

# Forney®

## 40 P PLASMA CUTTER OPERATING MANUAL



ENGLISH



WELDING IN AMERICA.  
SINCE THE BEGINNING.



ITEM# 440  
REV 08.08.2019



#### FIVE WAYS TO ORDER

**Web:** [www.forneyind.com](http://www.forneyind.com)

**Phone:** 800-521-6038

**Fax:** 970-498-9505

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

**Email:** [sales@forneyind.com](mailto:sales@forneyind.com)

#### U.S. Facilities:

- Fort Collins, CO
- Tipp City, OH



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### Forney Promise

We are committed to your success regardless of location, size or needs. We understand it is your goal to get the job done right, and we are ready to help you do just that.

### President's Message

We market the highest quality tools, equipment and accessories for the do-it-yourselfer and professional. Our passion and dedication in bringing new products to the industrial and retail market, combined with our personal service, is unmatched in our industry. Our ability to listen to our customers' needs enables us to create solutions to their problems.

Our dedication to the highest quality customer service within our corporate headquarters and the service provided in the field is unequalled. We are committed to creating the best solutions to our customer's needs. Above all, our employees will provide the same respect and caring attitude within the organization as they are expected to share with every Forney customer. Our goal will be to exceed our customers' expectations through empowered people, guided by shared values and commitments.

We work hard so our customers trust us because of our integrity, teamwork and innovation in the welding & metalworking industry. 80 years of unmatched product quality and an unwavering commitment to our customers.

When our customers succeed we succeed.

*Steven G. Anderson*

STEVEN G. ANDERSON, President & CEO



# 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!

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 x2 or [customerservice@forneyind.com](mailto:customerservice@forneyind.com) for inquires, technical and general questions.

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

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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
	EXPLOSION HAZARD		PERSONAL PROTECTIVE EQUIPMENT NEEDED		NOISE HAZARD
	ELECTRICAL HAZARD		ARC RAYS HAZARD		FUMES, VAPORS, GASSES HAZARD
	BURN HAZARD		MOVING PARTS HAZARD		MAGNETIC FIELD HAZARD
	OVERHEATING HAZARD		FIRE HAZARD		HF RADIATION INTERFERENCE
	ELECTRO MAGNETIC INTERFERENCE		WARNING/CAUTION		FALLING EQUIPMENT HAZARD
I	ON		INPUT VOLTAGE	1~	SINGLE PHASE ALTERNATING CURRENT (AC)
o	OFF		PLASMA CUTTING TORCH TRIGGERED	==	DIRECT CURRENT (DC)
A	AMPERAGE		TEMPERATURE	S	SUITABLE FOR CUTTING IN AN ENVIRONMENT WITH INCREASED RISK OF ELECTRIC SHOCK
	PLASMA ARC CUTTING		LINE CONNECTION		
-	-	-	-		SINGLE PHASE STATIC FREQUENCY CONVERTER TRANSFORMER RECTIFIER

## 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 beginning plasma cutting.

### 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](http://www.P65Warnings.ca.gov). P65 details at [forneyind.com](http://forneyind.com). Wash hands after 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](http://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](http://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](http://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](http://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](http://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](http://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](http://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) 642A900, Fax (212) 398-0023 - [www.ansi.org](http://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](http://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](http://www.aws.org).

## 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 welding.

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

1. Keep 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 plasma cutting machine and cables as far away from operator as practical.
5. Connect GROUND CLAMP (4) to workpiece as close to the cut or weld as possible.

**ABOUT PACEMAKERS & HEARING AIDS:** Pacemaker and hearing aid wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

## Plasma Arc Cutting Hazards



**CUTTING CAN CAUSE FIRE OR EXPLOSION.** Hot metal and sparks blow out from the cutting arc. The flying sparks and hot metal, hot workpiece, and hot equipment can cause fires and burns. Check and be sure the area is safe before doing any cutting.

- Do not cut in an area until it is checked and cleared of combustible and/or flammable materials. Be aware that sparks and slag can fly 35 feet and can pass through small cracks and openings. If workpiece and combustibles cannot be separated by a minimum of 35 feet, protect against ignition with suitable, snug-fitting, fire resistant, covers or shields.
- Connect the GROUND CABLE (4) to the workpiece as close as possible to the welding or cutting area. Do not connect GROUND CABLES to building framing or other locations away from the welding or cutting area. This increases the possibility of welding/cutting current passing through alternate circuits, creating fire hazards and other safety hazards.
- Do not weld, cut, or perform other such work on used barrels, drums, tanks, or other containers that had a flammable or toxic substance. The techniques for removing flammable substance and vapors, to make a used container safe for

welding or cutting, are quite complex and require special education and training.

- Do not cut in atmospheres containing flammable dust or vapors.
- Do not cut pressurized cylinders, pipes, or vessels.
- Do not cut containers that have held combustibles.
- Do not wear gloves or other clothing that contains oil, grease, or other flammable substances.
- Do not wear flammable hair preparations.
- Have fire extinguisher equipment handy for immediate use. A portable chemical fire extinguisher, type ABC, is recommended.
- Make sure the work area has a good, solid, safe floor, preferably concrete or masonry, not tiled, carpeted, or made of any other flammable material.
- Protect flammable walls, ceilings, and floors with heat resistant covers or shields.
- Check work area to make sure it is free of sparks, glowing metal or slag, and flames before leaving the work area.
- Wear garments free of oil or other flammable substances such as leather gloves, thick cotton shirts with no synthetic materials, cuff-less trousers, closed toed shoes. Keep long hair pulled back.
- Remove any combustibles such as lighters and matches before doing any welding or cutting.
- Follow requirements in OSHA and NFPA for hot work and have an extinguisher nearby.



