160 STx
OPERATING MANUAL

ENGLISH

WELDING IN AMERICA.
SINCE THE BEGINNING.

ITEM# 381

REV 03.09.2026

FOUR WAYS TO ORDER

Web: www.forneyind.com

Phone: 800-521-6038

Fax: 970-498-9505

Mail: Forney Industries
2057 Vermont Drive
Fort Collins, CO 80525

U.S. Facilities:
- Fort Collins, CO
- Vandalia, OH

The Forney Promise

At Forney Industries, we are unwavering in our commitment to your success, no matter your location, size or needs.

A Message from Our President & CEO

Thank you for choosing a Forney product.

Since 1932, Forney has been at the forefront of innovation and excellence in all facets of our business. J.D. Forney was an entrepreneur who invented the instant-heat soldering iron and the first 110-volt Arc Welder. For over 90 years, we have continued this legacy, introducing our latest welding machines, plasma cutters and several new metal working products for the retail and industrial sectors.

When you choose Forney, you are investing in reliability, dependability, and quality, backed by a dedicated team:

- Our Expert-Tech® team of engineers and technicians are just a phone call away anytime you need help with a Forney machine or have questions about our products and accessories.
- The Forney Customer Service team is staffed Monday through Friday from 7am – 5pm Mountain Time to address any questions regarding products, services, or account maintenance.
- Our Product Development and Marketing Teams communicate new, innovative products on a regular basis. Learn about our newest product innovations by signing up for our emails at www.Forneyind.com.

At Forney, we are dedicated to surpassing your expectations. Because, when our customers succeed, we succeed.

Steven G. Anderson

STEVEN G. ANDERSON, President & CEO
FORNEY INDUSTRIES, INC.

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TECHNICAL ISSUES?
FORNEY CAN HELP!

Thank you for choosing Forney! Please note: The store you purchased this machine from DOES NOT handle product returns. Forney Industries will repair or replace defective products at no charge to you that are under warranty!

When you call Forney's Technical Service department, you will speak to a trained product and application expert. Forney's primary goal is to get your machine up and running in as little time as possible. In fact, the majority of issues can be fixed over the phone! Please be near your machine when you call, so the Forney technician can guide you.

Speaking to a Forney Technician directly helps us gather better data, and improve our products. It is our highest priority to ensure our customers are cared for.

WE MAKE IT EASY!

Please contact Forney Industries Technical Service at 800-521-6038 Ext. 2 or customerservice@forneyind.com for inquiries, technical and general questions.

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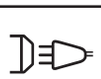
CAUTION!

BEFORE INSTALLING, OPERATING OR CARRYING OUT MAINTENANCE ON THE MACHINE, READ THE CONTENTS OF THIS MANUAL CAREFULLY, PAYING PARTICULAR ATTENTION TO THE SAFETY RULES AND HAZARDS.

In the event of these instructions not being clear, please contact your Forney Authorized Dealer or Forney Customer Service 1-800-521-6038.

Symbols Legend

SYMBOL	MEANING	SYMBOL	MEANING	SYMBOL	MEANING
	ARC RAYS HAZARD		FIRE HAZARD		NOISE HAZARD
	POISON HAZARD		ELECTRICAL HAZARD		WARNING/CAUTION
	BURN HAZARD		ELECTROMAGNETIC INTERFERENCE		EXPLOSION HAZARD
	FALLING EQUIPMENT HAZARD		FUMES, VAPORS, GASSES HAZARD		HF RADIATION INTERFERENCE
	MAGNETIC FIELD HAZARD		MOVING PARTS HAZARD		OVERHEATING HAZARD
	PERSONAL PROTECTIVE EQUIPMENT NEEDED		PLASMA ARC CUTTING		PLASMA CUTTING TORCH TRIGGERED
	PULSE (% ON)		MIG (GMAW)		INPUT VOLTAGE
	STICK (SMAW)		TEMPERATURE		LINE CONNECTION
	TIG (GTAW)		VOLTAGE	1~	SINGLE PHASE ALTERNATING CURRENT (AC)
	POSITIVE DINSE		AMPERAGE		DIRECT CURRENT (DC)
	NEGATIVE DINSE		WIRE-FEED	S	SUITABLE FOR USE IN AN ENVIRONMENT WITH INCREASED RISK OF ELECTRIC SHOCK
	MATERIAL THICKNESS		FLUX-CORE (FCAW)	I	ON / O OFF

Safety Summary

The data within this safety summary are highlights of various safety standards. It is recommended that you familiarize yourself with the standards listed below before use.

Principal Safety Standards

- ANSI Z49.1: SAFETY IN WELDING AND CUTTING - Obtainable from the American Welding Society, 550 NW Le Jeune Road, Miami, FL 33126 Telephone (800) 443-9353, Fax (305) 443-7559 - www.aws.org.
- OSHA 29 CFR, Part 1910, Subpart Q.: WELDING, CUTTING AND BRAZING - Obtainable from your state OSHA office or U.S. Dept. of Labor OSHA, Office of Public Affairs, Room N3647, 200 Constitution Ave., Washington, DC 20210 - www.osha.gov.
- AWS F4.1: SAFE PRACTICES FOR THE PREPARATION FOR WELDING AND CUTTING OF CONTAINERS AND PIPING FOR WELDING AND CUTTING. - Obtainable from the American Welding Society, 550 NW Le Jeune Road, Miami, FL 33126 Telephone (800) 443-9353, Fax (305) 443-7559 - www.aws.org.
- AWS A6.0. WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES - Obtainable from the American Welding Society, 550 NW Le Jeune Road, Miami, FL 33126 Telephone (800) 443-9353, Fax (305) 443-7559 - www.aws.org.
- NFPA 70: NATIONAL ELECTRICAL CODE - Obtainable from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101 Telephone (617) 770-3000 Fax (617) 770-0700 - www.nfpa.org.
- CGA Publication P-1: SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS - Obtainable from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 Telephone (703) 788-2700 Fax (703) 961-1831 - www.cganet.com.
- CSA W117.2 - Code for SAFETY IN WELDING AND CUTTING. - Obtainable from Canadian Standards Association, 178 Rexdale Blvd., Etobicoke, Ontario M9W 1R3 - www.csa.ca.
- ANSI Z87.1 - SAFE PRACTICE FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION - Obtainable from the American National Standards Institute, 11 West 42nd St., New York, NY 10036 Telephone (212) 642-900, Fax (212) 398-0023 - www.ansi.org.
- NFPA 51B: STANDARD FOR FIRE PREVENTION DURING WELDING, CUTTING, AND OTHER HOT WORK- Obtainable from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101 Telephone (617) 770-3000 Fax (617) 770-0700 - www.nfpa.org.
- AWS C5.2 - RECOMMENDED PRACTICES FOR PLASMA ARC CUTTING AND GOUGING - obtainable from the American Welding Society, 550 NW Le Jeune Road, Miami, FL 33126 Telephone (800) 443-9353, Fax (305) 443-7559 - www.aws.org.

