><li>3. Weld surface not cleaned sufficiently.</li></ol>	<ol style="list-style-type: none"><li>1. Increase weld time.</li><li>2. Clean or replace Electrode Tip and/or stud.</li><li>3. Clean surface down to bare metal.</li></ol>
Weld Burning Through Metal	<ol style="list-style-type: none"><li>1. Weld time too long.</li><li>2. Using incorrect stud.</li><li>3. Dirty Electrode Tip.</li></ol>	<ol style="list-style-type: none"><li>1. Shorten weld time.</li><li>2. Replace stud with correct size.</li><li>3. Clean Electrode Tip.</li></ol>
Circuit Breaker Continues to Trip	<ol style="list-style-type: none"><li>1. Circuit rating not large enough.</li><li>2. Electrical fault in Welder.</li></ol>	<ol style="list-style-type: none"><li>1. Connect to 20 A dedicated circuit.</li><li>2. Have qualified technician service Welder.</li></ol>



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

## PLEASE READ THE FOLLOWING CAREFULLY

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THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR 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.

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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.

## Parts List and Diagram

### Parts List

Part	Description	Qty
1	Nut 5/16-18	2
2	Insulator Sleeve	1
3a	2mm Studs (100/bag, not shown)	1 bag
3b	3mm Studs (100/bag, not shown)	1 bag
4	Slide Hammer (not shown)	1
5	Head Roller (not shown)	1
6	Terminal	2
7	Wire Assembly	1
8	Wire Assembly	1
9	Ground Sleeve	1
10	Spring	1
11	Sliding Electrode	1
12	2mm Stud Electrode Tip	1
12a	3mm Stud Electrode Tip (not shown)	
13	Cap Screw 1/4x20x5/8"	1
14	FRP Insulator	1
15	Circuit Breaker	1

Part	Description	Qty
16	Screw 10-32x7/8	2
17	Trigger Boot	1
18	Trigger	1
19	Power Cord	1
20	Left Housing	1
21	Nut 10-32	11
22	Insulator	1
23	Transformer	1
24	Cap Screw 1/4x20x3/4"	1
25	Flat Washer SAE 1/4"	4
26	Right Housing	1
27	Screw 10-32x1/2"	6
28	Braided Strap	1
29	Screw 10-32x1-1/2"	3
30	Nut 1/4x20	2
31	Flat Washer 5/16	2
32	Nut 5/16	1

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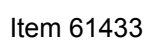
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## Limited 90 Day Warranty

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.