**ELECTRIC SHOCK CAN KILL.** Touching live electrical parts can cause fatal shocks or severe burns. The PLASMA TORCH (9) and work circuit are electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when POWER SWITCH (2) is ON. Plasma arc cutting requires higher voltages than welding to start and maintain the arc (200 to 400 volts DC are common). It also uses torches designed with safety interlock systems which turn off the machine when the SHIELD CUP (E) is loosened or if the CUTTING TIP (D) touches the ELECTRODE (B) during operation. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not, in any manner, come into physical contact with any part of the cutting current circuit. The cutting current circuit includes:
  - a. the workpiece or any conductive material in contact with it,
  - b. the GROUND CLAMP,
  - c. the ELECTRODE or CUTTING TIP.
- Do not cut in a damp area or come in contact with a moist or wet surface.
- Do not attempt to cut if any part of clothing or body is wet.
- Do not allow the cutting equipment to come in contact with water or moisture.
- Do not drag cables or PLASMA TORCH through or allow them to come into contact with water or moisture.
- Do not touch the machine or attempt to turn the machine ON or OFF if any part of the body or clothing is moist or if you are in physical contact with water or moisture.
- Do not attempt to plug the machine into input power if any part of body or clothing is moist, or if you are in physical contact with water or moisture.
- Do not connect GROUND CLAMP to or cut on electrical conduit.
- Do not alter INPUT POWER CABLE (3) or plug in any way.
- Do not attempt to plug the machine into input power if the ground prong on power cable plug is bent over, broken off, or missing.
- Do not allow the machine to be connected to input power or attempt to cut if the machine, cables, or cutting site are exposed to any form of atmospheric precipitation, or salt water spray.
- Do not carry coiled cables around shoulders, or any other part of the body, when they are plugged into the machine.
- Do not modify any wiring, ground connections, switches, or fuses in this cutting equipment.
- Wear welding gloves to help insulate hands from cutting circuit.
- Keep all liquid containers far enough away from the plasma cutting machine and work area so that if spilled, the liquid cannot possibly come in contact with any part of the machine or electrical cutting circuit.
- Replace any cracked or damaged parts that are insulated or act as insulators such as cables or PLASMA TORCH immediately.



## **SIGNIFICANT DC VOLTAGE EXISTS ON INTERNAL PARTS OF INVERTER-BASED MACHINES AFTER THE REMOVAL OF INPUT POWER.**

Before touching anything inside the cabinet or performing maintenance activities, turn unit OFF, disconnect INPUT POWER CABLE, and allow sufficient time for the capacitors to discharge (check with a volt meter that there are zero volts (0V) across the capacitor terminals).



## **EXPLODING PARTS CAN INJURE.**

On inverter-based machines, faulty parts can explode or cause other parts to explode when power is applied. Always wear a face shield and long sleeves when servicing inverters.



## **FLYING SPARKS CAN CAUSE INJURY.**

- Wear approved face shield or safety goggles with side shields.
- Wear proper body protection to protect skin. Wear flame-resistant ear plugs or ear muffs to prevent sparks from entering ears.



## **ARC RAYS CAN BURN EYES AND SKIN.**

Arc rays from the cutting process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.

- Wear face protection (helmet or shield) with correct filter shade to protect your face and eyes when cutting or watching.
- Wear approved safety glasses with side shields under your helmet or shield.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Refer to ANSI Z49.1 for OSHA 29CFR for shade recommendations.



## **NOISE CAN DAMAGE HEARING.**

Noise can cause permanent hearing loss. The plasma cutting processes can cause noise levels that exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

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



## **FUMES, GASSES, AND VAPORS CAN CAUSE DISCOMFORT, ILLNESS, AND DEATH!**

To reduce the risk, read, understand, and follow the safety instructions. In addition, make certain that anyone else that uses this welding equipment or is a bystander in the work area, understands and follows these safety instructions as well.

- Read and understand manufacturers SDS and MSDS.
- Do not weld or 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 (the operator) 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. Make certain the area is well ventilated, and the operator and all bystanders are wearing air-supplied respirators.
- 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 and death.
- Do not weld or cut in areas that are near chlorinated solvents. Vapors from chlorinated hydrocarbons, such as trichloroethylene and perchloroethylene, can be decomposed by the heat of an electric arc or its ultraviolet radiation. These actions can 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 can be drawn into the work area or where the ultraviolet radiation can penetrate to areas containing even very small amounts of these vapors.
- Do not weld or cut in a confined area unless it is being ventilated or the operator (and anyone else in the area) is wearing an air-supplied respirator.
- Stop welding or cutting if you develop momentary eye, nose, or throat irritation as this indicates inadequate ventilation. Stop work and take necessary steps to improve ventilation in the work area. Do not resume work if physical discomfort persists.





### **PLASMA ARC CAN CAUSE INJURY.**

The heat from the plasma arc can cause serious burns. The force of the arc adds greatly to the burn hazard. The intensely hot and powerful arc can quickly cut through gloves and tissue.

- Keep away from the torch CUTTING TIP (D).
- Do not grip material near the cutting path.
- The pilot arc can cause burns - keep away from torch CUTTING TIP when trigger is pressed.
- Wear proper flame-resistant clothing covering all exposed body areas.
- Point PLASMA TORCH away from your body and toward workpiece when pressing the torch trigger – pilot arc comes on immediately.
- Turn OFF machine and disconnect INPUT POWER CABLE before removing SHIELD CUP (E), changing torch consumables or disassembling PLASMA TORCH.
- Use only the PLASMA TORCH that came connected to your plasma cutting machine or a certified replacement.

## **Additional Symbols for Installation, Operation, and Maintenance**



### **HOT PARTS CAN CAUSE SEVERE BURNS.**

- Do not touch hot parts bare handed.
- Allow cooling period before working on PLASMA TORCH (9).



### **MOVING PARTS CAN CAUSE INJURY.**

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



### **FLYING METAL CAN INJURE EYES.**

- Wear safety glasses with side shields or face shield.



### **MAGNETIC FIELDS CAN AFFECT PACEMAKERS.**

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near plasma arc cutting operations.



### **OVERUSE CAN CAUSE OVERHEATING.**

- Allow cooling period; follow rated duty cycle.
- Reduce amperage or reduce length of continuous cutting to reduce duty cycle protection events.



### **EXPLODING HYDROGEN HAZARD.**

- When cutting aluminum underwater or with the water touching the underside of the aluminum, free hydrogen gas may collect under the workpiece and pose an explosion.



### **FALLING UNIT CAN CAUSE INJURY.**

- Use lifting handle to lift unit only, NOT running gear, gas cylinders, or any other accessories.



### **FIRE OR EXPLOSION HAZARD.**

- Do not locate unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure building power supply system is properly sized, rated, and protected to handle this unit.



### **H.F. RADIATION CAN CAUSE INTERFERENCE.**

- High frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment. Have only qualified persons familiar with electronic equipment perform this installation. The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation. If notified by the FCC about interference, stop using the equipment at once. Have the installation regularly checked and maintained. Keep machine doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



### **ARC CUTTING CAN CAUSE INTERFERENCE.**

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots. To reduce possible interference, keep cables as short as possible, close together, and down low, such as on the floor. Locate cutting operation 100 meters from any sensitive electronic equipment. Be sure this plasma cutting machine is installed and grounded according to this manual. If interference still occurs, the user must take extra measures such as moving the machine, using shielded cables, using power line filters, or shielding the work area.