California Proposition 65 Warning

⚠ **WARNING:** This product can expose you to chemicals including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. P65 details at forneyind.com. Wash hands after use.

EMF Information

Welding or cutting current, as it flows through the cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examination, the committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and a magnetic field is a human health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when using machine.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep electrode and ground cables close together by twisting or taping them when possible.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep power source and cables as far away from operator as practical.
5. Connect ground clamp to workpiece as close to the cut or weld as possible.

ABOUT PACEMAKERS & HEARING AIDS: If you wear a pacemaker or hearing aids, please consult your doctor before using this product. If cleared by your doctor, following the above procedures is recommended.

Computers and computer driven equipment can be harmed with electromagnetic fields.

- Be sure all equipment is compatible with electromagnetic energy.
- Keep cables short to reduce interference.
- Follow manual to install and ground machine.
- If interference continues, shield the work area or move the machine.
- Locate cutting operation 100 meters from any sensitive electronic equipment.

Personal Protection

THE WELDING AND PLASMA CUTTING PROCESSES PRODUCES VERY BRIGHT ULTRAVIOLET AND INFRARED LIGHT. THESE ARC RAYS WILL DAMAGE YOUR EYES AND BURN YOUR SKIN IF YOU ARE NOT PROPERLY PROTECTED. To reduce the risk of injury from arc rays, read, understand, and follow the safety instructions. In addition, please ensure anyone using this equipment or located near the work area understands and follows the safety precautions listed below.

- Helmets and filter should conform to ANSI Z87.1 standards.
- Do not look at a welding or plasma cutting arc without proper eye protection. A welding and plasma cutting arc is extremely bright and intense. Without adequate eye protection, your retinas may be severely burned, leaving permanent dark spots in your field of vision. Refer to ANSI Z49.1 or OSHA 29CFR for proper eye protection recommendations.
- Provide shields or helmets fitted with an appropriate shade filter lens to any bystanders.
- Do not strike an arc until all bystanders and the operator have shields and/or helmets in place.
- Do not wear a cracked or broken helmet and replace any cracked or broken filter lenses immediately.
- Do not allow the uninsulated portion of the MIG torch, TIG torch, Plasma torch or Electrode holder to touch the ground clamp or grounded workpiece to prevent an arc flash from being created on contact.
- Wear appropriate protective clothing. The intense light of the welding and plasma cutting arc can burn the skin in much the same way as the sun, even through lightweight clothing. Wear dark clothing made of heavy materials. The shirt worn should be long sleeved and the collar kept buttoned to protect your chest and neck.
- Protect yourself against reflected arc rays. Arc rays can be reflected off shiny surfaces such as a glossy painted surface, aluminum, stainless steel and glass. It is possible for your eyes to be injured by reflected arc rays even when wearing a protective helmet or shield. If working with a reflective surface behind you, arc rays may bounce off the surface and off the filter lens. These may enter your helmet or shield and damage your eyes. If a reflective background exists in your work area, either remove it or cover it with something non-flammable and non-reflective. Reflective arc rays may burn your skin in addition to damaging your eyes.
- Flying sparks may cause injuries to you or any bystanders. To avoid this, always wear approved safety glasses with side shields under your helmet or shield. Wear proper protection and work in a safe location whenever you shape a tungsten electrode on the grinder. Always keep flammables at a safe distance to prevent flying sparks from starting a fire.
- The heat and force from the plasma arc may cause serious burns. The danger of injury is greatly increased by the intensely hot and powerful arc, which can easily cut though gloves and tissue. To prevent injury, use the following precautions:
  A. Keep away from the torch CUTTING TIP.
  B. Do not grip material near the cutting path.
  C. The pilot arc may cause burns - keep away from torch CUTTING TIP when trigger is pressed.
  D. Wear proper flame-resistant clothing covering all exposed body areas.
  E. Point PLASMA TORCH away from your body and toward workpiece when pressing the torch trigger – pilot arc comes on immediately.
  F. Turn OFF machine and disconnect INPUT POWER CABLE before removing SHIELD CUP, changing torch consumables or disassembling PLASMA TORCH.
  G. Use only the PLASMA TORCH that came with your plasma cutting machine or a certified replacement.

WARNING: FUMES, GASSES AND VAPORS MAY CAUSE DISCOMFORT, ILLNESS OR DEATH!

To reduce the risk of injury or death, read, understand, and follow these safety instructions. In addition, ensure anyone using this equipment or located near the work area also understands and follows the safety precautions listed below.

- Read and understand manufacturers Safety Data Sheets (SDS) and Material Safety Data Sheets (MSDS).
- Do not weld or plasma cut in an area until it is checked for adequate ventilation as described in ANSI standard Z49.1. If ventilation is not adequate to exchange all fumes and gasses generated during the welding or cutting process with fresh air, do not weld or cut unless you and all bystanders are wearing air-supplied respirators.

- Do not heat metals coated with, or that contain, materials that produce toxic fumes (such as galvanized steel), unless the coating is removed. Ensure the area is well ventilated, and the operator and all bystanders are wearing air-supplied respirators.
- When cutting aluminum underwater or with the water touching the underside of the aluminum, free hydrogen gas may collect under the workpiece and cause an explosion or injury.
- Do not weld, cut or heat lead, zinc, cadmium, mercury, beryllium, antimony, cobalt, manganese, selenium, arsenic, copper, silver, barium, chromium, vanadium, nickel, or similar metals without seeking professional advice and inspection of the ventilation of the work area. These metals produce extremely toxic fumes which can cause discomfort, illness or death.
- Do not weld or cut in areas that are near chlorinated solvents. Vapors from chlorinated hydrocarbons, such as trichloroethylene and perchloroethylene, may be decomposed by the heat of an electric arc or its ultraviolet radiation. These actions may cause phosgene, a highly toxic gas to form, along with other lung and eye-irritating gasses. Do not weld or cut where these solvent vapors may be drawn into the work area or where ultraviolet radiation may penetrate areas containing even very small amounts of these vapors.
- Do not use machine in a confined area unless there is proper ventilation or the operator (and anyone else in the area) is wearing an air-supplied respirator.
- Stop using immediately if you experience eye, nose or throat irritation, as this may indicate inadequate ventilation. Stop work and take necessary steps to improve ventilation in the work area. Do not resume use if physical discomfort persists.

Fire Prevention

WARNING: FIRE OR EXPLOSION MAY CAUSE DEATH, INJURY OR PROPERTY DAMAGE! To reduce these risks, read, understand and follow these safety precautions. In addition, ensure anyone using this equipment or located near the work area also understands and follows the safety precautions listed below. NOTE: Arc welding and plasma cutting by nature produces sparks, hot spatter, molten metal drops, hot slag and hot metal parts that may start fires, burn skin and damage eyes.

