

HT2000[®]

50-Amp Upgrade

***Field Service Bulletin
802400 - Revision 0***



HT2000

50-Amp Upgrade

Field Service Bulletin

IM-240

(P/N 802400)

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HT2000 50-Amp Upgrade

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HT2000 50-Amp Upgrade

INTRODUCTION



WARNING



INSTALLATION MUST BE PERFORMED ONLY BY QUALIFIED ELECTRONICS TECHNICIANS FAMILIAR WITH ELECTRO-MECHANICAL ASSEMBLY AND TECHNIQUES!

Purpose

This field service bulletin will enable a qualified technician to upgrade an HT2000 system for 50-amp cutting.

General

This upgrade makes hardware changes to the remote high-frequency console , a firmware change to the power supply control board, and a change to the torch consumables for 50-amp cutting.

Customer Required Tools

Philips head screwdriver
5/32" Allen Wrench
Open-end wrench set

HT2000 50-Amp Upgrade Kit (128069):

Part No.	Description	Qty.
128069	HT2000 50-Amp Upgrade Kit	
120178	Electrode:HT2000 50A Oxygen	5
120182	Nozzle:HT2000 50A Oxygen	5
120186	Shield:HT2000 50A	3
120179	Swirl Ring:HT2000 50A Oxygen	2
120185	Retaining Cap:HT2000 50A	2
081004	Firmware:HT2000 Power Supply Rev. F	1
027338	Tool, Chip Extraction	1
027524	Nozzle wrench: 1" open end	1
129091	Shield Valve Subassembly	1
129092	Shield Pressure Tap Subassembly	1
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UPGRADE

Upgrade involves 3 basic steps:

- I Replacing the pressure switch and SV6 assembly in the remote high frequency console
- II Replacing firmware in the HT2000 power supply control board
- III Installing the 50-Amp consumable parts in the HT2000 machine torch



WARNING



SHOCK HAZARD: Always turn off all power to HT2000 power supply before removing covers in the HT2000 system. Set line voltage disconnect box to OFF. Lock out and tag out switch.



WARNING



Turn off all gas supplies before performing installation.

HT2000 50-Amp Upgrade

I. REPLACING THE PRESSURE SWITCH, AND SV6 ASSEMBLY IN THE REMOTE HIGH FREQUENCY CONSOLE

Removing the Pressure Switch and SV6 Assembly

1. Disconnect the external shield gas supply and sense hoses from the RHF console. See Fig. 1.

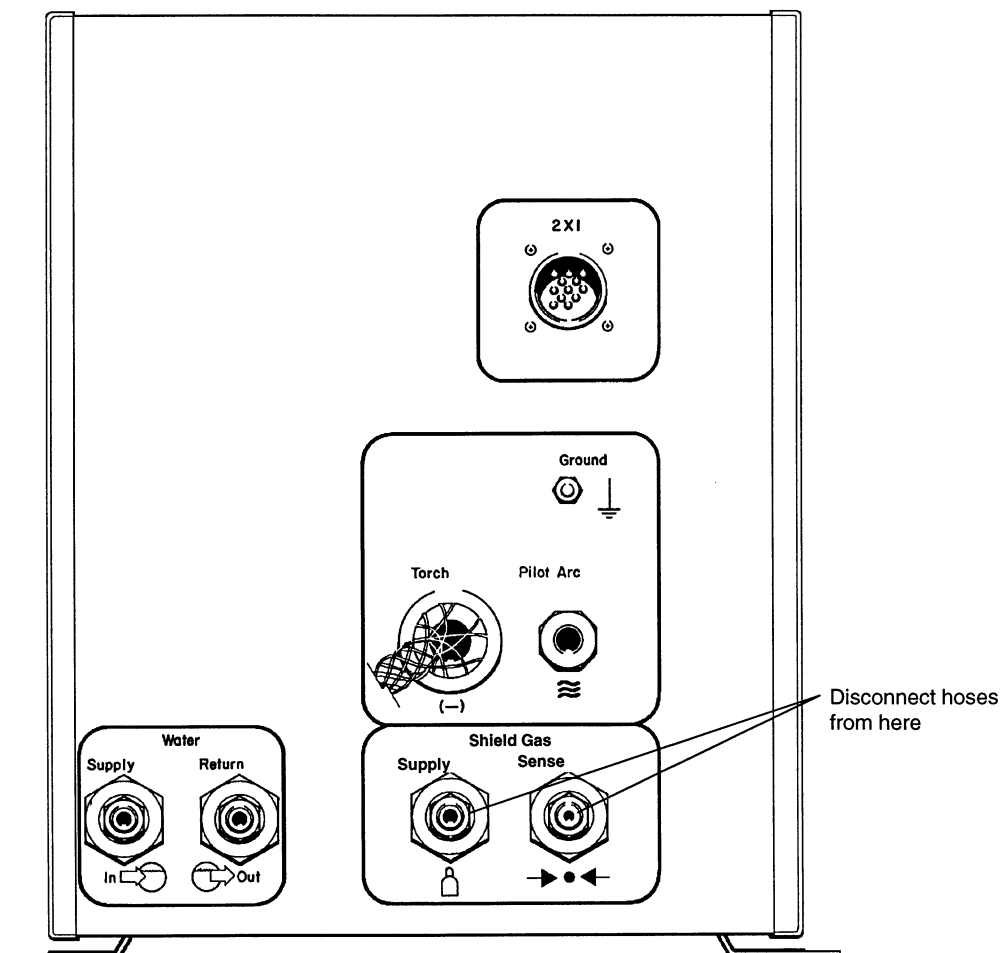


Figure 1 Disconnecting External Shield Gas Hoses

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2. Using a 5/8" open-end wrench, loosen nuts 1 and 2 from their fittings and disconnect the hoses.
3. Loosen nut 3 from the RHF console panel and remove shield pressure tap assembly.
4. Disconnect the two plastic electrical connectors marked SV6 and SV7 from their mating receptacles (SV6 and SV7 connectors not shown in Fig. 2.).
5. Remove wire terminals marked #4 & 5 that are connected to the pressure switch.
6. Using a 5/8" open-end wrench, loosen nut 4 and disconnect hose.
7. Using a 1/2" open-end wrench, loosen nut 5 and disconnect hose.
8. Using a 5/32" Allen wrench, remove the 2 Allen screws securing the pressure switch and SV6 assembly to the RHF console center panel.
9. Remove the pressure switch and SV6 assembly.

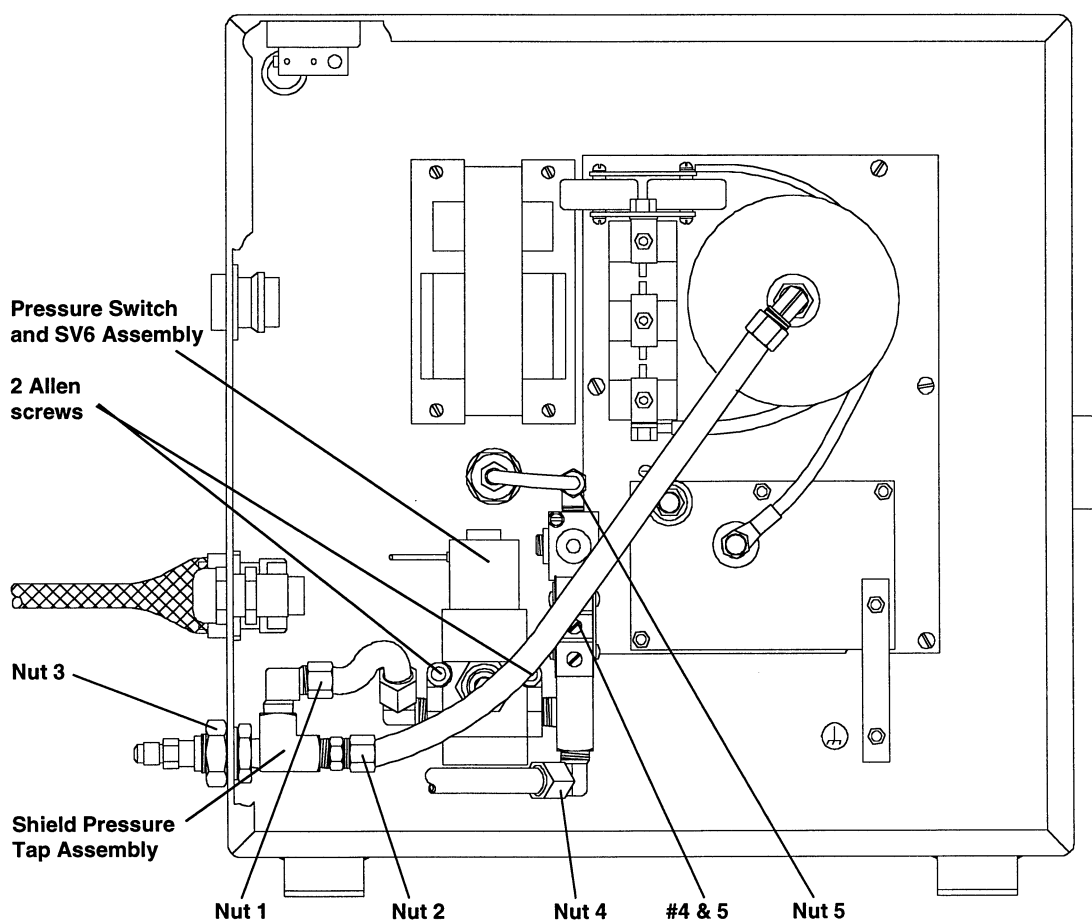


Figure 2 Removing Pressure Switch and SV6 Assembly

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Installing Subassemblies 129092 and 129091

1. Insert subassembly 129092 into the side panel of the RHF console.
2. Secure subassembly 129092 by tightening nut 3.
3. Mount subassembly 129091 to the RHF center panel by tightening down the 2 Allen screws.
4. Tighten nut 6 onto subassembly 129092 . Note: Nut 6 is on hose 1 which is attached to subassembly 129091.
5. Attach hose 2 to subassembly 129091 by tightening nut 4.
6. Attach hose 3 to subassembly 129091 by tightening nut 5.
7. Attach hose 4 to subassembly 129092 by tightening nut 2.