## Installation

### Plasma Cutting Machine Specifications

Primary (Input) Volts	240/120VAC
Maximum Output	40A maximum
Phase	Single
Frequency	50/60Hz
Recommended Circuit Breaker	50A for 240V or 30A for 120V
Extension Cord Recommendations	240V- 3 conductor # 8AWG 120V -3 conductor #12AWG or larger up to 25 ft.
Generator Requirements	240V -Minimum 10,000W continuous output with no low-idle function (or low-idle off), 5% THD Max. 120V- Minimum 5,000W continuous output with no low-idle function (or low-idle off), 5% THD Max.
Recommended Air Compressor	The Fornair™ 4.5 CFM Air Compressor is designed to supply air to this machine for continuous cutting. For other compressors, a flow rate of approximately 5.3 cu.ft/min at 90 PSI is recommended
CSA Rated Output and Duty	Refer to the data plate of your machine and the DUTY CYCLE section of this manual (page 15)
Dimensions	17" (444.5mm) X 7.5" (190.5mm) X 12.5" (317m)
Cutting Capacity	When using 240V cleanly cut thin sheet metal to 1/2" plate (sever cut up to 3/4")

### Site Selection

- Position your Forney 40 P plasma cutting machine near a 240/120V electrical outlet. If using 120V input power, be sure to use the power adapter provided in the box.
- Choose a location with good air flow and ensure no dust, smoke or gas is present.
- Place the unit on a flat and stable surface.
- Make sure obstacles do not obstruct air flow by allowing 12 inches clearance around all openings of the machine.
- Arrange an open space workspace of at least 15 feet (5m) near the machine.
- 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 Cable

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

The main supply voltage should be within  $\pm 10\%$  of the rated main supply voltage. Too low a supply voltage may cause poor cutting performance. Too high 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 plasma cutting machine.
- Check the electrical outlet for proper output voltage.
- Plug in the INPUT POWER CABLE to a 240V 20A electrical outlet.
- A 120V 20A electrical outlet (with a 30A time-delay breaker) can be used with supplied adapter at lower output amperage settings.

## **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.**

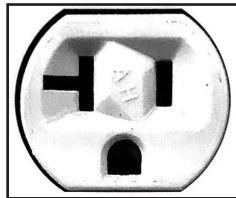
If you are unsure of any of the above, have your outlet inspected by a qualified electrician before using the plasma cutting machine.

### **NOTE:**

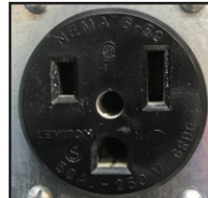
- Periodically inspect INPUT POWER CABLE for any cracks or exposed wires. If it is not in good condition, have it repaired by a Service Center.
- Do not cut off the grounding prong or alter the plug in any way. Only use the included adapter between the welder's INPUT POWER CABLE and the power source 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 or sharp edges.
- Do not use this plasma cutting machine on a circuit with a Ground Fault Circuit Interrupter (GFCI) on it. GFCIs are tripped by plasma arcs and your cutting operations will be interrupted regularly.

### **Using the 240 Volt – 120 Volt Plug Adapter**

If a 240V (50A) circuit is not available, you can connect your Forney 40 P plasma cutting 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 20 amps regularly.



120V/20A



240V/50A

### **Generators**

This plasma machine can be operated from an AC generator. As this is a dual voltage machine please ensure that when using on 240V, the generator must supply a minimum of 10,000 watts of continuous output. When using the 120V option, the generator must supply a minimum of 5,000 watts of continuous output. The generator must not have an auto-idle fuel saving feature or must have the option to turn auto-idle off. The generator must run at full speed at all times while your plasma machine is plugged into it or you risk damaging your machine. Any other power draws on the generator or anything that reduces the generator RPM 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 machine.
- To operate properly this machine needs a robust power supply and use of 120V extension cords is not recommended.

### **Ventilation**

Since the inhalation of toxic fumes can be harmful, ensure that the work area is effectively ventilated. See SAFETY SUMMARY for more details (pages 5-9).

## Additional Warnings

### FOR YOUR SAFETY, BEFORE CONNECTING THE PLASMA CUTTING MACHINE TO THE ELECTRICAL OUTLET, CLOSELY FOLLOW THESE INSTRUCTIONS:

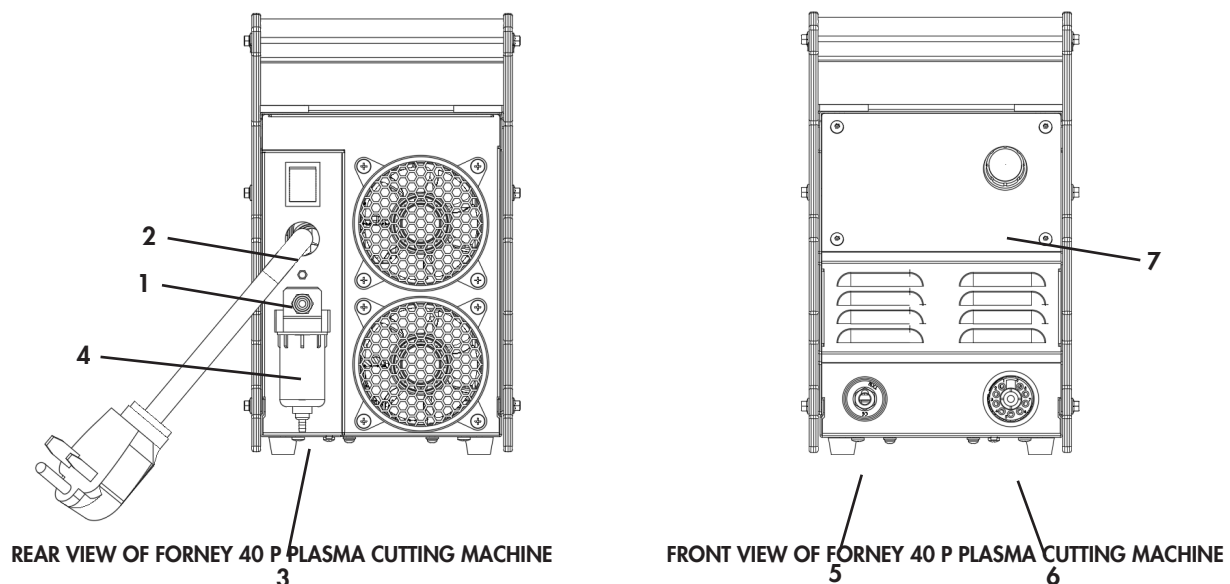
- An adequate two-pole breaker must be inserted before the main outlet. This breaker must be equipped with time-delay fuses.
- When working in a confined space, the plasma cutting machine must be kept outside the work area and the GROUND CABLE should be fixed to the workpiece. Never work in a damp or wet confined space.
- Do not use damaged INPUT POWER CABLE or GROUND CABLE.
- The PLASMA TORCH should never be pointed at the operator or other people.
- The plasma cutting 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 Plasma Cutting Machine

### Description

- The Forney 40 P Plasma Cutter is a highly portable, generator-friendly plasma cutting machine appropriate for a wide-range of cutting applications.
- Additional consumables and accessories can be ordered from any Forney Authorized Dealer or at [www.forneyind.com](http://www.forneyind.com). See MAINTENANCE and PARTS sections of this manual for additional information (pages 18-19, 23).

