F-15-296-E
Feb., 2004

INSTRUCTION MANUAL

PCM-500i
PLASMA ARC CUTTING PACKAGES

This manual provides complete instructions for the following PCM-500i cutting packages starting with Serial No. PORI612001:

ESAB P/N 36314 - 208/230 V, 1-Phase, 50/60 Hz
ESAB P/N 36316 - 400 V (380/415 V), 3-Phase, 50/60 Hz

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting, and Gouging," Form 52-529. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

Be sure this information reaches the operator.
You can get extra copies through your supplier.

ESAB® ESAB Welding & Cutting Products

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.

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SAFETY PRECAUTIONS

WARNING: These Safety Precautions are for your protection. They summarize precautionary information from the references listed in Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.

PROTECT YOURSELF AND OTHERS -- Some welding, cutting, and gouging processes are noisy and require ear protection. The arc, like the sun, emits ultraviolet (UV) and other radiation and can injure skin and eyes. Hot metal can cause burns. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, and goggles are also required.
2. Use a face shield fitted with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc when operating or observing operations. Warn bystanders not to watch the arc and not to expose themselves to the rays of the electric-arc or hot metal.
3. 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 against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
4. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing
5. Protect other personnel from arc rays and hot sparks with a suitable non-flammable partition or curtains.
6. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly far. Bystanders should also wear goggles over safety glasses.

FIRES AND EXPLOSIONS -- Heat from flames and arcs can start fires. Hot slag or sparks can also cause fires and explosions. Therefore:

1. Remove all combustible materials well away from the work area or cover the materials with a protective non-flammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
2. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.“
3. Do not weld, cut or perform other hot work until the workpiece has been completely cleaned so that there are no substances on the workpiece which might produce flammable or toxic vapors. Do not do hot work on closed containers. They may explode.
4. Have fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket, or portable fire extinguisher. Be sure you are trained in its use.
5. Do not use equipment beyond its ratings. For example, overloaded welding cable can overheat and create a fire hazard.
6. After completing operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
7. For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

ELECTRICAL SHOCK -- Contact with live electrical parts and ground can cause severe injury or death. DO NOT use AC welding current in damp areas, if movement is confined, or if there is danger of falling.

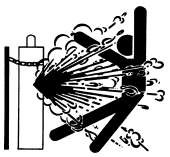
1. Be sure the power source frame (chassis) is connected to the ground system of the input power.
2. Connect the workpiece to a good electrical ground.
3. Connect the work cable to the workpiece. A poor or missing connection can expose you or others to a fatal shock.
4. Use well-maintained equipment. Replace worn or damaged cables.
5. Keep everything dry, including clothing, work area, cables, torch/electrode holder, and power source.
6. Make sure that all parts of your body are insulated from work and from ground.
7. Do not stand directly on metal or the earth while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
8. Put on dry, hole-free gloves before turning on the power.
9. Turn off the power before removing your gloves.
10. Refer to ANSI/ASC Standard Z49.1 (listed on next page) for specific grounding recommendations. Do not mistake the work lead for a ground cable.

ELECTRIC AND MAGNETIC FIELDS — May be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:

1. Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
2. Exposure to EMF may have other health effects which are unknown.
3. Welders should use the following procedures to minimize exposure to EMF:
   A. Route the electrode and work cables together. Secure them with tape when possible.
   B. Never coil the torch or work cable around your body.
   C. Do not place your body between the torch and work cables. Route cables on the same side of your body.
   D. Connect the work cable to the workpiece as close as possible to the area being welded.
   E. Keep welding power source and cables as far away from your body as possible.

FUMES AND GASES -- Fumes and gases, can cause discomfort or harm, particularly in confined spaces. Do not breathe fumes and gases. Shielding gases can cause asphyxiation. Therefore:

1. Always provide adequate ventilation in the work area by natural or mechanical means. Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium, or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes from these materials.
2. Do not operate near degreasing and spraying operations. The heat or arc rays can react with chlorinated hydrocarbon vapors to form phosgene, a highly toxic gas, and other irritant gases.
3. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.
4. Refer to ANSI/ASC Standard Z49.1 (see listing below) for specific ventilation recommendations.
5. **WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code §25249.5 et seq.)**



CYLINDER HANDLING -- Cylinders, if mishandled, can rupture and violently release gas. Sudden rupture of cylinder, valve, or relief device can injure or kill. Therefore:

1. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adaptors. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting regulator to a compressed gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, undercarriages, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
3. When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, and flames. Never strike an arc on a cylinder.
5. For additional information, refer to CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", which is available from Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

EQUIPMENT MAINTENANCE -- Faulty or improperly maintained equipment can cause injury or death. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are qualified to perform such work.
2. Before performing any maintenance work inside a power source, disconnect the power source from the incoming electrical power.
3. Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in faulty condition.
4. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres and inclement weather.
5. Keep all safety devices and cabinet covers in position and in good repair.
6. Use equipment only for its intended purpose. Do not modify it in any manner.

ADDITIONAL SAFETY INFORMATION -- For more information on safe practices for electric arc welding and cutting equipment, ask your supplier for a copy of "Precautions and Safe Practices for Arc Welding, Cutting and Gouging", Form 52-529.

The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, are recommended to you:

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting"
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding"
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting"
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting"
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding“
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding"“
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."

MEANING OF SYMBOLS - As used throughout this manual: Means Attention! Be Alert! Your safety is involved.

DANGER **Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.**

WARNING **Means potential hazards which could result in personal injury or loss of life.**

CAUTION **Means hazards which could result in minor personal injury.**

PRÉCAUTIONS DE SÉCURITÉ

AVERTISSEMENT: Ces règles de sécurité ont pour objet d' assurer votre protection. Veillez à lire et à observer les précautions énoncées ci-dessous avant de monter l' équipement ou de commercer à l'utiliser. Tout défaut d'observation de ces précautions risque d'entraîner des blessures graves ou mortelles.

1. PROTECTION INDIVIDUELLE-- Les brûlures de la peau et des yeux dues au rayonnement de l'arc électrique ou du métal incandescent, lors du soudage au plasma ou à l'électrode ou lors du gougeage à l'arc, peuvent s'avérer plus graves que celles résultant d'une exposition prolongée au soleil. Aussi convient-il d'observer les précautions suivantes:

a. Portez un écran facial adéquat muni des plaques protectrices et des verres filtrants appropriés afin de vous protéger les yeux, le visage, le cou et les oreilles des étincelles et du rayonnement de l'arc électrique lorsque vous effectuez des soudures ou des coupes ou lorsque vous en observez l'exécution.
AVERTISSEZ les personnes se trouvant à proximité de façon à ce qu'elles ne regardent pas l'arc et à ce qu'elles ne s'exposent pas à son rayonnement, ni à celui du métal incandescent.

b. Portez des gants ignifugés à crispins, une tunique épaisse à manches longues, des pantalons sans rebord, des chaussures à embout d'acier et un casque de soudage ou une calotte de protection, afin d'éviter d'exposer la peau au rayonnement de l'arc électrique ou du métal incandescent. Il est également souhaitable d'utiliser un tablier ininflammable de façon à se protéger des étincelles et du rayonnement thermique.

c. Les étincelles ou les projections de métal incandescent risquent de se loger dans des manches retroussées, des bords relevés de pantalons ou dans des poches. Aussi convient-il de garder boutonnés le col et les manches et de porter des vêtements sans poches à l'avant.

d. Protégez des étincelles et du rayonnement de l'arc électrique les autres personnes travaillant à proximité à l'aide d'un écran ininflammable adéquat.

e. Ne jamais omettre de porter des lunettes de sécurité lorsque vous vous trouvez dans un secteur où l'on effectue des opérations de soudage ou de coupage à l'arc. Utilisez des lunettes de sécurité à écrans ou verres latéraux pour piquer ou meûler le laitier. Les piquetures incandescentes de laitier peuvent être projetées à des distances considérables. Les personnes se trouvant à proximité doivent également porter des lunettes de protection.

f. Le gougeage à l'arc et le soudage à l'arc au plasma produisent un niveau de bruit extrêmement élevé (de 100 à 114 dB) et exigent par conséquent l'emploi de dispositifs appropriés de protection auditive.

2. PRÉVENTION DES INCENDES-- Les projections de laitier incandescent ou d'étincelles peuvent provoquer de graves incendies au contact de matériaux combustibles solides, liquides ou gazeux. Aussi faut-il observer les précautions suivantes:

a. Éloigner suffisamment tous les matériaux combustibles du secteur où l'on exécute des soudures ou des coupes à l'arc, à moins de les recouvrir complètement d'une bâche non-inflammable. Ce type de matériaux comprend notamment le bois, les vêtements, la sciure, l'essence, le kérosène, les peintures, les solvants, le gaz naturel, l'acétylène, le propane et autres substances combustibles semblables.

b. Les étincelles ou les projections de métal incandescent peuvent tomber dans des fissures du plancher ou dans des ouvertures des murs et y déclencher une ignition lente cachée. Veiller à protéger ces ouvertures des étincelles et des projections de métal.

c. N'exécutez pas de soudures, de coupes, d'opérations de gougeage ou autres travaux à chaud à la surface de barils, bidons, réservoirs ou autres contenants usagés, avant de les avoir nettoyés de toute trace de substance susceptible de produire des vapeurs inflammables ou toxiques.

d. En vue d'assurer la prévention des incendies, il convient de disposer d'un matériel d'extinction prêt à servir immédiatement, tel qu'un tuyau d'arrosage, un seau à eau, un seau de sable ou un extincteur portatif.

e. Une fois le travail à l'arc terminé, inspectez le secteur de façon à vous assurer qu'aucune étincelle ou projection de métal incandescent ne risque de provoquer ultérieurement un feu.

3. CHOC ÉLECTRIQUE-- Le gougeage à l'arc et à l'arc au plasma exige l'emploi de tensions à vide relativement importantes; or, celles-ci risquent de causer des dommages corporels graves et même mortels en cas d'utilisation inadéquate. La gravité du choc électrique reçu dépend du chemin suivi par le courant à travers le corps humain et de son intensité.

a. Ne laissez jamais de surfaces métalliques sous tension venir au contact direct de la peau ou de vêtements humides. Veillez à porter des gants bien secs.

b. Si vous devez effectuer un travail sur une surface métallique ou dans un secteur humide, veillez à assurer votre isolation corporelle en portant des gants secs et des chaussures à semelles de caoutchouc et en vous tenant sur une planche ou une plate-forme sèche.

c. Mettez toujours à la terre le poste de soudage/coupage en le reliant par un câble à une bonne prise de terre.

d. N'utilisez jamais de câbles usés ou endommagés. Ne surchargez jamais le câble. Utilisez toujours un équipement correctement entretenu.

e. Mettez l'équipement hors tension lorsqu'il n'est pas en service. une mise à la masse accidentelle peut en effet provoquer une surchauffe de l'équipement et un danger d'incendie. Ne pas enrouler ou passer le câble autour d'une partie quelconque du corps.

f. Vérifiez si le câble de masse est bien relié à la pièce en un point aussi proche que possible de la zone de travail. Le branchement des câbles de masse à l'ossature du bâtiment ou en un point éloigné de la zone de travail augmente en effet le risque de passage d'un courant de sortie par des chaînes delevage

des câbles de grue ou divers chemins électriques.

g. Empêchez l'apparition de toute humidité, notamment sur vos vêtements, à la surface de l'emplacement de travail, des câbles, du porte-électrode et du poste de soudage/coupage. Réparez immédiatement toute fuite d'eau.

4. VENTILATION-- La respiration prolongée des fumées résultant des opérations de soudage/coupage, à l'intérieur, d'un local clos, peut provoquer des malaises et des dommages corporels. Aussi convient-il d'observer les précautions suivantes:

a. Assurez en permanence une aération adéquate de l'emplacement de travail en maintenant une ventilation naturelle ou à l'aide de moyens mécaniques. N'effectuez jamais de travaux de soudage ou de coupage sur des matériaux de zinc, de plomb, de beryllium ou de cadmium en l'absence de moyens mécaniques de ventilation capables d'empêcher l'inhalation des fumées dégagées par ces matériaux.

b. N'effectuez jamais de travaux de soudage ou de coupage à proximité de vapeurs d'hydrocarbure chloré résultant d'opérations voisines de dégraissage ou de pulvérisation. La chaleur dégagée ou le rayonnement de l'arc peut déclencher la formation de phosgène -- gaz particulièrement toxique -- et d'autres gaz irritants, à partir des vapeurs de solvant.

c. Une irritation momentanée des yeux, du nez ou de la gorge constatée au cours de l'utilisation de l'équipement dénote un défaut de ventilation. Arrêtez-vous de travailler afin de prendre les mesures nécessaires à l'amélioration de la ventilation. Ne poursuivez pas l'opération entreprise si le malaise persiste.

d. Certaines commandes comportent des canalisations où circule de l'hydrogène. L'armoire de commande est munie d'un ventilateur destiné à empêcher la formation de poches d'hydrogène, lesquelles présentent un danger d'explosion; ce ventilateur ne fonctionne que si l'interrupteur correspondant du panneau avant se trouve placé en position ON (Marche). Veillez à manœuvrer cette commande en vérifiant si le couvercle est bien en place, de façon à assurer l'efficacité de la ventilation ainsi réalisée. Ne jamais débrancher le ventilateur.

e. Les fumées produites par l'opération de soudage ou de coupage peuvent s'avérer toxiques. Aussi est-il nécessaire de disposer en permanence d'un dispositif adéquat de ventilation de type aspirant, afin d'éliminer du voisinage de l'opérateur tout dégagement de fumée visible.

f. Consultez les recommandations particulières en matière de ventilation indiquées à l'alinéa 6 de la norme Z49.1 de l'AWS.

5. ENTRETIEN DE L'ÉQUIPEMENT-- Un équipement entretenu de façon défectueuse ou inadéquate risque non seulement de réaliser un travail de mauvaise qualité mais, chose plus grave encore, d'entraîner des dommages corporels graves, voire mortels en déclenchant des incendies ou des chocs électriques. Observez par conséquent les précautions suivantes:

a. Efforcez-vous de toujours confier à un personnel qualifié l'installation, le dépannage et l'entretien du poste de soudage et de coupage. N'effectuez aucune réparation électrique sur l'équipement à moins d'être qua-lifié à cet effet.

b. Ne procédez jamais à une tâche d'entretien quelconque à l'intérieur du poste de soudage/coupage, avant d'avoir débranché l'alimentation électrique.

c. Maintenez en bon état de fonctionnement les câbles, le câble de masse, les branchements, le cordon d'alimentation et le poste de soudage/coupage. N'utilisez jamais le poste ou l'équipement s'il présente une défectuosité quelconque.

d. Prenez soin du poste de soudage et de coupage et des équipements accessoires. Gardez-les à l'écart des sources de charleur, notamment des fours, de l'humidité, des flaques d'eau maintenez-les à l'abri des traces d'huile ou de graisse, des atmosphères corrosives et des intempéries.

e. Laissez en place tous les dispositifs de sécurité et tous les panneaux de l'armoire de commande en veillant à les garder en bon état.

f. Utilisez le poste de soudage/coupage conformément à son usage prévu et n'effectuez aucune modification.

6. INFORMATIONS COMPLÉMENTAIRES RELATIVES À LA SÉCURITÉ--

Pour obtenir des informations complémentaires sur les règles de sécurité à observer pour le montage et l'utilisation d'équipements de soudage et de coupage électriques et sur les méthodes de travail recommandées, demandez un exemplaire du livret N° 52529 "Precautions and Safe Practices for Arc Welding, Cutting and Gouging" publié par ESAB. Nous conseillons également de consulter les publications sui-vantes, tenues à votre disposition par l'American Welding Society, 550 N.W. LeJuene Road, Miami, FL 32126:

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.

f. "Recommended Safe Practices for Air Carbon Arc Gouging and Cutting" AWS-C5. 3.

g. "Code For Safety in Welding and Cutting" CSA-Standard W117. 2.

1.1 GENERAL

The PCM-500i is a compact, completely self-contained plasma cutting system. As shipped, the system is fully assembled and ready to cut after being connected to input power and a source of prefiltered compressed air (90-150 psi). The PCM-500i package uses the PT-31XL torch to deliver cutting power for materials up to 1/2 inch thick or for severing up to to 5/8-in. thick. Refer to the following paragraphs for descriptions of the PCM-500i packages available as well as performance specifications.