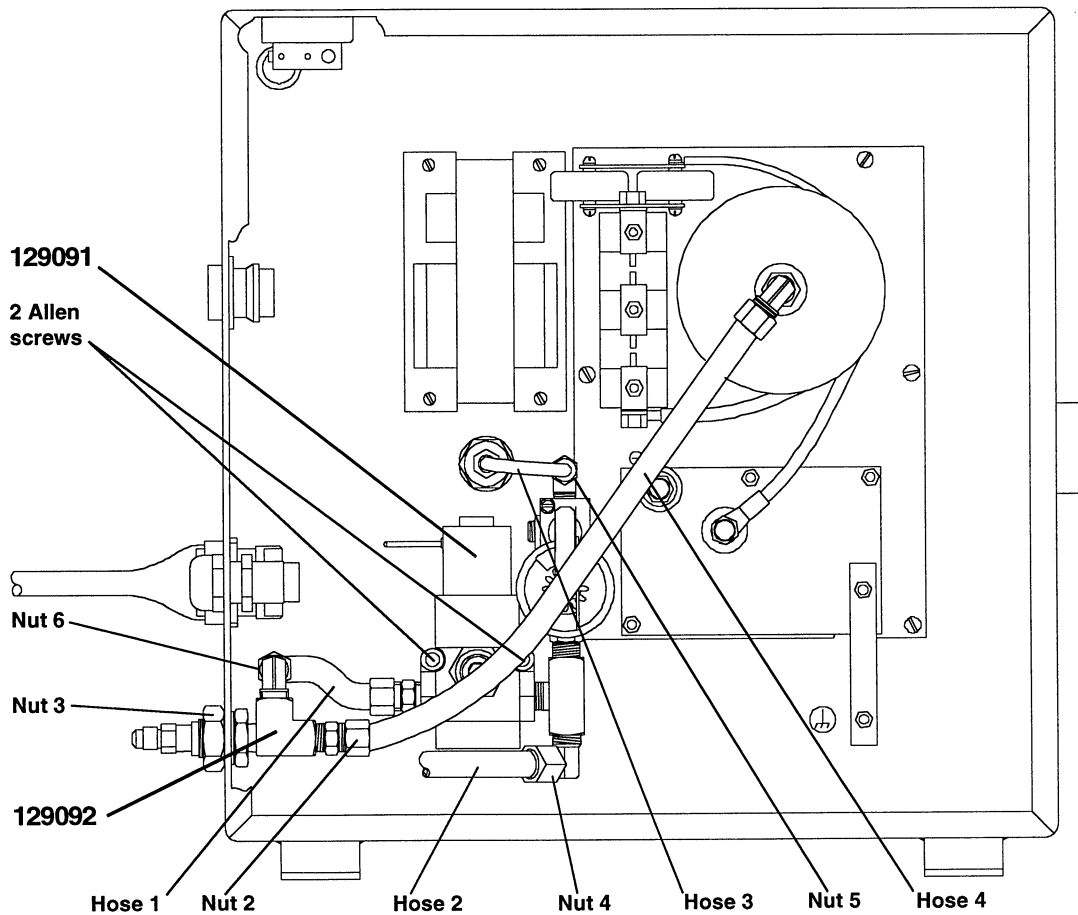


Figure 3 Installing the Shield Valve Subassembly

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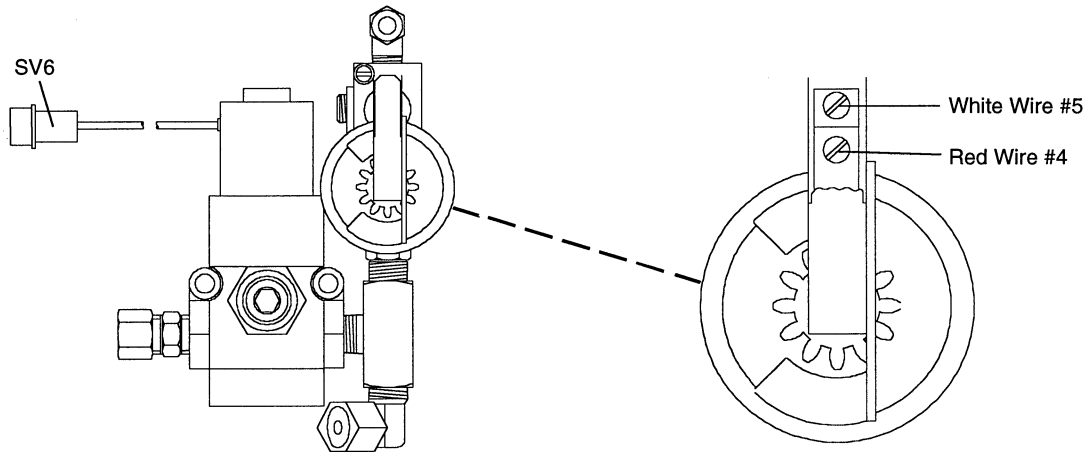


Figure 4 Pressure Switch Electrical Connection Points on 129091

8. Reconnect the two plastic electrical connectors marked SV6 and SV7 to their mating receptacles (SV7 not shown in Fig. 4).
9. Connect wire terminals marked #4 & 5 to the pressure switch as shown in Fig. 4.
10. Reconnect the external shield gas supply and sense hoses to the RHF console.
11. Turn on gases and check for leaks. Tighten internal fittings, if necessary.

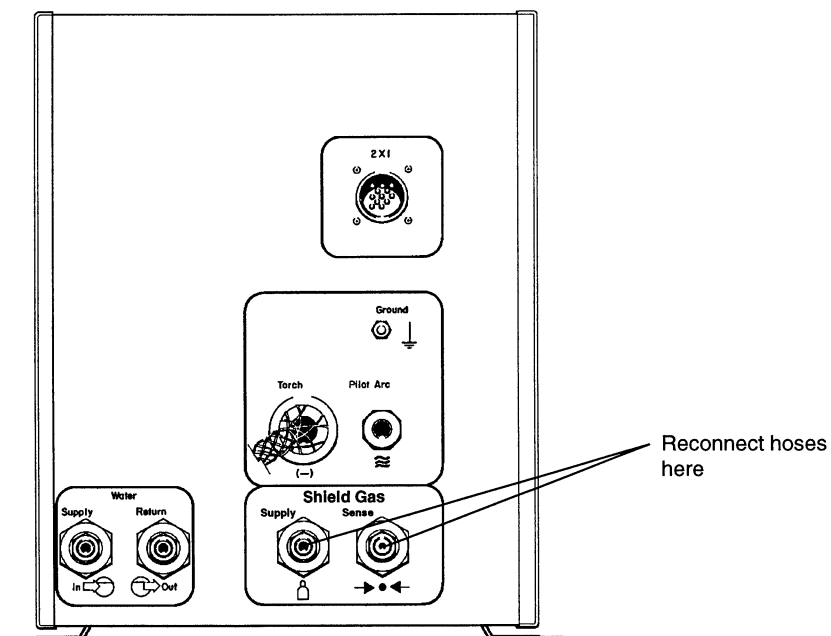


Figure 5 Installing the Shield Valve Subassembly

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II. REPLACING FIRMWARE IN HT2000 CONTROL BOARD



WARNING



SHOCK HAZARD: Always turn off all power to HT2000 power supply before removing any cover. Set line voltage disconnect box to OFF. Lock out and tag out switch.

1. Disconnect power from the HT2000 system - see warning above.
2. Remove the front panel of the power supply.
3. Unscrew the control panel and rotate it to sit on top of the power supply with the electrical wires still attached.

Caution: Before replacing the old firmware with the new firmware, ground yourself to the power supply chassis to reduce the chance of electrical static discharge.

4. Find control board PCB2 and firmware IC 081004. Firmware IC is located in a socket underneath the high-frequency cover. See Fig. 6.