### Plasma Cutting Machine Layout & Control



1. **INPUT POWER CABLE**
2. **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).
3. **MOISTURE SEPARATOR and filter with automatic exterior drain.**
4. **COMPRESSED AIR INPUT**
5. **GROUND CABLE CONNECTION**
6. **PLASMA TORCH EURO CONNECT**
7. **OUTPUT CURRENT ADJUSTMENT KNOB** adjusts the cutting current supplied by the machine according to the thickness of material and travel speed of the PLASMA TORCH.
8. **INPUT POWER LED** turns on when input voltage is within normal range and the POWER SWITCH is ON.

9. **TORCH LED** turns on when PLASMA TORCH is triggered.
10. **THERMAL FAULT LED** turns on when the thermal protection is activated.
11. **PLASMA TORCH**
12. **GROUND CLAMP AND CABLE**

### Grounding Requirements

- To ensure personal safety, proper operation, and to reduce electromagnetic interference (EMI), the plasma cutting machine must be properly grounded.
- The plasma cutting machine must be grounded through the INPUT POWER CABLE (1) 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.

### Air Supply

- The plasma cutting machine does not include a built-in air compressor; therefore, a source of clean, dry air or nitrogen must be supplied to your plasma cutting unit.
- The air supply pressure must be between 80 and 120 PSI. NOTE: The Fornair™ 4.5 CFM Air Compressor is designed to supply air to the Forney 40 P Plasma Cutter. To ensure continuous operation with other air compressors a flow rate of approximately 5.3 cu.ft./min is recommended.
- The unit will not operate if the input air pressure is below 55 PSI.
- In-line particulate filtration is recommended upstream of the PLASMA CUTTING MACHINE to avoid damage to the PLASMA TORCH.
- Failure to observe these parameters could result in excessive operating temperatures and/or damage to PLASMA TORCH or machine.

### MOISTURE SEPARATOR AND AUTOMATIC PURGE

- Oil and moisture in the air may damage the machine.
- The unit is equipped with an air filter, which captures the water and oil vapor in the supplied air.
- Water captured by the filter is automatically purged.
- The equipped MOISTURE SEPARATOR is designed to remove small amounts of moisture and oil from the air supply. If you are operating in a humid environment, it may be necessary to put additional filtering in the air supply line before its input to the machine. Use additional filtering if a spray of moisture can be seen coming out of the torch head during pilot arc, there are signs of moisture on the CUTTING TIP (D) or workpiece after cutting, or cut quality is poor.
- Be sure and select a filter that is rated for the pressure and air flow requirements listed above.

### Torch Consumable Parts (Replacement or Inspection of Consumables)



**USE ONLY THE PLASMA TORCH THAT CAME CONNECTED TO YOUR MACHINE OR A CERTIFIED REPLACEMENT.**



**CAUTION! DISCONNECT INPUT POWER CABLE FROM THE ELECTRICAL OUTLET AND WAIT FOR THE PLASMA TORCH TO COOL BEFORE REMOVING THE SHIELD CUP (E). IT IS EXTREMELY IMPORTANT THAT YOU CAREFULLY READ THESE INSTRUCTIONS BEFORE CHOOSING THE CONSUMABLES FOR YOUR PLASMA TORCH. THIS WILL PREVENT DAMAGE TO YOUR PLASMA TORCH AND PLASMA CUTTING MACHINE.**

BEFORE BEGINNING CUTTING OPERATIONS, VERIFY THAT THE PARTS ARE PROPERLY ASSEMBLED BY INSPECTING THE BODY OF THE PLASMA TORCH AS SHOWN BELOW



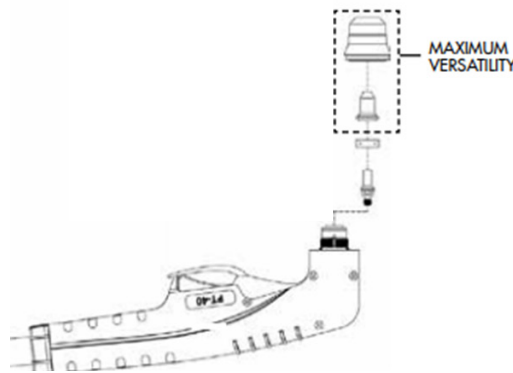
**THE PLASMA ARC FROM INSTANT-ON TORCHES CAN CAUSE INJURY AND BURNS.**



**CAUTION!** The plasma arc comes on immediately when the torch trigger is activated. Make sure the POWER SWITCH is OFF and the machine disconnected before changing consumables.



PROPERLY ASSEMBLED PLASMA TORCH



#### MAXIMUM VERSATILITY

- Should be used on thinner material in tight spaces, or where maximum input power is not available.
- Use smaller diameter tip when cutting with 120V input.

Your plasma torch consumable parts will come already assembled. Plasma torch consumables will wear through the course of normal use and need to be replaced periodically. Before each use of the plasma cutting machine, you should check your parts for wear and replace if necessary. **NOTICE:** Failure to replace worn cutting tip or electrode may damage the PLASMA TORCH. Before inspecting or replacing the consumables, make sure to read and follow the below notes:

1. Turn the machine OFF and disconnect it from the electrical outlet. Wait for the PLASMA TORCH to cool before disassembly.
2. Position the PLASMA TORCH with the SHIELD CUP (E) facing upward to prevent these parts from falling out.
3. Unscrew and remove the SHIELD CUP from the TORCH BODY (A).
4. Remove the CUTTING TIP (D), AIR DIFFUSER RING (C), and ELECTRODE (B).
5. Install the ELECTRODE, AIR DIFFUSER RING, and CUTTING TIP.
  - Make sure all components are installed as shown above.
  - Use the included wrench to tighten the ELECTRODE. A loose ELECTRODE can further loosen during operation and damage the PLASMA TORCH.
6. Ensure the SHIELD CUP is properly seated on the TORCH BODY, not cross-threaded. Failure to do so will cause the machine to not operate properly. Only hand-tighten the SHIELD CUP. Over-tightening can damage the PLASMA TORCH.