- Do not wear gloves or other clothing that contains oil, grease, or other flammable substances.
- Do not wear flammable hair products or accessories.
- Do not touch the hot weld bead, weld puddle or work material until it has fully cooled.
- When plasma cutting aluminum underwater or with the water touching the underside of the aluminum, free hydrogen gas may collect under the workpiece and cause an explosion.
- Do not weld or cut in an area until it is checked and cleared of combustible and/or flammable materials. Be aware that sparks and slag may fly 35 ft and can pass through small cracks and openings. If work and combustibles cannot be separated by a minimum of 35 ft, protect against ignition with suitable, snug-fitting, fire resistant covers or shields.
- Do not weld or cut into walls before checking for and removing any combustibles touching the other side of the wall.
- Connect the ground cable to the workpiece as close as possible to the work area. Do not connect ground cables to building framing or other locations away from the work area. This increases the possibility of the electrical current passing through alternate circuits, creating a fire hazard and other safety hazards.
- Do not weld, cut or work on used barrels, drums, tanks, or any other containers where flammable or toxic substances have been stored. The techniques used to remove flammable substances and vapors to make used containers safe for welding or cutting are quite complex and require specialized training. Never allow any electrically "hot" parts to touch a cylinder. Doing so will create a brittle area capable of becoming a violent rupture.
- Ensure any compressed gas cylinders in the work area have properly operating regulators rated for the gas and pressure used. All hoses, fittings, etc. should be in good condition.
- Do not stand in front of or put your head or face in front of a cylinder valve outlet when opening the valve.
- If a cylinder is not in use or connected for use, keep a valve protection cap in place to protect the valve.
- Keep cylinders upright and securely chain them to a fixed support to prevent tipping.
- Keep cylinders away from areas where they may be subjected to physical damage or accidentally struck. Keep them a safe distance from any source of flame, sparks or heat.
- Do not weld or cut in an area where the air may contain flammable dust (such as grain dust), gas or liquid vapors (such as gasoline).
- Never handle hot metal, such as the workpiece or electrode stubs, with bare hands.
- Always wear leather gloves, a heavy long-sleeved shirt, cuffless pants, high-topped and closed-toed shoes, a helmet and welding cap when operating this product. Use additional fire-resistant protective clothing to cover and protect the upper and lower body as needed. Hot sparks or metal may become lodged in rolled up sleeves, pant cuffs or

pockets. Keep your sleeves and collars buttoned at all times and use a shirt without pockets on the front. Keep long hair securely pulled back.

- Have fire extinguisher equipment handy in case of an emergency. A portable chemical fire extinguisher, type ABC, is recommended.
- Wear ear plugs when welding or cutting overhead to prevent spatter or slag from falling into your ears.
- Choose a work area with a solid, safe floor. Concrete or masonry is recommended. Avoid floors that are tiled, carpeted or containing any flammable material.
- Protect flammable walls, ceilings and floors with heat-resistant covers or shields.
- Always ensure your work area is free of sparks, flames or glowing metal or slag before leaving the area.
- Remove any combustibles such as lighters and matches before doing any welding or cutting.
- Do not overload building wiring – ensure the building power supply system is properly sized, rated and protected to handle this unit.
- Always ensure your work area is free of sparks, flames or glowing metal or slag before leaving the area.
- Follow OSHA and NFPA requirements for hot work and always keep an extinguisher nearby.

High-Frequency Radiation

- High-Frequency (H.F) can interfere with radio navigation, safety services, computers and communication equipment.
- It is your responsibility to have a qualified electrician promptly correct any interference problems resulting from the installation. An electrician should regularly check and maintain the installation.
- Stop using the equipment if notified by the FCC about interference.
- Keep H.F. source doors and panels tightly shut and keep spark gaps at the correct setting.

Electric Shock

WARNING: ELECTRIC SHOCK CAN KILL! To reduce the risk of death or serious injury from shock, read, understand and follow these safety instructions. In addition, ensure anyone using this equipment or located near the work area also understands and follows the safety precautions listed below.

WARNING: TO REDUCE THE RISK OF DEATH, INJURY OR PROPERTY DAMAGE, DO NOT ATTEMPT OPERATING the equipment until you have read and understand the following safety summary.

- Never make physical contact with any part of the welding or cutting current circuit. The welding and cutting current circuit includes:
  a. The workpiece or any conductive material in contact with the welding/cutting current.
  b. The ground clamp.
  c. The electrode or welding wire.
  d. Any metal parts on the electrode holder, TIG torch, MIG gun, or Plasma Torch.
- Plasma arc cutting requires higher voltages than welding to start and maintain the arc (200 to 400 volts DC are common). It also uses a plasma torch designed with safety interlock systems which turn the machine output off when the SHIELD CUP is loosened or if the CUTTING TIP touches the ELECTRODE during operation. Incorrectly installed or improperly grounded equipment is hazardous.
- Do not weld or cut in a damp area or come in contact with a moist or wet surface.
- Do not attempt to weld or cut if any part of your body or clothing is wet.
- Do not allow the machine to come in contact with water or moisture.
- Do not drag cables, MIG gun, TIG torch, Plasma torch, or machine's INPUT POWER CABLE through, or allow them to come into contact with, water or moisture.
- Do not touch the machine, or attempt to turn the equipment ON or OFF, if any part of your body or clothing is moist or if you are in physical contact with water or moisture.
- Do not attempt to plug the machine into the power source if any part of your body or clothing is wet or moist, or if you are in physical contact with water or moisture.
- Do not connect the ground clamp to electrical conduit and do not weld or cut on electrical conduit.
- Do not alter the INPUT POWER CABLE or plug in any way.
- Do not attempt to plug the machine into the power source if the ground prong on INPUT POWER CABLE plug is bent over, broken off or missing.

- Do not allow the machine to be connected to the power source or attempt to use if the machine, cables, work site or machine's INPUT POWER CABLE are exposed to any form of atmospheric precipitation or salt water spray.
- Do not carry coiled cables around your shoulders or any other part of your body when they are plugged into the machine.
- Do not modify any wiring, ground connections, switches or fuses in this equipment.
- Wear welding gloves to help insulate your hands from electrical circuit.
- Keep all liquid containers away from the machine and work area to prevent liquids from coming into contact with any part of the machine or electrical circuit.
- Immediately replace any cracked or damaged parts that are insulated or act as insulators, such as cables, INPUT POWER CABLE, Plasma torch or electrode holder.
- When not MIG welding, cut the wire back to the contact tip. When not stick or TIG welding, remove the electrode from the electrode holder or TIG torch.

Noise

WARNING: Noise can cause permanent hearing loss. Welding and plasma cutting processes may create noise levels that exceed safe limits. You must always protect your ears from loud noise while operating this machine to prevent permanent hearing loss.

- To protect your hearing from loud noise, wear protective ear plugs and/or earmuffs.
- Noise levels should be measured to ensure the decibels (sound intensity) do not exceed safe levels.

Additional Safety Information

For additional information concerning welding and plasma cutting safety, refer to the standards listed at the beginning of this safety summary.