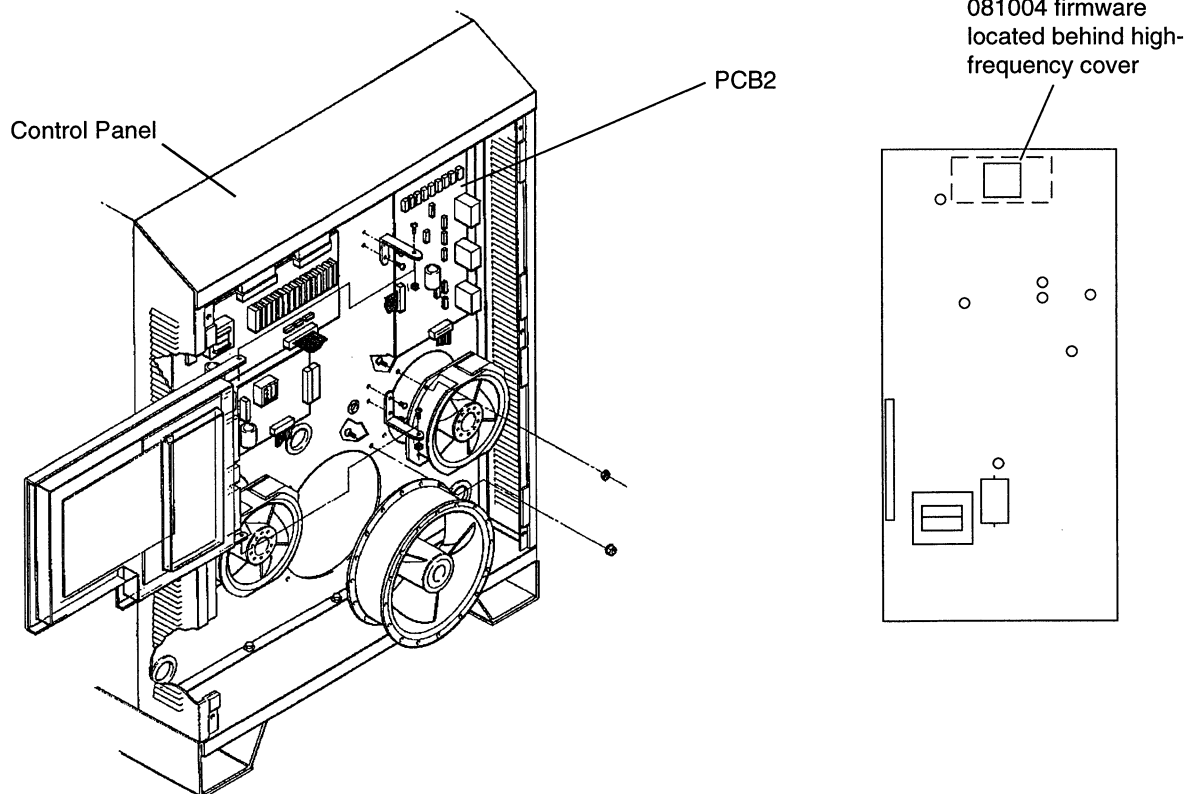


Figure 6 PCB2 and 081004 Firmware Location

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5. Remove 081004 firmware from socket by using the enclosed extraction tool (027338). See Fig. 7.
 - a. Insert the removal tool into corner slot. Ensure bend on the removal tool catches on the bottom of the IC.
 - b. Pull the removal tool straight out until IC releases from socket.
 - c. If IC only partially releases, repeat steps a. and b. at the opposite corner.
 - d. Discard IC.

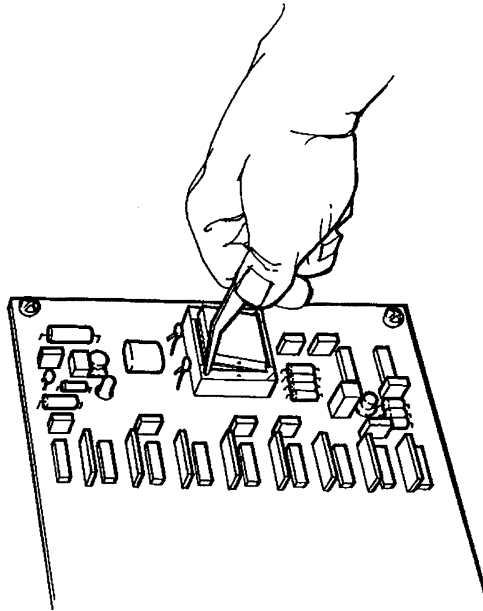


Figure 7 Firmware Removal

6. Carefully install the latest version (Rev. F) of 081004 firmware into socket.
 - a. Orient firmware by aligning the dot and bevel on IC (indicating pin 1) to the dot on socket. (Some firmware has only a bevel indicating the side where pin 1 is located.) See Fig. 8. Be careful not to bend any pins during installation.

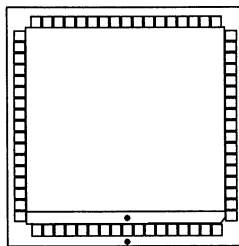


Figure 8 HT2000 Firmware 081004 (shown in socket)

HT2000 50-Amp Upgrade

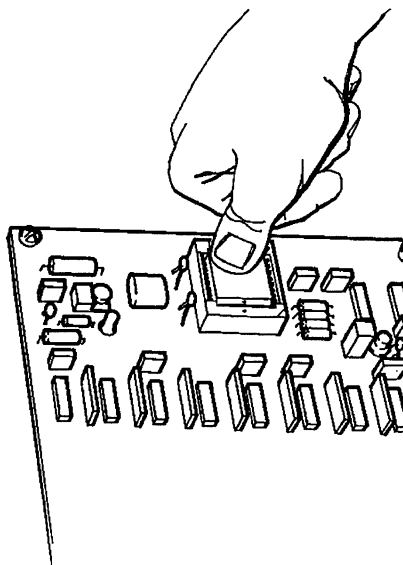


Figure 9 Press Firmware in Socket

- b. Press IC into place. See Fig. 9. When properly installed, IC will be flush with the top of socket.
- 7. Reinstall the high-frequency cover.

Caution: The high-frequency cover shields firmware IC and other control circuit components from high-frequency noise. If the cover is not reinstalled, system operation could be erratic or reduced.

- 8. Replace the front panel and control panel on the HT2000 power supply.

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III. INSTALLING THE 50-AMP CONSUMABLE PARTS IN THE HT2000 MACHINE TORCH

1. Lightly lubricate any O-rings with silicone.
2. Install 50-Amp consumables into the torch head in the order and orientation as shown in Fig. 10.

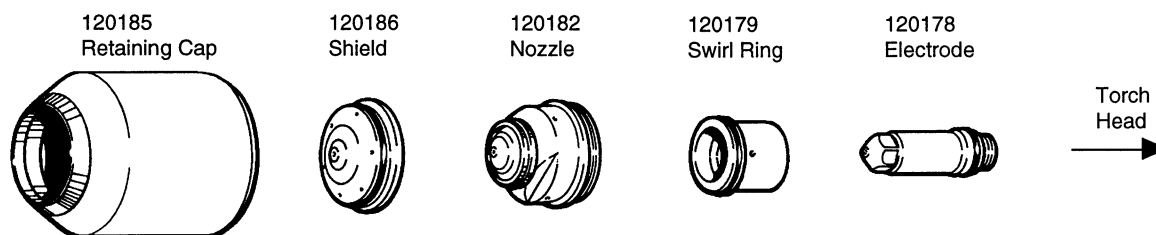


Figure 10 HT2000 50-Amp Consumables

The HT2000 system is now ready to cut at 50 amps. A 50-amp cut chart is included in this bulletin. See the *Operation* section of the HT2000 instruction manual for details on operating the HT2000 system. See also *Special Notes About Cutting at 50 Amps* on the following page.

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SPECIAL NOTES ABOUT CUTTING AT 50 AMPS

- The oxygen shield gas must be supplied from a regulator separate from the oxygen plasma gas regulator - see Fig. 11 below.
- A nitrogen gas supply must be hooked up to the nitrogen plasma gas inlet of the gas console so that preflow gas mixtures can be adjusted.
- When using the Digital Remote or Programmable Remote, set the current to 60 amps.

