HTP America Inc.

HTP Air Plasma Cutting System
Micro Cut 380

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Introduction

Congratulations on your purchase of an HTP America Micro Cut 380 Air Plasma Cutting System. Your purchase of a Micro Cut 380 means you have purchased one of the most technologically advanced, safest and economical plasma cutters available today.

The owner's manual has been designed to instruct you on the safe operation of your Micro Cut 380. If you read and follow the instructions in this manual, your plasma cutter will provide you with years of trouble free operation. If you fail to read and understand this manual, as well as correctly follow the operating instructions, you will significantly shorten the operating life of your plasma cutter.

Operation of your plasma cutting system without proper understanding of the facts contained within this manual or under unsafe or hazardous conditions may lead to SERIOUS INJURY OR DEATH!

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Limited Warranty

Subject to the terms and conditions hereof, HTP warrants to its Distributor/Dealer that all new and unused Equipment furnished by HTP is free from defect in workmanship and material as of the time and place of delivery by HTP. No warranty is made by HTP with respect to trade accessories or other items manufactured by others. Such trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any.

Except as specified below, HTP's warranty does not apply to components having normal useful life of less than one (1) year, such as relay and contactor points.

HTP shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Plasma cutters, power sources and components: 1 year.
2. All plasma torches: 90 days.
3. The electrode, cutting nozzle, insulator, spring, and gas diffuser are consumable items, WHICH CARRY NO WARRANTY.

provided that HTP is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, HTP may honor claims submitted by the original user within the foregoing periods.

In the case of HTP's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at HTP's option (1) repair or (2) replacement or, where authorized in writing by HTP in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized HTP service station upon return of the goods at Customer's risk and expense. HTP's option of repair or replacement will be F.O.B., Factory at Arlington Heights, Illinois, therefore; no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, HTP shall instruct the claimant on the warranty claim procedures to be followed.

HTP America, Inc. has reserved the right to make changes in design or add any improvements to its products at any time without incurring any obligation to install same on equipment.

This warranty is null and void unless warranty card is sent to HTP America, Inc. within 15 days from date of purchase.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY HTP IS EXCLUDED AND DISCLAIMED BY HTP.

Safety Precautions

WARNING: Before performing any installation or operating procedures read and follow the safety precautions listed below. Failure to observe these safety precautions can result in personal injury or death.

Personal Protection: Skin and eye burns resulting from body exposure to the electric-arc welding rays or hot metal can be more severe than sunburn:

a. Use a proper face shield fitted with correct filter and cover plates to protect your eyes, face, neck and ears from sparks and rays of the cutting arc when cutting or observing cutting. WARN bystanders not to watch the arc or expose themselves to the welding-arc rays or hot metal.

b. Wear flameproof gauntlet-type gloves, heavy long-sleeve shirt, cuffless trousers, high topped shoes and a welding helmet or cap for hair protection to protect the skin from arc rays and hot sparks or metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.

c. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs or pockets. Sleeves and collars should be buttoned, and pockets eliminated from the front of the clothing. Protect other nearby personnel from arc rays and sparks with a suitable non-flammable partition.

d. Always wear safety glasses or goggles within the cutting area. Use safety glasses with side shields or goggles when chipping slag or grinding. Chipped slag is hot and can travel considerable distances. Bystanders should also wear safety glasses or goggles.

Fire Protection: Hot slag, or sparks, can cause serious fires when in contact with combustible solids, liquids or gases:

a. Remove all combustible materials well away from the welding area or completely cover the materials with a non-flammable covering. Such combustible materials include wood, clothing, sawdust, gasoline, kerosene, paints, solvents, natural gas, acetylene, propane and similar combustible articles.

b. Hot sparks or hot metals can fall into cracks in floors or wall openings and cause a hidden smoldering fire. Make certain that such openings are protected from hot sparks and metal. Do not weld, cut or perform other work on used barrels, drums, tanks or other containers until they have been completely cleaned.

c. For fire protection, have fire-extinguishing equipment handy for instant use. After completion of cutting, inspect the work area for hazardous hot sparks or metal.

