



MODEL H8153

DC STICK/TIG PULSE WELDER

OWNER'S MANUAL



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#TS9033 PRINTED IN CHINA



WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance and service of this machine/equipment.

Failure to read, understand and follow the instructions given in this manual may result in serious personal injury, including amputation, electrocution or death.

The owner of this machine/equipment is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, blade/cutter integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



WARNING!

Fumes created by welding, cutting, grinding, drilling, and other metal working activities may contain hazardous chemicals that can cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Galvanized metal welding and cutting.**
- **Lead from lead-based paints.**

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 respirators that are specially designed to filter out microscopic particles and gases.

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INTRODUCTION

Foreword

We are proud to offer the Model H8153 DC Stick/TIG Pulse Welder. This machine is part of a growing Grizzly family of fine metalworking equipment. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The specifications, drawings, and photographs illustrated in this manual represent the Model H8153 when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly.

For your convenience, we always keep current Grizzly manuals available on our website at **www.grizzly.com**. Any updates to your machine will be reflected in these manuals as soon as they are complete. Visit our site often to check for the latest updates to this manual!

Contact Info

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
c/o Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

We stand behind our machines. If you have any service questions or parts requests, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com
Web Site: <http://www.grizzly.com>



Specifications

Stick Welding Current.....	5–130A
Stick Duty Cycle	35% @ 130A
TIG Welding Current	5–160A
TIG Duty Cycle.....	35% @ 160A
TIG Start Current.....	15A
TIG Start Current Upslope	0.2 sec
TIG Gas Pre-Flow	0.5 sec
TIG Gas Post-Flow.....	1–10 sec
Upslope	0–5 sec
Downslope.....	0–5 sec
Pulse Frequency Range.....	0.5–25 Hz
Power Consumption	22.4A @ 220VAC
Output Power	60–80V DC
Length/Width/Height.....	12 x 6½ x 11½ in.
Net Weight.....	22 lbs.

Identification

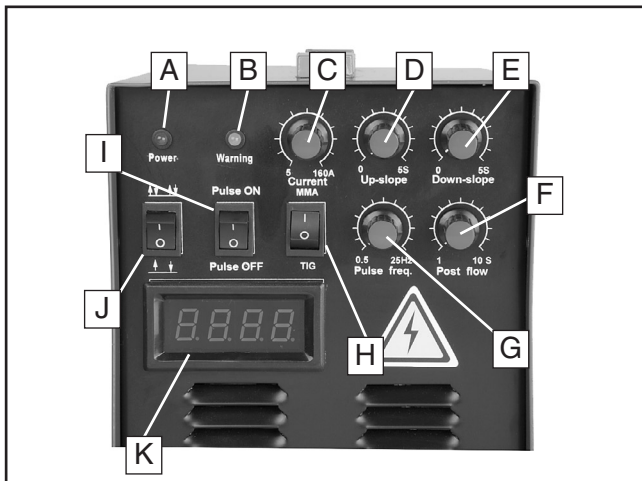


Figure 1. Model H8153 top front control panel.

- A. Power Light
- B. Warning Light
- C. Output Current Dial
- D. Upslope Current Dial
- E. Downslope Current Dial
- F. Post Flow Time Dial
- G. Pulse Frequency Dial
- H. Stick/TIG Selector
- I. Pulse ON/OFF Selector
- J. 2-Step/4-Step Selector
- K. Digital Welding Current Display (Amps)

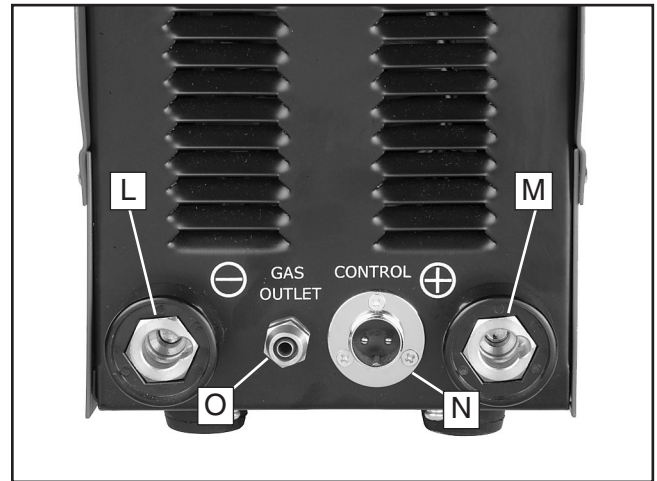


Figure 2. Model H8153 bottom front connections.

- L. Negative Output Socket
- M. Positive Output Socket
- N. Remote Control Connection
- O. Gas Outlet Connection

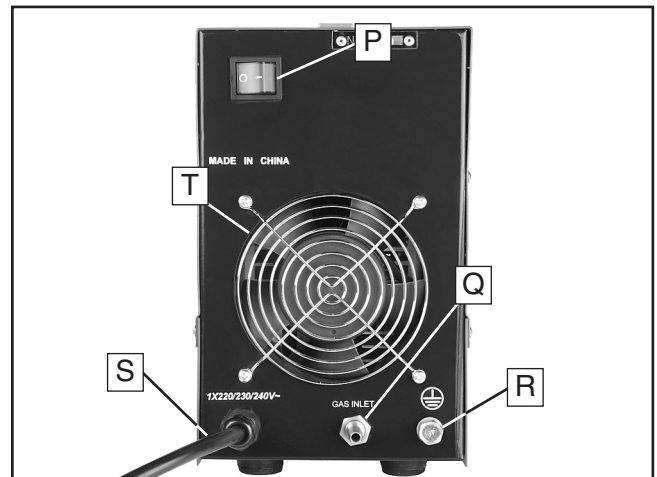


Figure 3. Model H8153 features on back of enclosure.