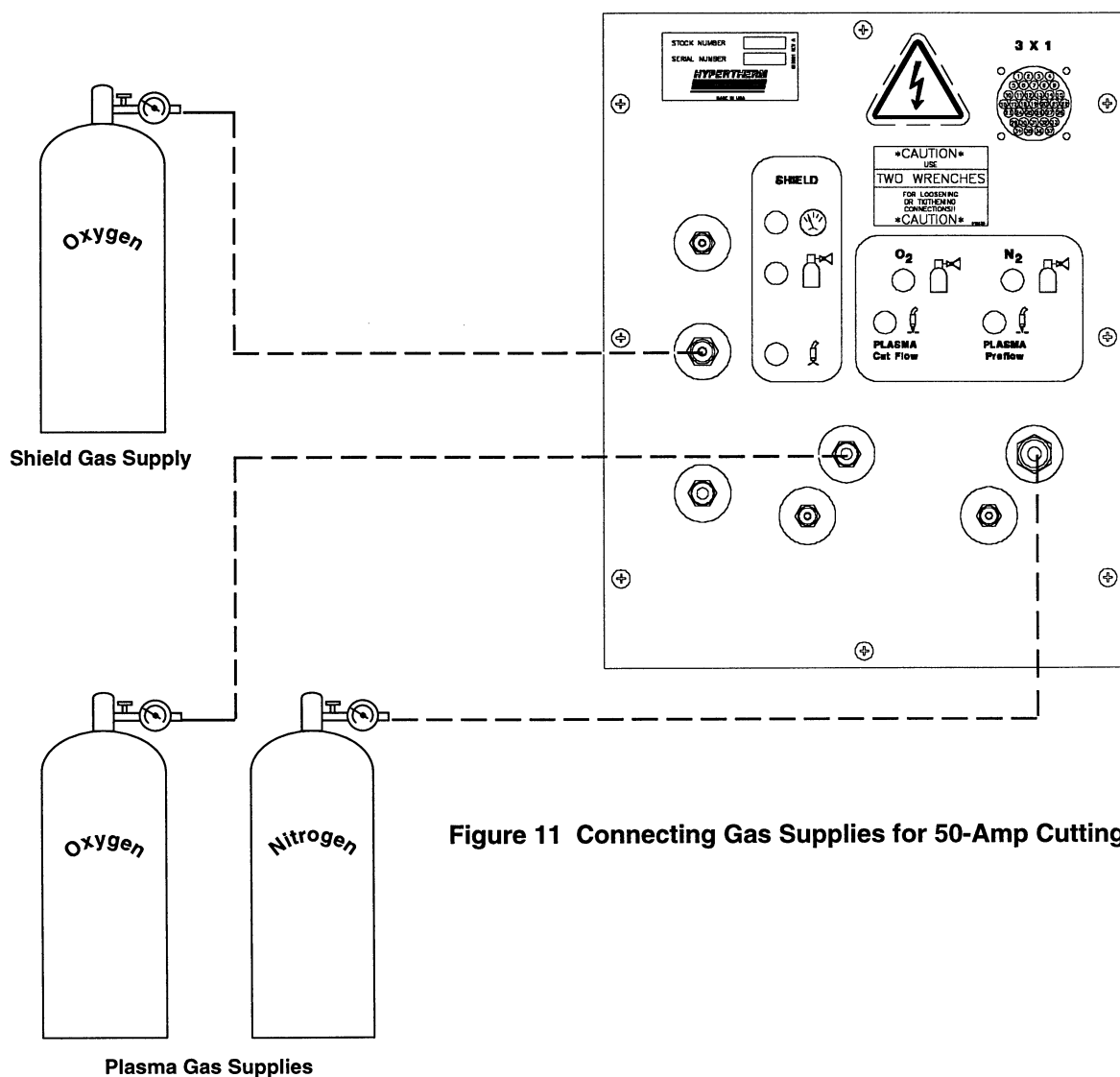
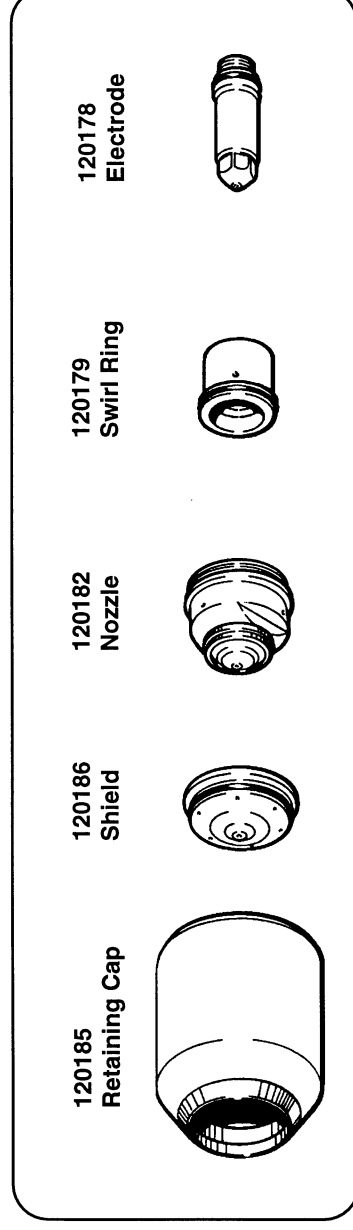


Figure 11 Connecting Gas Supplies for 50-Amp Cutting

HT2000 Machine Torch - Above Water

Mild Steel

50 amps • O₂ Plasma / O₂ Shield



Material Thickness (inches) (GA)	Plasma Gas Flow Rate %		Shield Gas (O ₂) Pressure (psi)	Torch-to-work Distance (inches)	Torch-to-work Distance (mm)	Arc Current Setting (amps)	Arc Voltage Setting (volts)	Duty Cycle (%)	Travel Speed (ipm)	Travel Speed (mm/min)	Approx. Motion Delay Time (sec)	Plasma Gas Inlet Pressure O ₂ (psi) N ₂		Shield Gas (O ₂) Inlet Pressure (psi)
	Preflow (O ₂ % N ₂ %)	Cut Flow (O ₂ % N ₂ %)												
.048 (18 GA.)	3	27	30	0	.060	1.5	50	108	100	160	4060	120	120	120
.074 (14 GA.)					.060	1.5		108	100	120	3050			
.100 (12 GA.)					.070	1.75		113	100	100	2540			
.125 (10 GA.)					.080	2.0		118	100	60	1520			

Notes: The oxygen shield gas must be supplied from a regulator separate from the oxygen plasma gas regulator.

If using the Digital Remote (DR) or Programmable Remote (PR), set current to 60 amps.

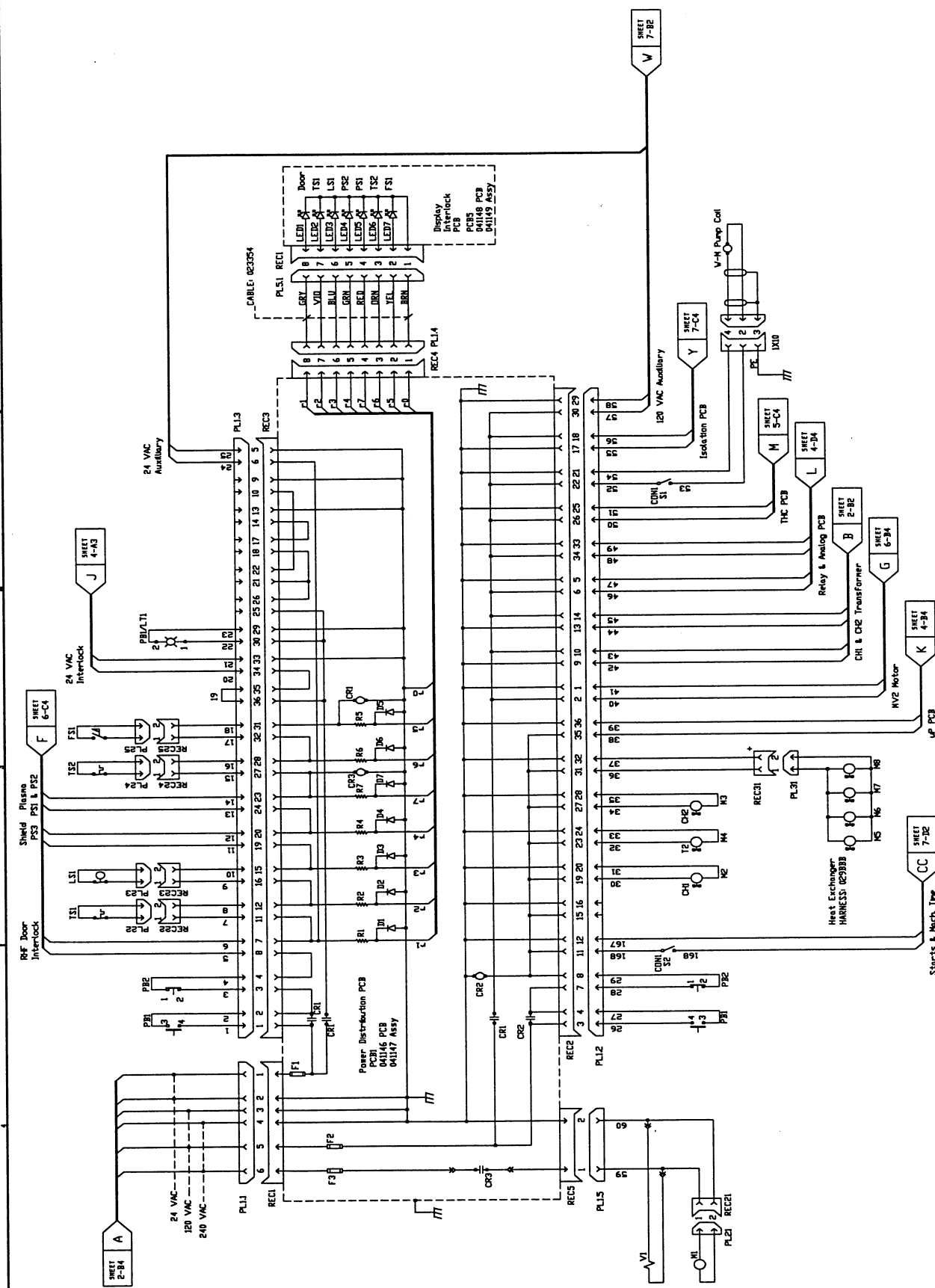
Set initial torch height (before piercing) to approximately twice the Torch-to-work Distance for the material you are cutting.

Torch-to-work Distance tolerances are ± .010 inch (± .25 mm). When using a THC the tolerances are ± 1 volt.

Stay within travel speed ranges to produce cross-free cuts.