WARNING

Do not use any torch with this power source other than the ESAB brand PT-31XL torch. Serious injury may occur if used with any other torch.

1.2 SCOPE

The purpose of this manual is to provide the operator with all the information required to install and operate the PCM-500i plasma arc cutting package. Technical reference material is also provided to assist in troubleshooting the cutting package.

1.3 PACKAGES AVAILABLE

Table 1-1 lists available PCM-500i packages.

Table 1-1. PCM-500i Cutting Packages

Each PCM-500i Plasma Arc Cutting Package includes a Power Source, PT-31XL Torch with 25-ft. (8m) service lines, and Torch Spare Parts Kit as listed.

Contents of Package	PCM-500i Cutting Package, P/N 36314	36316
PCM-500i Power Source with Regulator and Work Cable 208/230 Vac, 1-phase, P/N 36304	●	
400 Vac, 3-phase, P/N 36306		●
PT-31XL Torch Assembly, 25-ft (8m)*, P/N 21985	●	●
Spare Parts Kit (see Table 1-2 for contents) , P/N 0558003301	●	●

* PT-31XL torch assembly has front end parts assembled.

Table 1-2. PT-31XL Spare Parts Kit Contents

Description	Part Number	Quantity
Spare Parts Kit P/N 0558003301 includes:		
35/40 A Nozzle	20860	3
Electrode	20862	2
Swirl Baffle	20463	1
Heat Shield	20282	1

NOTE: PT-31XL Torch Assembly P/N 21985 is supplied with the nozzle, electrode, swirl baffle, and heat shield assembled.

1.4 SPECIFICATIONS

Refer to Tables 1-3, 1-4, and Figures 1-1 and 1-2 for PCM-500i technical specifications.

Table 1-3. PCM-500i Specifications

Rated Output	40% Duty Cycle*	35 A @ 120 V dc
	60% Duty Cycle*	30 A @ 120 V dc
	100% Duty Cycle*	22 A @ 120 V dc
Output Current Range		10 to 35 Amperes
Open Circuit Voltage		265 V dc Nominal
Rated Primary Input @ 35 A @ 120 VDC Output	208/230 VAC, 1-Phase	30/25 A, 50/60 Hz
	380/415 VAC, 3-Phase	8/7.5 A/Phase, 50/60 Hz
Power Factor @ 35 Amperes Output		81% (1-Phase)/94% (3-Phase)
Efficiency @ 35 Amperes Output		90% (Typical)
Current Capacity	PT-31XL	50 A DCSP
Air Requirements	PT-31XL	250 cfh @ 80 psi
Dimensions of PCM-500i	Length Height Width	19.3-in. (490 mm) 17.8-in. (452 mm)** 8.6-in. (218 mm)
Weight (less torch, work cable)		50 lbs (23 kg)

* Duty cycle is based on a 10-minute period; therefore, a 40% duty cycle means the machine may operate for 4 minutes with a cool down period of 6 minutes; a 60% duty cycle means the machine may operate for 6 minutes with a cool down period of 4 minutes; a 100% duty cycle means the machine may operate continuously.

** Includes 2.2-in. (56 mm) high handle.

Table 1-4. PT-31XL Torch Specifications

PT-31XL Torch
Current Capacity ..... 50A DCSP
Shipping Wgt. ..... 2 lbs (1 kg)
Length of Service Lines ..... 25-ft. (7.6 m)

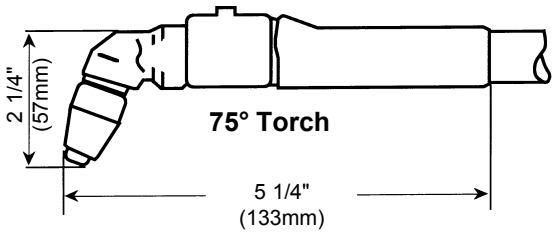


Figure 1-1. PT-31XL Dimensions

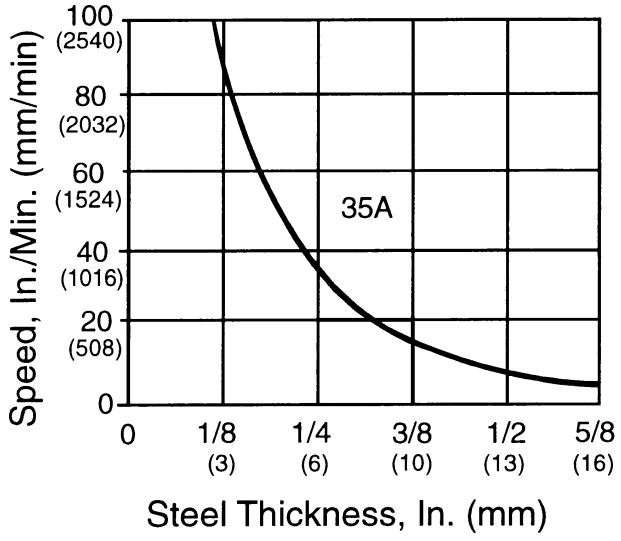


Figure 1-2. PT-31XL Cutting Performance

1.5 OPTIONAL ACCESSORIES

1. **Torch Wrap/Spare Parts Kit Holder, P/N 33952GY.** Units now have 4 mounting holes on left side for mounting this accessory holder starting around October, 1996.
2. **Wheel Cart, P/N 34324.** This 5 7/8" high cart has front swivel casters and rear casters to make it easier to roll the PCM-500i around the job site.
3. **Spare Parts Kits, P/N 19676.** Recommended when cutting below 20 amps. See Section 3.3 and Figure 3-2A. The kit includes; 4-Heat Sheld, P/N 20282; 4-Nozzle, P/N 19667; 4-Electrode, P/N 18205; 1-Swirl Baffle, P/N 18785; and 1 oz. Lubricant, P/N 17672.

2.1 GENERAL

Proper installation can contribute materially to the satisfactory and trouble-free operation of the PCM-500i cutting package. It is suggested that each step in this section be studied carefully and followed as closely as possible.

2.2 EQUIPMENT REQUIRED

A source of clean, prefiltered dry air that supplies 250 cfh at 80 psig is required for the cutting operation. The air supply should not exceed 150 psig (the maximum inlet pressure rating of the air filter-regulator supplied with the package).

2.3 LOCATION

Adequate ventilation is necessary to provide proper cooling of the PCM-500i and the amount of dirt, dust, and excessive heat to which the equipment is exposed, should be minimized. There should be at least one foot of clearance between the PCM-500i power source and wall or any other obstruction to allow freedom of air movement through the power source.

Installing or placing any type of filtering device will restrict the volume of intake air, thereby subjecting the power source internal components to overheating. The warranty is void if any type of filter device is used.

2.4 INSPECTION

A. Remove the shipping container and all packing material and inspect for evidence of concealed damage which may not have been apparant upon receipt of the PCM-500i. Notify the carrier of any defects or damage at once.

B. Check container for any loose parts prior to disposing of shipping materials.

C. Check air louvers and any other openings to ensure that any obstruction is removed.

2.5 PRIMARY ELECTRICAL INPUT CONNECTIONS (FIGURE 2-1)

⚠ WARNING

ELECTRIC SHOCK CAN KILL! Precautionary measures should be taken to provide maximum protection against electrical shock. Be sure that all power is off by opening the line (wall) disconnect switch and by unplugging the power cord to the unit when connections are made inside of the power source.

CAUTION

Be sure that the power source is properly configured for your input power supply. DO NOT connect a power source configured for 208/230 V to a 460 V input power supply. Damage to the machine may occur.

The PCM-500i power source operating on 230 V, 1-phase input power is equipped with a 10-ft, 3-conductor cable with plug. An optional mating receptacle (P/N 674540) is available. A line (wall) disconnect switch with a 40-ampere fuse or circuit breaker should be provided at the main power panel. The cable connecting the disconnect switch to the receptacle should include three (two power and one ground) No. 10 AWG insulated conductors.

⚠ WARNING

The chassis must be connected to an approved electrical ground. Failure to do so may result in electrical shock, severe burns or death.

NOTE: If using 208 V input power, the PCM-500i must be reconnected for 208 V use as directed in Section 2.7 and Fig. 2-2.

For all other PCM-500i power sources, they are equipped with a 10-ft, 4-conductor input power cord with no plug for connecting to 3-phase power. A line (wall) disconnect switch, with proper sized fuse or circuit breaker (see Table 2.1), should be provided at the main power panel. The customer may connect the input power cord directly to the disconnect switch or purchase a proper plug and receptacle from a local electrical supplier. The cable connecting the disconnect switch to the receptacle should include four (three power and one ground) No. 12 AWG insulated conductors.

2.6 SECONDARY (OUTPUT) CONNECTIONS (REFER TO FIG. 2-1)

WARNING

Before making any connections to the power source output terminals, make sure that all primary input power to the power source is deenergized (off) at the main disconnect switch and that the input power cable is unplugged.

1. For operator safety, the torch connections are located on the output terminal board behind the lower portion of the front panel. Remove access door to output terminal board from right panel of power source.
2. Thread the power cable and switch lead of the PT-31XL through the right open bushing of the front panel. Connect power cable to the torch fitting (left-hand threads) and plug in the switch lead to the torch switch receptable on the output terminal board. Make sure the power cable connection is wrench-tight. Make sure plug of switch lead is firmly locked in place.
3. Reassemble the access door to the power source.
4. Connect your air supply to the inlet connection of the filter-regulator.
5. Clamp the work cable to the workpiece. Be sure the workpiece is connected to an approved earth ground with a properly sized ground cable.

Table 2.1. Recommended Sizes for Input Conductors and Line Fuses

Rated Input			Input & GND Conductor CU/AWG*	Fuse Size Amps
Volts	Amp	Phases		
208	30	1	No. 10	40
230	25	1	No. 10	40
380	8/ph.	3	No. 12	15
415	7.5/ph.	3	No. 12	15

* Sized per National Code for 80°C rated copper conductors @ 30°C ambient. Not more than three conductors in raceway or cable. Local codes should be followed if they specify sizes other than those listed above.

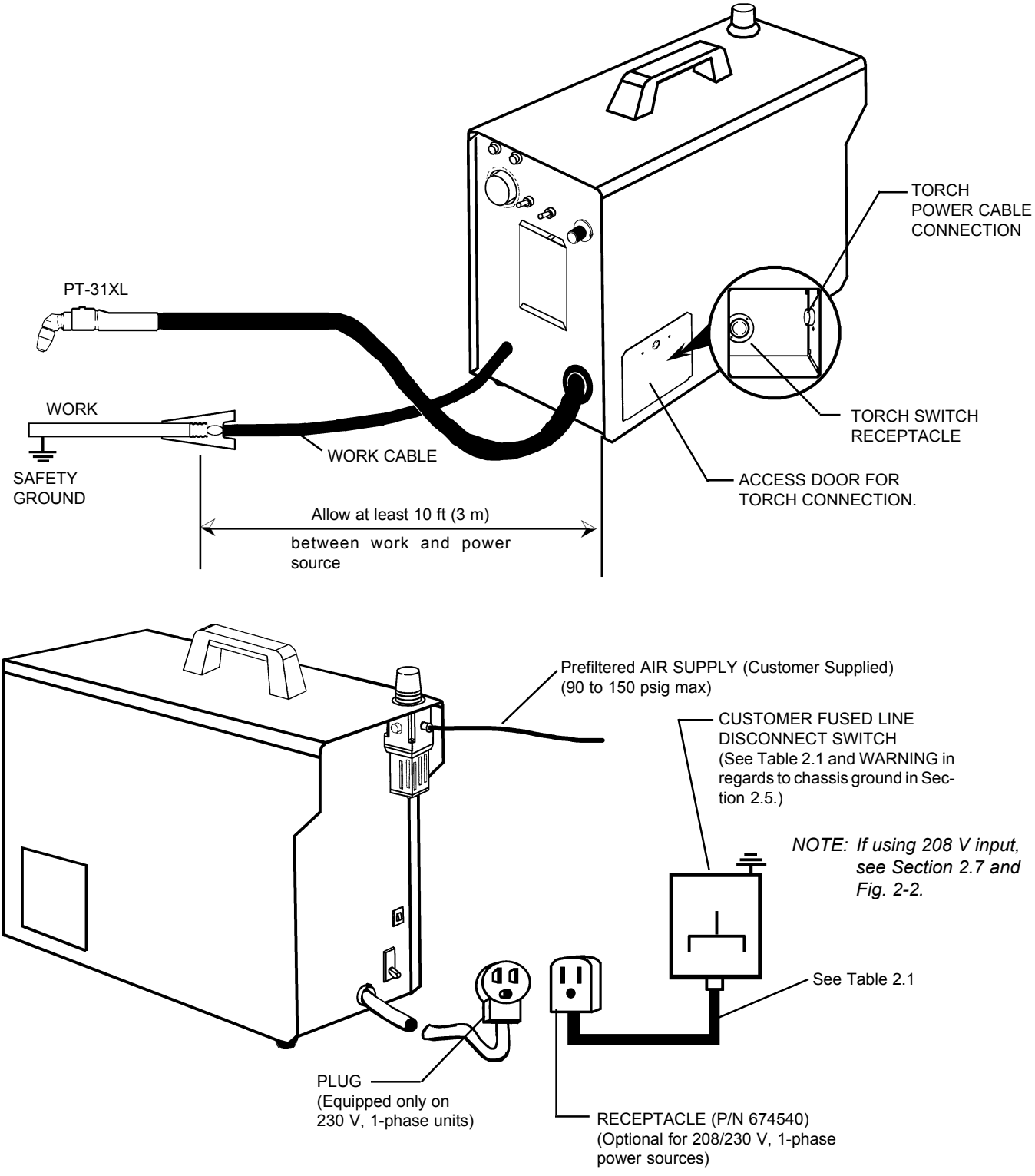


Figure 2-1. PCM-500i Interconnection Diagram

2.7 CONNECTING PCM-500I FOR 208 VAC INPUT

WARNING

ELECTRIC SHOCK CAN KILL! Precautionary measures should be taken to provide maximum protection against electrical shock. Be sure that all power is off by opening the line (wall) disconnect switch and by unplugging the power cord to the unit when reconnecting for 208 Vac input.

The PCM-500i power source with 208/230 vac, 1-phase input capability is factory set for 230 vac input. If using 208 vac input, the PCM-500i must be reconnected as follows before connecting to your input power.

1. Remove cover from the PCM-500i power source.
2. Locate the input bridge (IBR) and the two-position terminal block on the left side of the unit towards the rear panel (see Fig. 1). Locate the gray wire connected to TB5-2 and to IBR terminal "R". For 108 Vac input, disconnect the gray wire from TB5-2 and then firmly connect it to TB5-1.
3. Locate the output bridge (D1) on the left side towards the front panel (see fig. 2). Disconnect and swap leads X2 and X3 from the main transformer. For 208 Vac input, X2 is connected to TB3 and X3 is connected to terminal 3 of D1. Make sure the connections are firmly tightened.
4. Leave all other wires the same.
5. Reinstall cover and connect the PCM-500i to the 208vac input power.