- P. Power ON/OFF Switch
- Q. Gas Inlet Connection
- R. Welder Enclosure Ground Terminal
- S. Power Cord
- T. Cooling Fan and Cover



SECTION 1: SAFETY

WARNING

For Your Own Safety, Read Instruction Manual Before Operating this Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.



Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

This symbol is used to alert the user to useful information about proper operation of the machine.

WARNING

Safety Instructions for Stick/TIG Welders

- 1. READ THIS MANUAL.** This manual contains proper operating and safety procedures for this equipment.
- 2. WELDING FUMES.** Breathing welding fumes can cause suffocation or poisoning without warning. Keep your head out of welding fumes. Use adequate ventilation at the arc to safely remove the fumes from your breathing zone and the general area. Use ANSI approved respirators for the type of welding operation. Protect others from these fumes.
- 3. WELDING IN A CONFINED SPACE CAN BE HAZARDOUS.** Always open all covers, sustain forced ventilation, remove toxic and hazardous materials, and provide a power disconnect to the welder inside the work space. Always work with someone who can give you help from outside the space. Welding can displace oxygen. Always check for safe breathing atmosphere and provide air-supplied respirators if necessary. Keep in mind that all normal welding hazards are intensified in a confined space.



WARNING

4. **ELECTRIC SHOCK.** DO NOT touch live electrical parts. Connect welder to power source with approved earth ground. Make sure all electrical connections are tight, clean, and dry. Connect workpiece to approved earth ground. The work lead is NOT a ground connection and is to be used only to complete the working welding circuit.
5. **PREVENT FIRES.** Welding work zones must be kept clear of flammable liquids, such as gasoline and solvents; combustible solids, such as paper and wood; and flammable gases, such as acetylene and hydrogen. Provide approved fire barriers and fire extinguishing equipment for the welding zone. Stay alert for sparks and spatter thrown into cracks and crevices that can start a smoldering fire.
6. **PERSONAL PROTECTIVE EQUIPMENT.** Wear eye, ear, and body protection approved for welding operations. Wear complete body protection, such as clean and oil-free protective clothing, leather gloves, protective cap, heavy long-sleeve shirt, cuffless pants, and high leather boots. DO NOT wear jewelry or frayed clothing. Use a welding helmet with correct shade of filter for the operation. Protect other people and property in your working zone from exposure to arc radiation, sparks, and spatter.
7. **WORKING AREA.** Keep working area clear of any material not involved in the welding operation. Keep all equipment, workpieces, and work surfaces clean, dry, and free of entanglements. Keep lead cables organized and away from your body.
8. **AVOID EXPLOSION HAZARD.** Never weld on closed containers or containers with fumes inside. Containers should be prepared per American Welding Society Publication F4.1, Section 7.
9. **HANDLING GAS CYLINDERS.** Regardless of content, pressurized gas cylinders can explode. Always secure a protector cap in place over the outlet valve assembly when moving the cylinder. A broken off valve could release the pressurized contents and cause the cylinder to be hurled about at dangerously high speeds, causing serious property damage, personal injury, or death. Always use safe methods when moving gas cylinders. Always secure a gas cylinder to a wall or approved cylinder cart with a chain before using or storing.
10. **PROTECT GAS CYLINDERS FROM HEAT OR DAMAGE.** An excess of heat can cause the pressurized gas to expand and explode the cylinder. Never weld on the gas cylinder. Damaging the outside of the cylinder can cause the cylinder to crack and explode. Exploding pressurized gas cylinders can cause serious property damage, personal injury, or death.
11. **ELECTRIC AND MAGNETIC FIELDS (EMF).** Welding operations create EMF around the welding equipment and workpieces. Workers who have pacemakers must consult with their physician before using this equipment or being within 50 feet of welding operations.
12. **EQUIPMENT MAINTENANCE.** Make sure equipment inspections and maintenance are performed by a qualified person as required. Stop the welding operation and disconnect the welder from power if the equipment is damaged or malfunctions.
13. **EXPERIENCING DIFFICULTIES.** If you are experiencing difficulties performing the intended operation, stop using the equipment. Contact our Technical Support Department at (570) 546-9663.



Additional Sources for Welding Codes and Standards

American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126, (305) 443-9353, Website: www.aws.org.

- Safety in welding, Cutting, and Allied Processes, ANSI Standard Z49.1
- Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, AWS F4.1

National Fire Protection Association, P. O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101, (617) 770-3000, Website: www.nfpa.org and www.sparky.org.

- National Electrical Code, NFPA Standard 70
- Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B

Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102, (703) 412-0900, Website: www.cganet.com.

- Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1

Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3, (800) 463-6727, Website: www.csa-international.org.

- Code for Safety in Welding and Cutting, CSA Standard W117.2

American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036-8002, (212) 642-4900, Website: www.ansi.org.