Box Contents

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
	Machine		8′ Electrode Holder w/Clamp		8′ Ground Clamp
ITEM	**DESCRIPTION**	**ITEM**	**DESCRIPTION**		
	120-240V Adapter		Nylon Carry Strap		

Installation

Machine Specifications

Primary (Input) Volts	120VAC 240VAC
Phase	Single
Frequency	50/60Hz
Maximum Output	120V - 85A 240V - 160A
Recommended Circuit Breaker	120V - 20A time-delay (slow-blow) breaker minimum (30A for maximum performance) 240V - 50A time-delay (slow-blow) breaker for maximum performance (30A minimum breaker size) Refer to the ratings label and set the output amperage so that the listed input amperage is not exceeded.
Extension Cord Recommendations	3 conductor #12 AWG or larger up to 25'.
Generator Requirements	120V - Minimum 4,000W continuous output with no low-idle function (or low-idle off), 5% THD Max 240V - Minimum 10,000W continuous output with no low-idle function (or low-idle off), 5% THD Max
CSA Rated Output and Duty-cycle	Refer to the data plate of your machine and the Duty-cycle section of this manual
Weight	10.5 lbs. (4,8 kg)
Dimensions	13.8" (351mm) X 5" (127mm) X 10.4" (263mm)
Recommended Electrode Diameter	Electrode Diameter: Up to 1/8" (120V) - Up to 5/32" (240V)

Site Selection

BE SURE TO LOCATE THE WELDER ACCORDING TO THE FOLLOWING GUIDELINES:

- Position your machine near a 240V or 120V electrical outlet. If using 120V input power, be sure to use the power adapter provided in the box.
- Place at a distance of 12" or more from walls or similar obstructions that could restrict natural air flow for cooling.
- Arrange an open space workspace of at least 15' (5m) near the machine.
- In areas free from moisture and dust.
- In areas with ambient temperature between 30° to 90°F.
- In areas free from oil, steam and corrosive gases.
- In areas not subjected to abnormal vibration or shock.
- In areas not exposed to direct sunlight or rain.
- If the machine must be moved, always disconnect the INPUT POWER CABLE from the electrical outlet and gather the cables so as not to damage them.

Connect Input Power

Before you make any electrical connection, ensure the POWER SWITCH is OFF and the electrical circuit ratings meet those stated in the ratings label of your machine.

The main supply voltage should be within ±10% of the rated main supply voltage. Too low of a supply voltage may cause poor performance. Too high of a supply voltage will cause components to overheat and possibly fail. The electrical outlet must be:

- Correctly installed, if necessary, by a qualified electrician;
- Correctly grounded (electrically) in accordance with national and local regulations;
- Connected to an electric circuit that is rated for sufficient amperage per the ratings label of your machine.
- Check the electrical outlet for proper output voltage.
- Plug in the INPUT POWER CABLE to a 240V 50A electrical outlet.
- A 120V 20A electrical outlet (with a 30A time-delay breaker) can be used with supplied adapter at lower output amperage settings.

If you are unsure of any of the above, have your outlet inspected by a qualified electrician before using the machine.

CHECK LOCAL AND NATIONAL ELECTRICAL CODES TO BE SURE THE USE OF A 30A BREAKER WITH A 20A ELECTRICAL OUTLET IS ALLOWABLE IN YOUR AREA.

NOTE:

- Periodically inspect the INPUT POWER CABLE for any cracks or exposed wires. If it is not in good condition, have it repaired by a Service Center.

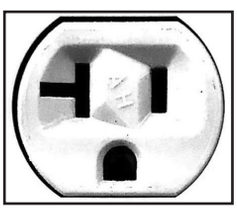
- Do not cut off the grounding prong or alter the plug in any way. Only use the included adapter between the machine's INPUT POWER CABLE and the power source receptacle.
- Do not violently pull the INPUT POWER CABLE to disconnect it from electrical outlet.
- Do not lay material or tools on the INPUT POWER CABLE. The cable may be damaged and result in electrical shock.
- Keep the INPUT POWER CABLE away from heat sources, oils, solvents and sharp edges.
- Do not use this machine on a circuit with a Ground Fault Circuit Interrupter (GFCI). GFCIs are tripped by welding and cutting arcs and your operations will be interrupted regularly

Grounding Requirements

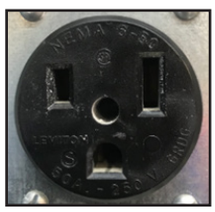
- To ensure personal safety, proper operation and to reduce electromagnetic interference (EMI), the machine must be properly grounded.
- The machine must be grounded through the INPUT POWER CABLE according to national and local electrical standards.
- Single-phase service must be of the 3-wire type with a green or green/yellow wire for the protective earth ground. Do not use 2-wire service.

Using Power Adapters

If a 240V (50A) circuit is not available, you can connect your machine to 120V outlet (with a 30A circuit breaker) using the plug adapter. When using the plug adapter on 120V, use lower power settings on the machine to avoid frequent circuit breaker trips. At maximum settings, the machine will draw more than 20A regularly.



120V/20A



240V/50A

Generators

This machine can be operated from an AC generator. As this is a dual-voltage machine, the generator must supply a minimum of 10,000W of continuous output when using the 240V option. When using the 120V option, the generator must supply a minimum of 4,000W of continuous output. Do not use a generator with an auto-idle fuel saving feature unless it has the option to turn auto-idle off. The generator must always run at full speed while your machine is plugged into it to avoid damaging your machine. Any other power draws on the generator or anything that could reduce the generator RPM, may damage your machine. If the Total Harmonic Distortion (THD) of the generator exceeds 5% THD, it may damage your machine.

Extension Cords

For optimum machine performance, an extension cord should not be used unless absolutely necessary. If necessary, care must be taken in selecting an extension cord appropriate for use with your specific machine.

Select a properly grounded extension cord that will connect directly with the AC power source receptacle and the machine INPUT POWER CABLE. Use only the included adapter if necessary to adapt the machine's INPUT POWER CABLE and the extension cord. Ensure that the extension cord is properly wired and in good electrical condition. Extension cords must fit the following wire size guidelines:

- #12 AWG or larger wire.
- Do not use an extension cord over 25' in length.

Ventilation

Since the inhalation of toxic fumes may be harmful, ensure that your work area is properly ventilated. See SAFETY SUMMARY of this manual for more details.

Additional Warnings

FOR YOUR SAFETY, CLOSELY FOLLOW THESE INSTRUCTIONS BEFORE CONNECTING THE POWER SOURCE TO THE OUTLET:

- An adequate two-pole breaker must be inserted before the main outlet. This breaker must be equipped with time-delay fuses.
- When working in a confined space, the machine must be kept outside the workarea and the ground cable should be fixed to the workpiece. Never work in a damp or wet confined space.
- Do not use a damaged INPUT POWER CABLE or damaged cables.
- The welding or cutting torch/electrode should never be pointed at the operator or other people.
- The machine must never be operated without its panels attached. This could cause serious injury to the operator and could damage the equipment.