Electrical Shock: Voltages in excess of 110V can cause severe burns or fatal shock. Severity of electrical shock is determined by the path and amount of current through the body:

a. Never allow live metal parts to touch bare skin or wet clothing. When standing on metal or welding in a damp area you must be well insulated. Wear dry gloves and rubber-soled shoes. Stand on a dry board or platform.

b. Always ground the plasma cutter by connecting a ground wire between the machine and electrical ground. Do not use worn, damaged or overloaded welding cables. Use well maintained equipment.

c. When not cutting, turn off the equipment. Accidental grounding can cause overheating and create a fire hazard. Do not coil or loop the welding cable around parts of your body. Be sure the ground cable is connected to the workpiece as close to the cutting area as possible. Grounds connected to the building framework or remote locations increase the possibility of stray cutting currents.

d. Keep everything dry; clothing, work area, welding cables, electrode holder, and cutting machine. Fix water leaks immediately.

Ventilation: Cutting fumes, particularly in confined places, can cause discomfort and physical harm if breathed over an extended period of time:

a. Provide adequate ventilation by natural or mechanical means. Do not cut on galvanized zinc, lead, beryllium, or cadmium materials unless positive mechanical ventilation is provided!

b. Do not cut in locations close to chlorinated hydrocarbon vapors from degreasing or spraying operations. Heat or arc rays react with solvent vapors forming phosgene, a highly toxic gas.

c. If you develop momentary eye, nose or throat irritation during cutting, ventilation is not adequate. Stop work and take necessary steps to improve ventilation. Discontinue cutting if physical discomfort persists.

d. Refer to AWS Standard Z49.1 in Item 6 for specific ventilation recommendations.

Equipment Maintenance: Faulty or improperly maintained plasma cutting equipment results in poor cut-quality. It can cause physical injury or death through fires or electrical shock.

a. Whenever possible, have a qualified person perform the installation, troubleshooting and maintenance work on the plasma cutter. Do not perform any electrical work on the plasma cutter unless qualified to perform such work. Before performing any maintenance work inside the plasma cutter, disconnect the machine from the main electrical power source.

b. Maintain plasma cutting cables, grounding wire and connections, power cord and plasma cutter in safe working order. Do not operate the plasma cutter or accessory equipment in faulty condition. Keep the equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres and inclement weather.

c. Keep all safety devices and cabinet covers in position and in good repair. Use the plasma cutter for its intended purpose and do not modify it in any manner. Unauthorized maintenance repair will result in loss of warranty coverage.

Additional Safety Information:

a. "Safety in Welding and Cutting" - AWS Z49.1

b. "Recommended Safe Practices for Gas-Shielded Arc Welding" - AWS A6.1

c. "Safe Practices for Welding and Cutting Containers that Have Held Combustibles" - AWS A6.0

d. "Recommended Safe Practices for Plasma Arc Cutting" - AWS A6.3

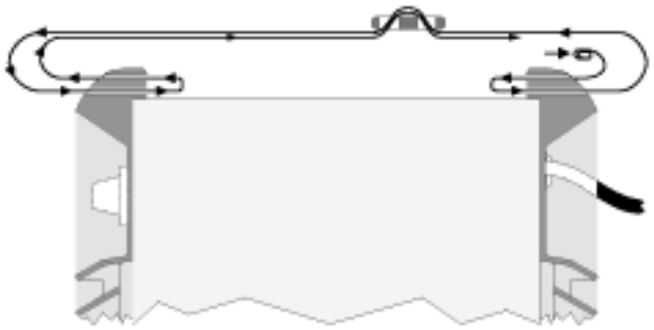
e. "Recommended Safe Practices for Plasma Arc Welding" - AWS C5.1

Inspection

After removing your plasma cutter from its shipping carton, inspect the plasma cutter for any concealed damage not seen upon receiving the unit. Any claims for loss or damage occurring during shipping must be filed by the purchaser with the freight company.

Check the inlet air supply at the rear of the cabinet to be sure no packing materials have gotten inside to obstruct the airflow to the plasma torch.

Install the carrying strap according to Figure 1.



(Fig 1) Carrying Strap Installation

Plasma/Cooling Gas Connection

Your Micro Cut 380 has been designed to use clean, dry compressed air as both the plasma and cooling gas. Water and/or oil in the air will significantly reduce the life of the electrode and the cutting nozzle, at the same time reducing the quality of the cut.