- Practice for Occupational and Educational Eye and Face Protection, ANSI Standard Z87.1

U. S. Government Printing Office, Superintendent of Documents, P. O. Box 371954, Pittsburgh, PA 15250 (312) 353-2220, Website: www.osha.gov.

- OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1929, Subpart J

American Conference of Government Industrial Hygienists (ACGIH), 1330 Kemper Meadow Drive, Suite 600, Cincinnati, OH 45240-1634, (513) 742-2020, Website: www.acgih.org.

- Threshold Limit Values (Booklet)

WARNING

Like all equipment there is potential danger when operating this welder. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this welder with respect and caution to lessen the possibility of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other equipment with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or poor work results.



SECTION 2: CIRCUIT REQUIREMENTS

220V Operation

!WARNING

Serious personal injury could occur if you connect the machine to the power source before you have completed the set up process. DO NOT connect the machine to the power source until instructed to do so.

Amperage Draw

The Model H8153 welder draws the following amps under maximum load:

Draw at 220V, Single Phase.....22.4 Amps

Circuit Requirements

Connect your welder to a dedicated and grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Minimum 220V Circuit Requirement30 Amps

Plug/Receptacle Type

Recommended Plug/Receptacle....NEMA L6-30

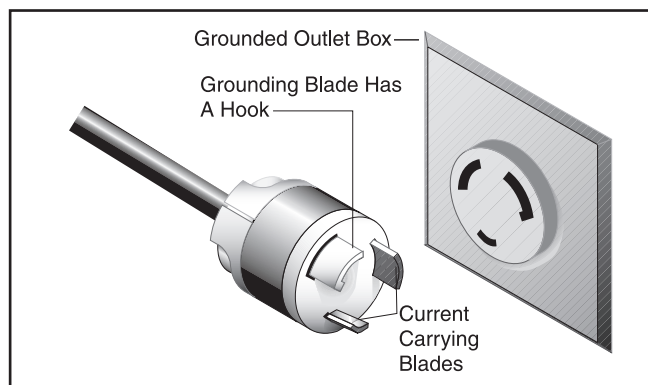
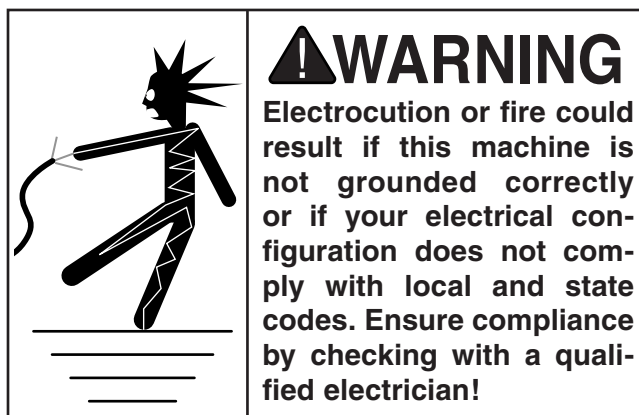


Figure 4. NEMA L6-30 plug and receptacle.

Grounding

In the event of an electrical short, grounding reduces the risk of electric shock. The grounding wire in the power cord must be properly connected to the grounding prong on the plug; likewise, the outlet must be properly installed and grounded. All electrical connections must be made in accordance with local codes and ordinances.



Extension Cords

We do not recommend the use of extension cords. Instead, arrange the placement of your equipment and the installed wiring to eliminate the need for extension cords.

If you find it absolutely necessary to use an extension cord at 220V with your machine:

- Use at least a 10 gauge cord that does not exceed 50 feet in length.
- The extension cord must also contain a ground wire and plug pin.
- A qualified electrician **MUST** size cords over 50 feet long to prevent damage to the welder.



Grounding for Welding Safety

There are two or more electrical circuits involved in any welding operation. The practice of safely grounding these circuits is documented in various codes and standards (refer to **Additional Sources for Welding Codes and Standards** on Page 6).

Welding Machine Ground

When properly connected to a power source, the Model H8153 welder is grounded through the power cord and power grid. The internal welding circuit of the welder is insulated from the external enclosure. However, to avoid shocking hazards if this internal insulation fails, you must establish a separate earth ground for the welder's external enclosure. This ground will ensure that if a short does occur and the metal enclosure becomes intergrated with the welding current, the current will safely dissipate directly through the ground instead of through you.

Note: Refer to the publication NFPA 70, *National Electric Code, Article 250, Grounding*, and your local electrical codes for the correct method of establishing this ground.

The grounding terminal for the Model H8153 external enclosure is located on the right rear of the welder (see **Figure 5**).



Figure 5. Location of external enclosure grounding terminal on the rear of the Model H8153.

Workpiece Ground

The incoming power circuit to the welder and the working welding circuit are two separate circuits that must have separate grounds. The welding circuit consists of the internal components of the welder, the welding cables, the electrode holder/torch assembly, the work clamp, and the workpiece.

ANSI Welding Standards (Z49.1, 11.3.2.1) specify that "Grounding [of the workpiece] shall be done by locating the work on a grounded metal floor or platen, or by connection to a grounded building frame or other satisfactory ground."

WARNING

Always ensure that the ground for the incoming power circuit to the welder and the ground for the working welding circuit are never connected. Failure to comply with this warning could result in death, serious personal injury, or property damage.