Getting to Know Your Machine

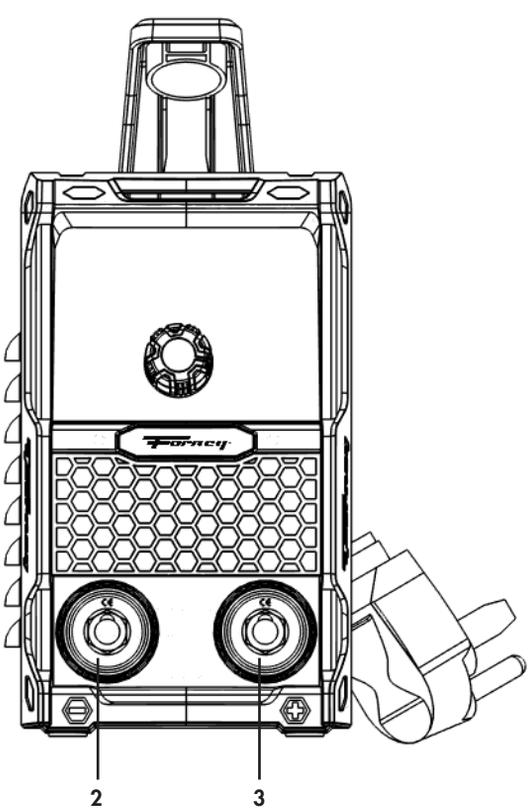
Description

Your new Forney 160 STx is backed by a 3-year warranty, our Colorado-based Expert-Tech® service and has been rated by CSA certifying its safety and welding output. The passive LCD screen is clear and bright, making it easy to see in all environments. Adjustable Arc Force enables you to dial settings into any welding rod, including E6010. Dual-voltage capability ensures compatibility with various power setups, while generator support makes this unit an ideal choice for field work. The simple, one-knob interface makes it easy to use, even with a gloved hand. With a lightweight design and a nylon carrying strap, you can easily and comfortably take your welder wherever you need. Additionally, the DC LIFT TIG process enables welding jobs on thin materials. The Forney 160 STx is a versatile and efficient solution for all your Stick and DC Lift TIG welding needs.

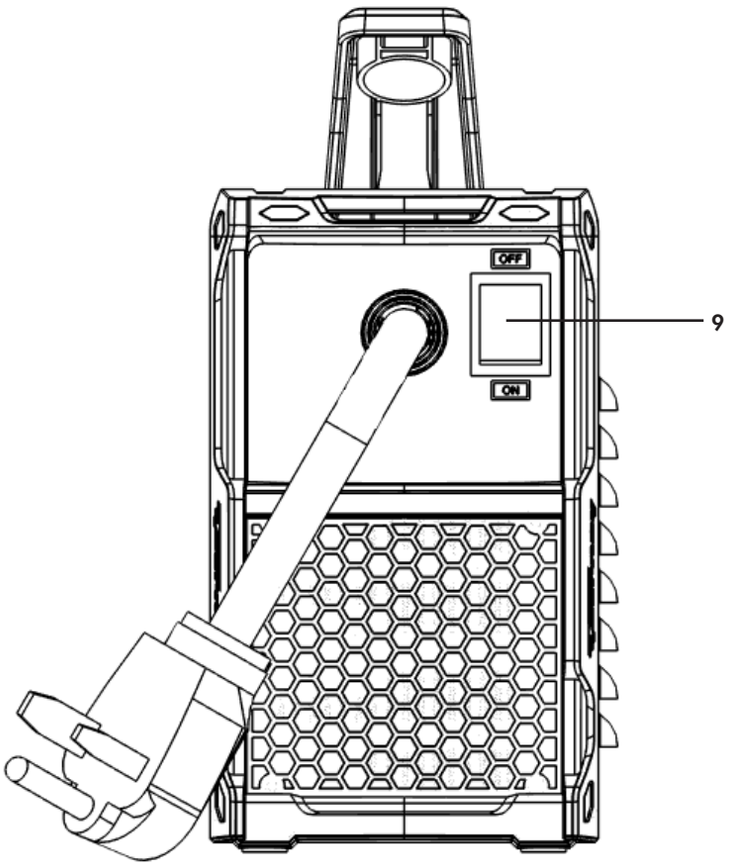
Machine Layout and Controls

1. **OUTPUT CURRENT/ARC FORCE ADJUSTMENT KNOB:** Single knob interface for ease of use. Pressing the knob will switch what the knob is adjusting. The display will show Amps or Arc Force underneath the numeric display, indicating what is being adjusted.
   - **a. AMPS:** The set output amperage.
   - **b. ARC FORCE:** Affects penetration while also modifying arc from soft to hard.
2. **NEGATIVE DINSE CONNECTOR**
3. **POSITIVE DINSE CONNECTOR**
4. **PROCESS SELECTOR BUTTON:** Press button to switch between Stick and DC TIG LIFT.
5. **PROCESS INDICATOR:** Will display which process the machine is set to.
   - **a. STICK:** SMAW welding process.
   - **b. DC TIG LIFT:** GTAW welding process. DC output only, not suitable for aluminum TIG welding.
6. **INDICATOR LIGHTS**
   - **a. TEMPERATURE LIGHT:** Will be lit solid if machine has reached duty cycle. Will flash if electrode is stuck or shorted to the workpiece.
   - **b. INPUT VOLTAGE LIGHT:** Will be lit when input power is present.
7. **HANDLE:** Rugged, top mounted handle allows for easy transport and a place to wrap cables.
8. **POWER CORD:** Fitted with a NEMA 6-50 style plug. Can be adapted to a NEMA 5-15 plug for 120V outlets with the included adapter.
9. **POWER SWITCH:** Turns the machine ON and OFF. (Make sure the POWER SWITCH is in the OFF position before performing any maintenance on the machine).