If resistance is felt when installing the ELECTRODE or SHIELD CUP, check the threads before proceeding

**NOTE: THE PLASMA CUTTING MACHINE WILL NOT OPERATE UNLESS THE PLASMA TORCH SHIELD CUP IS FULLY SEATED AGAINST THE PINS THAT ENSURE THE CONSUMABLES ARE PROPERLY ASSEMBLED TO THE TORCH BODY. INSPECT THESE PINS FOR DAMAGE ANYTIME THE SHIELD CUP IS REMOVED.**

**USE ONLY COMPATIBLE CONSUMABLES IN YOUR PLASMA TORCH. USING INCOMPATIBLE PARTS MAY DAMAGE YOUR PLASMA CUTTING MACHINE OR INTRODUCE A SAFETY HAZARD. SEE PAGE 23 FOR PART NUMBERS.**

# Operation

## Ground Clamp Attachment

Connect the GROUND CLAMP AND CABLE to the workpiece to be cut 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 cutting area to reduce EMI.
- Do not make a ground connection on the piece which is to be removed.
- The GROUND CLAMP must be attached to the workpiece while cutting.

## Power ON the System

Set the POWER SWITCH on the rear of the machine to the ON position. If the input voltage is suitable, the INCOMING POWER LED will turn on.

## Checking Air Supply Quality







- To check supplied air quality, activate and deactivate the PLASMA TORCH so there is no active arc but air flow continues (post-flow). Place a welding filter lens in front of the PLASMA TORCH. Any oil or moisture in the air will be visible on the lens.
- DO NOT initiate pilot arc while checking air quality.

## Performance Data Plate & Duty Cycle

On the machine, there is a plate that includes all the operating specifications for your new unit. The serial number of the product is also found on this plate.

The duty cycle rating of a plasma cutting machine defines how long the operator can cut and how long the plasma cutting machine must rest and be cooled. Duty cycle is expressed as a percentage of 10 minutes and represents the maximum cutting time allowed. The balance of the 10-minute cycle is required for cooling.

For example, a plasma cutting machine has a duty cycle rating of 30% at the rated output of 90A. This means with that machine, you can cut at 30A output for three (3) minutes out of 10 with the remaining seven (7) minutes required for cooling. The duty cycle of your new plasma cutting machine can be found on the data plate affixed to the machine. It looks like the diagram below. Referring to the sample below, the "X" row lists duty cycle percentages while the "I2" row lists the amp draw corresponding to the duty cycle. Various duty cycles at other amperages are listed on your data plate.

40 P		SER #:			
		CAN/CSA-E60974-1:12 ANSI/IEC 60974-1:2008			
		min #A/min #V – max #A/max #V			
		X	Y%	Z%	100%
	U <sub>0</sub> =xxxV	I <sub>2</sub>	##A	##A	##A
		U <sub>2</sub>	##V	##V	##V
 1~50/60Hz	U <sub>1</sub> =xxxV	I <sub>1max</sub> =##A		I <sub>1eff</sub> =##A	
IP21S					

## Internal Thermal Protection

If you exceed the duty cycle of the plasma cutting machine, the thermal protection system will engage, shutting OFF all plasma cutting output. After cooling, the thermal protector will automatically reset and the welding functions can resume. This is normal and automatic behavior of the machine, and does not require any user action. However, you should wait at least ten minutes after the thermal protector engages before resuming 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 PLASMA CUTTING MACHINE CAN RESULT.**

### Cutting Capacity

STEEL	STAINLESS STEEL	ALUMINUM	GALVANIZED	BRASS	COPPER	3/4"
1/2"	1/2"	3/16"	1/2"	1/2"	1/2"	
RECOMMENDED CAPACITY						SEVERANCE CAPACITY
<ul style="list-style-type: none"> <li>• Optimal system performance.</li> <li>• Ideal operating range for excellent cut quality.</li> <li>• Rated with new consumables.</li> </ul>						<ul style="list-style-type: none"> <li>• Top end of machine capabilities.</li> <li>• Intended for occasional severance requirements; where a lower degree of cut quality is acceptable.</li> <li>• Slower cut speeds.</li> </ul>

### Cutting

**IMPORTANT!** Frequently review the Important Safety Precautions at the front of this manual.



**CAUTION!** Be sure the operator is equipped with proper gloves, clothing, and eye & ear protection. Make sure no part of the operator's body comes into contact with the workpiece while the PLASMA TORCH is activated.



**CAUTION!** Sparks from the cutting process can cause damage to coated, painted, and other surfaces such as glass, plastic and metal.

Fig. A

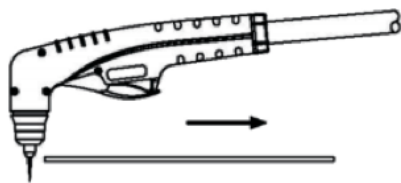
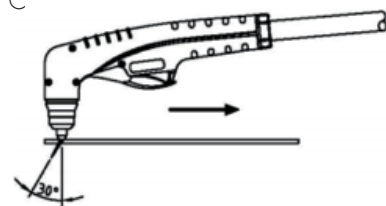