1 inch = 25.4 mm; 1 scfh = 28.316 liter/hour; 1 psi = .0689 bar = 6.895 KPa





HT2000 SCH: POWER DISTRIBUTION

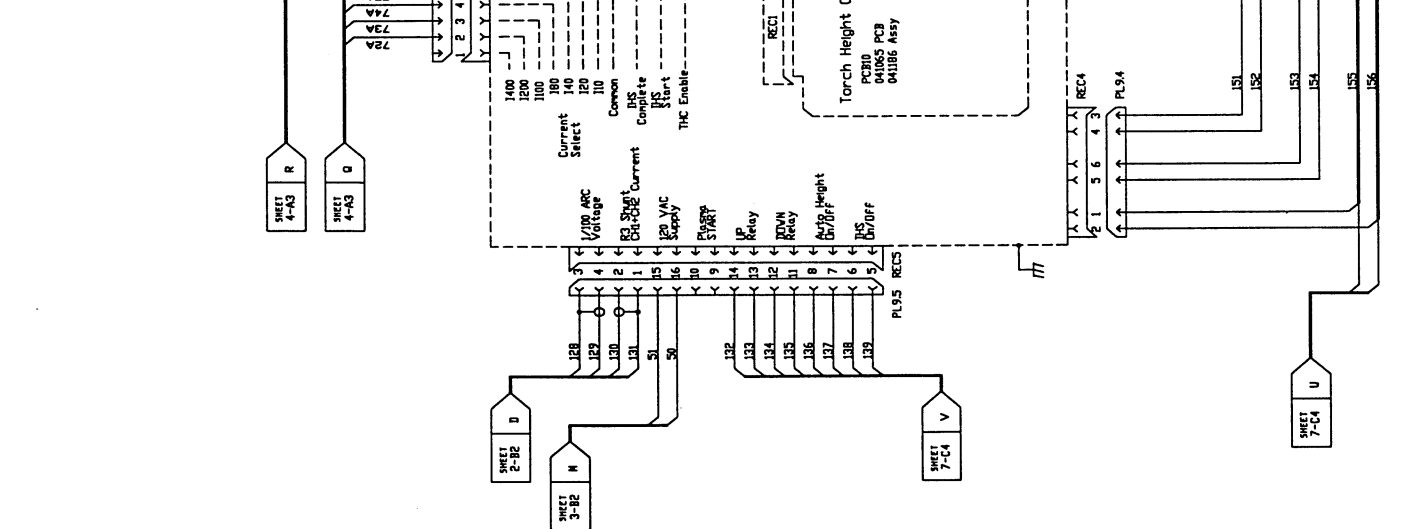
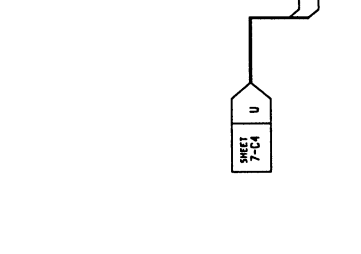
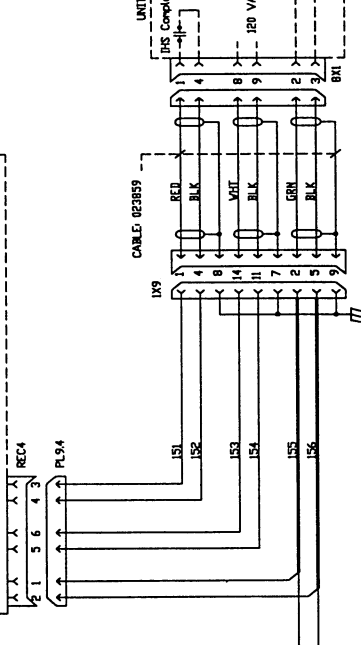
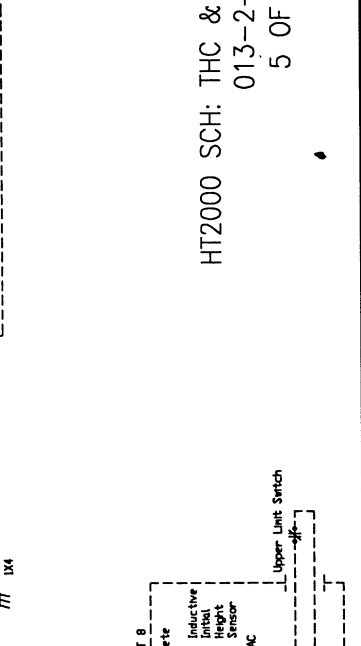
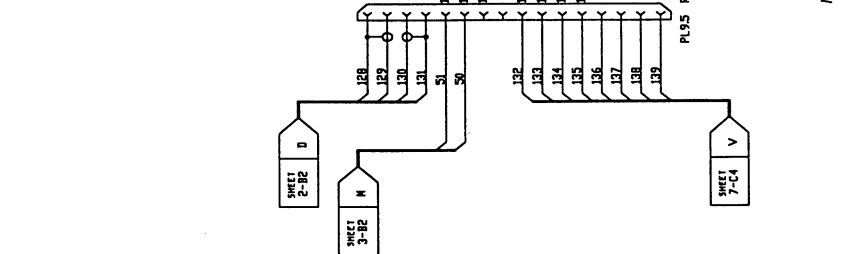
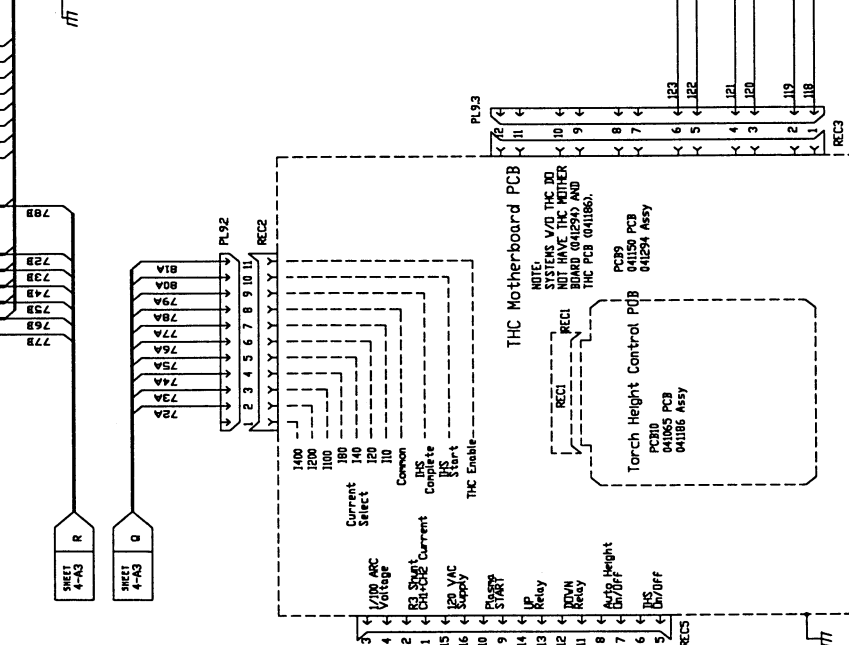
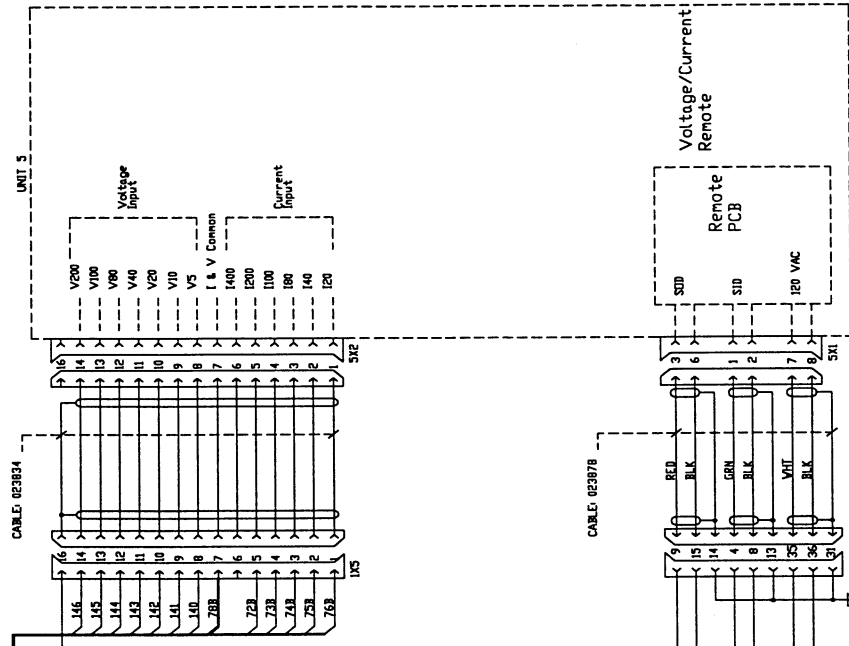
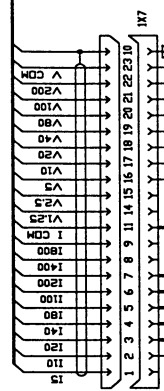
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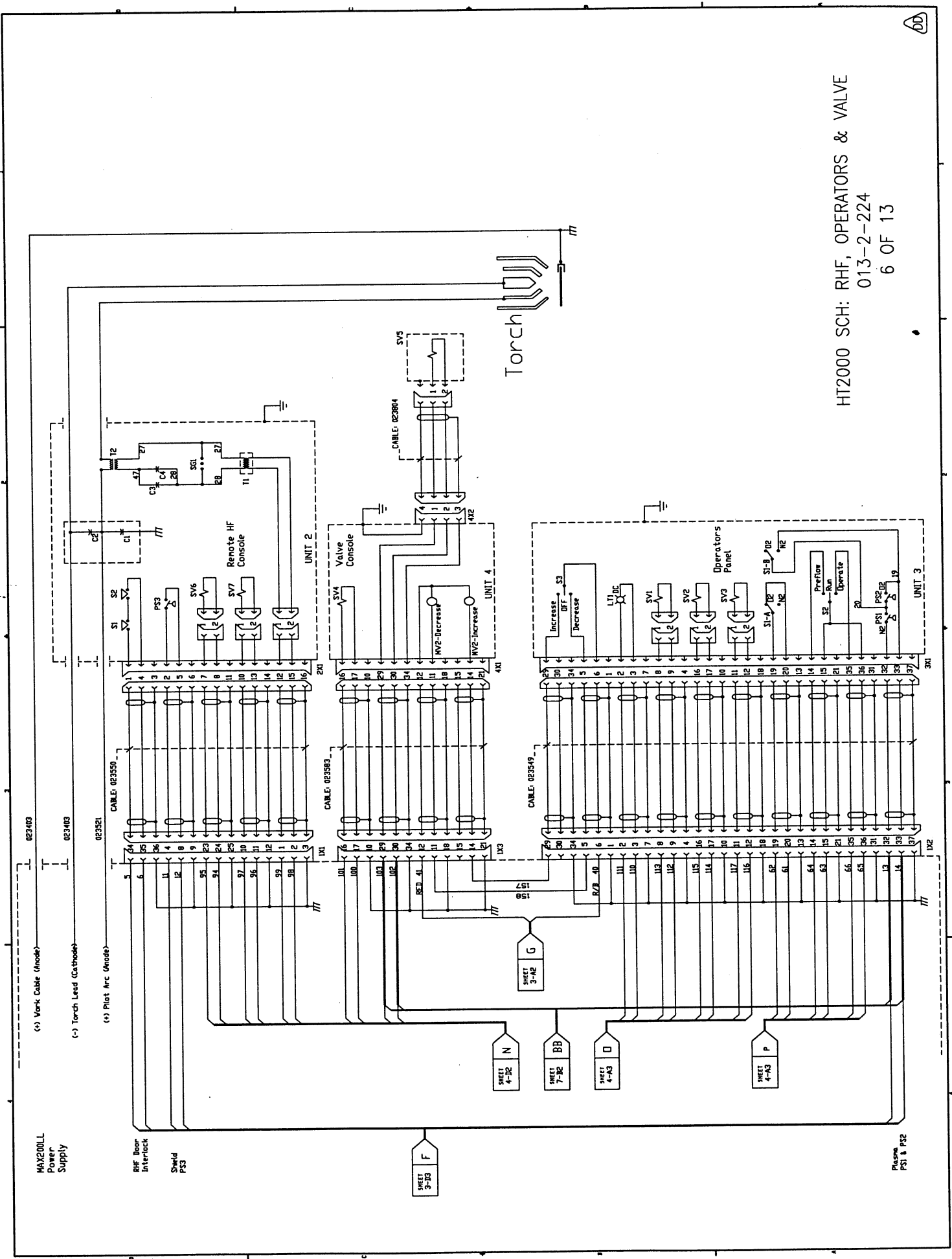
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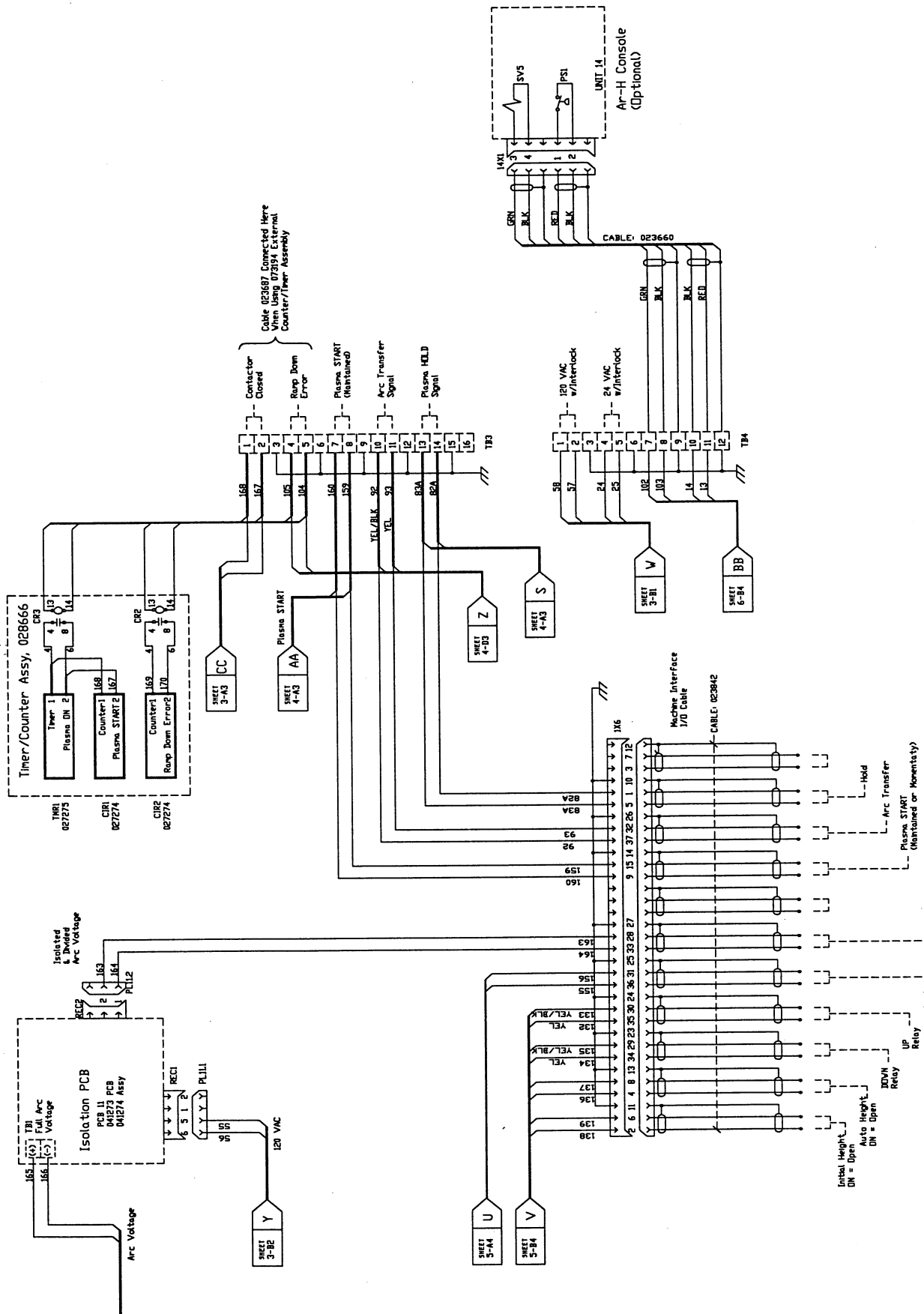
Mech Interface VAC or RCC Cable
023871





