CHICAGO ELECTRIC welding systems

PLASMA CUTTER - 35 AMP

Model 45949

ASSEMBLY AND OPERATING INSTRUCTIONS

Distributed Exclusively by HARBOR FREIGHT TOOLS®

3491 Mission Oaks Blvd., Camarillo, CA 93011
Visit our Web site at http://www.harborfreight.com

For technical questions and replacement parts, please call 1-800-444-3353

Specifications

ITEM	DESCRIPTION
Cutting Capacity	Steel: up to 3/8"; Aluminum up to 5/16"; Stainless steel 1/4" to 5/16"
Power Requirement	230 VAC, 60 Hz, single phase, 35 amps
Air Pressure Requirement	70 PSI
Power Output	20 ~ 35 amps
Duty Cycle	80% at 20 amps; 35% at 35 amps
Gas Consumption	3.5 CFM at 70 PSI
Line Cord	10 foot, UL approved (without plug)
Torch Cable	20 foot
Ground Cable	15 foot
Accessories	3 - electrode tips 3 - nozzles
Overall Dimensions	12-5/8 (W) x 17-7/8 (L) x 31 (H) inches
Weight	98.5 lbs.

Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

Safety Warnings and Precautions

WARNING: When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this tool!

1. **Keep work area clean**. Cluttered areas invite injuries.
2. **Observe work area conditions**. Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use electrically powered tools in the presence of flammable gases or liquids.
3. **Keep children away**. Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.
4. **Store idle equipment**. When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. **Use the right tool for the job**. Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this tool was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this tool and do not use this tool for a purpose for which it was not intended.

6. **Dress properly**. Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.

7. **Use eye and ear protection**. Always wear ANSI approved impact safety glasses. Wear a shaded lens welding helmet when cutting or welding. Wear an ANSI approved dust mask or respirator when working around metal, welding, and chemical dusts and mists.

8. **Do not overreach**. Keep proper footing and balance at all times. Do not reach over or across running machines.

9. **Maintain tools with care**. Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords periodically and, if damaged, have them repaired by an authorized technician. The handles must be kept clean, dry, and free from oil and grease at all times.

10. **Disconnect power**. Unplug tool when not in use.

11. **Avoid unintentional starting**. Be sure the switch is in the Off position when not in use and before plugging in. Do not carry any tool with your finger on the trigger, whether it is plugged in or not.

12. **Stay alert**. Watch what you are doing, use common sense. Do not operate any tool when you are tired.

13. **Check for damaged parts**. Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not turn On and Off properly.

14. **Guard against electric shock**. Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.

15. **Replacement parts and accessories**. When servicing, use only identical replacement parts. Use of any other parts will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from Harbor Freight Tools.

16. **Do not operate tool if under the influence of alcohol or drugs**. Read warning labels if taking prescription medicine to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.

17. **Use proper size and type extension cord**. If an extension cord is required, it must be of the proper size and type to supply the correct current to the tool without heating up. Otherwise, the extension cord could melt and catch fire, or cause electrical damage to the tool. This tool requires use of an extension cord with up to **35 amps** capability (up to 50 feet), with wire size rated at **11 AWG**. Longer extension cords require larger size wire. If you are using the tool outdoors, use an extension cord rated for outdoor use. (signified by “WA” on the jacket).

18. **Maintenance**. For your safety, service and maintenance should be performed regularly by a qualified technician.

19. **Pacemaker safety warning**. People with pacemakers should consult with their physician(s) before using this product; operation of equipment in close proximity to a heart pacemaker could cause interference or failure of the pacemaker.

Note: Performance of this tool may vary depending on variations in local line voltage. Extension cord usage may also affect tool performance.

Warning: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Plasma Cutting Safety Precautions

Setup and Use

1. Connect the earth ground as near as possible to the operating area. Earth connections to structural parts of the building or other places distant to the operating area will reduce their effectiveness and increase the danger of electric shock.

2. Do not pass equipment cables through or near lifting chains, crane cables, or any electrical lines.

3. Besides grounding the workpiece with the Plasma Cutter Grounding Cable, an earth grounding of the workpiece is recommended. Ground it directly to an earth pipe or grounding rod with a separate cable of appropriate size.