Fig. B



Fig. C



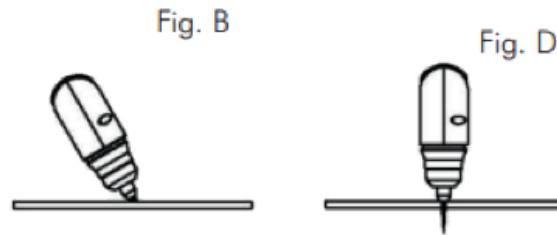
### CUTTING WITH A HAND TORCH

- The PLASMA TORCH can be comfortably held in one hand or steadied with two hands. Choose the technique that feels most comfortable and allows good control and movement. Position the index finger or thumb to press the control switch on the PLASMA TORCH handle.
- With the PLASMA TORCH in starting position, press the trigger. The pilot arc will come on and remain on for 3 seconds during which the CUTTING TIP (D) must come into contact with the workpiece.
- In the event the CUTTING TIP does not come into contact with the workpiece within 3 seconds of pilot arc start, the arc automatically stops (the post flow air continues to run, cooling the PLASMA TORCH).
- For edge starts, hold the PLASMA TORCH perpendicular to the workpiece with the front of the CUTTING TIP on the edge of the workpiece at the point where the cut is to start (Fig. A). For piercing, angle the PLASMA TORCH slightly to direct the sparks away from the PLASMA TORCH until the pierce is complete (Fig. B).
- During cutting, the CUTTING TIP must be kept in contact with the workpiece. If contact is lost, the arc will automatically stop (the post flow air continues to run, cooling the PLASMA TORCH).
- Once started, the cutting arc remains on as long as the trigger is pressed, unless the PLASMA TORCH is withdrawn from the workpiece or torch motion is too slow. Keep moving while cutting. Cut at a steady speed without pausing. Maintain the cutting speed so that the arc lag is about 30° behind the travel direction (Fig. C).
- Adjust the torch speed so sparks go thru the metal and out the bottom of the cut at that angle.
- If sparks are being blown upward and back at the PLASMA TORCH CUTTING TIP (D), your torch travel speed is too fast, decrease your travel speed.
- Pause at the edge (end of your cut) until the arc has cut completely through the workpiece.
- To shut off the PLASMA TORCH, simply release the control switch. When the switch is released a post-flow will occur. If the torch trigger is pressed during the post-flow, the pilot arc will restart.
- Refer to the TROUBLESHOOTING section of this operating manual should the PLASMA TORCH or plasma cutting machine not operate as expected (pages 20-22).



**NOTE:** If sparks are being blown upward and back at the PLASMA TORCH CUTTING TIP, your torch travel speed is too fast, decrease your travel speed.

**NOTE:** To cut grates (interrupted cut), set cutting current at 40A.



### PIERCING WITH A HAND TORCH

**NOTE:** If necessary to make a cut on a metal sheet which is thicker than the maximum piercing capacity (without an edge start) make a 1/4" hole using an electric drill to start cutting.

- When piercing with a hand torch, CUTTING TIP the PLASMA TORCH slightly so that blowback particles blow away from the PLASMA TORCH CUTTING TIP (and operator) rather than directly back into it (Fig. B).
- Complete the pierce off the cutting line and then continue the cut onto the line. Hold the PLASMA TORCH perpendicular to the workpiece after the pierce is complete (Fig. D).
- Clean spatter and scale from the SHIELD CUP (E) and the CUTTING TIP as soon as possible. Spraying or dipping the SHIELD CUP in anti-spatter compound will minimize the amount of scale which adheres to it.
- Refer to the TROUBLESHOOTING section of this operating manual should the PLASMA TORCH or plasma cutting machine not operate as expected (pages 20-22).

# Maintenance & Servicing

## General Maintenance



**DISCONNECT INPUT POWER CABLE FROM THE ELECTRICAL OUTLET AND WAIT FOR THE PLASMA TORCH TO COOL BEFORE REMOVING THE SHIELD CUP (E) OR PERFORMING MAINTENANCE.**



**CAUTION!** Maintenance can only be carried out on the unit if the person in charge of this operation has the necessary technical knowledge and the correct tools. If this is not the case, contact your nearest service center.



**CAUTION!** Never access inside the machine (panel removal) or touch the torch head (disassembly) without having disconnected INPUT POWER CABLE.



**ANY INSPECTION PERFORMED UNDER VOLTAGE INSIDE THE MACHINE OR INSIDE THE PLASMA TORCH MAY CAUSE SEVERE ELECTRIC SHOCKS CAUSED BY DIRECT CONTACT WITH PARTS UNDER VOLTAGE.**



**CAUTION!** Use only dry compressed air for cleaning. Do not point the jet of air at the electronic circuits contained within this plasma cutting machine.

Your plasma cutting machine must routinely receive maintenance to keep the system in optimal working condition and to provide long-term value for your investment. It is recommended to inspect the unit every 3-4 months (depending on the frequency of use).

- Use compressed air to remove any dust deposits.
- The torch SHIELD CUP (E) and CUTTING TIP (D) should be periodically inspected for wear or damage.
- Replace the CUTTING TIP if the orifice becomes damaged or enlarged.
- If consumable surfaces are particularly oxidized, clean them with an extra fine abrasive.
- Replace the AIR DIFFUSER RING (C) if it is burned or cracked.
- Replace the ELECTRODE (B) when the crater on the end surface is approximately 1/16.".

**FAILURE TO MAINTAIN THE PLASMA CUTTING MACHINE, CONSUMABLES AND THE WORKING ENVIRONMENT WILL DECREASE THE SYSTEM'S PERFORMANCE AND PRODUCE RESULTS BELOW OPTIMAL PERFORMANCE LEVELS.**

FREQUENCY	PERIODIC MAINTENANCE TO BE PERFORMED
Each Use	<ul style="list-style-type: none"> <li>• Check the indicator lights/LEDs and correct any fault conditions.</li> <li>• Check &amp; clean SHIELD CUP, CUTTING TIP, AIR DIFFUSER RING and ELECTRODE for proper installation, wear, damage (burns, distortions or cracks), dirt, debris and restricted holes.</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>• Verify the operation of the SHIELD CUP shut-down system. (Remove SHIELD CUP and pull trigger. Pilot arc should not start.)</li> </ul>
3 Months	<ul style="list-style-type: none"> <li>• Check for and replace any cracked or damaged parts.</li> <li>• Check the torch trigger guard for damage.</li> <li>• Check TORCH BODY (A) and trigger for wear, exposed wires or damage, replace as required.</li> <li>• Check outer covering of all cables for wear, repair or replace as required.</li> </ul>
6 Months	<ul style="list-style-type: none"> <li>• Blow out or vacuum inside.</li> </ul>

## Consumable Maintenance



**CAUTION!** Always tighten the ELECTRODE with the provided wrench. A loose ELECTRODE can further loosen and damage the PLASMA TORCH. SHIELD CUP should be hand-tightened. Over-tightening could damage PLASMA TORCH.



**CAUTION!** Inspect SHIELD CUP (E), CUTTING TIP (D), AIR DIFFUSER RING (C) and ELECTRODE for wear and debris before cutting or whenever cutting speed has been significantly reduced.



**WRENCH FOR ELECTRODES (B)**



**CAUTION!** Do not operate PLASMA TORCH without a CUTTING TIP or ELECTRODE in place. Be sure to use genuine Forney parts.

**NOTE:** It is recommended that the ELECTRODE and CUTTING TIP should be replaced at the same time to ensure even wear and optimal performance.