However, you must also avoid "double grounding" the workpiece. ANSI Z49.1 states that "Care shall be taken to avoid the flow of welding current through a connection intended only for safety grounding since the welding current may be of a higher magnitude than the grounding conductor can safely carry."

Note: The work lead from the welder is sometimes incorrectly referred to as the "ground lead." The work lead from the welder is NOT a ground. The work lead and the ground connection to the workpiece are separate and must NOT be connected in any way.

WARNING

TIG welders use a high frequency current that creates a high electro-magnetic field (EMF) around the welder. EMF disrupts electronic devices. To avoid damage, keep electronic devices at least 50 feet from the welder when it is powered on. Workers who have pacemakers must consult with their physician before using this equipment or being within 50 feet of welding operations.



SECTION 3: INVENTORY

The Model H8153 was carefully packed when it left our warehouse. If you discover the machine is damaged or a part is missing after you have signed for delivery, *please immediately call Customer Service at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, inventory the contents.

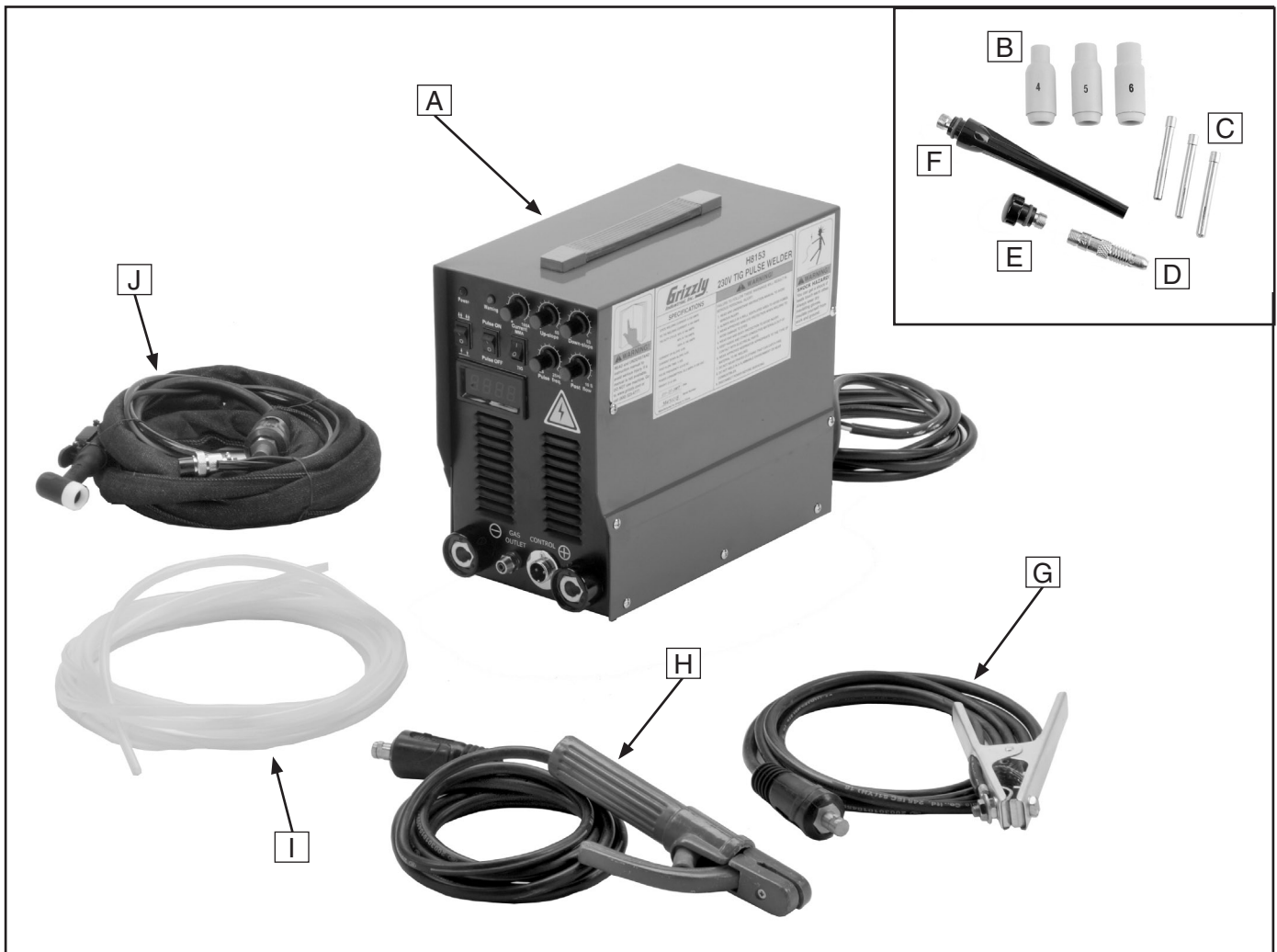


Figure 6. Model H8153 inventory.