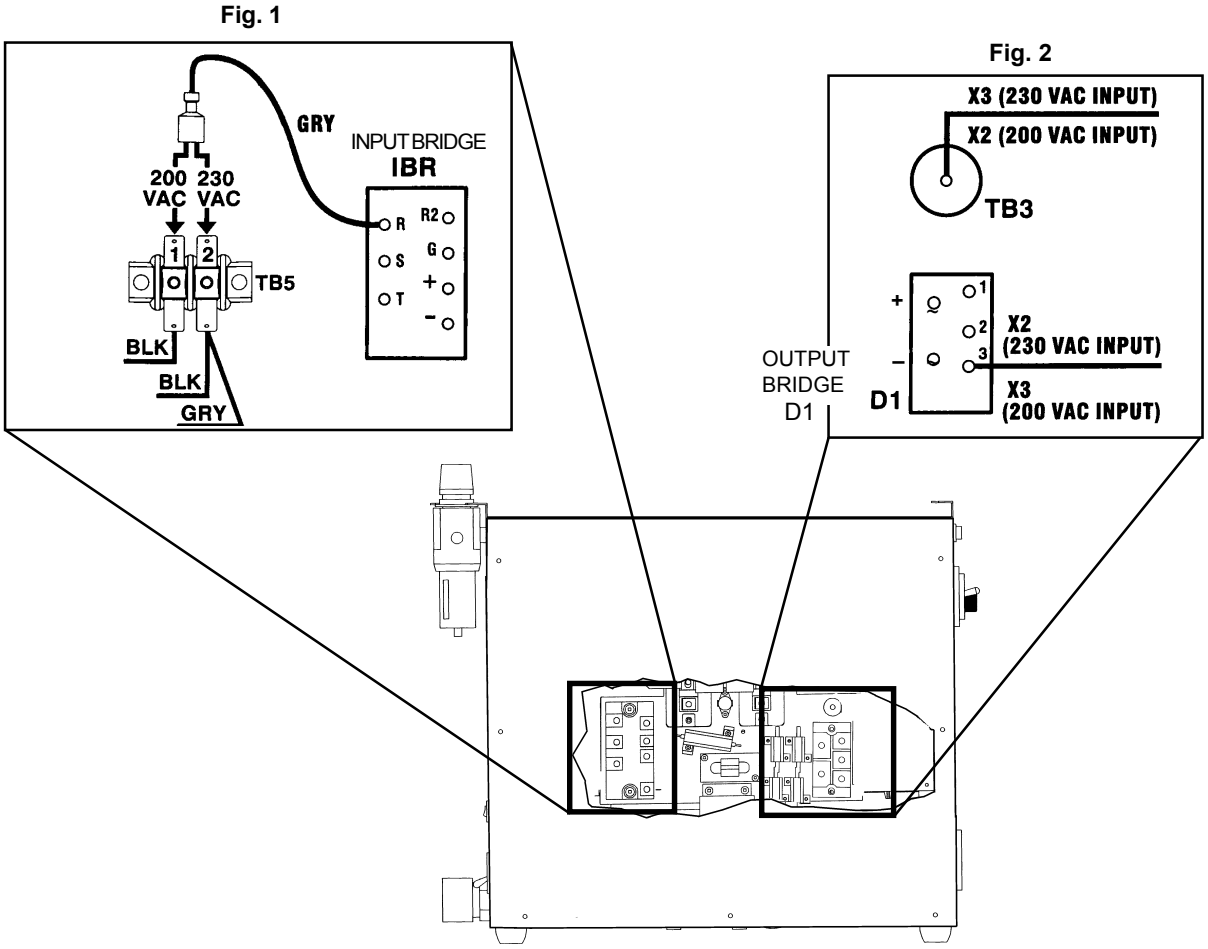
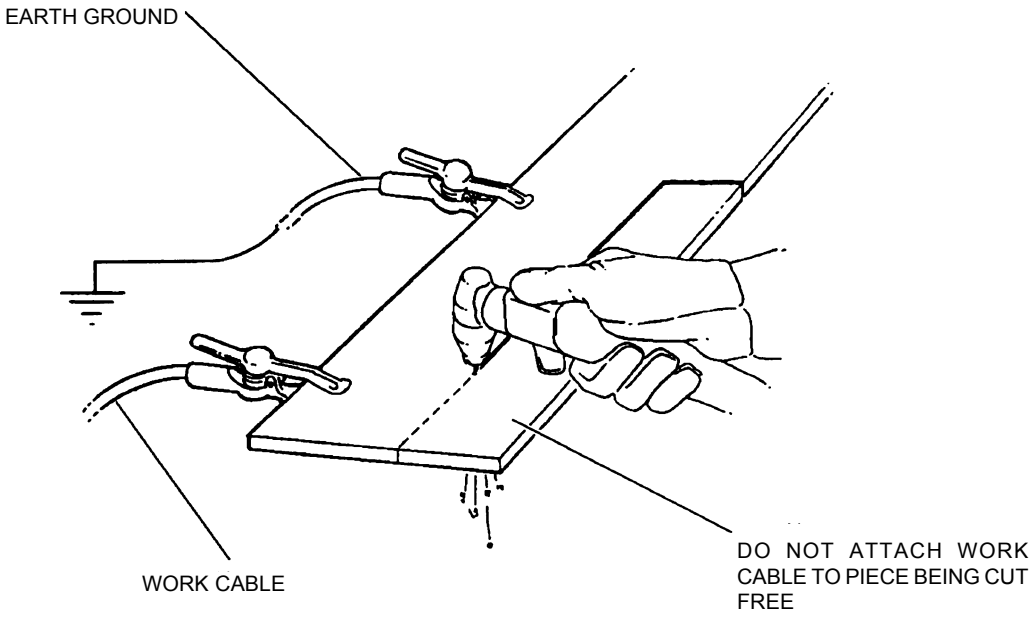


Figure 2.2. Original Factory Setup for 230 Vac Input on Power Source with 208/230 Vac Input Power Capability



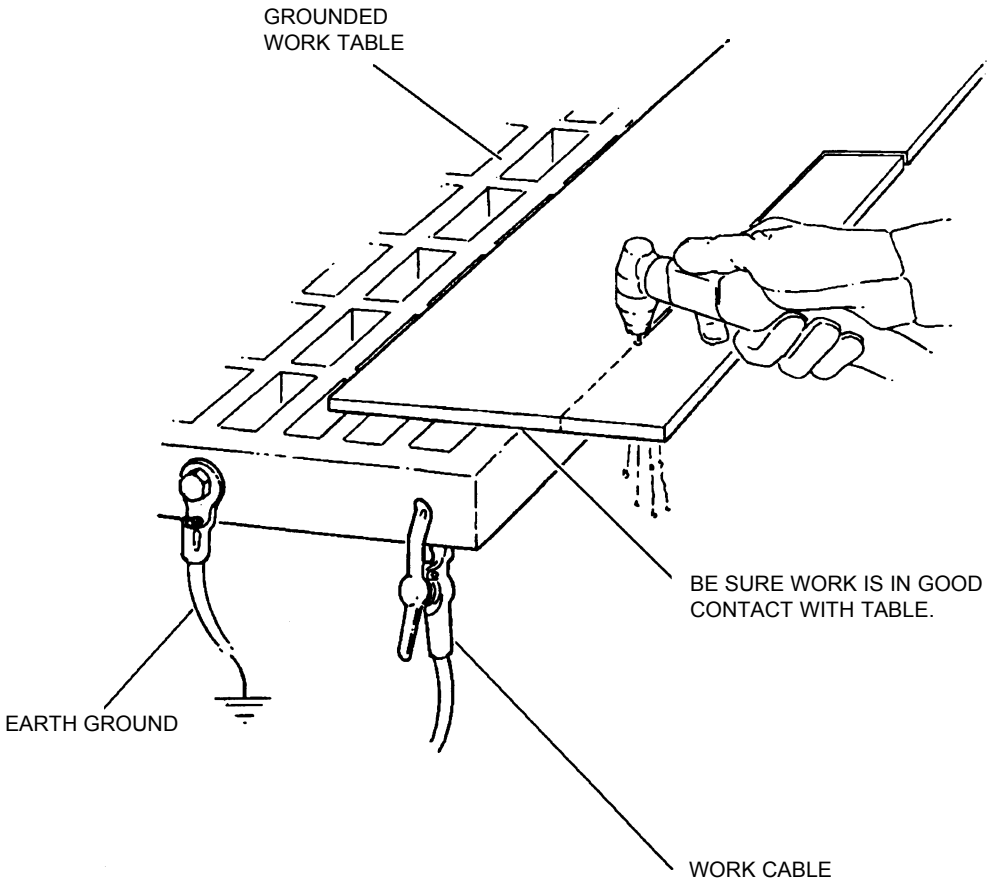


Figure 2-3. Ground and Work Cable Connections

3.1 OPERATION

WARNING

ELECTRIC SHOCK can kill.

- **Do NOT operate the unit with the cover removed.**
- **Do NOT apply power to the unit while holding or carrying the unit.**
- **Do NOT touch any torch parts forward of the torch handle (nozzle, heat shield, electrode, etc.) with power switch on.**

WARNING

ARC RAYS can burn eyes and skin;
NOISE can damage hearing.

- **Wear welding helmet with No. 6 or 7 lens shade.**
- **Wear eye, ear, and body protection.**

CAUTION

Position the PCM-500i at least 10 feet (3 meters) from the cutting area. Sparks and hot slag from the cutting operation can damage the unit.

3.2 PCM-500i CONTROLS (FIGURE 3-1)

A. **Power Switch (located on rear panel).** When placed in ON position, the white pilot light will glow indicating control circuit is energized and the cooling fan will run.

B. **Output Current Control.** Adjustable from 10 to 35 amperes to suit cutting conditions.

C. **Air Check Switch.** When placed in ON position, air filter-regulator can be adjusted to desired pressure (65-75 psig) before cutting operations. Allow air to flow for a few minutes. This should remove any condensation that may have accumulated during shutdown period. Be sure to place switch in OFF position before starting cutting operations.

D. **Lock-In Switch.** When placed in ON position, permits releasing torch switch button after cutting arc has been initiated. To extinguish arc at end of cut, press and release torch switch button again or pull torch away from work. When placed in OFF position, torch switch must be held closely by the operator during the entire cutting operation and then released at the end of cut.

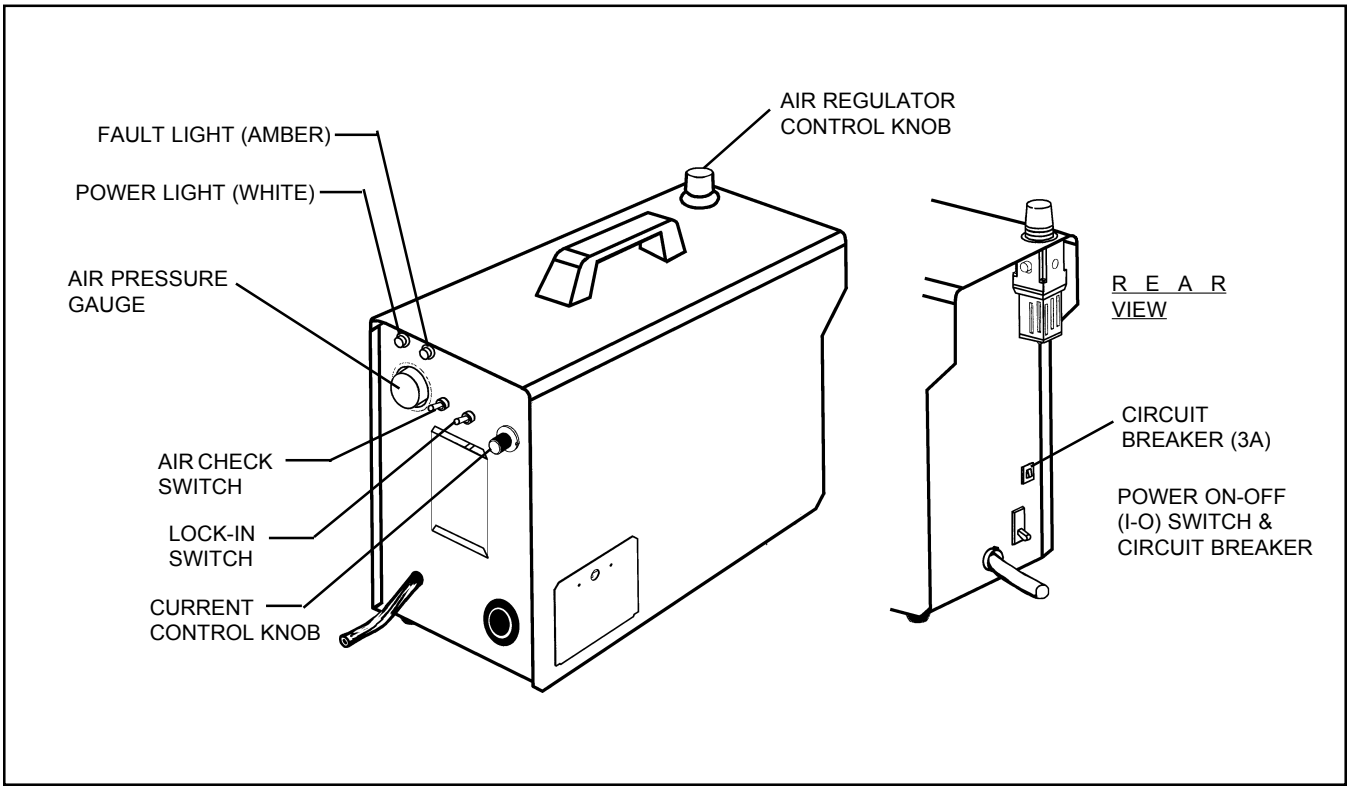


Figure 3-1. PCM-500i Controls

E. Fault Light. Will glow amber under the following conditions and operations will come to a complete stop.

Flow Fault: The fault light will be **mostly on** but will flick off for about 1/10th of a second every second. This indicates that the air flow supply is low.

Over Temperature: The fault light will be **mostly off** but will flick on for about 1/10th of a second every second. This indicates that the duty cycle has been exceeded. Allow the power source to cool down before returning to operate.

High/Low Line Voltage: The fault light will **rapidly blink on and off** (five times per second). This indicates that the input voltage is outside the "+ or -" 15% range of the input rating.

Over-Current: The fault light will be on **continuously**. This indicates that input current has been exceeded.

All fault signals will remain on for a minimum of 10 seconds. If fault clears, all will reset automatically except for over-current. To clear over-current, the power must be shut off for 5 seconds and then turned back on.

3.3 ASSEMBLING PT-31XL COMSUMABLE PARTS

WARNING

Make sure power switch on power source is in OFF position and primary input power is deenergized.

To assemble "XT" consumables, remove the seat supplied with the torch. Insert the plunger into the head. (The plunger is reversible.) Then reassemble the seat firmly with a wrench. Install the electrode, baffle, nozzle, and heat shield as shown in Fig. 3-2. Tighten heat shield snugly but do not overtighten.

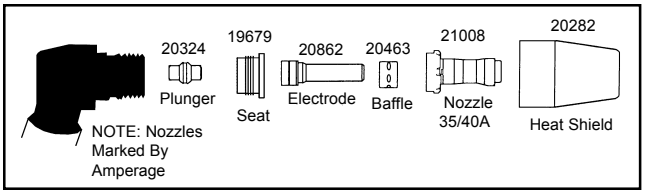


Fig. 3-2 - Assembly of "XT" Consumable Parts

NOTE: If cutting at less than 20 amps, standard consumables illustrated below in Figure 3-2A are recommended. These consumables are supplied in Spare Parts Kit, P/N 19676. Air presssure should be set at 40 to 50 psig.

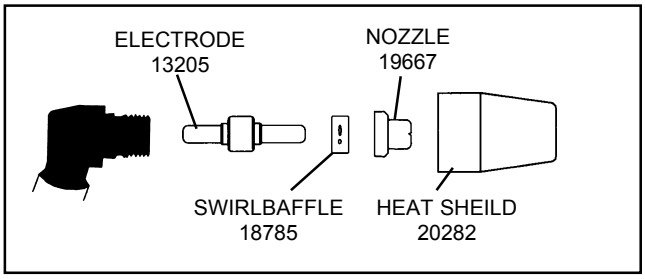


Fig. 3-3A - Assembly of Standard Consumable Parts

WARNING

BE SURE to install the swirl baffle in the torch. Failure to do so would allow the nozzle (tip) to contact the electrode. This contact would permit high voltage to be applied to the nozzle. Your contact with the nozzle or workpiece could then result in serious injury or death by electric shock.

WARNING

The PT-31XL torch head contains a gas flow check valve that acts in conjunction with the flow switch and circuitry within the power source. This system prevents the torch from being energized with high voltage if the torch switch is accidentally closed when the hield is removed. ALWAYS REPLACE TORCH WITH THE PROPER TORCH MANUFACTURED BY ESAB SINCE IT ALONE CONTAINS ESAB'S PATENTED SAFETY INTERLOCK.

For additional torch information, see booklet (F-14-246) packed with the PT-31XL torch.

3.4 CUTTING WITH THE PT-31XL

WARNING

Wear the usual protective gloves, clothing, and helmet. Helmet with filter lens shade No. 6 or 7 should provide adequate protection for your eyes.

WARNING

Never touch any parts forward of the torch handle (tip, heat shield, electrode, etc.) unless the power switch is in the OFF position.