		INSPECT	ACTION
	Shield Cup	The center hole for round-ness.	Replace the SHIELD CUP if the hole is no longer round.
		The gap between the SHIELD CUP and CUTTING TIP for accumulated debris.	Remove the SHIELD CUP and clean any debris away, replace if damaged or un-cleanable.
		Examine for cracks, burn-through or chips.	Replace SHIELD CUP if cracked, burned-through or chipped.
	Cutting Tip	The center hole for roundness, enlargement.	Replace the SHIELD CUP if the hole is no longer round or enlarged.
		Oxidized exterior.	Can be cleaned with an extra-fine abrasive cloth, use no solvents.
	Air Diffuser Ring	Verify there are no burns or cracks or that airflow holes are not obstructed.	If damaged, replace.
	Electrode	The center surface for wear and verify pit depth.	Replace ELECTRODE when crater on emitting surface is about 1/16" (2mm) deep.
	Torch Body	Check surface for damage, wear, debris.	Clean without use of solvents if debris is present.
			Replace PLASMA TORCH if TORCH BODY (A) is damaged, cracked, or worn.
	Torch Handle & Cable	These parts usually need no maintenance except for a periodic inspection and cleaning.	Clean without use of solvents if debris is present.
			Replace PLASMA TORCH if any part of the handle or cable is cracked or worn.
			DO NOT touch PLASMA TORCH and cable with warm or hot parts.
			DO NOT strain the cable.
			DO NOT move the cable on sharp edges or abrasive surfaces.
DO NOT step on the cable.			
	Ground Clamp & Cable	These parts usually need no particular maintenance with the exception of a periodic inspection and cleaning.	Follow same actions as Torch Handle and Cable.
			Additionally, ensure there is no corrosion on the GROUND CLAMP contact surfaces.

# Troubleshooting

During cutting operations, performance faults may arise which are not caused by equipment malfunctioning but by other operational faults such as:

1. The cut speed is too fast.
2. The consumables are worn.
3. The metal being cut is too thick.
4. The GROUND CLAMP is not properly attached to the workpiece.
5. The supplied air pressure and flow rate is inadequate.
6. Input power is insufficient (use of extension cords can cause this).
7. PLASMA TORCH is not being dragged in contact with the workpiece.

The following table represents the most common problems associated with using the plasma cutting machine and an explanation on how to resolve them.

If you are unable to fix the problem by following the basic troubleshooting guide or if you need further assistance call Forney Customer Service at 1-800-521-6038 or email at customerservice@forneyind.com.

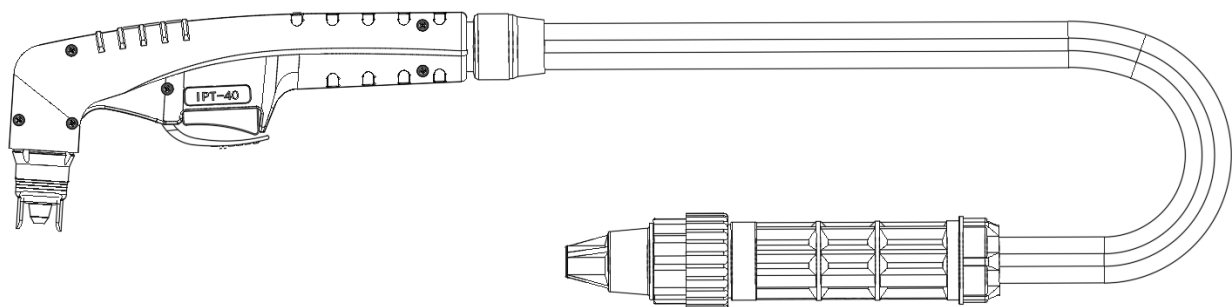
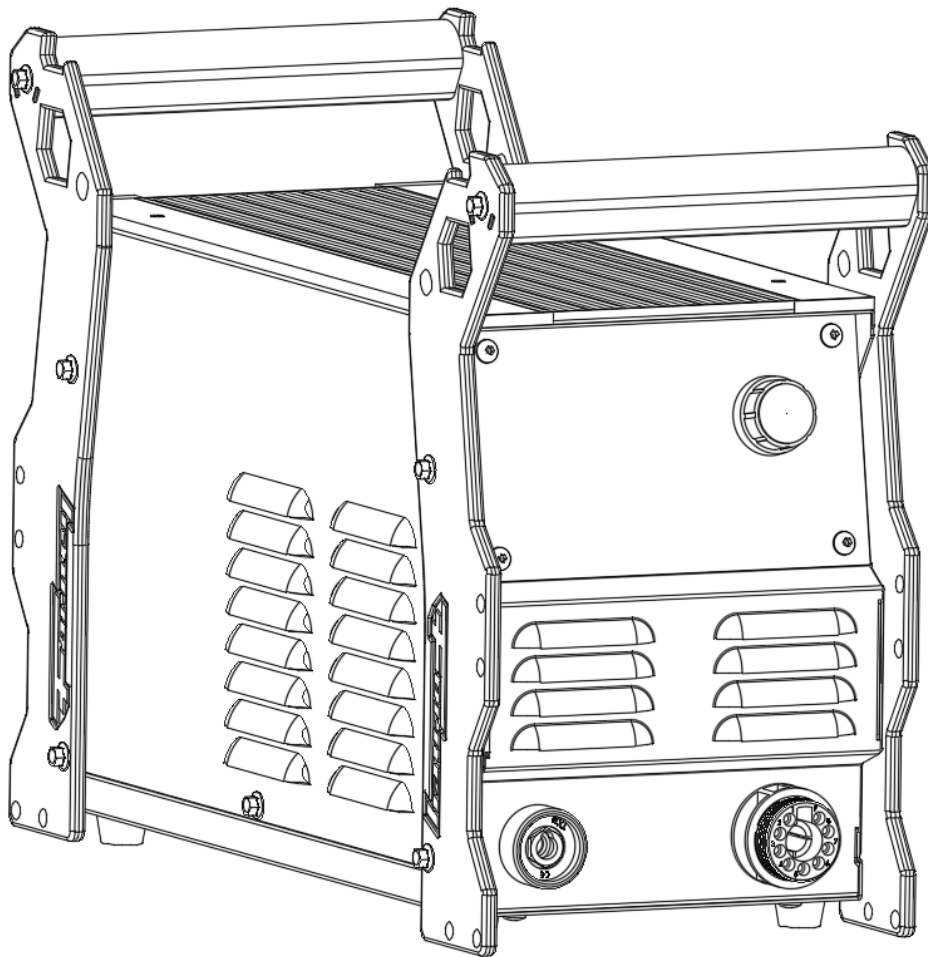
TROUBLE EXPERIENCED	POSSIBLE REASONS	RECOMMENDED SOLUTION
All LEDs OFF, No output power, Fan not operating.	No input power.	Connect machine to proper input power source.  Verify that circuit breaker has not been tripped in your main power panel. Reset if needed.
	POWER SWITCH IS OFF.	Ensure POWER SWITCH (rear) is in the ON position.
FAULT CODE: F01 DISPLAYED	Exceeded duty cycle; thermal protector engaged.	Allow welder to cool at least 10 minutes with machine ON (observe and maintain proper duty cycle). FAULT/THERMAL OVERLOAD INDICATOR LED should turn off after the machine has cooled.
	Insufficient air flow causing machine to overheat before reaching duty cycle.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.
FAULT CODE: F02 DISPLAYED	No voltage or incorrect voltage supplied to welder.	Make sure the machine is plugged in. Check the status of your INPUT VOLTAGE INDICATOR LED. It should be illuminated. Check the voltage of your outlet. If it is 10% more or less than 120V or 240V, call a qualified electrician.
FAULT CODE: F03 DISPLAYED	SHIELD CUP (E) not properly installed or consumables missing or installed improperly.  Excessively worn consumables.	Check PLASMA TORCH consumables are properly installed, electrode is tightened with wrench, and that SHIELD CUP properly contacts the pins in the TORCH BODY (A).  Replace electrode and cutting tip.
FAULT CODE: FO4 DISPLAYED	Input air pressure too high or too low.	Connect a proper air supply with 80-120 PSI and 5.3 CFM minimum. Ensure that any inline moisture filters are rated to handle these requirements. The Fornair™ 4.5 CFM Air Compressor meets these requirements.
		Check for moisture or dirt in filter.
FAULT CODE: FO5 DISPLAYED	Torch triggered before machine is ready.	Torch triggered or turned on before machine is powered on will fault. Release torch trigger and machine will reset within five seconds.
FAULT CODE: FO6 DISPLAYED	TORCH HEAD piston stuck.	Electrode spring or piston needs replacing.
FAULT CODE: FO7 DISPLAYED	Electrode or nozzle is not reset.	Electrode spring or piston needs replacing. Cutting residue build up needs to be removed.
	GROUND CLAMP not connected.	Properly connect the GROUND CLAMP to the workpiece. Ensure it is on clean, bare metal (not rusty or painted).