- | | |
|---|---|
| A. Model H8153 DC Stick/TIG Pulse Welder | G. Work Clamp and Cable |
| B. Gas Nozzles (#4, #5, and #6) | H. Stick Electrode Clamp and Cable |
| C. Collets (1.6, 1.8, and 2.0mm) | I. Gas Tubing (Inlet) |
| D. Collet Body | J. TIG Torch Assembly, Cable, Gas Tubing, and Remote Control |
| E. Small Collet Backcap | |
| F. Long Collet Backcap | |

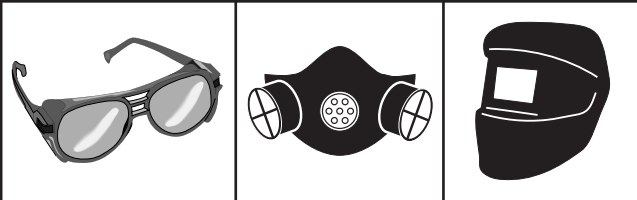


SECTION 4: OPERATIONS

Operation Safety

WARNING

Damage to your eyes and lungs could result from using this machine without proper protective gear. Always wear safety glasses, welder's helmet, and a respirator when operating this welder.



NOTICE

If you have never used this type of machine or equipment before, WE STRONGLY RECOMMEND that you read books, trade magazines, or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

Welder Duty Cycle

As the welder produces the desired power output for the welding operation, some of the power is converted to heat. In order to protect the welder components from over-heating, each welder has an established duty cycle. The duty cycle is variable depending upon the amperage output being used.

A duty cycle is the number of minutes out of 10 minutes that the welder can safely operate at the current amperage output without over-heating. For instance, the Model H8154 has a stick duty cycle of 35% at 130A output. This means that the welder can operate continuously for 3.5 minutes at 130A output, then the arc must be stopped for at least 6.5 minutes to allow the welder to cool off before starting the arc again. It is important to leave the main power to the welder **ON** so that the cooling fan can speed the cooling process.

The Model H8153 operates with an efficient cooling fan (at the rear of the welder) and has an internal thermostat that will shut the welder down if the maximum duty cycle has been reached. Shutdown will be evident by the loss of welding circuit and the yellow warning light on the face of the welder will illuminate. When the welder has cooled sufficiently, the internal thermostat will re-establish the welding circuit and the yellow warning light will go out.

Note: Most electrodes used with stick welding are consumed within a few minutes, so the welder has a chance to cool down when the welding circuit is stopped to install a new electrode.

However, with TIG welding, the operator needs to plan his work within the duty cycle constraints of the welder.

WARNING

Always treat the welding components as if they carry live welding current, even when the welder reaches the duty cycle limit and shuts down. When the welder re-establishes the welding current, the electrode and work lead will immediately carry live welding current. Ignoring this warning could result in serious personal injury or death.



Welder Controls

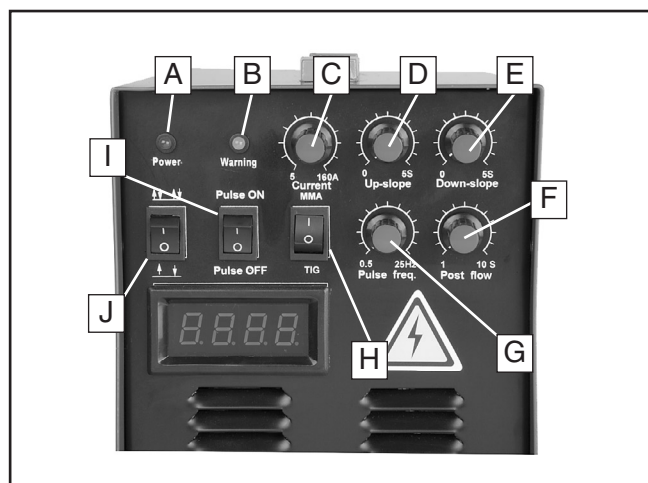


Figure 7. Model H8153 controls.

A. Power Light: This will light when the power is turned **ON**.

B. Warning Light:

—*Not Lit*: The welder is ready for use.

—*Yellow*: When the duty cycle has been exceeded, the internal thermostat will disable the welding circuit until the fan has sufficiently cooled the welder.

—*Green*: Output current is too high or the welder has failed.

—*Red*: Input current is incorrect.

C. Output Current Dial: Adjust this control for the correct welding output current (0–130A).

D. Upslope Current Dial: Use this dial to control the amount of time (0–5 seconds) the welding current takes to reach the selected output current.

E. Downslope Current Dial: Use this dial to control the amount of time (0–5 seconds) the welding current decreases from the selected output current to **OFF**.

F. Post Flow Time Dial: This knob will control the amount of time (0–10 seconds) gas will flow through the TIG torch after the welding arc is shut off.

G. Pulse Frequency: If pulse welding is selected, use this dial to adjust the pulse frequency (0.5–25Hz).

H. Stick/TIG Selector: Use this switch to select stick or TIG welding.

I. Pulse ON/OFF Selector: Use this switch to turn pulse welding **ON** or **OFF**.

J. 2-Step/4-Step Selector (TIG only): Select either the 2-step or 4-step sequence for TIG welding.

—2-Step

1. To start the sequence, press and hold the torch thumb switch.
2. Gas flows for 0.5 seconds to purge the torch line of air.
3. The welding current starts with a preset upslope time of 0.2 seconds from the preset starting current of 15A to the selected output current
4. Release the thumb switch to end the welding sequence.
5. The welding current decreases from the selected output current to the preset finish current over the preset downslope time, then the welding current shuts off.
6. The shielding gas continues to flow for the post flow time selected.