4. Do not touch the electrode if you are in contact with the workpiece, ground, or another electrode from a different machine.

5. Never use the Plasma Cutter near water. Ensure that the surrounding area and cutting objects are dry. Do not spray water or other liquids on or near the Plasma Cutter.

6. Avoid all direct contact between the skin or wet garments and metal parts under electrical power. Check that gloves and protective clothing are dry.

7. Always wear welding gloves and rubber soled shoes when working in damp areas, or standing on metal objects.

8. Always turn off the Plasma Cutter when it is not in use, or in the event of a power failure. Do not allow the Torch Head to touch earth ground. Accidental earth discharges may cause overheating and fire hazards.

9. Do not leave the powered Plasma Cutter unattended.

10. Significant DC voltage exists after turning off and unplugging the unit. Discharge the electrode to ground before handling.

Wear Protective Clothing

1. Welding and cutting operations are a source of radiation, noise, hear, and noxious fumes; for this reason, the protection of the operator and any spectators must be guaranteed with suitable safety devices and precautions. Never approach arc rays or hot metal without protection. Failure to observe these standards during operation could lead to serious health risks.
2. Wear fire-resistant work gloves, a heavy, long-sleeved shirt, trousers without cuffs, shoes with high insteps to protect skin from arc rays and metal sparks, and a welder's helmet to protect hair and face.
3. Always wear safety glasses with side shields under the welding helmet. High temperature slag may be thrown to great distances. Pay attention to fellow workers in the vicinity.

Fire and Explosion Safety

1. Position a fire-resistant screen around the Plasma Cutting area to protect persons in the vicinity from arc rays, sparks, and slag.
2. Clear away or protect flammable objects such as wood, saw dust, clothing, paints, solvents, petroleum products, natural gas, acetylene, propane, and other substances with fireproof material.
3. Keep an ABC type fire extinguisher near the work area.
4. Never perform welding or cutting operations on closed pipes or containers as the possible internal fumes may cause an explosion.
5. Never perform welding or cutting operations on open pipes or containers that may have come in contact with moisture, chemicals, or flammable materials. Always clean and dry the areas first.

Fumes and Gases Hazards

1. Welding and cutting fumes and gases may be hazardous if inhaled for long periods of time.
2. Install a natural or forced-air ventilation system in the work area. If the ventilation system is inadequate, use an air respirator.
3. Use a forced-air ventilation system when welding or cutting lead, beryllium, cadmium, zinc, zinc-coated or painted materials. Always wear a protective breathing mask.
4. When welding or cutting in small areas, the operator should be externally accompanied by another person to observe accident prevention procedures.
5. Do not perform welding operations near chlorinated hydrocarbon vapors produced by degreasing or painting; the heat generated by arc rays can react to form phosgene, a highly toxic gas.
6. Irritation of the eyes, nose, and throat are symptoms of inadequate ventilation. Take immediate steps to improve ventilation. Do not continue operations if symptoms persist.

Transporting the Plasma Cutter

1. When moving the Plasma Cutter, the power must be shut off and disconnected.
2. Pull the Plasma Cutter by its handle and roll on its wheels.
3. Do not drag, pull, or lift the Plasma Cutter by it's cables.

High Frequency Radiation

1. When cutting or welding, be aware that high frequency radiation may be produced which can interfere with radio navigation, safety services, computers, and communications equipment. Before operations, have a qualified electronics technician check out that possibility.
2. Keep high frequency source doors and panels tightly shut. Keep spark gaps at the correct settings. Use proper grounding and shielding to minimize the possibility of interference. Keep all cables close together and close to the ground. Locate the welding or cutting operation as far as possible from sensitive electronic equipment; or have the electronic equipment shut down temporarily.

Electrical Shock Hazard

1. Electric shock could be fatal. Never touch exposed electrical parts.
2. Switch off and disconnect the power source before installing or opening the Plasma Cutter.
3. Installation must be performed by a qualified technician.
4. Installation procedures must comply with the National Electric Code, and all other relevant regulations.