Install the bracket with 2 Phillips head screws to the back of your Micro Cut 380 as shown in Fig 2. Install the regulator in the quick connect fitting and secure it to the bracket. Install a _ male quick disconnect fitting to match your air supply. Using the airflow switch (Fig 4, #8), adjust the regulator so the gauge on the front of the machine reads 65 psi with the air flowing.

(Fig 2) Installing Pressure Regulator

Safety sensing circuitry has been installed to eliminate arc-initiation if the pressure and volume are inadequate. If the air pressure is too low, both the red general alarm led (Fig 3, #7) and the yellow low air pressure led (Fig 3 #6) will light up.

Damage to your plasma cutter due to excessive water and/or oil in the air supply line is not covered under warranty. Your Micro Cut 380 comes equipped with a regulator/filter. In addition, HTP has 2 filters available for removing any impurities from the air. If you already have a drier on your compressor, we recommend the HTP Super Dry (Part # 25300) which is a disposable in-line filter. This filter uses a desiccant to completely remove all moisture from the air. The desiccant is blue when new and turns clear when the filter needs to be discarded.

Plasma/Cooling Gas Pressure	*Volume*
60 to 75 psi	3 1/2 CFM

If you do not have a drier on your compressor, we strongly recommend the HTP Max Dry (Part # 25310). This is a 3-stage filter, which completely removes all oil and water from the air. The first stage of the Max Dry removes the water which is present in the air. The second stage of the filter removes any oil which may be in the air along with particulate down to .03 microns. The final stage is the desiccant drier, which removes the humidity from the air. The desiccant in the final stage is reusable. It is blue when it is fresh, and changes to pink when it has absorbed moisture. Just put the pink desiccant in the oven to bake the moisture out and reuse. This filter extends the life of your air tools and is great for painting also.

WARNING: Check the air regulator set every day for proper pressure, volume and water/oil levels.

Electrical Connection

All electrical connections should be performed by a qualified electrician in accordance with the National Electrical Code and local codes and ordinances. When connecting your plasma cutter, the yellow-green wire MUST BE CONNECTED TO GROUND, OR SERIOUS INJURY OR DEATH MAY RESULT!

ELECTRICAL SHOCK CAN KILL! Do not connect an input wire to the ground terminal. Do not connect the ground (yellow-green or green) wire to an input (hot) line terminal. It is also strongly recommended that a fusible line disconnect switch be installed in the input power circuit to the plasma machine. This would provide a safe and easy method to remove all electrical power from your plasma system whenever it is necessary to perform internal inspection or servicing.

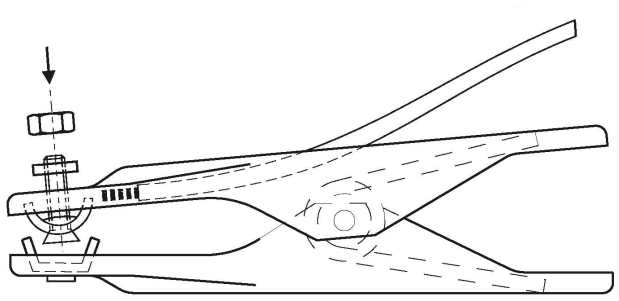
BEFORE ATTEMPTING TO MAKE ANY PRIMARY POWER CONNECTIONS TO YOUR PLASMA CUTTER, BE SURE THAT ALL POWER IS OFF BY OPENING THE LINE DISCONNECT SWITCH.

Your Micro Cut 380 has been designed to operate from 220 volt single phase power wired for a minimum of 16 amps. The green or yellow-green wire must be connected to ground. The blue and brown wires must be connected to the hot legs of the 220-volt power.

Ground Cable Connection

Assemble the ground cable as shown in Figure 4. The ground cable is connected to the front (see Fig 4, #10) of the machine. Plug the cable into the receptacle and twist clockwise until tight.