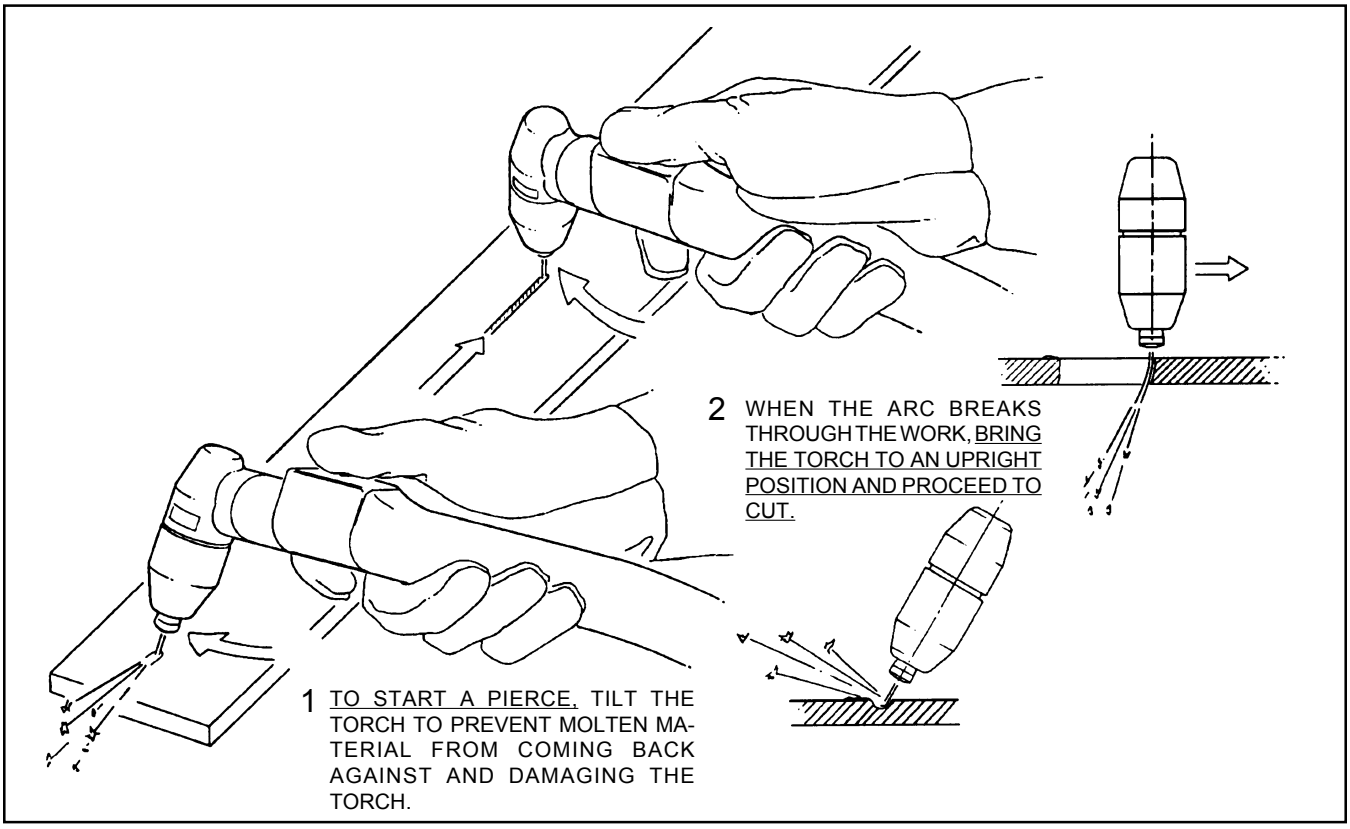


Figure 3-4. Piercing Technique using the PT-31XL

CAUTION: Do not depress the torch switch unless the torch nozzle is touching or within 0.020-in. (less than 1/32-in.) of the workpiece.

CAUTION: Locate the console at least 10-ft. from the cutting work area. Chips and hot slag from the cutting operation can damage the console.

After placing the primary (wall) switch to the ON position

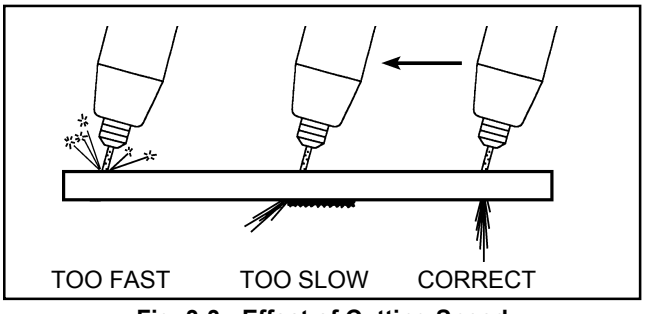


Fig. 3-3 - Effect of Cutting Speed

and making control and air pressure adjustments as described above, proceed as follows:

1. Touch the tip of the torch to the workpiece (or within 0.020-in. of the workpiece) holding the torch at about 15- 30° angle to avoid damaging the tip.

Cutting Speed Range — PCM-500i
(Using Air with XT Consumables @ 75 psi)

Material	Thickness (In.)	Output Current (Amps)	Cutting Speed (ipm)
Carbon Steel (AISI 1020)	1/16	30	180
	1/8	30	75
	1/8	35	85
	1/4	35	30
	3/8	35	15
	1/2	35	12
Stainless Steel (AISI 304)	1/16	30	200
	1/8	30	85
	1/8	35	85
	1/4	35	30
	3/8	35	14
	1/2	35	10
Aluminum (6061)	1/16	30	200
	1/8	30	85
	1/8	35	85
	1/4	35	30
	3/8	35	15
	1/2	35	12

NOTE: The speeds given here are typical for best quality cuts. Your actual speeds may vary depending on material composition, surface condition, operator technique, etc. If cutting speed is too fast, you may lose the cut. With slower speeds excessive dross may accumulate. If speed is too slow, the arc may extinguish. Air cutting typically produces a rough face on stainless steel and aluminum.

2. Depress the torch switch. (Air and high frequency should energize.)
3. Two seconds after depressing torch switch, the plasma arc will start cutting. (If using the LOCK-IN mode, torch switch can be released after establishing the cutting arc.)
4. After starting the cut, the tip can be dragged along the workpiece if cutting up to 1/4'' thick material. When cutting material greater than 1/4'', maintain a 1/8'' tip-to-work (standoff) distance.
5. When ending a cut, the torch switch should be released (press and release if using LOCK-IN mode) and lifted off the workpiece just before the end of the cut to minimize double-arcing which can damage the tip. This is to prevent high frequency from reigniting after cutting arc extinguishes.
6. In the postflow mode, the arc can be restarted immediately by depressing the torch switch. The two second preflow will automatically cancel.

3.5 OPERATING TECHNIQUES

1. **Piercing** - Materials (up to 1/4-in. thick) may be pierced with the torch touching the work. When piercing thicker materials (up to 3/16-in. aluminum or 1/4-in. stainless or carbon steel) immediately raise the torch to 1/16-in. standoff after initiating the cutting arc. This will reduce the chance of spatter from entering the torch and prevent the possibility of welding the tip to the plate. The torch should be angled at about 30° when starting to pierce, and then straightened after accomplishing the pierce.
2. **Grate Cutting** - For rapid restarts, such as grate or heavy mesh cutting, do not release the torch switch. This avoids the 2 second preflow portion of the cutting cycle.

3.6 COMMON CUTTING PROBLEMS

Listed below are common cutting problems followed by the probable cause of each. If problems are determined to be caused by the PCM-500i, refer to the maintenance section of this manual. If the problem is not corrected after referring to the maintenance section, contact your ESAB representative.

A. Insufficient Penetration.

1. Cutting speed too fast.
2. Damaged cutting nozzle.
3. Improper air pressure.

B. Main Arc Extinguishes.

Cutting speed too slow.

C. Dross Formation. (In some materials and thicknesses, it may be impossible to get dross-free cuts.)

1. Cutting speed too fast or too slow.
2. Improper air pressure.
3. Faulty nozzle or electrode.

D. Double Arcing. (Damaged Nozzle Orifice.)

1. Low air pressure.
2. Damaged cutting nozzle.
3. Loose cutting nozzle.
4. Heavy spatter.

E. Uneven Arc.

Damaged cutting nozzle or worn electrode.

F. Unstable Cutting Conditions.

1. Incorrect cutting speed.
2. Loose cable or hose connections.
3. Electrode and/or cutting nozzle in poor condition.

G. Main Arc Does Not Strike.

Loose connections.

H. Poor Consumable Life.

1. Improper gas pressure.
2. Contaminated air supply.

4.1 GENERAL

CAUTION

If this equipment does not operate properly, stop work immediately and investigate the cause of the malfunction. Maintenance work must be performed by an experienced person, and electrical work by a trained electrician. Do not permit untrained persons to inspect, clean, or repair this equipment. Use only recommended replacement parts.

WARNING

Be sure that the wall disconnect switch or wall circuit breaker is open before attempting any inspection or work inside of the PCM-500i.

4.2 INSPECTION AND CLEANING

Frequent inspection and cleaning of the PCM-500i is recommended for safety and proper operation. Some suggestions for inspecting and cleaning are as follows:

A. Check work cable to workpiece connection.

B. Check safety earth ground at workpiece and at power source chassis.

C. Check heat shield on torch. It should be replaced if damaged.

D. Check the torch electrode and cutting nozzle for wear on a daily basis. Remove spatter or replace if necessary.

E. Make sure cable and hoses are not damaged or kinked.

F. Make sure all fittings and ground connections are tight.

CAUTION

Water or oil occasionally accumulates in compressed air lines. Be sure to direct the first blast of air away from the equipment to avoid damage to the PCM-500i.

H. With all input power disconnected, and wearing proper eye and face protection, blow out the inside of the PCM-500i using low-pressure dry compressed air.

4.3 FLOW SWITCH (FIGURE 4-1)

When excessive contamination is found in the air, the flow switch (FS) should be removed, disassembled and cleaned as follows:

A. Ensure the system is shut down and there is no trapped air under pressure in the piping.

B. Remove the piston plug.

C. Remove the spring (FS-4 only). Use care when handling spring to prevent distortion.

D. Remove the piston.

E. Clean all parts with cleaning agent.

NOTE

Ensure cleaning agent does not contain solvents which can degrade polysulfone. Warm water and detergent is recommended for cleaning. Allow all parts to dry thoroughly before reassembly.

Reassemble the flow switch in reverse order.

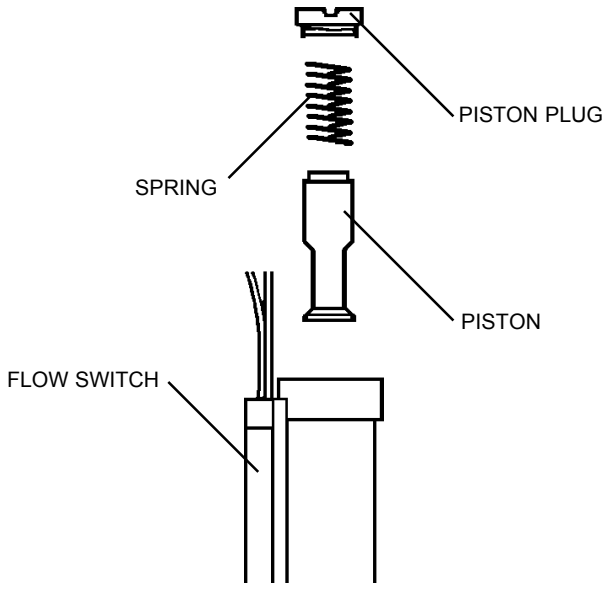


Figure 4-1. Disassembly / Assembly of Flow Switch

5.1 TROUBLESHOOTING

WARNING

ELECTRIC SHOCK CAN KILL! Be sure that all primary power to the machine has been externally disconnected. Open the line (wall) disconnect switch or circuit breaker before attempting inspection or work inside of the power source.

Check the problem against the symptoms in the following troubleshooting guide. The remedy may be quite simple. If the cause cannot be quickly located, shut off the input power, open up the unit, and perform a simple visual inspection of all the components and wiring. Check for secure terminal connections, loose or burned wiring or components, bulged or leaking capacitors, or any other sign of damage or discoloration.

The cause of control malfunctions can be found by referring to the sequence of operations and electrical schematic diagram (Figure 5-1) and checking the various components. A volt-ohmmeter will be necessary for some of these checks.

WARNING

Voltages in plasma cutting equipment are high enough to cause serious injury or possibly death. Be particularly careful around equipment when the covers are removed.

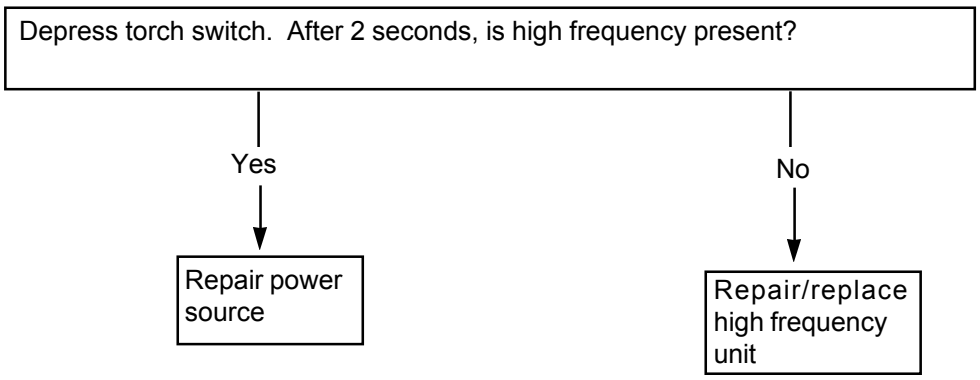
NOTE

Before checking voltages in the circuit, disconnect the power from the high frequency generator to avoid damaging your voltmeter.