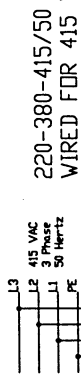
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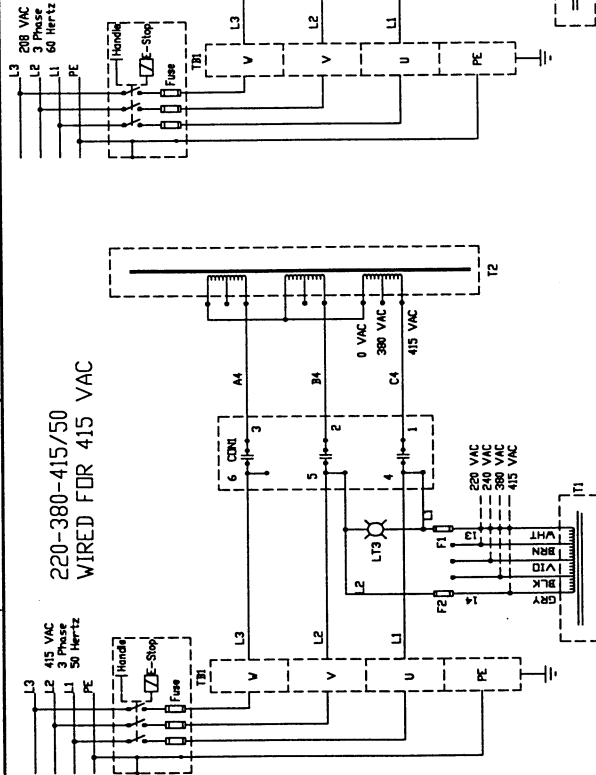


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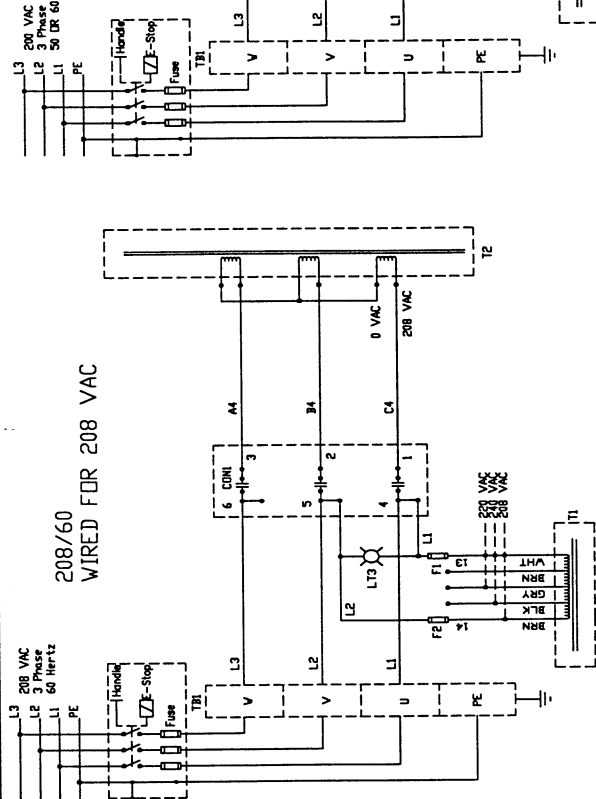