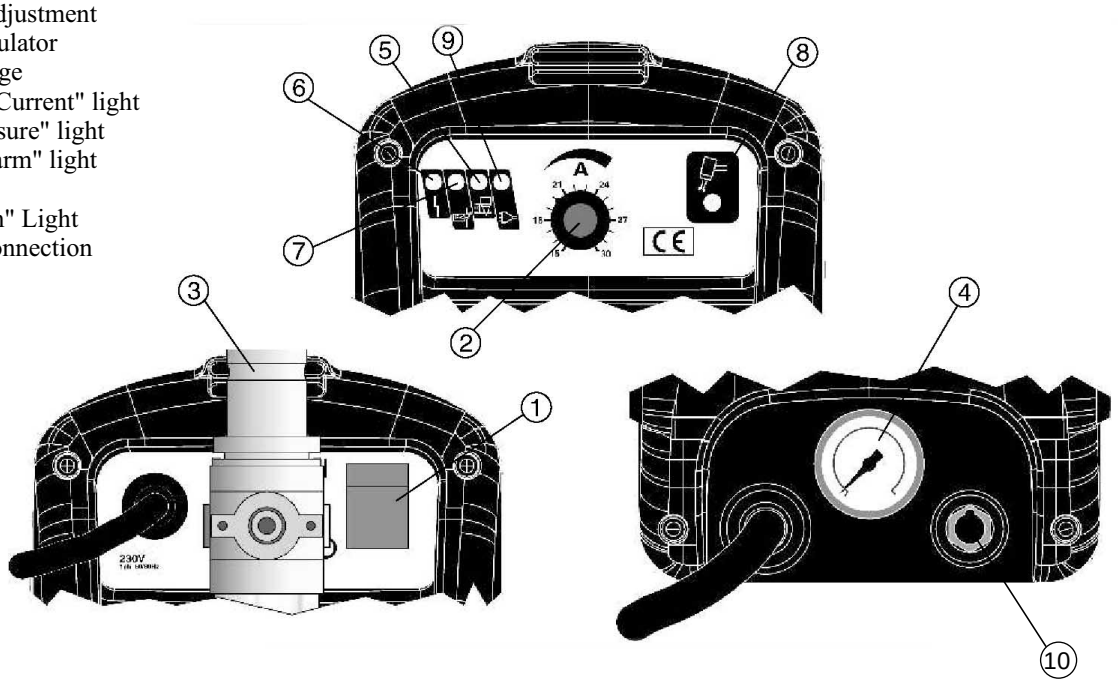
Connect the ground clamp as close to the workpiece as possible. This will reduce the possibility of current loss through stray paths. Always connect the clamp to clean, bare metal. Do not connect the ground clamp to the piece which will be cut off.



(Fig 3) Ground Clamp Assembly

Micro Cut 380 CONTROLS

1) On-Off Switch
2) Cutting Power Adjustment
3) Air Pressure Regulator
4) Air Pressure Gauge
5) Yellow "Cutting Current" light
6) Yellow "Air Pressure" light
7) Red "General Alarm" light
8) Air Purge Switch
9) Green "Power On" Light
10) Ground Cable Connection



(Fig. 4) Micro Cut 380 Controls

1) ON-OFF SWITCH – the On-Off switch is located on the rear of your Micro Cut 380. I is on and O is off. When the switch is in the on position, it will light up.

2) CUTTING POWER ADJUSTMENT – the cutting power adjustment controls the cutting amperage of your Micro Cut 380. It is infinitely variable from 15 to 30 amps. At the lower power settings, the machine will throw fewer sparks - but will also cut slower. The maximum cutting power will give you the maximum cutting speed through all materials.

3) AIR PRESSURE REGULATOR – use the air pressure regulator to adjust the pressure gauge on the front of the cutter to 65 psi. The pressure regulator also has a filter, which should be drained regularly.

4) AIR PRESSURE GUAGE – the air pressure gauge measures the plasma gas pressure and should be set to 65 psi for optimum cutting performance. To adjust the plasma gas pressure, flip the air purge switch (#8) to start air flowing. Adjust the regulator to achieve the correct pressure while air is flowing through the plasma torch.

5) YELLOW "CUTTING CURRENT LIGHT – when this lamp is on, the trigger on the cutting torch is depressed and either the pilot arc or the cutting arc has been activated. This lamp will not be illuminated with the trigger depressed when:

A) The cutting arc has been interrupted because the torch was moved too far away from the workpiece.

B) If the cutting arc is not brought in contact with the workpiece within 2 seconds.

C) If the electrode or cutting tip is worn out.