Unpacking

When unpacking, check to make sure the following parts are included.

3 - Electrodes (not shown)
3 - Nozzles (not shown)

If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual as soon as possible.

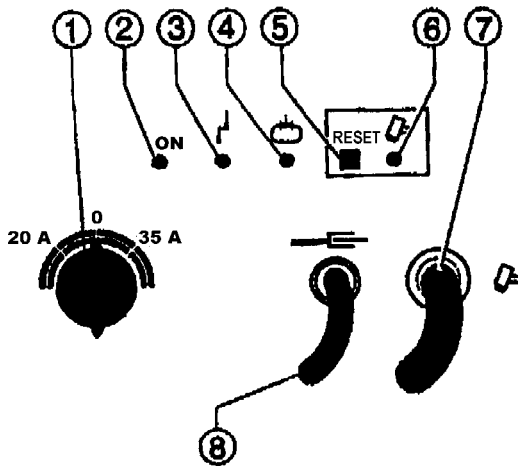
Assembly

1. Assembly the platform stand and attach the wheels using the supplied hardware.
2. Place the Plasma Cutter on the Platform Stand and secure with the supplied hardware.
3. Attach the Pull Handle to the Plasma Cutter with the supplied hardware.
4. Install a 3-prong, 220 VAC power connector with at least a 35 amp capacity. This should only be done by a licensed electrician.

Operation

WARNING: This product, when used for welding and similar applications, produces chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code 25249.5, et seq.)

Front Panel Controls and Indicators



ITEM	DESCRIPTION
1	On - Off Switch and regulation of the cutting current. O = Off; 20A = Power on; 20 amp cutting current 35A = Power on; 35 amp cutting current
2	Power source ON indicator LED
3	Protection ON indicator LED
4	Insufficient air pressure LED
5	Reset Button: Puts the power source back in service after torch servicing. When the shield cup is screwed on the torch head, the LED (ref. # 6) is off.
6	Shield Cup disconnected LED
7	Plasma Torch Cable
8	Ground Cable

Cutting Operation

1. Connect the air supply hose to the manometer located on the back panel, and set the air pressure to 60 PSI. The air supply should have an in-line moisture filter.
2. Check the Plasma Torch. Replace or clean the nozzle and electrode if worn or dirty.
3. Clamp the Plasma Cutter Ground Cable Clamp to the bare metal workpiece.
4. With the On/Off switch set to “O”, plug the power cord into the 220 VAC (35 amp capacity) electrical outlet.
5. Place your protective clothing, gloves, and welding helmet.
6. While holding the Torch handle away from the workpiece, set the On/Off switch to 20A or 35A depending on the hardness of the metal being cut.

   It is recommended to do a test cut on a piece of scrap metal of the same type as the work piece to determine the correct amperage and air pressure for a clean cut.

7. Adjust the air pressure from the Control Filter Knob on the back panel.

Caution: Verify that no wires, cables, or other obstructions are below the cutting area.

8. Place the Torch Head on the metal to be cut and press the Start button on the Torch handle.

   Start to cut slowly, then increase the speed to obtain the desired cut quality. Regulate the speed to obtain a good cut. See illustration “A” below. Air plasma will create a straight arc with stainless steel or aluminum, or a 5” arc with softer steel. The arc varies depending on speed, material, and thickness.

   In some cutting operations, it may be necessary to start the cut from a point away from the edge. See illustration “B” above. The backfire from this operation could shorten the life of the torch components, so it is recommended to do this cut as fast as possible.

   Slightly incline the Torch so that the backfire particles are blown away by the nozzle (and by the operator), instead of bouncing back into the Torch. Clean away slag and incrustations from the Torch Head. Spraying or immersing the Torch Head in an anti-slag substance, minimizes the quantity of incrustation that would stick to it.

9. When the cutting process is complete, release the Start button on the Torch handle, place the Torch handle in a safe place, and wait 5 minutes before turning the On/Off switch to “O” to allow proper cooling. The pilot arc is automatic, not manually controlled. Handle the torch components with care and protect them from damage.