NOTICE

Always keep the power **ON** to the welder after completing the welding operation to let the welder fan cool the welder down. To avoid damage to your welder, never shut the power **OFF** before the welder enclosure is completely cool to the touch.



—4-Step

1. To start the sequence, press the torch thumb switch.
2. The welding current starts at the preset starting current of 15 amps, and stays at that level while the torch thumb switch is depressed.
3. Gas flows for 0.5 seconds to purge the torch line of air.
4. Release the torch thumb switch at any time to raise the welding current to the selected output current over the preset upslope time of 0.2 seconds.
5. Press the thumb switch again to end the welding operation.
6. The welding current decreases to the preset finish current, and stays at the level while the thumb switch is depressed.
7. Release the thumb switch at any time to shut off the welding current.
8. The shielding gas continues to flow for the post flow time selected.

2. Establish a safe and efficient welding environment and ensure that you are properly protected for the welding operation. Ensure that there is a working fire extinguisher readily available.
3. Have an experienced welder stand by to assist if needed.
4. Select the correct electrode, tungsten rod, and filler metal type and size for your welding project.
5. Choose the correct amperage output and be aware of the duty cycle for this amperage.
6. Decide which type of weld is correct for your project and properly prepare the metal.
7. Select the correct settings on the front control panel for your welding operation.
8. Make sure all connections, hoses, gas cylinder, and grounds are correct and secure.

Note: *Insert the welding cable connectors into the welder output sockets and twist clockwise until fully secure. For TIG welding, connect the additional remote connector and gas hose to the appropriate connections.*

9. Stay aware of the work environment around you as you weld, and ensure that flying sparks do not start a fire.
10. Look slightly ahead of the arc. Even with the protection of the welder's hood, looking directly at the arc can damage your eyes.
11. Listen to the sound of the weld. Each type of weld has its own distinct sound when it is progressing correctly.

General Welding Operations

Becoming a good welder takes a lot of practice and experience. If you are a novice, read books and get help from an experienced welder before beginning a welding operation.

Practice on scrap metal and expect to spend considerable time learning the many aspects of good welding.

Although it is beyond the scope of this manual to instruct how to weld, here are some general steps for successful welding:

1. Read and understand this manual and ensure that all safety instructions are followed.



SECTION 5: ACCESSORIES

H7786—Auto Darkening Welding Helmet

Automatic UV and IR filters protect eyes from harmful visible and invisible light during welding. Switching time is less than or equal to 2 milliseconds, so there's no need to flip the helmet up to see your work under normal light conditions. Full face protection features adjustable head suspension and adjustable delay time, sensitivity and dark shade protection. Viewing area is 3½" x 1½". Includes 2 AAA batteries.



Figure 8. Model H7786 welding helmet.

G7868—Welding Respirators

Flame retardant outer shell is recommended for welding applications. Special depth filter provides high loading capacity for metal fumes without increasing breathing resistance. Heavy-duty adjustable headstrap and soft, closed cell foam face seal offers maximum comfort, protection and fit. 5 pack.



Figure 9. Model G7868 welding respirators.

H9745—Leather Shoe Covers

H9746—Leather Knee Pads

H9748—Leather Jacket Medium (40–42)

H9887—Leather Jacket Large (44–46)

H9888—Leather Jacket X-Large (48–52)

These leather jackets, knee pads, and shoe covers provide full protection from welding sparks and spatter. Gloves not included.



Figure 10. Models H9748/H9746/H9745 leather welding protection.

H3157—Deluxe Welding Gloves

Top grain, leather gloves protect against welding hazards. Extra long to protect wrists and fore-arms. One size fits all.



Figure 11. Model H3157 deluxe welding gloves.

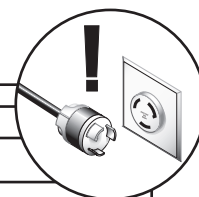
Call 1-800-523-4777 To Order



SECTION 6: SERVICE

Review the troubleshooting and procedures in this section to fix or adjust your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.