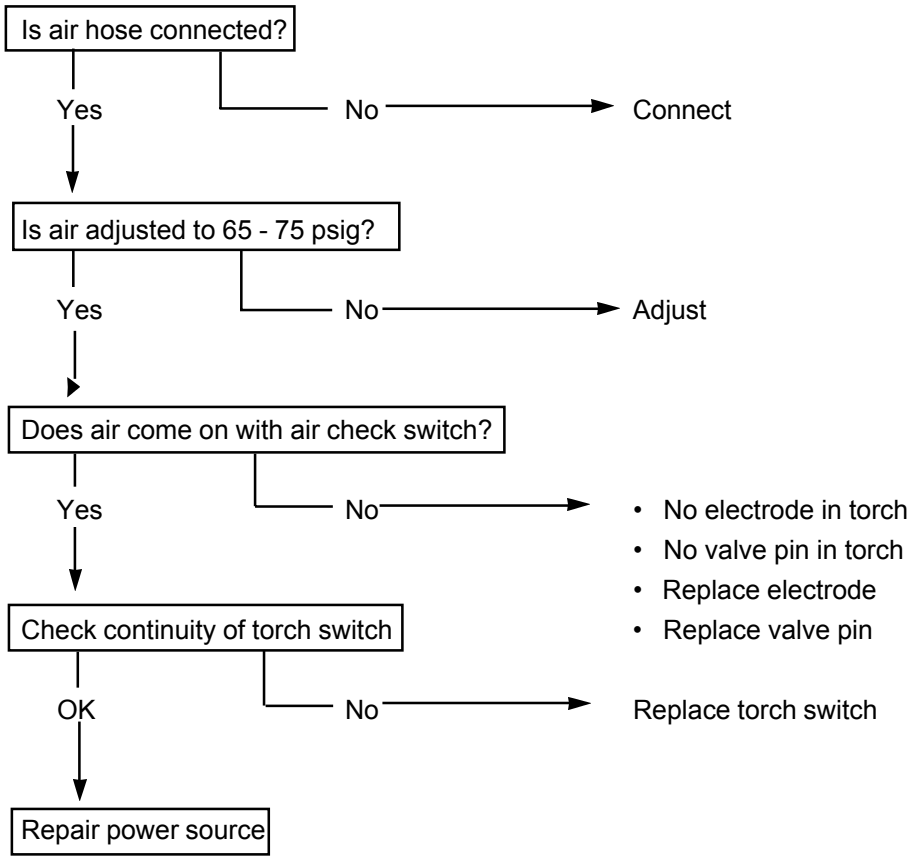
5.2 TROUBLESHOOTING GUIDE

A. Difficult Starting.

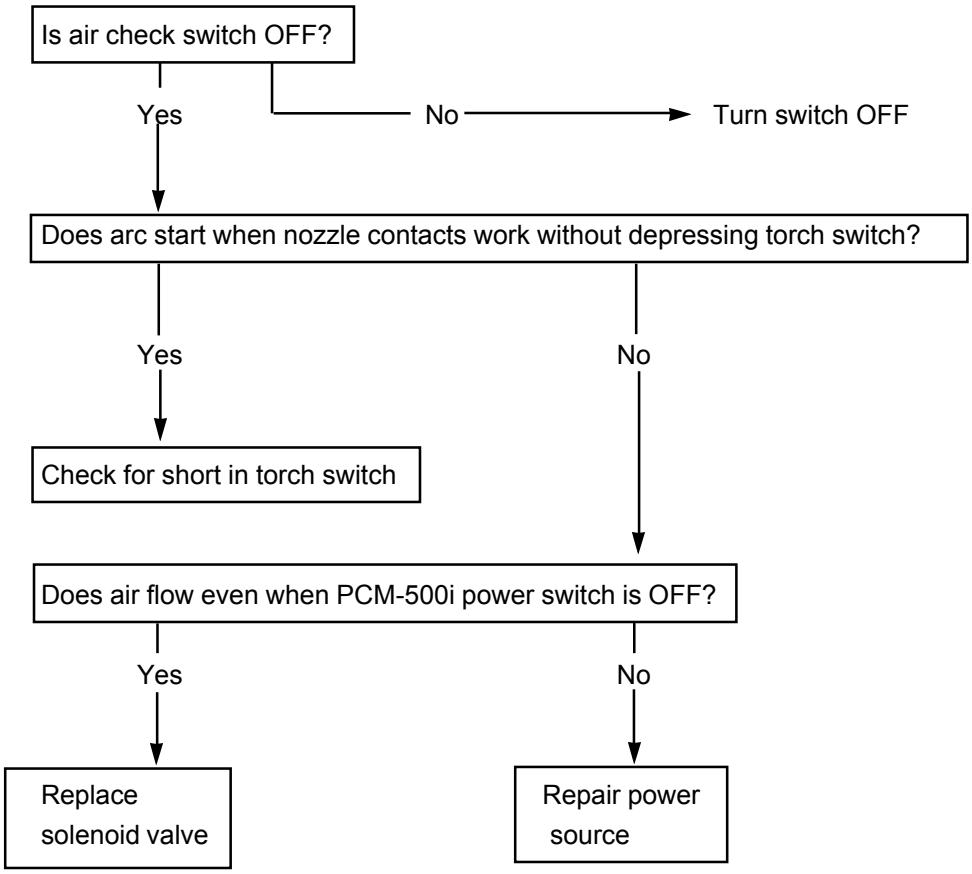
- Change electrode
- Change nozzle
- Check for good, clean connection of work lead to workpiece
- Check air pressure (65 - 75 psig)
- Check torch power cable for continuity



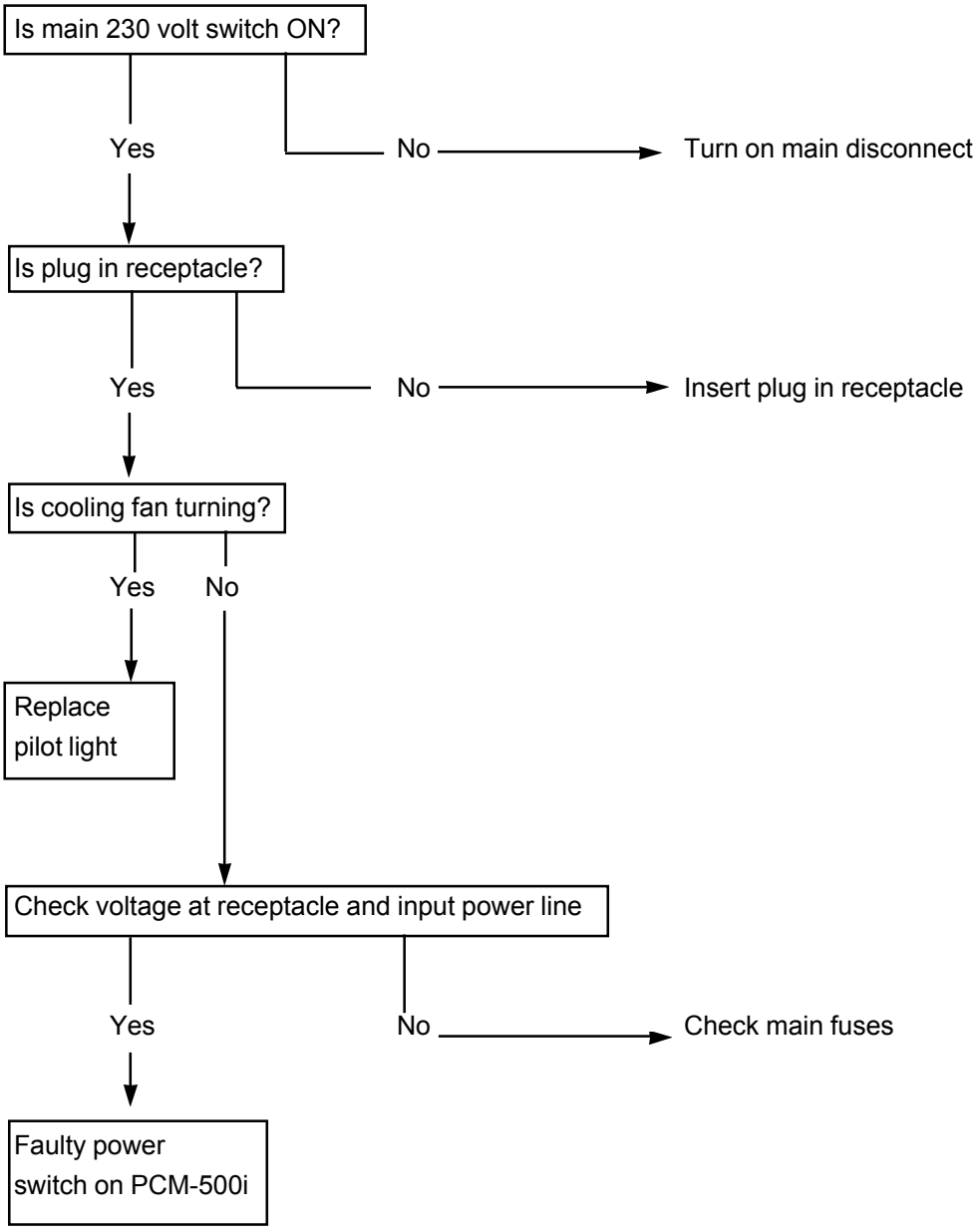
B. No Air


Is air hose connected?
Yes
No
Connect
Is air adjusted to 65 - 75 psig?
Yes
No
Adjust
Does air come on with air check switch?
Yes
No
• No electrode in torch
• No valve pin in torch
• Replace electrode
• Replace valve pin
Check continuity of torch switch
OK
No
Replace torch switch
Repair power source

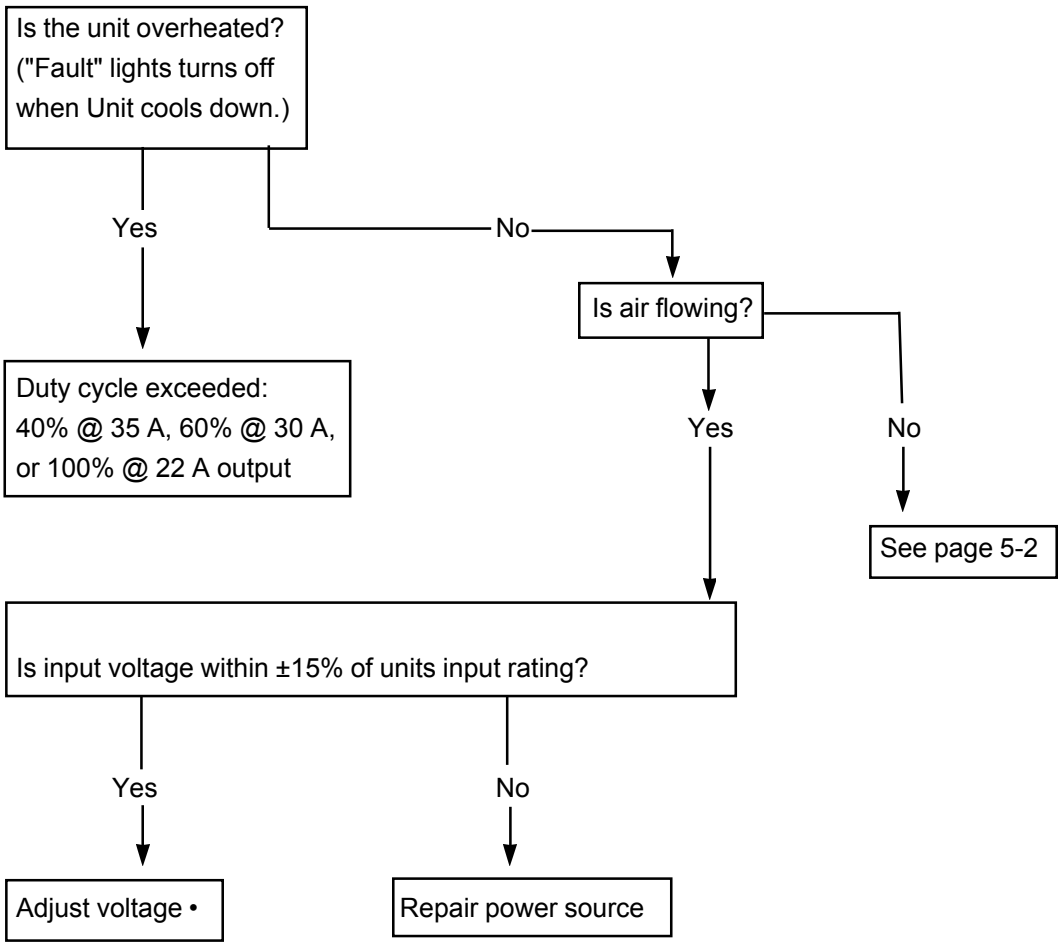
C. Air does not shut off



D. White "Power" light not energized.



E. Amber "FAULT" light ON.

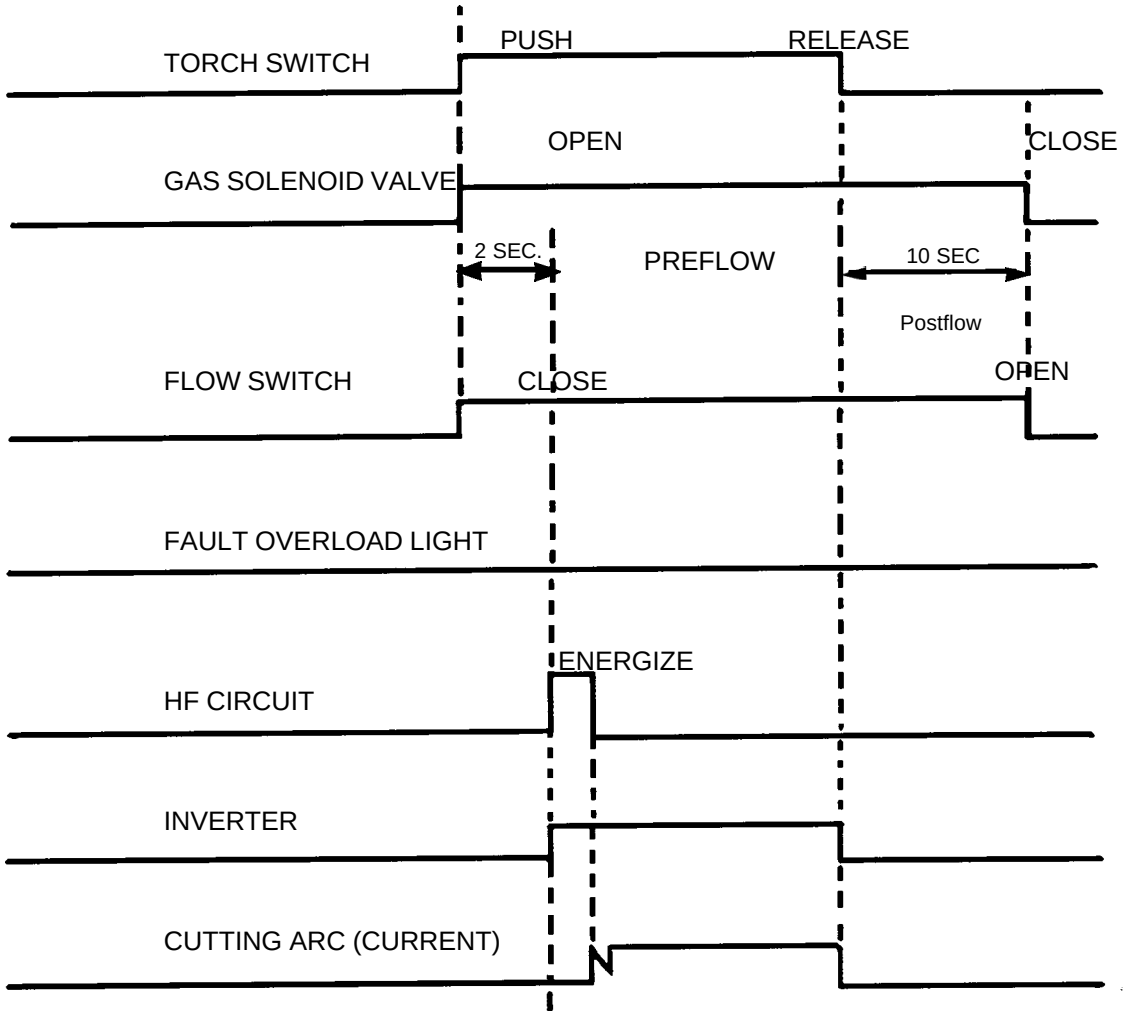


- Fault light will energize if input voltage goes below or above ±15% of units input rating. The light will not turn OFF even when correct voltage is restored. Reset by placing PCM-500i power switch OFF and then ON again.

NOTE: When in LOCK-IN mode, the FAULT light will turn on during second "trigger". This does not affect performance. Turn off.

5.3 SEQUENCE OF OPERATION

A. LOCK-IN "OFF" position

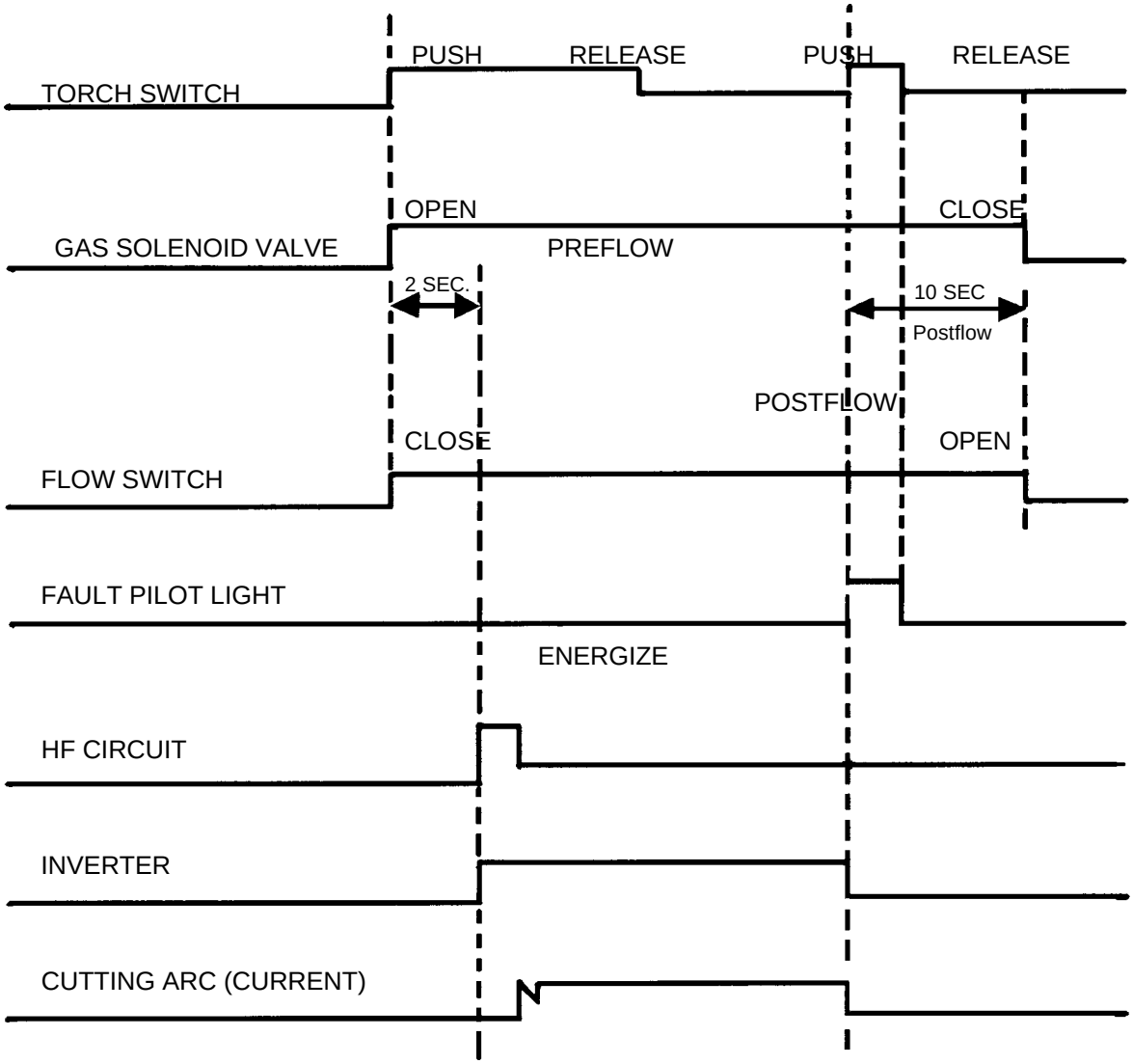


NOTES:

1. When the torch switch is pushed during postflow period, the postflow and preflow times are canceled, and the HF is energized immediately.