10. Unplug the line cord from the electrical outlet.

Troubleshooting

SYMPTION	POSSIBLE CAUSE
Insufficient penetration	1. Cutting speed too fast 2. Not enough amperage or air pressure 3. Workpiece too thick 4. Torch components damaged or worn
Main arc goes out	1. Cutting speed too slow 2. Nozzle is too far from the workpiece
Slag formation	1. Wrong gas pressure 2. Wrong cutting power 3. Torch components damaged or worn
Burned nozzle	1. Cutting power too high 2. Nozzle damaged or loose 3. Nozzle touching the workpiece 4. Excessive slag; Low gas plasma pressure

Maintenance

Warning: Before performing any maintenance you must disconnect power to the Plasma Cutter and discharge it's electrode to ground.

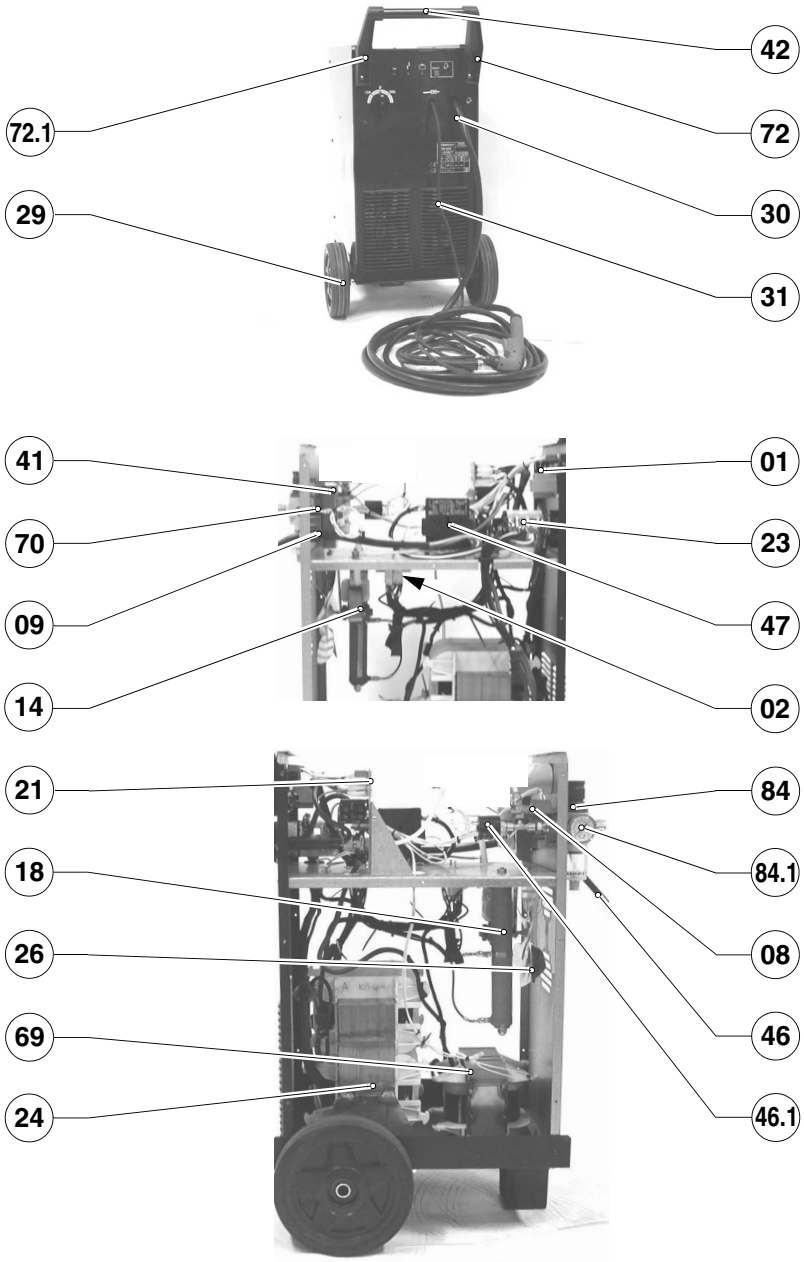
1. Regularly clean the Control Filter Receptacle on the rear panel.
2. Clean or replace the nozzle and electrode when they become dirty or worn.
3. Store the Plasma Cutter in a clean and dry location.