Troubleshooting



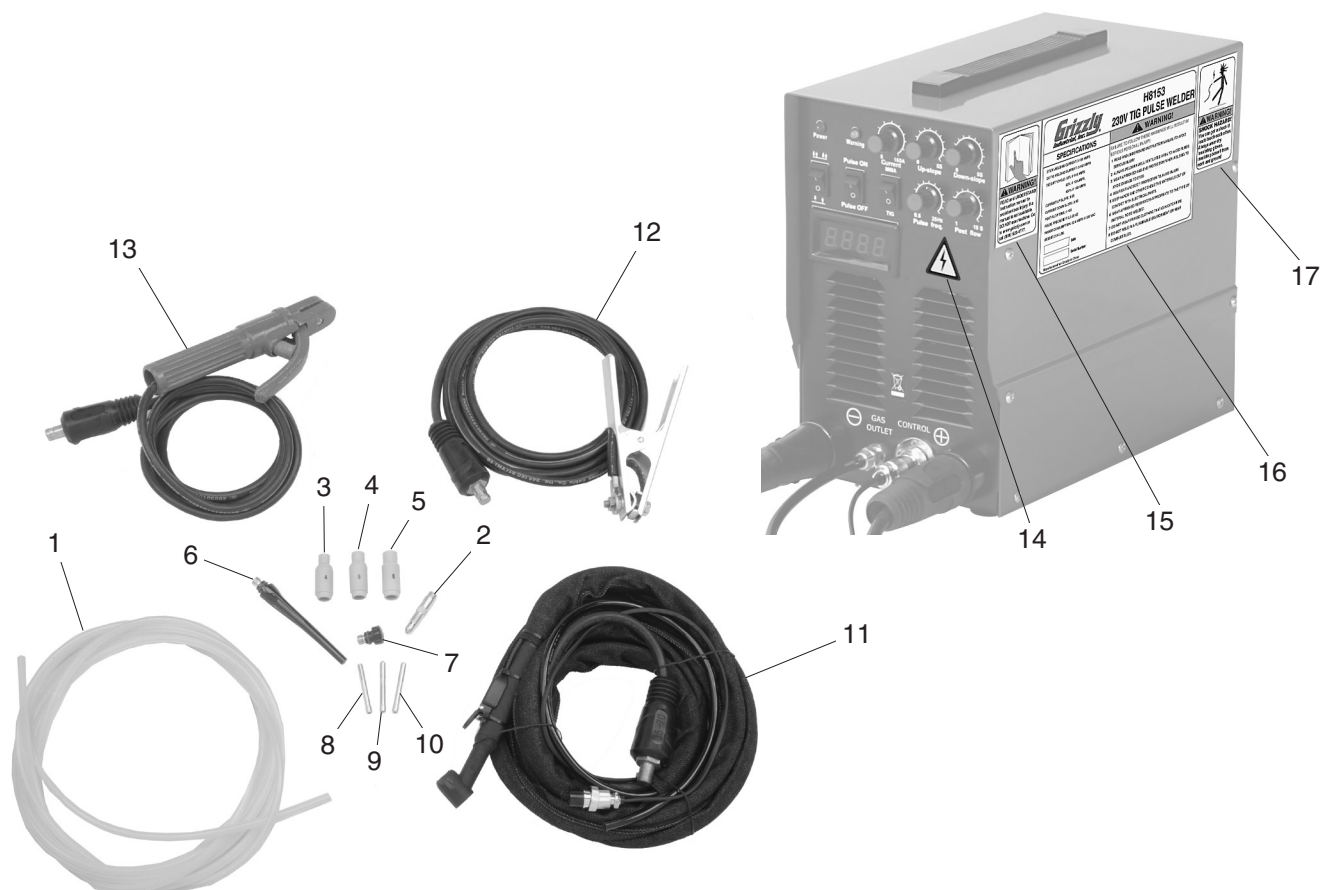
Symptom	Possible Cause	Possible Solution
Welder does not power up or the breaker trips.	1. Plug/receptacle is at fault or wired incorrectly. 2. Wiring is open/has high resistance. 3. ON/OFF switch is at fault. 4. Duty cycle has been exceeded.	1. Test for good contacts; correct the wiring. 2. Check for broken wires or disconnected/corroded connections, and repair/replace as necessary. 3. Replace faulty ON/OFF switch. 4. Let the fan cool the welder.
Porosity (small cavities or holes caused from gas pockets in weld); poor weld bead color.	1. Arc length is too long. 2. Workpiece is dirty or damp. 3. Damp electrodes. 4. Inadequate gas flow (TIG). 5. Incorrect electrode/filler metal used. 6. Loose fittings in torch/gas hoses (TIG).	1. Reduce length of arc. 2. Remove all grease, oil, moisture, coatings, rust, and dirt from workpiece before welding; blow out all air and moisture from gas lines. 3. Use dry electrodes. 4. Adjust gas flow rate as necessary. 5. Use correct type and size of electrode/filler metal. 6. Tighten torch/gas hose fittings; check gas hoses and connections for leaks; replace if necessary.
Excessive spatter.	1. Amperage too high for electrode. 2. Voltage too high; arc length too long. 3. Incorrect electrode/tungsten rod used. 4. Incorrect gas or gas settings (TIG).	1. Select large electrode or decrease amperage. 2. Reduce voltage or arc length. 3. Use correct type and size of electrode/tungsten rod. 4. Use the correct gas for the welding operation; adjust the gas flow as necessary.
Distortion of base metal.	1. Excessive heat applied to base metal.	1. Make tack welds along joint before starting operation; select lower amperage for electrode; increase travel speed; weld in small segments and allow cooling between welds.
Burn through or excessive penetration of base metal.	1. Excessive heat applied to base metal.	1. Select lower amperage; use smaller electrode; increase and/or maintain steady travel speed.
Lack of penetration.	1. Improper joint preparation. 2. Improper weld technique. 3. Insufficient heat applied to weld. 4. Incorrect gas or gas settings (TIG).	1. Material too thick; joint preparation must provide access to bottom of groove. 2. Keep arc on leading edge of weld puddle; reduce travel speed. 3. Increase amperage; select larger electrode. 4. Use the correct gas for the welding operation; adjust the gas flow as necessary.