6) RED "GENERAL ALARM" LIGHT – this lamp will illuminate red when the duty cycle of the machine has been exceeded (30% @ 30 amps). This lamp also indicates an overvoltage or undervoltage condition. Reset is automatic. The lamp will also illuminate when the air pressure is too low. Reset is also automatic.

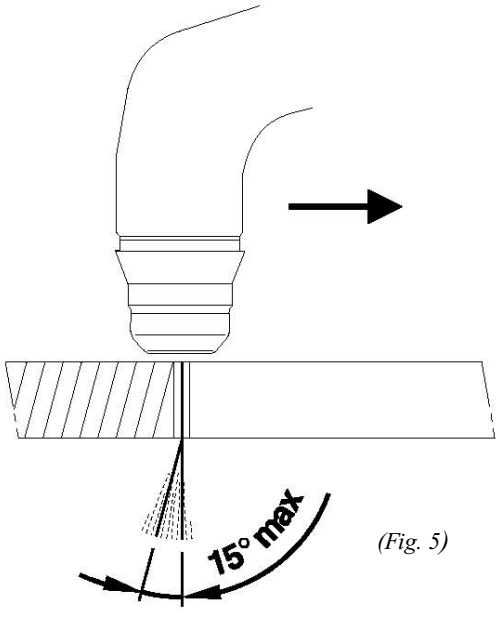
7) YELLOW "AIR PRESSURE" LIGHT – your Micro Cut 380 has a safety sensing circuit which has been installed to eliminate the arc ignition if the air pressure and volume are inadequate. If this occurs, the yellow air pressure light will be illuminated. Once air pressure has been restored, the light will go out. Your Micro Cut 380 requires 65 psi of air when air is flowing through the torch.

8) AIR PURGE SWITCH – the air purge switch allows you to purge air through the torch, allows you to manually cool the cutting torch after long periods of cutting, and allows you to set the air pressure while flowing air through the plasma torch.

To purge the torch, simply flip the toggle switch up and release. Air will flow for approximately 30 seconds and stop.

9) GREEN "POWER ON" LIGHT – when the machine is correctly connected to a 220 volt input power supply, and the on-off switch at the rear of the plasma cutter is turned on, a green light will be illuminated, indicating your Micro Cut 380 is connected to the correct power supply.

10) GROUND CABLE CONNECTION – this is where the ground cable connects to the front of your Micro Cut 380. Align the tab on the ground clamp with the notch in the connection. Insert the ground clamp and twist to lock in place. Be sure to connect the ground to the workpiece properly. (See page 6 – ground cable connection)



(Fig. 5)

Operation

1. Be sure your Micro Cut 380 is connected to a clean, dry source of com-pressed air with a line pressure of at least 80 but not more than 140 psi. Be sure the air pressure is adjusted to 65 psi (see Micro Cut 380 Controls #4)

2. Connect your Micro Cut 380 to a 220-volt power supply. (See electrical connection). Turn the On-Off switch on the back of the unit on. The green "power on" light will turn on. The fan will begin to run.

3. Set your cutting power adjustment to the desired amperage. (usually 30 amps)

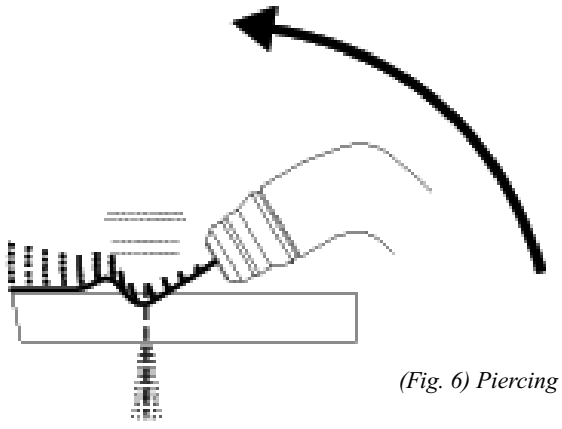
4. Refer to the safety suggestions to be sure the operator has the correct eye protection, gloves, clothing, and that all of the safety precautions have been followed.