Main Parts List

Item #	Description
01	Circuit Board C.E. - 22606
02	Rectifier, 35A, 1200V
08	Power Cable
09	Cable Clamp
14	Fan Unit
18	Resistor
21	Circuit Board, C.E. - 22609
23	Changeover Switch
24	Transformer
25	Thermal Cut-out
26	Fan
29	Fixed Wheel
30	Torch Plasma TP 40S
31	Pliers Cable
41	Auxiliary Transformer
42	Handle Tube
46	Solenoid Valve
46.1	Pressure Switch
47	Power Contactor
69	Impedance Coil
70	Fuse Holder
72	Mount
72.1	Mount
84	Pressure Reducer
84.1	Gauge

NOTE: Some parts are listed and shown for illustration purposes only and are not available individually as replacement parts.

Main Assembly Drawing



PLEASE READ THE FOLLOWING CAREFULLY

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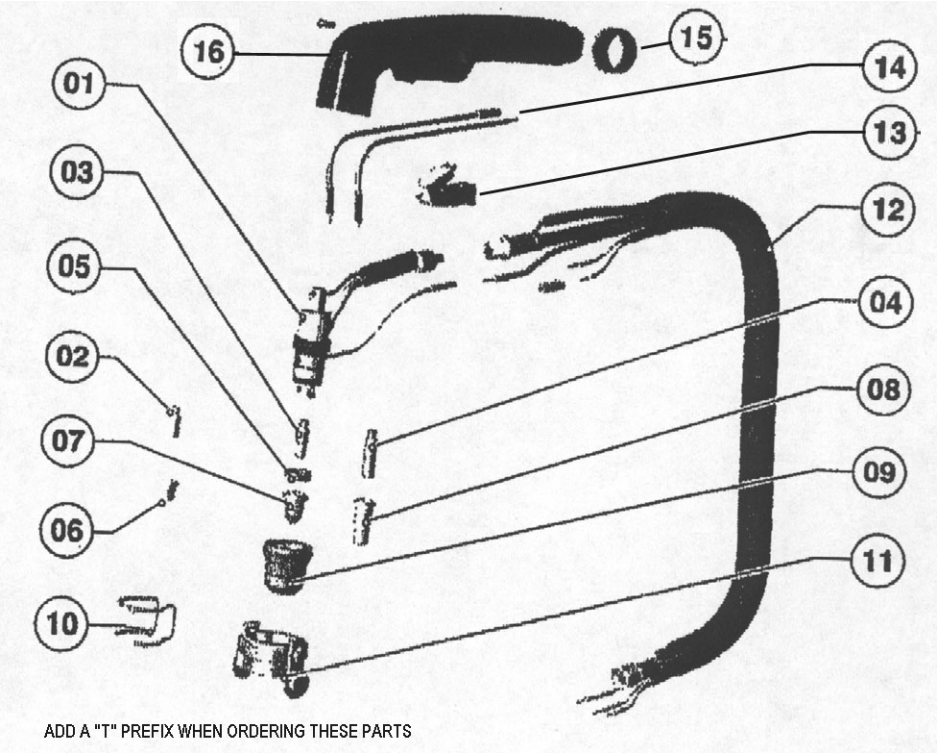
Torch Assembly Drawing



Torch Parts List

Item #	Description
T01	Torch Body
T02	Short Electrode
T03	Electrode
T04	Extended Electrode
T05	Gas Distributor
T06	Tip, D.1
T07	Tip, D.08
T08	Extended Tip, D.0.9
T09	Protective Bush
T10	Spacer Spring
T11	Trolley
T12	Cable Assy
T13	Start Button
T14	Wires
T15	Handle Cable Clamp
T16	Handle

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LINE CONNECTION