2. When the amber fault pilot light comes on, cutting operation should be stopped. The postflow time starts from the moment the torch switch is released.

B. LOCK-IN "ON" position

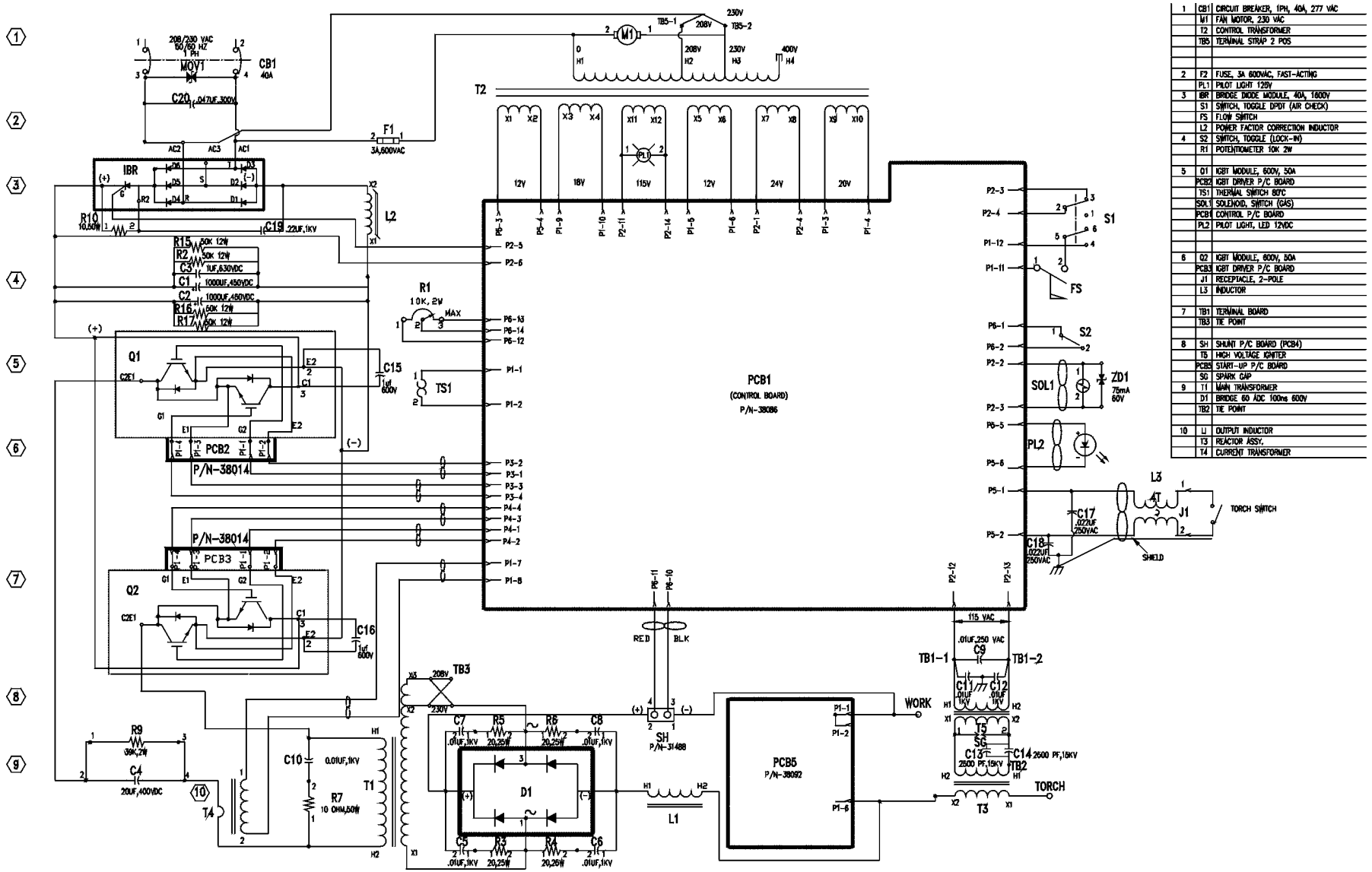


NOTES:

1. When the torch switch is pushed during postflow period, the postflow and preflow times are canceled, and the HF is energized immediately.

2. When the amber fault pilot light comes on, cutting operation should be stopped. The postflow time starts from the moment the torch switch is released.

3. FAULT pilot light is on during second "turn-off" trigger only. This does not affect performance in any way.



NOTE: For 220 V, 1- and 3-phase CE Units, see Supplement F-15-395

Figure 5-1. Schematic Diagram PCM-500i, 200/230 Vac, 50/60 Hz, 1-Phase

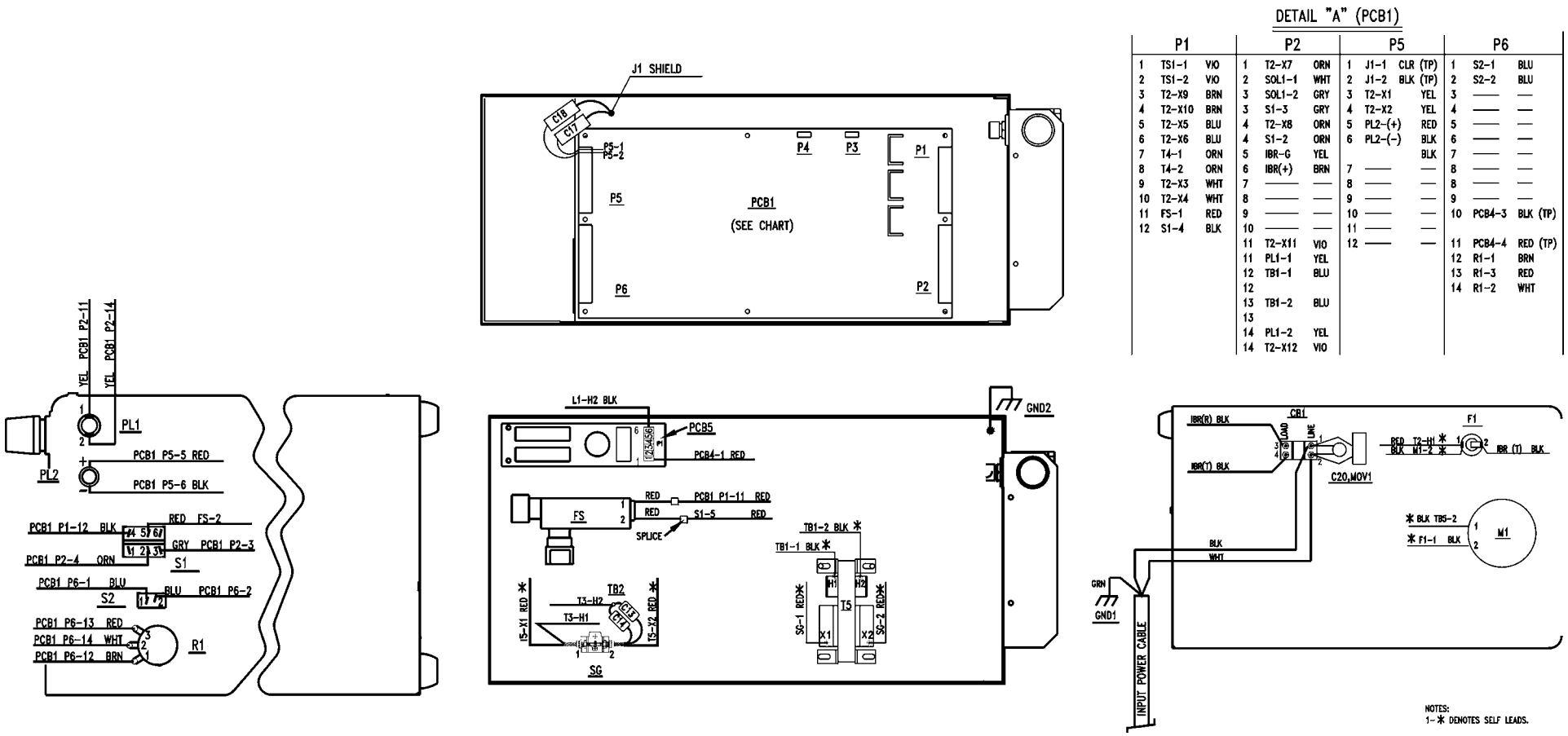


Figure 5-2. Wiring Diagram - PCM-500i 200/230 Vac, 50/60 Hz, 1-Phase (Sheet 1)

D-36403-G (Sheet 2)

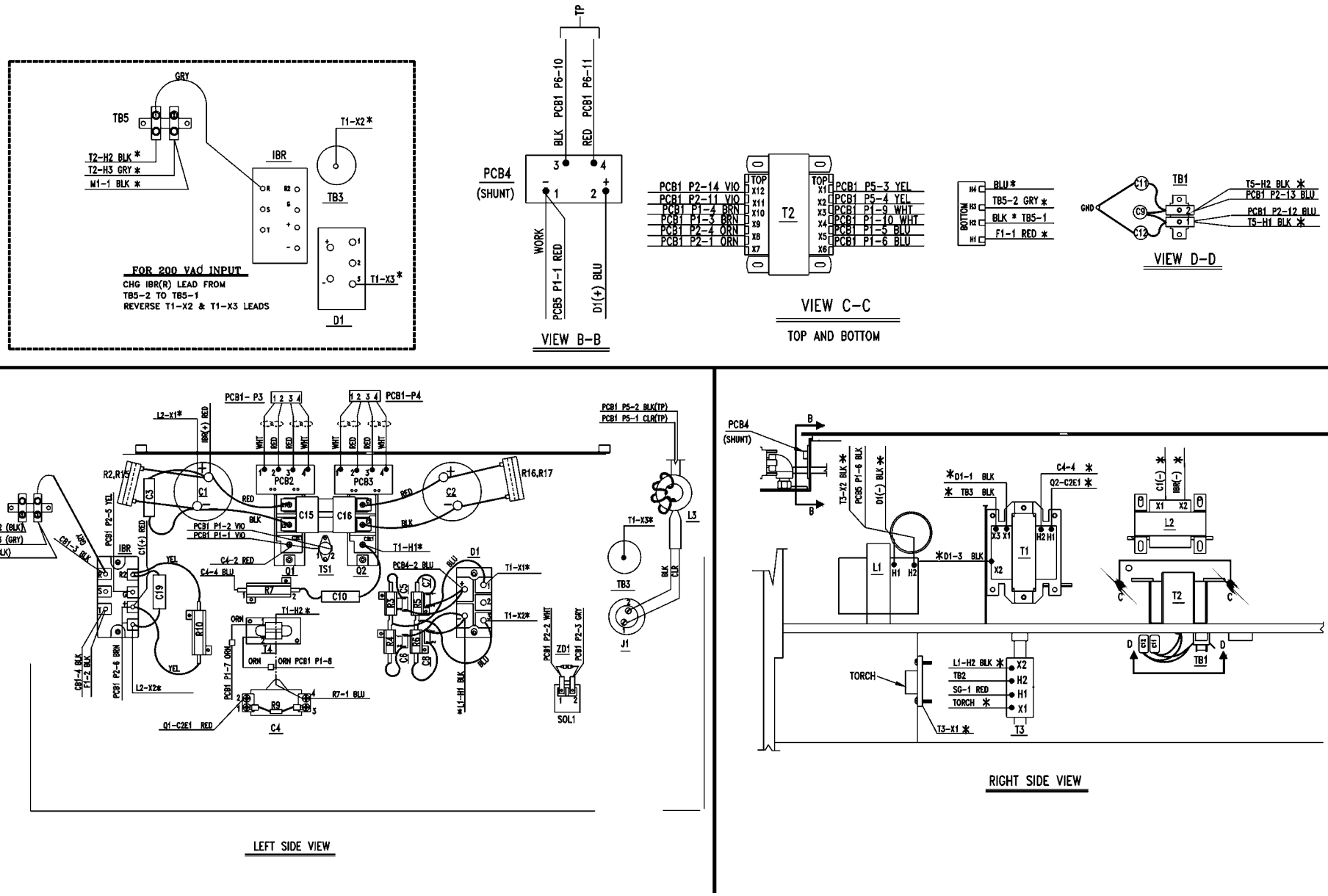


Figure 5-2. Wiring Diagram - PCM-500i 200/230 Vac, 50/60 Hz, 1-Phase (Sheet 2)

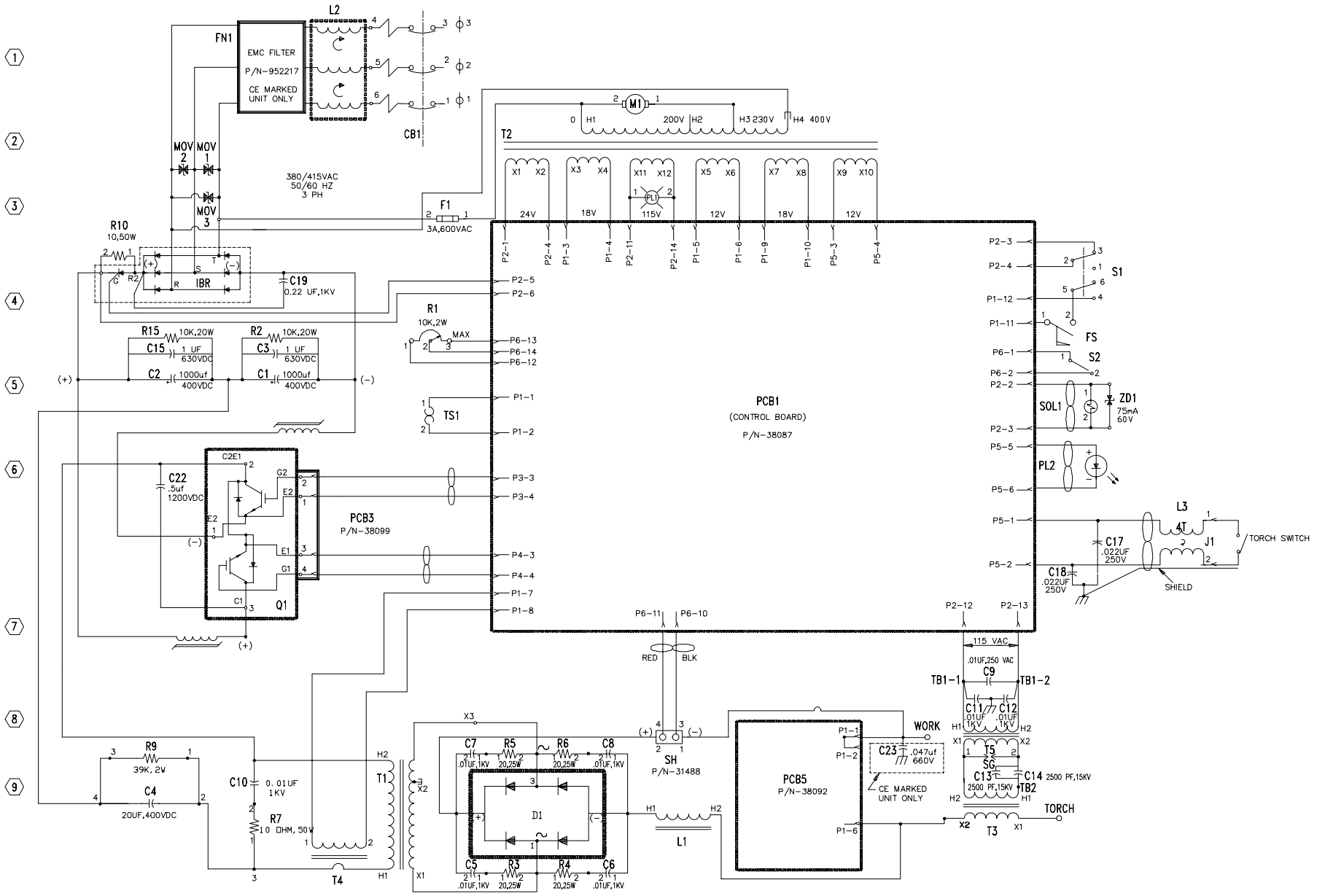


Figure 5-3. Schematic Diagram - PCM-500i 380/415 Vac, 50/60 Hz, 3-Phase

D-36524-E (Sheet 1)