5. Connect the ground clamp to a clean surface on the vehicle or the work piece that is as close as possible to the area to be cut. Make sure the ground clamp comes in contact with clean, freshly ground, bare metal. If you are working on an automobile, make sure the ignition is off, and disconnect the battery. Many auto manufacturers recommend the removal of on-board computers - if you have any questions, check with the vehicle manufacturer. Be sure not to connect the ground clamp to the piece which is being cut off.

6. Place the cutting torch on the edge of the material to be cut. Depress the trigger on the cutting torch. Pre-air flow will occur for about 1/2 second. The pilot arc will start immediately after that and will operate for 2 seconds. If the pilot arc is not brought in contact with the work piece, it will go out and post air flow will occur for 30 seconds. Once the main arc is established, keep the plasma torch in contact with the workpiece. Adjust the cutting speed based on the thickness and type of material you are cutting. Hold the plasma torch perpendicular to the work. Move the plasma torch at a speed which keeps the plasma arc bent anywhere from 5 to 15 degrees. (See Fig 5). When you release the trigger, the arc will stop, but air will continue to flow for about 30 seconds to cool the plasma torch

   The highest cutting efficiency is achieved by keeping the plasma cutting tip perpendicular and in contact with the work surface putting very little downforce on the plasma torch. If you move too fast, sparks will shoot up and you will not cut all the way through the work. If you are cutting correctly all the plasma sparks will go beneath the panel you are cutting.

7. When piercing a thicker sheet of steel (1/8" thick to 5/16"), hold the torch at approximately a 45 degree angle and gradually roll the torch until it is perpendicular to the work piece (Fig. 6) If the torch is held perpendicular to the work to start, there will be no where for the slag to flow, and it will come straight up and damage the gas diffuser, cutting tip, and electrode.



(Fig. 6) Piercing

8. Familiarize yourself with the consumable parts and their correct assembly onto the torch head (see page 10).

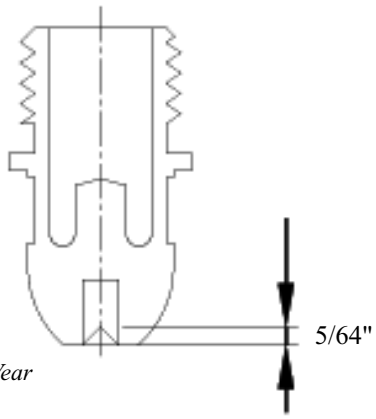
WARNING: Never disassemble the cutting torch unless the machine has been disconnected from its power supply.

Maintenance and Service

Always disconnect the machine from the main power source before performing any maintenance or service work.

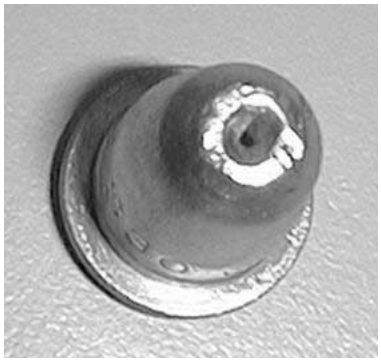
1. Remove machine housing frequently and blow residual material from inside of machine.

2. Check nozzle and electrode often for excessive wear due to cutting. The electrode will develop a pit in the center of it. When the pit reaches approximately 5/64" deep, the electrode should be replaced. (Fig. 7)



(Fig. 7) Electrode Wear

Likewise, when the hole in the center of the cutting tip becomes enlarged to approximately 1/16" in diameter, the cutting efficiency will be reduced and the cutting tip should be replaced.



(Fig. 8)
Cutting Tip Wear

3. Clean exposed torch consumables often. This will maintain their life.

4. Check nozzle and electrode often for proper installation.

5. Frequently check the air supply quality. This is the single most important factor in the maintenance of the plasma system.

6. If any damage to the machine or torch is noticed, contact your local distributor or HTP America, Inc. directly at 1-800-USA-WELD.

IF ANY SERVICE OTHER THAN THE AFOREMENTIONED IS NECESSARY, IT SHOULD BE PERFORMED BY AUTHORIZED PERSONNEL ONLY.