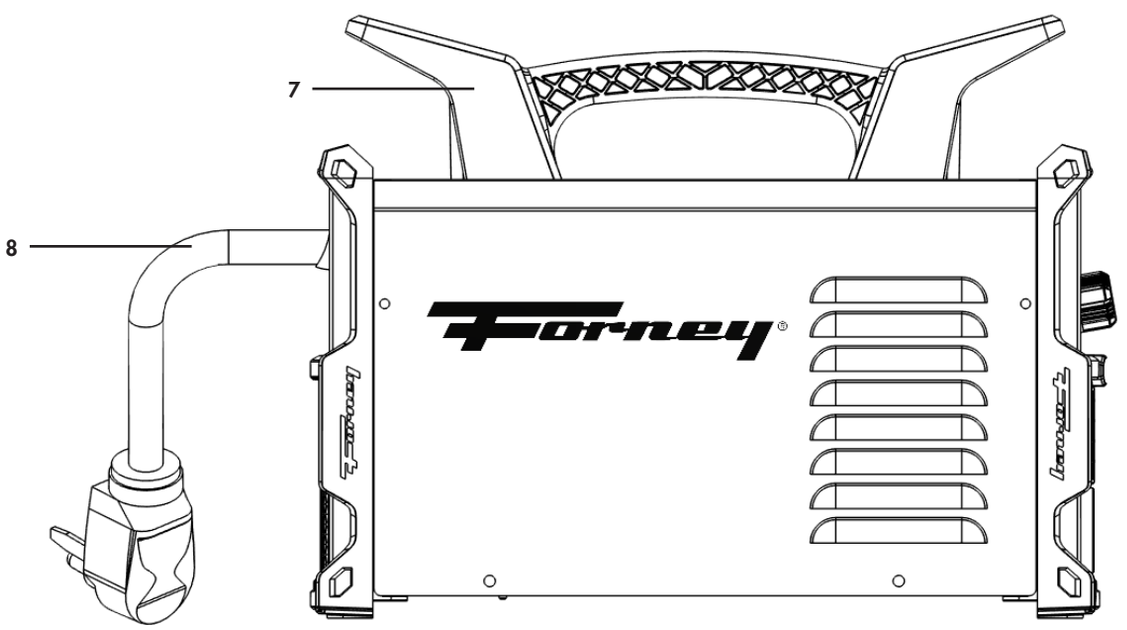
FRONT VIEW OF FORNEY 160 STx



REAR VIEW OF FORNEY 160 STx



SIDE VIEW OF FORNEY 160 STx



Operation

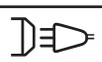
Performance Data Plate and Duty-Cycle

The data plate of a machine holds a lot of information. This includes the machine name, process and various duty cycle charts, among other things. While the below section does not show the actual data found on your machine, it does provide you with the tools needed to understand any data plate regardless of model or brand.

The duty-cycle rating of a machine defines how long the operator can work and how long the machine must rest and be cooled. Duty-cycles are expressed as a percentage of 10 minutes and represents the maximum work time allowed. The balance of the 10-minute cycle is required for cooling. It is common for machines to show three separate rates, showing the difference in duty cycle based on the set output. For example, using a machine with a duty-cycle rating of 30% at the rated output of 90A, you can weld/cut at 90A output for three (3) minutes out of 10 with the remaining seven (7) minutes required for cooling. A sample of the data plate can be found in the diagram below. A completed data plate with duty-cycle and other specifications can be found affixed to the machine. Referring to the sample below, J., K., and L. list duty-cycle percentages while P., Q., and R. list the output amperage and T., U., and V. list the output voltage. Various duty-cycles at other amperages/voltages are listed on your data plate.

The data plate also shows both the maximum amperage draw, Y., for a given input voltage, X. Data plates can be very complex and show duty cycle rates for different input voltages and breaker sizes. Pay close attention to the breaker on the circuit the machine is plugged into and follow the appropriate ratings. User settings on the machine may need to be reduced or limited to avoid exceeding the rated input amperage. Failure to do so could result in frequent breaker trips or electrical hazards.

Machines capable of multiple processes and/or multiple input powers will see sections F-Z, below, repeated on the data plate for every combination of process and input power (voltage and breaker size) the machine is capable of.

<table>
<tr><td colspan="6">Forney Industries
2057 Vermont Drive, Fort Collins, CO 80525 (A)</td></tr>
<tr><td colspan="3">(B) Machine Name</td><td colspan="3">(C) Serial Number:</td></tr>
<tr><td colspan="3">(D) </td><td colspan="3">(E) </td></tr>
<tr><td rowspan="2">(F) </td><td rowspan="2">(G) </td><td colspan="4">(H) Minimum AMP/Volt to Maximum AMP/Volt</td></tr>
<tr><td>(I) X</td><td>(J) ###%</td><td>(K) ###%</td><td>(L) ###%</td></tr>
<tr><td rowspan="2">(M) S</td><td rowspan="2">(N) U_0 = ###V</td><td>(O) I_2</td><td>(P) ###A</td><td>(Q) ###A</td><td>(R) ###A</td></tr>
<tr><td>(S) U_2</td><td>(T) ###V</td><td>(U) ###V</td><td>(V) ###V</td></tr>
<tr><td>(W) 
1-50/60Hz</td><td>(X) U_1 = ###</td><td colspan="2">(Y) I_{1max} = ###A</td><td colspan="2">(Z) I_{1eff} = ###A</td></tr>
</table>

a. Manufacturer.

b. Machine name.

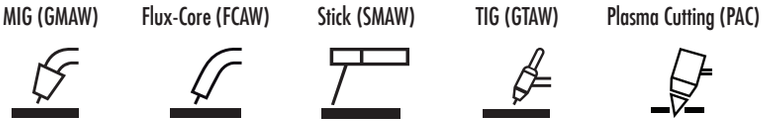
c. Serial number.

d. Electrical phase line diagram.

e. Independent product safety certificates

f. Process diagram:

MIG (GMAW) Flux-Core (FCAW) Stick (SMAW) TIG (GTAW) Plasma Cutting (PAC)



g. Signifies the output current:

Direct Current (DC) Alternating Current (AC) Alternating & Direct Current (AC/DC)

h. Minimum output amperage/voltage to maximum output amperage/voltage

i. Duty cycle chart

j. Duty cycle rating #1

k. Duty cycle rating #2

l. Duty cycle rating #3

m. Identifies a welding power source suitable for welding in an environment with an increased risk of electric shock

n. $U_{(0)}$ indicates the open circuit voltage

o. $I_{(2)}$ indicates the output amperage the duty cycle above it represents

p. Output amperage of duty cycle rating #1

q. Output amperage of duty cycle rating #2

r. Output amperage of duty cycle rating #3

s. **$U_{(2)}$ indicates the output voltage that the duty cycle above it represents**

t. **Output voltage of duty cycle rating #1**

u. **Output voltage of duty cycle rating #2**

v. **Output voltage of duty cycle rating #3**

w. **Indicates input power phase and hertz requirements**

x. **$U_{(1)}$ indicates the input power voltage:** This indicates the input power voltage of the machine for the duty cycle chart shown. Multi-voltage machines will have both 120V and 240V duty cycle charts. This will indicate which chart is shown here.

y. **$I_{(max)}$ indicates the maximum amperage draw:** Metal working machines have a high amperage draw when initiating the arc. It is brief and will drop to the running amperage once the arc is initiated.

z. **$I_{(1eef)}$ indicates the running amperage:** This is the maximum running amperage draw of the machine while operating under normal conditions, after arc initiation and at the highest output settings.

Internal Thermal Protection

If you exceed the duty-cycle of the machine, the thermal protection system will engage and shut off all machine output. After cooling, the thermal protector will automatically reset and the welding or cutting functions can resume. This behavior is normal and automatic and does not require any user action. However, you should wait at least 10 minutes after the thermal protector engages before resuming welding or cutting. You must do this even if the thermal protector resets itself before the ten minutes is up or you may experience less than specified duty-cycle performance.

CAUTION: DO NOT REGULARLY EXCEED THE DUTY-CYCLE OR DAMAGE TO THE MACHINE CAN RESULT.

Welding and Cutting Preparation

An important factor in making a satisfactory weld or cut is preparation. This includes studying the process and equipment and practicing welding or cutting before attempting to complete a finished product. An organized, safe, ergonomic, comfortable and well-lit work area should be prepared for the operator. To make the work area safe, all combustible materials should be kept a safe distance away and a fire extinguisher and bucket of sand should be kept near the work area at all times.