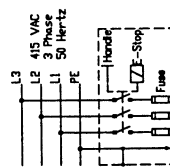
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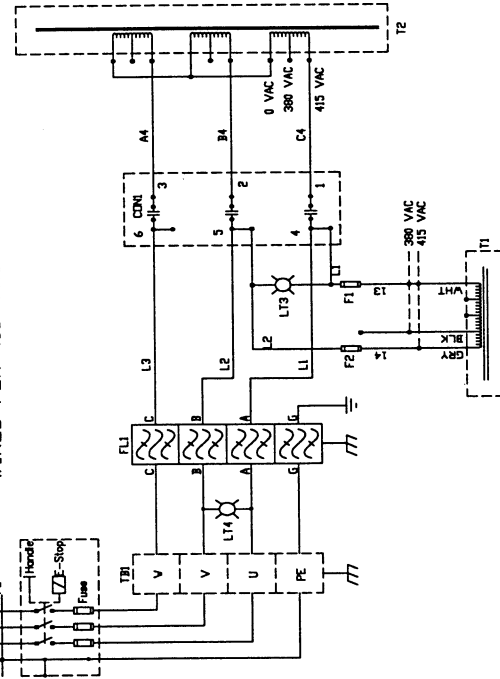
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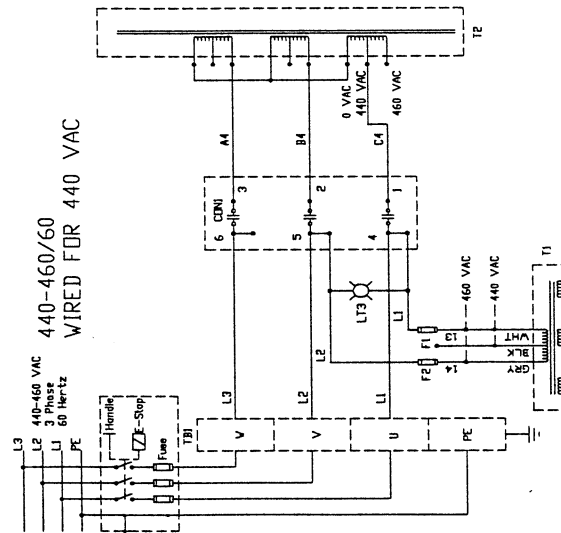
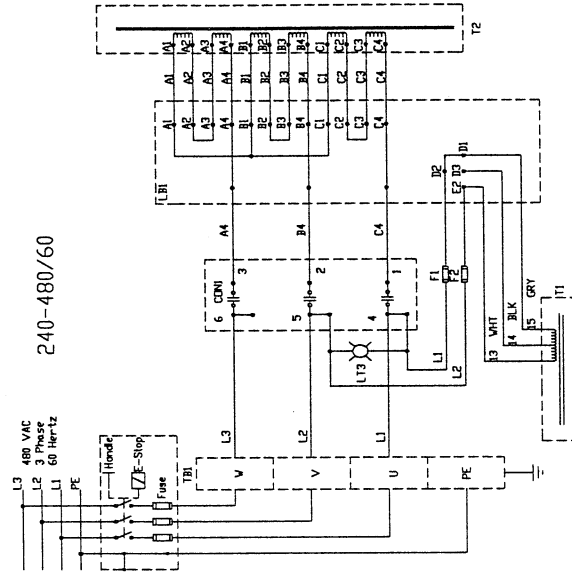
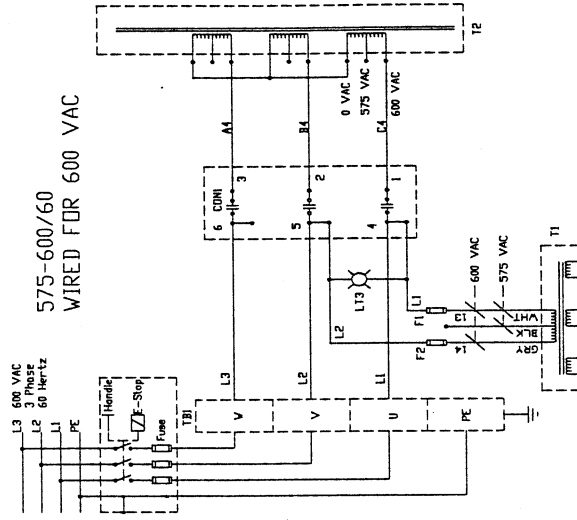
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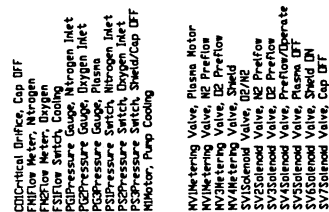


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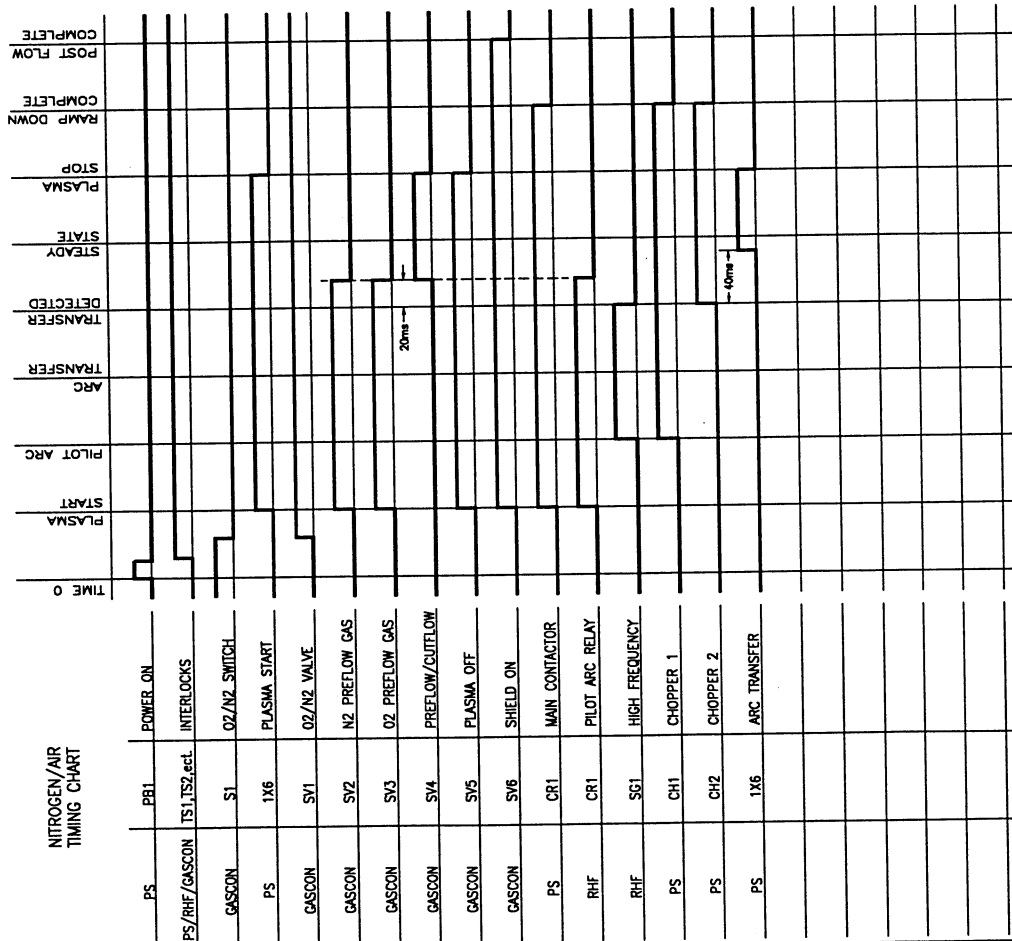
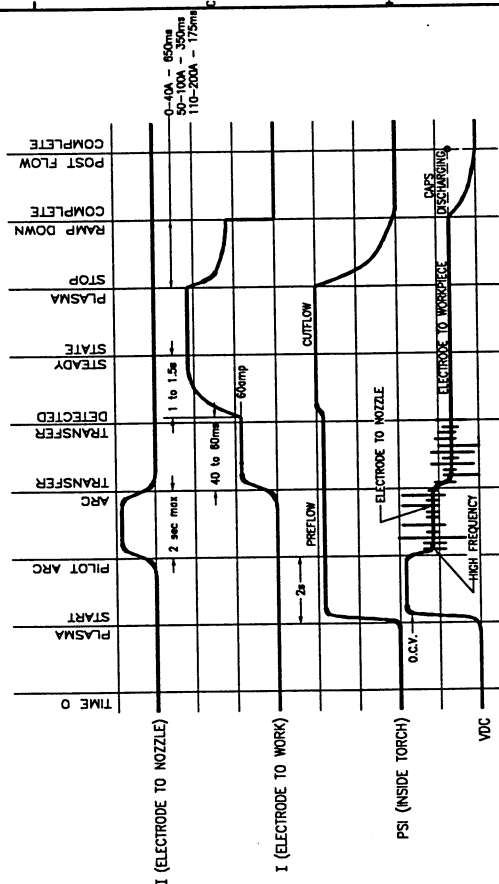