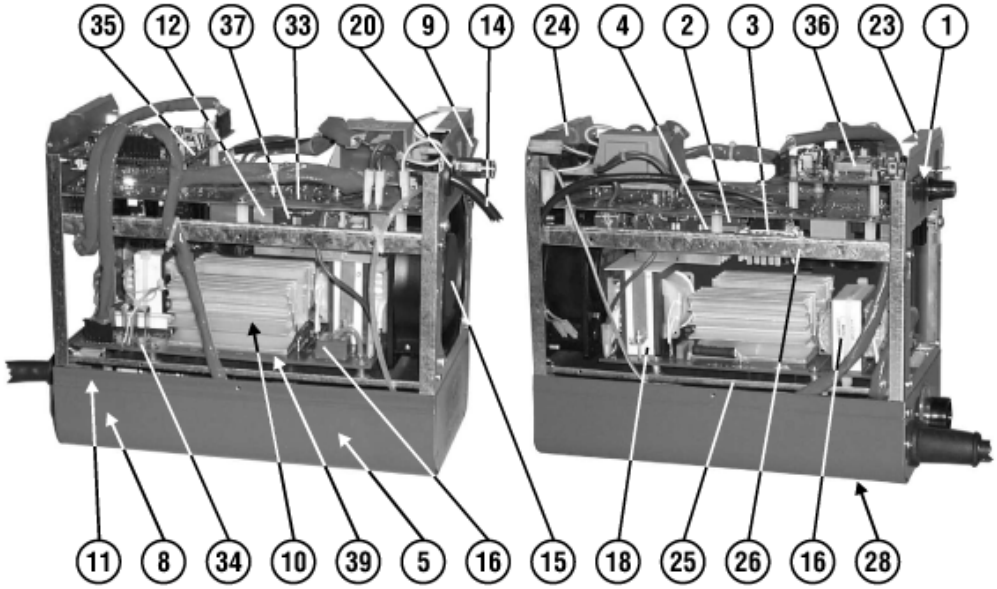
Cutting Tips

1. When making long, straight cuts, it may be easier to use a metal straight edge as a guide. Simply clamp it to the workpiece to be cut. HTP America, Inc. also manufactures a complete Circle-Cutting and Straight-Line Traversing Assembly for frequent cutting of circles and lines.
2. When cutting heavier gauge material (up to the machine capability) it is recommended to initiate the pilot arc off the edge of the material and dragging the pilot arc to the workpiece.
3. When making rust repairs, it is possible to place the new metal over the rusted area and then cut your patch panel at the same time you cut the rust. This process works similarly when splicing a quarter panel.
4. Please note that sparks from cutting arcs can damage painted surfaces. The sparks will also pit glass. We recommend the use of a welding blanket to protect these surfaces.
5. The best cutting speed is achieved when the plasma arc penetrates the workpiece at an angle of 5-15 degrees. The cutting speed is dependent on material thickness and composition as well as operator proficiency.
6. Never turn the machine off immediately after cutting. Always allow the post airflow circuitry to run its complete cycle to ensure proper cooling of the torch head.
7. It is highly recommended that piercing requirements be kept to a maximum of 75% of rated cutting thickness. This will greatly enhance the plasma torch's consumable life. When piercing thick pieces of metal, it is best to hold the cutting torch at a 45-degree angle to the work until the plasma arc has pierced the material. Holding the torch perpendicular to the work will result in sparks and slag firing back up into the plasma torch, greatly reducing consumable life.

Specifications:

Primary Voltage	220 volts	Weight	25 lbs.
Primary Amperage	16 amps	Dimensions	17 3/4" L x 6 3/4" W x 11 3/4" H
Cutting Current	15 to 30 amps	Cutting Torch Length	19 ft.
	Infinitely Variable	Ground Cable Length	16 ft.
Open Circuit Voltage	370 Volts DC	Input Power Cord Length	6 ft.
Duty Cycle	30% @ 30 amps	Plasma/Cooling Gas Pressure	65 psi
Quality Cutting Capacity	3/8"@ 10"/min	Plasma/Cooling Gas Volume	3.5 cfm
Severance Cutting Capacity	1/2" @ 5"/min		