<b>TROUBLE EXPERIENCED</b>	<b>POSSIBLE REASONS</b>	<b>RECOMMENDED SOLUTION</b>
<b>PLASMA TORCH has pilot arc but does not cut.</b>	AC input power too low.	Ensure plasma cutting machine has proper input power source. If used, eliminate or reduce length of extension cord.
	<b>The arc does not transfer to the workpiece.</b>	Insufficient GROUND CLAMP contact with the workpiece.
PLASMA TORCH may not be in contact with the workpiece.		Be sure to physically drag the CUTTING TIP (D) on the workpiece as you cut.
<b>Poor cut quality.</b>	Improper use of PLASMA TORCH.	Review operating instructions.
	PLASMA TORCH parts are worn out.	Examine the consumables for wear and replace worn parts with new Forney consumable parts.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
<b>Moisture coming out of the PLASMA TORCH.</b>	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
<b>Sparks are being blown upward and back at the PLASMA TORCH CUTTING TIP (D).</b>	Cutting speed too fast.	Decrease your torch travel speed.
	Workpiece is too thick.	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
<b>Insufficient cut penetration.</b>	Cutting speed too fast.	Decrease your torch travel speed.
	PLASMA TORCH is too tilted.	Ensure that PLASMA TORCH HEAD is perpendicular to the workpiece.
	Workpiece is too thick.	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Cutting current too low.	Turn current setting up.
		Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	PLASMA TORCH parts are worn out.	Examine the consumables for wear and replace worn parts with new Forney consumable parts.
Non-genuine manufacturer's parts.	Use only genuine Forney consumables for optimum performance.	
Insufficient air flow or pressure.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.	

<b>TROUBLE EXPERIENCED</b>	<b>POSSIBLE REASONS</b>	<b>RECOMMENDED SOLUTION</b>
<b>Interruption of the cutting arc, but re-ignites when triggered again.</b>	Cutting speed too slow.	Increase your torch travel speed.
	PLASMA TORCH may not be in contact with the workpiece.	Be sure to physically drag the CUTTING TIP (D) on the workpiece as you cut.
	AC input power too low.	Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	PLASMA TORCH parts are worn out.	Examine the consumables for wear and replace worn parts with new Forney consumable parts.
	Non-genuine manufacturer's parts.	Use only genuine Forney consumables for optimum performance.
GROUND CABLE is disconnected.	Securely CLAMP the GROUND CABLE to the material being cut, as close to the work area as possible.	
<b>Excessive dross.</b>	Cutting speed too slow (bottom dross).	Increase your torch travel speed.
	Cutting speed too fast (top dross).	Decrease your torch travel speed.
	Cutting current too low.	Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	PLASMA TORCH parts are worn out.	Examine the consumables for wear and replace worn parts with new Forney consumable parts.
Non-genuine manufacturer's parts.	Use only genuine Forney consumables for optimum performance.	
<b>Tilted cut edge angle (not perpendicular).</b>	PLASMA TORCH position not correct.	Ensure that PLASMA TORCH HEAD is perpendicular to the workpiece.
	Workpiece thickness is near the capacity of the machine.	Cut thinner material. 3/4" thick material cuts will not have a clean cut edge.
	Asymmetric wear of CUTTING TIP hole and/or wrong assemblage of the PLASMA TORCH parts.	Check PLASMA TORCH consumables for wear and proper installation.
		Examine the consumables for wear and replace worn parts with new Forney consumable parts.
<b>Excessive wear of the CUTTING TIP (D) or ELECTRODE (B).</b>	Air pressure too low.	Inspect air compressor, air lines, and filters for proper operation.
		Inspect consumables for obstructions and proper installation.
	Exceeding plasma cutting machine capability (material too thick).	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
	Improperly assembled or loose PLASMA TORCH consumables	Check PLASMA TORCH consumables for proper installation.
	Damaged PLASMA TORCH consumable.	Check PLASMA TORCH consumables for damage and replace if damaged.
	Non-genuine manufacturer's parts.	Use only genuine Forney consumables for optimum performance.

## Machine Parts Diagram & Consumables List

NO.	PART NUMBER	ITEM DESCRIPTION
1	85755	Electrode
2		Air Diffuser Ring (Swirl Ring)
3	85679	Cutting Tip
4		Shield Cup
5		Wrench for Electrode
6	5084	Expert-Tech Tool
7	85680	Plasma Torch
8	85667	Ground Clamp and Cable
9	85516	12-240V Power Adapter Plug















**Forney Industries, Inc.**  
2057 Vermont Drive  
Fort Collins, CO 80525  
+1-800-521-6038  
[www.forneyind.com](http://www.forneyind.com)