Symptom	Possible Cause	Possible Solution
Failure of weld to fuse completely with base metal or prior weld bead.	1. Insufficient heat applied to weld. 2. Improper welding technique. 3. Workpiece dirty. 4. Duty cycle exceeded.	1. Increase amperage; select larger electrode. 2. Widen groove to access bottom during welding; keep arc on leading edge of weld puddle; place stringer bead in proper location at joint during welding. 3. Remove all grease, oil, moisture, coatings, rust, and dirt from workpiece before welding. 4. Shut down welder and allow it to cool.
Unstable arc.	1. Weld circuit polarity is incorrect. 2. Tungsten rod is contaminated (TIG). 3. Arc too long. 4. Workpiece is dirty or damp. 5. Incorrect gas or gas settings (TIG).	1. Switch cable polarity at welder. 2. Remove ½" of contaminated tungsten rod and properly repoint rod. 3. Shorten arc; lower torch/electrode closer to workpiece. 4. Remove all grease, oil, moisture, coatings, rust, and dirt from workpiece before welding. 5. Use the correct gas for the welding operation; adjust the gas flow as necessary.
Arc wanders.	1. Improper gas flow (TIG). 2. Arc too long. 3. Contaminated electrode/tungsten rod. 4. Workpiece is dirty or damp. 5. Incorrect gas or gas settings (TIG).	1. Adjust gas flow as necessary. 2. Shorten arc; lower torch/electrode closer to workpiece. 3. Replace electrode; (TIG) remove ½" of contaminated tungsten rod and properly repoint rod. 4. Remove all grease, oil, moisture, coatings, rust, and dirt from workpiece before welding. 5. Use the correct gas for the welding operation; adjust the gas flow as necessary.
Arc is difficult to start.	1. Weld circuit not complete. 2. No or inadequate gas flow (TIG). 3. Incorrect electrode/tungsten rod used. 4. Workpiece is dirty or damp. 5. Incorrect gas or gas settings (TIG).	1. Check clamps and cables; tighten all connections. 2. Check all gas hoses and connections for leaks and tighten/replace as necessary; adjust gas flow as necessary. 3. Use correct type and size of electrode/tungsten rod. 4. Remove all grease, oil, moisture, coatings, rust, and dirt from workpiece before welding. 5. Use the correct gas for the welding operation; adjust the gas flow as necessary.



Replacement Parts & Labels



REF	PART #	DESCRIPTION
1	PH8153001	GAS INLET TUBE
2	PH8153002	COLLET BODY
3	PH8153003	GAS NOZZLE #4
4	PH8153004	GAS NOZZLE #5
5	PH8153005	GAS NOZZLE #6
6	PH8153006	LONG COLLET BACKCAP
7	PH8153007	SMALL COLLET BACKCAP
8	PH8153008	COLLET 1.6MM
9	PH8153009	COLLET 1.8MM

REF	PART #	DESCRIPTION
10	PH8153010	COLLET 2MM
11	PH8153011	TIG TORCH & CABLE ASSEMBLY
12	PH8153012	WORK CLAMP & CABLE
13	PH8153013	ELECTRODE CLAMP & CABLE
14	PLABEL-14	ELECTRICITY LABEL
15	PLABEL-12	READ MANUAL LABEL
16	PH8153016	WELDER ID LABEL
17	PH8153017	SHOCK WARNING LABEL

WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this welder **MUST** maintain the original location and readability of the labels on the welder. If any label is removed or becomes unreadable, **REPLACE** that label before using the welder again. Contact Grizzly at (800) 523-4777 or www.grizzly.com to order new labels.





WARRANTY CARD

Name _____

Street _____

City _____ State _____ Zip _____

Phone # _____ Email _____ Invoice # _____

Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. **Of course, all information is strictly confidential.**

1. How did you learn about us?

_____ Advertisement

_____ Friend

_____ Catalog

_____ Card Deck

_____ Website

_____ Other:

2. Which of the following magazines do you subscribe to?

_____ Cabinet Maker

_____ Popular Mechanics

_____ Today's Homeowner

_____ Family Handyman

_____ Popular Science

_____ Wood

_____ Hand Loader

_____ Popular Woodworking

_____ Wooden Boat

_____ Handy

_____ Practical Homeowner

_____ Woodshop News

_____ Home Shop Machinist

_____ Precision Shooter

_____ Woodsmith

_____ Journal of Light Cont.

_____ Projects in Metal

_____ Woodwork

_____ Live Steam

_____ RC Modeler

_____ Woodworker West

_____ Model Airplane News

_____ Rifle

_____ Woodworker's Journal

_____ Modeltec

_____ Shop Notes

_____ Other:

_____ Old House Journal

_____ Shotgun News

3. What is your annual household income?

_____ \$20,000-\$29,000

_____ \$30,000-\$39,000

_____ \$40,000-\$49,000

_____ \$50,000-\$59,000

_____ \$60,000-\$69,000

_____ \$70,000+

4. What is your age group?

_____ 20-29

_____ 30-39

_____ 40-49

_____ 50-59

_____ 60-69

_____ 70+

5. How long have you been a woodworker/metalworker?

_____ 0-2 Years

_____ 2-8 Years

_____ 8-20 Years

_____ 20+ Years

6. How many of your machines or tools are Grizzly?

_____ 0-2

_____ 3-5

_____ 6-9

_____ 10+

7. Do you think your machine represents a good value?

_____ Yes

_____ No

8. Would you recommend Grizzly Industrial to a friend?

_____ Yes

_____ No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?

Note: We never use names more than 3 times.

_____ Yes

_____ No

10. Comments: _____

FOLD ALONG DOTTED LINE



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Stamp
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P.O. BOX 2069
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City_____State_____Zip_____

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WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

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 products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

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