To properly prepare for welding or cutting with your new machine, it is necessary to:

- Read the safety precautions at the front of this manual.
- Prepare an organized, well-lit work area with proper ventilation.
- Provide protection for the eyes and skin of the operator and bystanders.
- Attach the ground clamp to the bare metal to be welded or cut, ensuring good contact.
- Plug the machine into a suitable outlet.
- Completely open the gas cylinder valve. Adjust the gas pressure regulator to the correct flow rate. (Not applicable to stick "SMAW", flux-core "FCAW" or cut processes.)
- Provide a source of clean, dry air or nitrogen. (Only applicable for Plasma Cutting).

EXPOSURE TO A WELDING OR CUTTING ARC IS EXTREMELY HARMFUL TO THE EYES AND SKIN. PROLONGED EXPOSURE TO A WELDING OR CUTTING ARC MAY CAUSE BLINDNESS AND BURNS. NEVER STRIKE AN ARC OR BEGIN WELDING UNLESS YOU ARE ADEQUATELY PROTECTED. WEAR FIRE-RESISTANT WELDING GLOVES, A LONG-SLEEVED SHIRT, CUFFLESS PANTS, HIGH-TOPPED SHOES AND A WELDING HELMET.

Ground Clamp Connection

Connect the GROUND CABLE CLAMP to the workpiece to be cut or welded, or to the metallic workbench.

Take following precautions:

- Ensure that the GROUND CLAMP is attached with a good connection to an area of the workpiece that is clean and free from any coatings such as paint, rust, oil/grease or scale.
- Make ground connections as close as possible to the work area to reduce EMI.
- When plasma cutting, do not make a ground connection on the piece which is to be removed.

Setup for Stick Welding (SMAW)

- Connect the ELECTRODE HOLDER to the POSITIVE DINSE SOCKET.
- Connect the GROUND CABLE to the NEGATIVE DINSE SOCKET.

Expert-Tech® Tip: Electrode positive is the correct polarity for most stick welding. Check the stick electrode manufacturer's packaging for more information on recommended polarity.

- Ensure the ground clamp has a good connection to the workpiece and is clamped on clean, bare metal (not rusty or painted).
- Switch the unit ON with the POWER SWITCH.
- Press the PROCESS SELECTOR BUTTON to choose STICK.
- Press KNOB to illuminate ARC FORCE. Rotate KNOB to adjust.

Expert-Tech® Tip: ARC FORCE determines the amount of amperage boost when the machine detects a drop in voltage during welding, which may occur from holding the arc too close or touching the material. This adjustment influences penetration and is also known as 'dig.'

- Press KNOB to illuminate AMPS. Rotate KNOB to set the desired amperage.
- Use scratch start technique to start the arc.
- To end the arc, pull electrode away from the weld area.

160 STx STICK SETUP CHART

MATERIAL	ELECTRODE TYPE	ELECTRODE DIAMETER				
		1/16" (1,6mm)	5/64" (2mm)	3/32" (2,4mm)	1/8" (3mm)	5/32" (4mm)
Regulation Knob		Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Mild Steel	E6010	–	–	30-75A	65-125A	80-160A
	E6011	–	–	30-75A	35-120A	80-160A
	E6013	10-50A	30-80A	40-90A	50-130A	90-160A
	E7014	–	30-70A	40-90A	60-130A	90-160A
	E7018	–	–	50-80A	80-160A	90-160A
Stainless Steel	E308L	–	–	40-70A	50-80A	70-130A

CANNOT WELD ALUMINUM

Setup for TIG Welding (GTAW)

Setting up the Equipment for TIG Welding (GTAW):
Ceriated tungsten 1/16" to 1/8" (MAX) recommended for use. DO NOT USE WITH PURE TUNGSTEN.

WARNING: TIG TORCH IS ALWAYS LIVE (ELECTRICALLY HOT). Use caution and ensure the TIG torch is not in contact with or near conductive or grounded materials.

- Connect the TIG TORCH to the NEGATIVE DINSE SOCKET.
- Connect the GROUND CABLE to the POSITIVE DINSE SOCKET.

Expert-Tech® Tip: Electrode negative is the correct polarity for all TIG welding.

- Ensure the ground clamp has a good connection to the workpiece and is clamped on clean, bare metal (not rusty or painted).
- See the Gas Selection section of this manual. Ensure you are using the correct type and flow of shielding gas required.
  - Gas flow is controlled by the valve located on the TIG torch.

USE INERT GAS (ARGON OR ARGON/HELIUM) ONLY.

- Fix the tungsten electrode so that it protrudes from the torch nozzle approximately 2-3 times the diameter of the tungesten.
- Ensure the TIG torch is not in contact with grounded or conductive material.
- Switch the unit ON with the POWER SWITCH.
- Press the PROCESS SELECTOR BUTTON to choose DC LIFT TIG.
- Set the desired amperage using the AMPERAGE ADJUSTMENT KNOB.
- Shortly before beginning the weld, use the valve on the TIG torch to begin the flow of shielding gas.
- Use lift arc technique to start the arc.
- To end the arc, pull the torch away from the weld area.
    - After using the shield gas flow to cool the weld, use the valve on the TIG torch to end the flow of shield gas.

160 STx TIG SETUP CHART

MATERIAL	GAS	MATERIAL THICKNESS				
		24 Gauge (,51mm)	16 Gauge (1,29mm)	12 Gauge (2,052mm)	10 Gauge (2,58mm)	3/16" (5mm)
Regulation Knob		Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Mild Steel	100% Argon	25-35A	70-85A	80-100A	90-120A	130-160A
CANNOT WELD ALUMINUM						

Tungsten Recommendations

TUNGSTEN TYPE	COMMENTS
1.5-2% Lanthanated (La)	Most versatile tungsten
1.5-2% Ceriated (Ce)	Solid performance for most applications
1-2% Thoriated (Th)	Performance OK but hazardous
Pure	**Will NOT work with unit**

Recommended Amperage & Electrode Types for TIG Welding

TUNGSTEN	DCEN (Th,La,Ce)
.040"	15-80A
1/16"	70-150A
3/32"	100-200A
1/8"	150A+

Gas Selection

- Use 100% argon or argon/helium mix gas when TIG welding.

Maintenance & Servicing

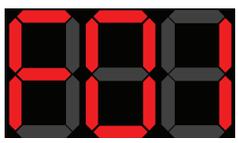
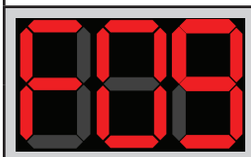
General Maintenance

This machine has been engineered to need minimal service providing that a few very simple steps are taken to properly maintain it.

WARNING: ELECTRIC SHOCK CAN KILL! Be aware that the ON/OFF SWITCH, when OFF, does not remove power from all internal circuitry in the welder. To reduce the risk of electric shock, always unplug the welder from its AC power source and wait several minutes for electrical energy to discharge before removing the side panels.

1. Replace INPUT POWER CABLE, ground cable, ground clamp, welding torch or plasma torch if damaged or worn.
2. Avoid directing grinding particles towards the machine. These conductive particles can build up inside the machine and cause severe damage.
3. Periodically clean dust, dirt, grease, etc. from your machine. Every six months or as necessary, remove the cover from the machine and use compressed air to blow out any dust and dirt that may have accumulated inside the machine.
4. Check all cables periodically. They must be in good condition and not cracked.