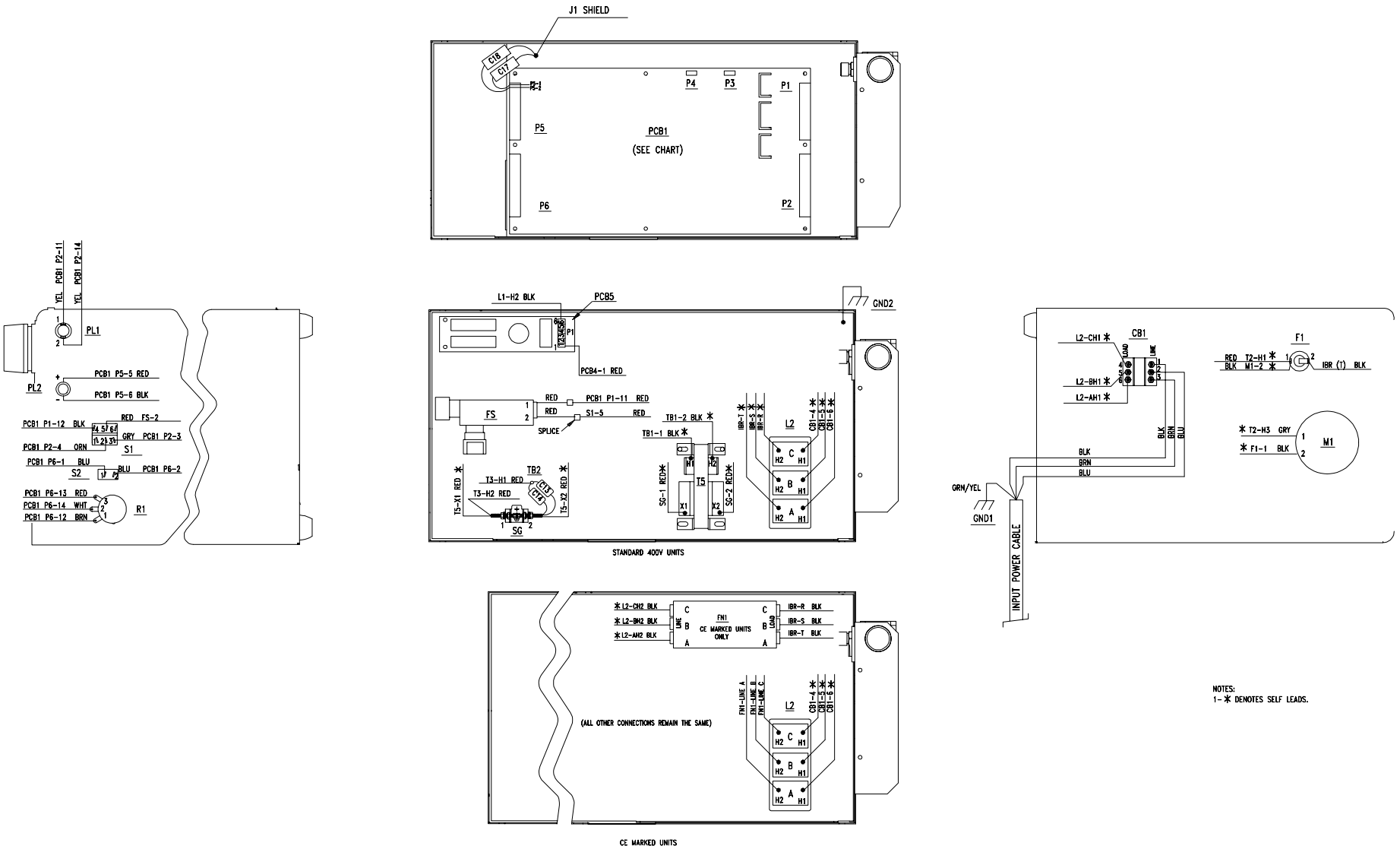


Figure 5-4. Wiring Diagram - PCM-500i 380/415 Vac, 50/60 Hz, 3-Phase (Sheet 1)

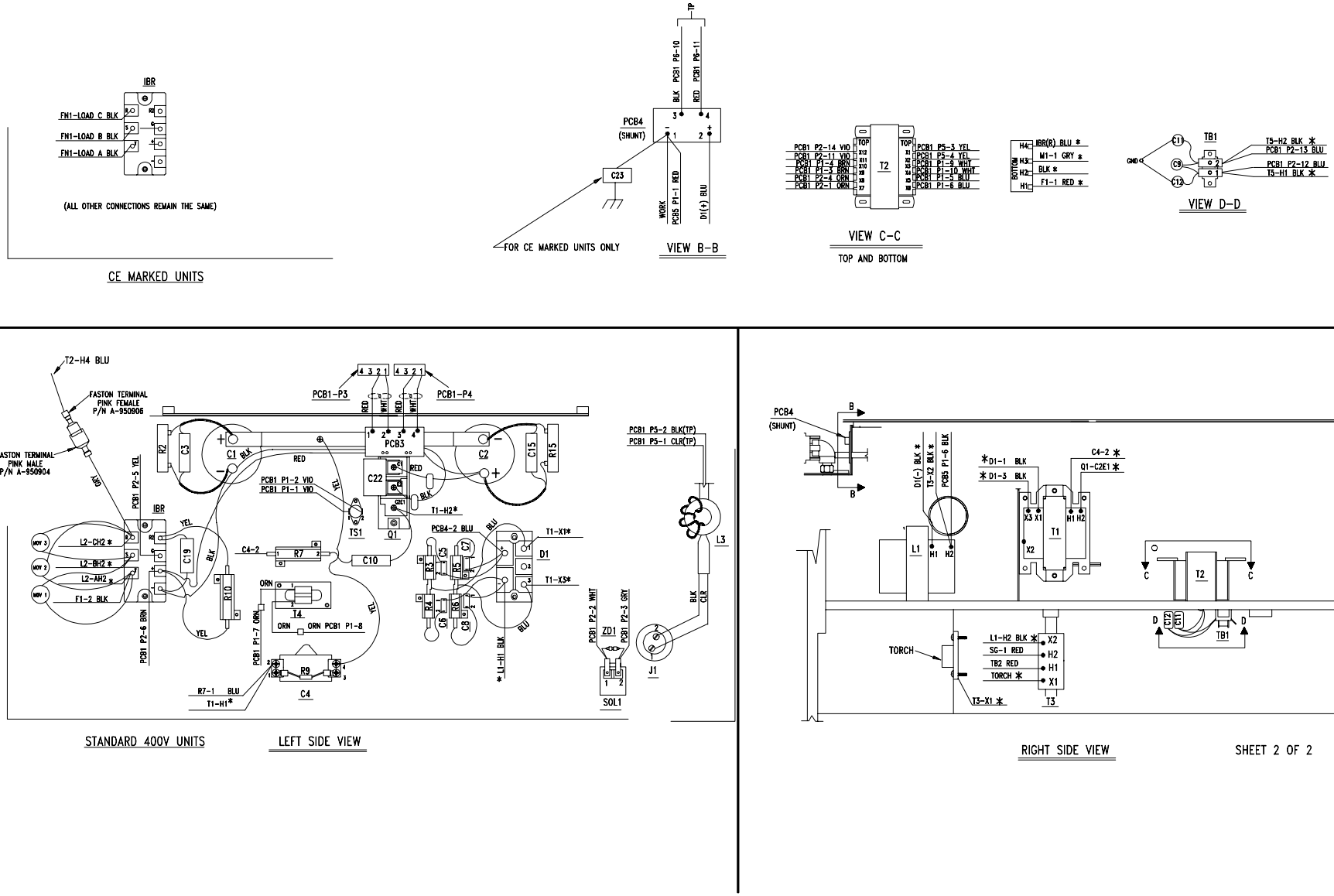


Figure 5-4. Wiring Diagram - PCM-500i 380/415 Vac, 50/60 Hz, 3-Phase (Sheet 2)

6.1 GENERAL

Replacement Parts are illustrated on the following figures. When ordering replacement parts, order by part number and part name, as illustrated on the figure.

Figures 6-1 through 6-4 show replacement parts for the following PCM-500i Power Source Assemblies:

208/230 Vac, 1-phase - P/N 36304 (ESAB)
400 Vac, 3-phase - P/N 36306 (ESAB)

Always provide the series or serial number of the unit on which the parts will be used. The serial number is stamped on the unit nameplate.

6.2 ORDERING

To assure proper operation, it is recommended that only genuine ESAB parts and products be used with this equipment. The use of non-ESAB parts may void your warranty.
Replacement parts may be ordered from your ESAB distributor or from:

ESAB Welding & Cutting Products
Attn: Customer Service Dept.
PO Box 100545, Ebenezer Road
Florence, SC, 29501-0545

Be sure to indicate any special shipping instructions when ordering replacement parts.

To order parts by phone, contact ESAB at 1-843-664-5540. Orders may also be faxed to 1-800-634-7548. Be sure to indicate any special shipping instructions when ordering replacement parts.

Refer to the Communications Guide on back cover of this manual for a list of customer service phone numbers.

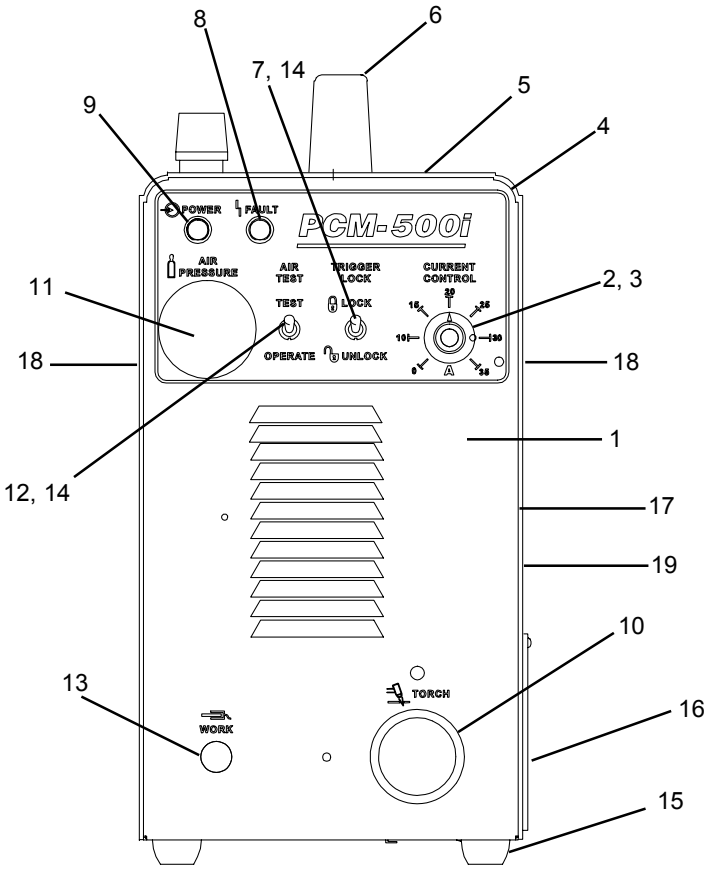


Figure 6-1. Front View, PCM-500i

ITEM NO.	QTY. REQ.	PART NO.	DESCRIPTION	CIRCUIT SYMBOL
1	1	35946	CHASSIS	
2	1	2062018	POTENTIOMETER 10K 2W	R1
3	1	13730611	KNOB	
4	1	35947YL	COVER TOP	
5	1	954707	WARNING LABEL	
6	1	951575	HANDLE (Screws and Lockwashers included)	
7	1	634518	SWITCH TOGGLE DPDT 2POS 15A	S1
8	1	951526	LAMP, WHITE	PL2
9	1	951754	LAMP, YELLOW	PL1
10	2	993426	GROMMET 1.5" ID	
11	1	21711	GAUGE PRESSURE	
12	1	673213	SWITCH TOGGLE SPST 2 POS 15A	S2
13	1	23602576	STRAIN RELIEF	
14	2	951474	SWITCH SEAL	
15	4	182W12	FOOT	
16	1	36330YL	ACCESS DOOR (ESAB)	
	1	36330LG	ACCESS DOOR (L-TEC)	
17	1	2091514	WARNING LABEL	
18	2	13734588	LABEL (ESAB)	
19	1	954008	WARNING LABEL, HI-VOLTAGE	