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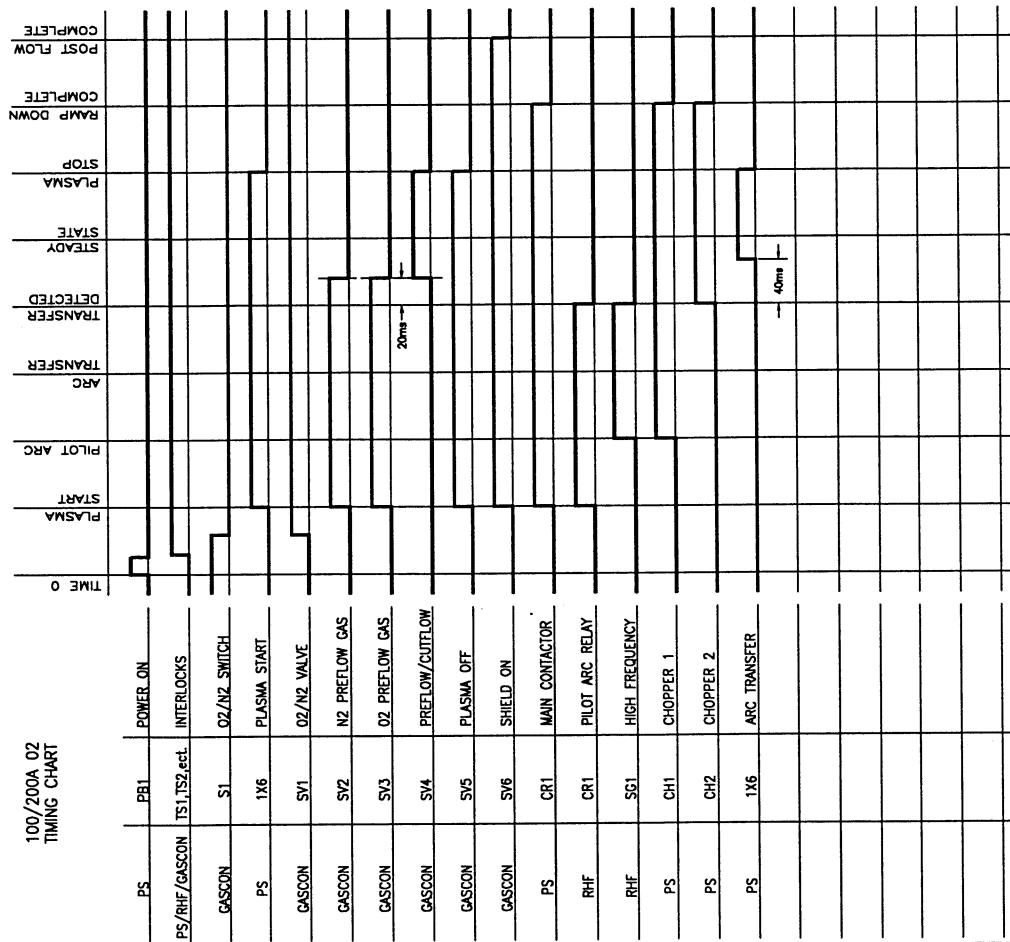
NITROGEN/AIR OPERATION CURRENT, PRESSURE, AND VOLTAGE WAVEFORMS



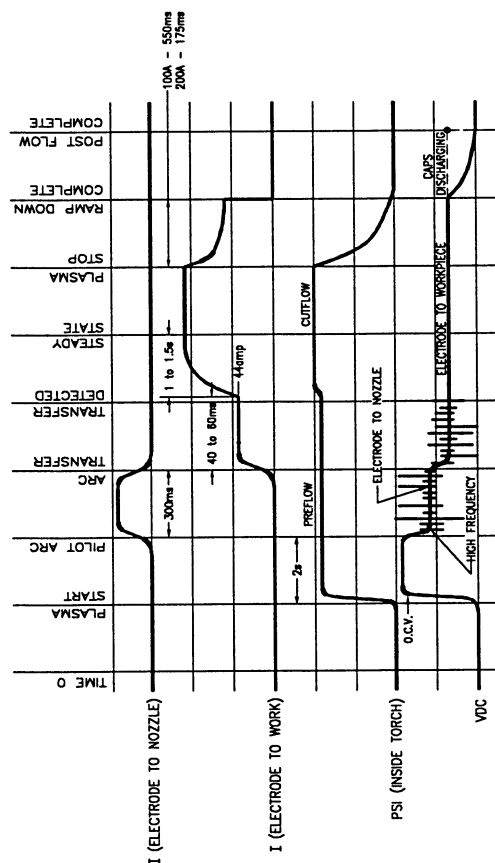
HT2000 TIMING CHART
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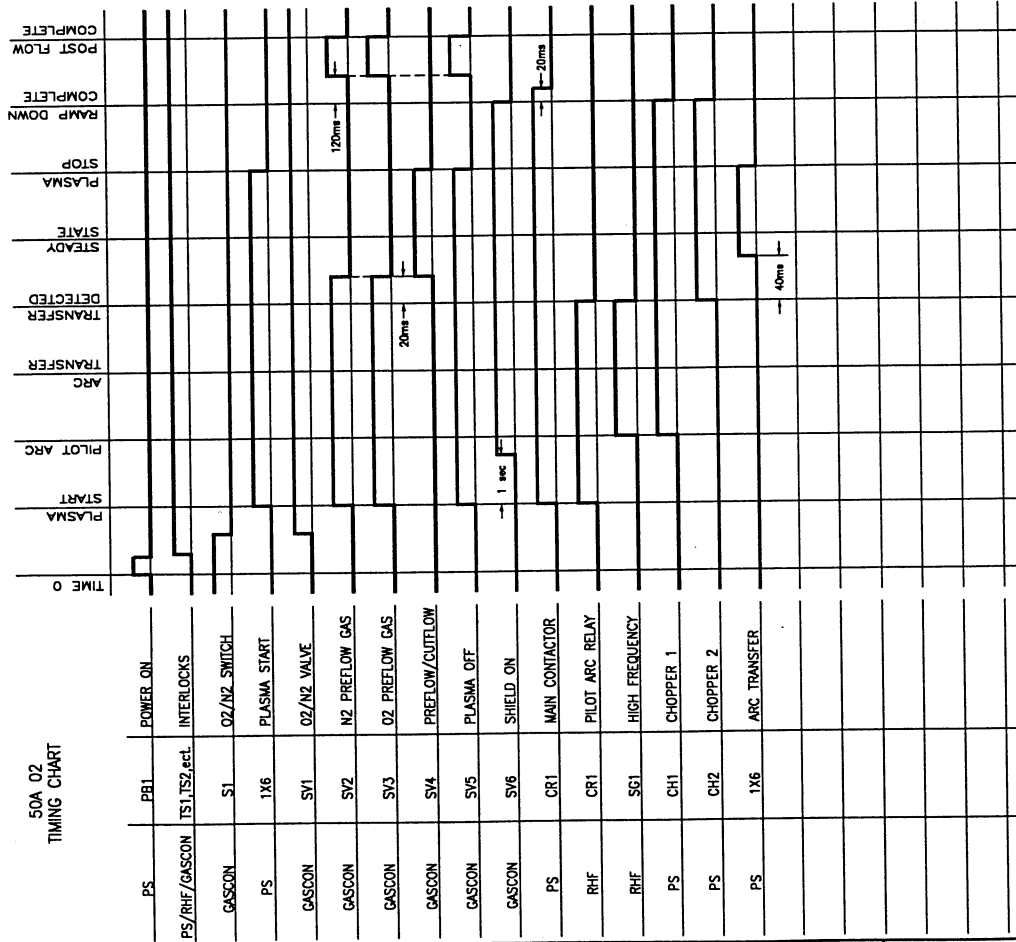
100/200A O2
TIMING CHART



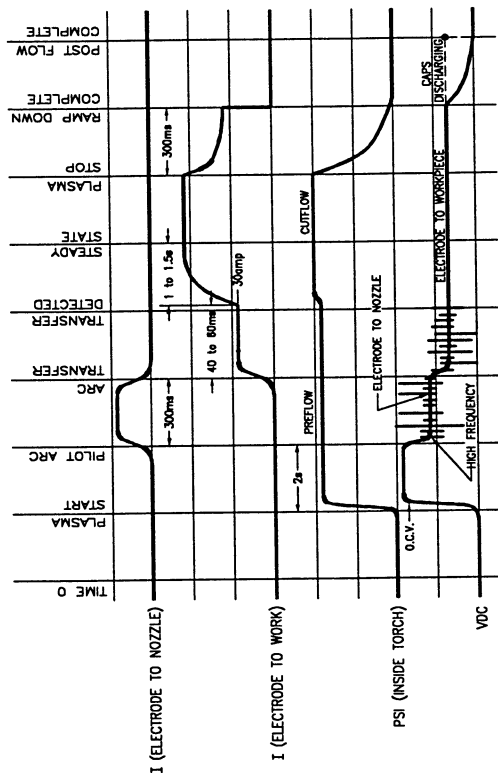
OXYGEN OPERATION
CURRENT, PRESSURE,
AND VOLTAGE WAVEFORMS



50A O2
TIMING CHART



OXYGEN OPERATION
CURRENT, PRESSURE,
AND VOLTAGE WAVEFORMS



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