Troubleshooting

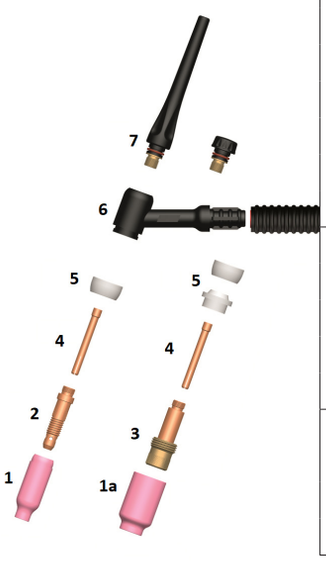
PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
	The thermal protector was engaged because the duty-cycle was exceeded.	Observe and maintain the proper duty-cycle while you allow the machine to cool for at least 10 minutes with the machine ON. The fault state will clear after the machine has cooled.
	Insufficient air flow caused the machine to overheat before reaching the duty cycle.	Check for obstructions blocking the airflow and ensure there are 12" of clearance between any obstacles and the vents on all sides of the machine.
	The electrode is stuck to the workpiece.	Ensure the TIG electrode is not touching the grounded workpiece.
		Ensure your stick electrode is not stuck to the grounded workpiece.
The fan does NOT operate normally (it cannot be heard) and there is no arc.	There is no voltage or the incorrect voltage is being supplied to the welder.	Ensure the machine is plugged in.
		Check the voltage of your outlet. If it is 10% more or less than optimal, call a qualified electrician.
	The ON/OFF SWITCH is in the OFF position.	Turn the ON/OFF SWITCH to the ON position.
	The circuit breaker has been tripped.	Ensure the circuit breaker has been reset.
		Do not use the machine on a GFI outlet.
Low output or non-penetrating weld.	The weld parameters are too low.	Adjust the welding parameters
	The extension cord is too long or improper.	Use a proper extension cord. See the “Extension Cords” section of this manual.
	The ground connection or torch/electrode connection is poor.	Reposition the clamp on the workpiece and check the cable to clamp connection.
		Check the connection of the ground cable, TIG torch and electrode holder to the machine.
	The input power is too low.	Have a qualified electrician verify the voltage at your outlet.
Poor quality welds.	(TIG) There is insufficient gas at the weld area.	Check that the gas is not being blown away by drafts. If it is, move to a more sheltered weld area. If it is not, check the gas cylinder contents, the gauge, the regulator setting and the operation of the gas valve.
		Ensure the gas connections are tight and there are no leaks.
	The workpiece is rusty, painted, oily or greasy.	Ensure the workpiece is clean and dry.
	The ground connection or torch/electrode connection is poor.	Check the ground clamp/workpiece connection and all other connections to the machine.
(TIG) The arc is wandering.	The tungsten is too large.	Use a smaller tungsten.
	The gas flow is too high.	Reduce the gas flow.
	Loose consumables	Remove consumables and ensure they are installed correctly and hand tight

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Frequent circuit breaker trips.	The machine is drawing too much amperage because the electrode/weld wire is too large or the output amperage setting is too high.	Use a smaller electrode/weld wire or turn the output settings down.
	The machine is not the only piece of electrical equipment on the circuit.	Ensure the machine is on a dedicated circuit or is the only item plugged into a circuit.
	The circuit breaker is incorrect/insufficient for use with this machine.	Verify the circuit breaker is the correct one. See the "Machine Specifications" section of this manual.
The ground clamp or ground cable get hot.	The ground clamp is not properly placed or the ground clamp cable is not properly connected to the machine.	Check the connection of the ground clamp and gun to the machine.
		Check the connection of the ground cable to the ground clamp. Tighten the cable connection to the ground clamp if needed.
		Ensure the connection between the ground clamp and the workpiece is good and on clean, bare (not painted or rusted) metal.
		Ensure the cable is not damaged.
Difficult arc start.	The output setting is too low.	Increase the output setting.
	Ensure the base metal is clean.	Properly clean the base metal.
	Ensure the electrode and/or torch is not damaged.	Replace them as needed.

Machine Parts Diagram & Accessories

NO.	PART NUMBER	ITEM DESCRIPTION
1	381	160 STx
2	78033	8' Electrode Holder w/Clamp
3	78034	8' Ground Clamp
4	78036	120-240V Adapter
5	-	Nylon Carry Strap
6	85659	17FV TIG Torch *(Additional purchase required)*

TIG Torch & TIG Consumables List



Number	ITEM#	Industry#	Description	Number	ITEM#	Industry#	Description
1	100817	10N50	#4 1/4" Alumina Nozzle (10/bx)	3	100964	45V24	.040" Gas Lens Collet Bag (2/bag)
	100825	10N49	#5 5/16" Alumina Nozzle (10/bx)		100965	45V25	1/16" Gas Lens Collet Bag (2/bag)
	100824	10N48	#6 3/8" Alumina Nozzle (10/bx)		100966	45V26	3/32" Gas Lens Collet Bag (2/bag)
	100823	10N47	#7 7/16" Alumina Nozzle (10/bx)		100967	45V27	1/8" Gas Lens Collet Bag (2/bag)
	100822	10N46	#8 1/2" Alumina Nozzle (10/bx)	4	100808	10N22	.040" Collet (5/bag)
	100821	10N45	#10 5/8" Alumina Nozzle (10/bx)		100809	10N23	1/16" Collet (5/bag)
	100820	10N55	#12 3/4" Alumina Nozzle (10/bx)		100810	10N24	3/32" Collet (5/bag)
1a	101013	54N18	#4 1/4" Gas Lens Alumina Nozzle (10/bx)		100811	10N25	1/8" Collet (5/bag)
	101012	54N17	#5 5/16" Gas Lens Alumina Nozzle (10/bx)	5	100880	18CG	Nozzle Gasket (5/bag)
	101011	54N16	#6 3/8" Gas Lens Alumina Nozzle (10/bx)		100917	3GHS	Nozzle Gasket Gas Lens (5/bag)
	101010	54N15	#7 7/16" Gas Lens Alumina Nozzle (10/bx)	6	100859	17F	Torch Body, 150A Flexible Neck
	101009	54N14	#8 1/2" Gas Lens Alumina Nozzle (10/bx)	7	101025	57Y04	Back Cap, Short
2	100817	10N30	.040" Collet Body (5/bag)		100919	300M	Back Cap, Medium
	100818	10N31	1/16" Collet Body (5/bag)		101022	57Y02	Back Cap, Long
	100819	10N32	3/32" Collet Body (5/bag)	Replacement Torch	85659	WP17FVx12.5	TIG torch, 150A x 12.5' long with dins connector
	100815	10N28	1/8" Collet Body (5/bag)				

User Notes

User Notes

Forney Industries, Inc.
2057 Vermont Drive
Fort Collins, CO 80525
+1-800-521-6038
www.forneyind.com