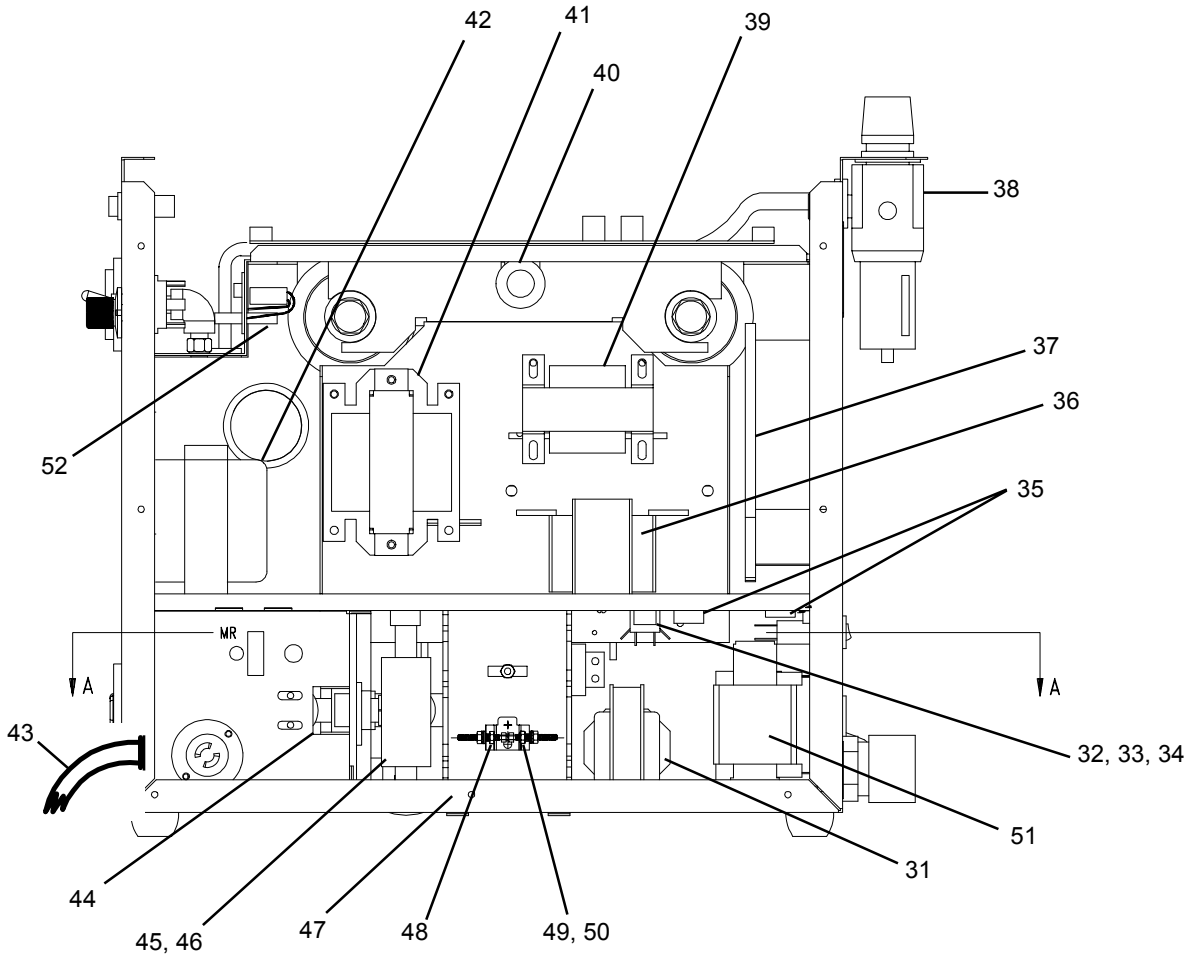
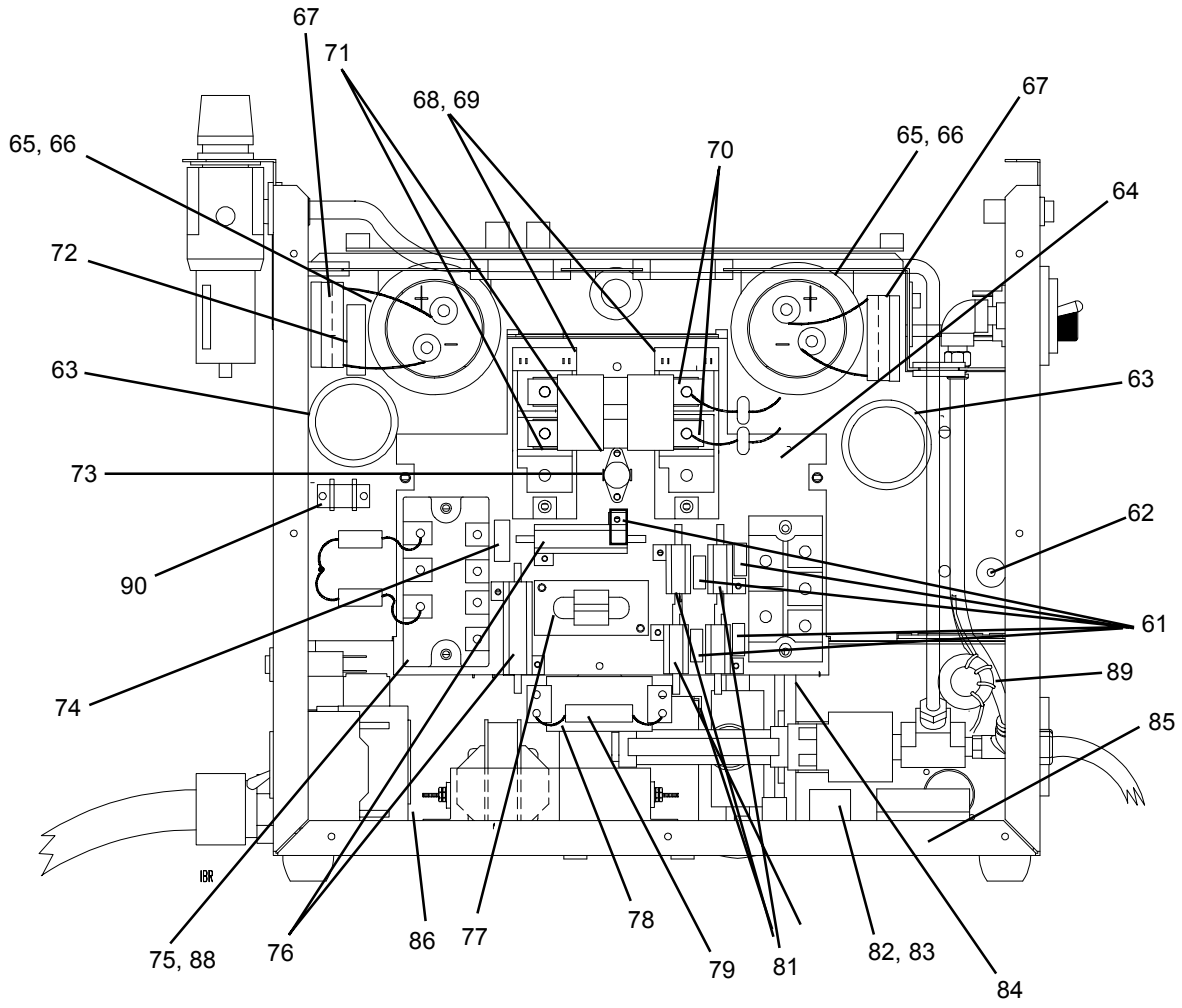


Figure 6-2. Right Side View, PCM-500i

ITEM NO.	QTY. REQ.	PART NO.	DESCRIPTION	CIRCUIT SYMBOL
31	1	951179	HI VOLTAGE TRANSFORMER	T5
32	1	950487	TERMINAL BLOCK 2 POS	TB1
33	1	950204	CAPACITOR 0.1µf 250 VAC	C9
34	2	672348	CAPACITOR 0.01µf 1 KV	C11, C12
35	2	950823	SNAP BUSHING	
36	1	35940	CONTROL TRANSFORMER	T2
37	1	951182	FAN AC AXIAL	M1
38	1	21698	AIR LINE FILTER REGULATOR	
39	1	35945	INDUCTOR POWER FACTOR CORRECTION (230V)	L2
40	1	92W57	GROMMET -.63" ID	
41	1	35941	MAIN TRANSFORMER	T1
42	1	952606	INDUCTOR OUTPUT	L1
43	1	680560	WORK CABLE 25 FT includes CLAMP 13730862	
44	1	182W64	RECEPTACLE, TWIST LOCK MIDGET	J1
45	1	36333	OUTPUT TERMINAL BOARD	
46	1	58V75	ADAPTOR B/A 1/4 NPTM BULKHEAD	
47	1	32969	REACTOR HI FREQ	T3
48	1	36431	SPARK GAP ASS'Y includes (2) POINT 32931	SG
49	1	951569	STANDOFF	TB2
50	2	951342	CAPACITOR 2500µf 15 KV	C13, C14
51	1	952212	3%, 3-PH LINE REACTOR, 8A/PH (400 V)	L2
52*	1	951515	CAPACITOR 0.047µf, 660 V (CE UNITS ONLY)	C23

* Not shown. See Wiring Diagram, Figure 5-4 for location.



200/230 V, 1 Phase Power Source illustrated.

Figure 6-3. Left Side View, PCM-500i

ITEM NO.	QTY. REQ.	PART NO.	DESCRIPTION	CIRCUIT SYMBOL
61	5	951313	CAPACITOR 0.01µF 1KV	C5, 6, 7, 8, 10
62	1	952208	STANDOFF (230, 1-PHASE)	TB3
63	2	673038	SNAP BUSHING	
64	1	952147	HEATSINK	
65	2	950518	GROMMET 2.12" ID	
66	2	952185	CAPACITOR 1000µf 400 VDC (230V)	C1, C2
67	4	17235150	RESISTOR 50K 12W (230 V)	R2
	2	17290210	RESISTOR 10K 20W (400 V)	R2, R15
68	2	951205	IGBT 100 A 600 V (includes PAD 951190) (230 V)	Q1, Q2
	1	952175	DUAL MODULE IGBT 75 A 1200 V (incl. PAD 951191) (400 V)	Q1
69	2	38014	PC BOARD IGBT DRIVER (230 V)	PCB2, PCB3
	1	38099	PC BOARD IGBT DRIVER (400 V)	PCB3
70	2	36404	BUSBAR (230 V)	
	1	36425	BUSBAR (400 V)	
71	2	951940	CAPACITOR 1µf 600 VDC (230 V)	C15, C16
	1	951917	CAPACITOR .5µf 1200 VDC (400 V)	C22
72	1	951028	CAPACITOR 1µf 630 VDC (230 V)	C3
	2	951028	CAPACITOR 1µf 630 VDC (400 V)	C3, C15
73	1	951085	THERMAL SWITCH D/T 176 15 A 120 V	TS1
74	1	2062282	CAPACITOR 0.22µf 1KV	C19
75	1	952149	MODULE INPUT BRIDGE 50 A (includes PAD 951191)	IBR
76	2	17750010	RESISTOR 50 W 10 OHM (PAD 951194)	R7, R10
77	1	32958	CURRENT TRANSFORMER	T4
78	1	951161	CAPACITOR 20µf 400 VDC	C4
79	1	17145339	RESISTOR 39 K 2 W	R9
80	1	951202	FLOW SWITCH 2.5 SCFM SPST	FS
81	4	17721020	RESISTOR 20 OHM 25 W (PAD 951193)	R3, 4, 5, 6
82	1	950249	SOLENOID VALVE 1/4 NPT 24 VAC	SOL1
83	1	951471	ZENER DIODE 60 V 75 mA	ZD1
84	1	952150	OUTPUT BRIDGE MODULE (includes PAD 951192)	D1
85	1	38092	PC BOARD ASSY'S START UP (hidden)	PCB5
86	1	647361	TERMINAL LUG GROUND (hidden)	GND1
88	3	950591	VARISTOR METAL OXIDE 510 (400 V)	MOV 1, 2, 3
89	1	952002	CORE SATURABLE	L3
90	1	950487	TERMINAL BLOCK 2 POS (230 V ONLY)	TB5

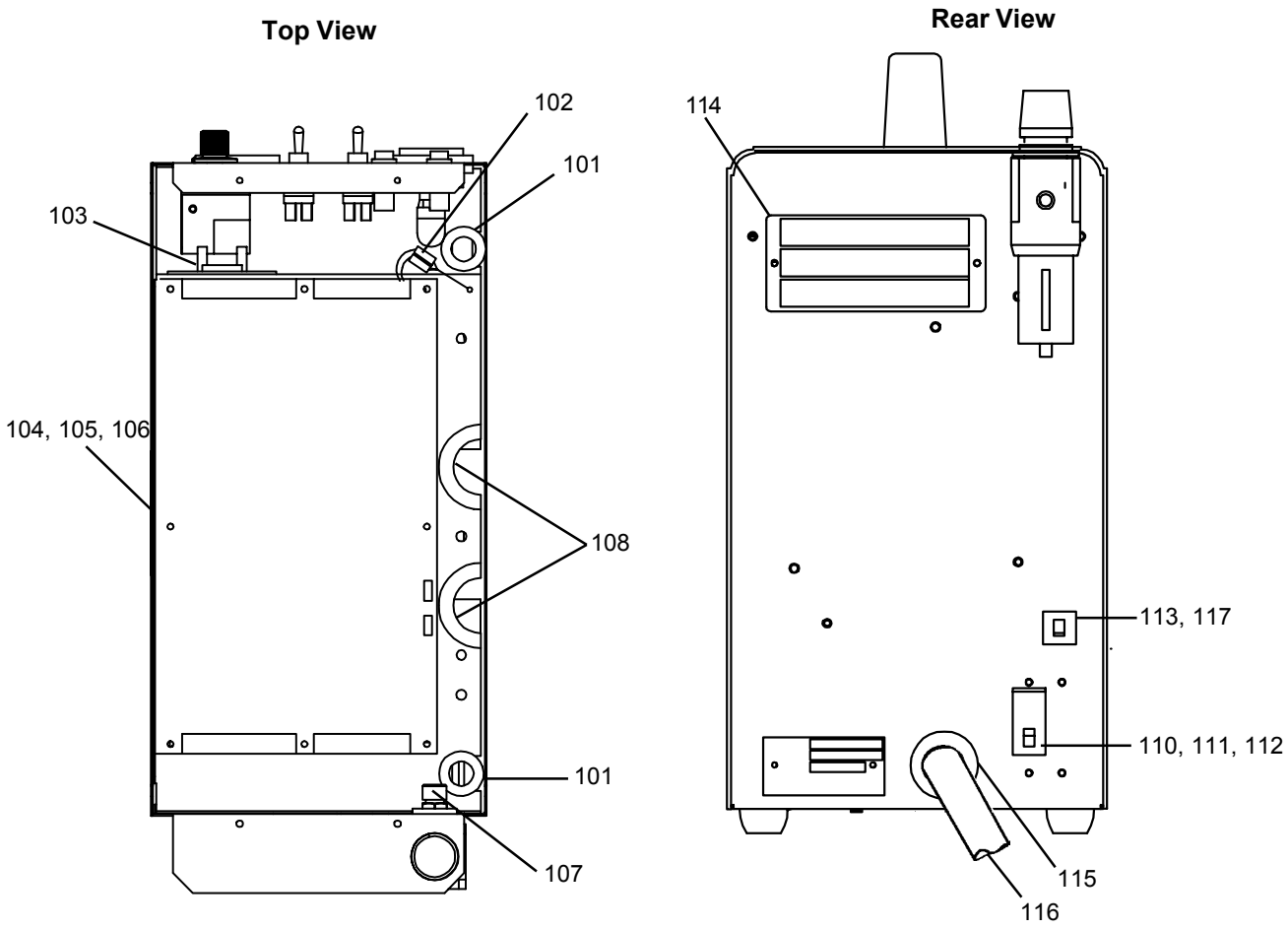


Figure 6-4. Top and Rear View, PCM-500i

ITEM NO.	QTY. REQ.	PART NO.	DESCRIPTION	CIRCUIT SYMBOL
101	2	92W57	GROMMET 0.63 ID	
102	2	951469	CAPACITOR 0.22µf 250 VAC	C17, C18
103	1	31488	PC BOARD SHUNT	PCB4
104	1	38086	PC BOARD ASS'Y CONTROL (230 V)	PCB1
	1	38087	PC BOARD ASS'Y CONTROL (400 V)	PCB1
105	8	950708	SUPPORT, PC BOARD	
106	1	23604891	WARNING LABEL HI VOLTAGE	
107	1	10Z30	ADAPTOR, AIR-WATER	
108	1	993426	GROMMET 1.5" ID (cut into 2 equal halves)	
110	1	952176	CIRCUIT BREAKER 40 A (208/230 v, 1 ph)	CB1
	1	952178	CIRCUIT BREAKER 15 A (ALL 3 PH)	CB1
111	1	951470	CAPACITOR 0.047µf 300 VAC (208/230 V, 1 PH)	C20
112	1	951321	VARISTOR METAL OXIDE (208/230 V, 1 PH)	MOV1
113✸	1	952559	FUSE 3A 600VAC FAST ACTING	F1
114	1	954555	LABEL RATING, 208/230 V 1 PH, ESAB	
	1	954616	LABEL RATING, 400 V 3 PH, ESAB	
115	1	13734727	STRAIN RELIEF	
116	1	34574	CABLE INPUT POWER w/PLUG 10 FT (208/230 V)	
	1	35582	CABLE INPUT POWER, 10 FT (3-PH UNITS)	
117	1	952136	FUSE HOLDER	

✸ Units made prior to May, 1997 were equipped wiith 3A circuit breaker 950829.

The "B" edition of (10/98) of this manual covers the following changes that have occurred between May, 1997 (Serial No. PX-I618001) and September, 1998:

1. Removed the L-TEC and the European CE labeled packages. L-TEC units were discontinued. CE units are now covered in F-15-417 and F-15-424.
2. TB5 Terminal Block (950487) was added to simplify reconnection from 230Vac input to 208Vac.
3. Changed L1 Output Inductor 32909 to 952606 and in series with torch switch leads from J1 to PCB to provide more protection for the PCB.
4. Added saturable core output Inductor (952002) for improved performance.
5. Thermal Pads are now included with IBGT's and Bridge Modules.
6. On the 208/230Vac units, the Q1 and Q2 50A IGBT's (952148) was changed to 100A IGBT (951205).
7. On the 208/230Vac units, the 10-ft. Input Power Cable (34574) was changed to 6-ft. cable (36673).

The "C" edition (1/02) of this manual covers the following changes:

1. Wiring Diagram 36403 has been updated.
2. Item 116 (P/N 36673) was changed to (P/N 34574) and the Plug (208/230 V) was changed from 6 Ft. to 10 Ft.

The "D" edition (06/03) of this manual covers the following changes:

1. Item 80 Description on Page 37 was changed from 0.25 GPM to 2.5 SCFM.

The "E" edition (02/04) of this manual covers the following changes:

1. Revised Spare Parts Kit from 21980 to 0558003301.

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