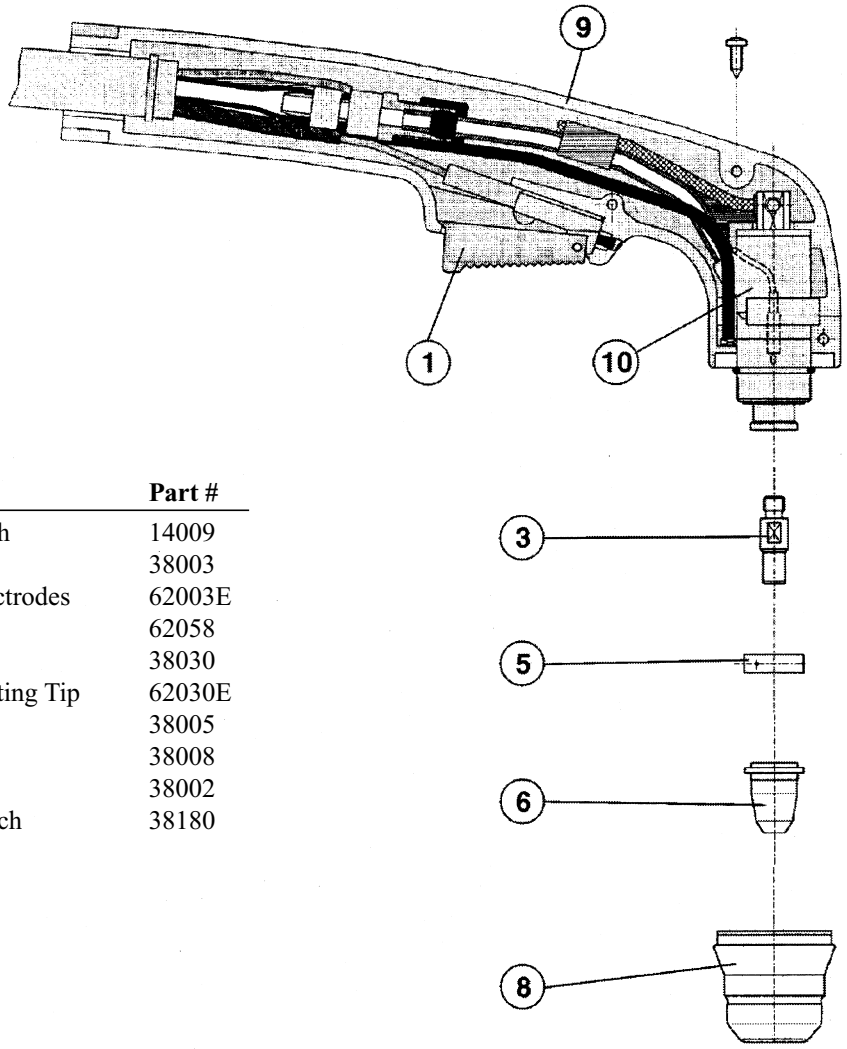
Spare Parts List



Ref#	Description	Part#
1	Potentiometer	112017
2	Resistor	112048
3	Rectifier	112357
4	Relay	112898
5	PCB	114028
6	Gas Regulator	120203
7	Air Switch	122144
8	Solenoid Valve	122155
9	Switch	122381
10	Thermoswitch	122571
11	Pressure Switch	122599
12	Thermoswitch	122974
13	Ground Cable	12359
14	Power Cord	132155
15	Fan	152101
16	Current Transformer	152230
17	Choke Coil	164989
18	Transformer	164990
19	Buckle	322065

Ref#	Description	Part#
21	Belt	322408
22	Frame	322497
23	Front Panel	482829
24	Back Panel	482830
25	Diaphram	482833
26	Side Member	482834
27	Pressure Guage	602072
28	Bottom	644183
29	Cover	655061
30	Work Clamp	712231
31	Ground Receptacle	20320
32	Plasma Torch	38180
33	Primary PCB	990179
34	Secondary PCB	990183
35	Control Card	990188
36	Microcontroller	990192
37	Igbt	990252
38	Knob Kit	990328
39	Diodes	990613

Micro Cut 380 Torch Parts Breakdown



Ref #	Description	Part #
1	Trigger Switch	14009
3	Electrodes	38003
	Extended Electrodes	62003E
5	Swirl Ring	62058
6	Cutting Tips	38030
	Extended Cutting Tip	62030E
8	Gas Diffuser	38005
9	Handle	38008
10	Torch Head	38002
	Complete Torch	38180

MicroCut 380
Wiring Diagram